

THE GRASSES OF ECUADOR, PERU, AND BOLIVIA

By A. S. HITCHCOCK

INTRODUCTION

In 1923 the author visited Ecuador, Peru, and Bolivia for the purpose of studying the grasses of the central Andes. The identification of the specimens collected was difficult, because the descriptions of the species are widely scattered in journals and isolated articles and because the grasses of the region have never been studied and coordinated as a whole. There is no flora of the region nor of any one of the countries, nor are there revisions of any of the larger genera of grasses of the Andes. Having brought together much of the scattered information while identifying the grasses collected during the exploration mentioned above, it seemed desirable to continue the work and prepare an account of all the grasses known from the three countries mentioned.

ITINERARY¹

The expedition to Ecuador was made in cooperation with the Gray Herbarium of Harvard University and with the New York Botanical Garden. Collections were made on the coastal plain at Guayaquil and at the Oil Camp between Guayaquil and Salinas and at Milagro, Teresita, and Panigón Plantation. Later, with Huigra as a center, several localities between Naranjapata and Alausí were visited. From Quito an overland trip was made to Tulcán, stopping at La Rinconada, a ranch in the Province of Carchi. A trip was made also to Pichincha, a mountain near Quito. A second overland trip was made in the southern part of the country from Santa Rosa, on the coast, through Portovelo, El Tambo, and La Toma to Loja, then north through Oña and Cuenca to Huigra. A third trip was made from Ambato to Baños and a day's journey eastward to Cashurco, a short distance west of Mera. The last trip was the ascent of Mount Chimborazo to snow line (about 5,000 meters), starting from Urbina on the railroad.

¹ See also *Scientific Monthly* 19: 611-624. 1924; 20: 47-63. 1925; 20: 163-175. 1925. *Explorations and Field Work in 1924*, *Smiths. Misc. Coll.* 77³: 57-67. 1925, *Ann. Rep. Smiths. Inst.* 1924: 335-351. 1925.

The itinerary in Peru included visits to the central and southern parts of the country. Landing at Callao, a journey was made inland over the marvelous mountain railroad to Oroya and Cerro de Pasco. Then followed a side trip to Tarma, La Merced, and Colonia Perené, a large coffee plantation on the Perené River, to the east, and to Atocsaico Ranch near Junín. From Cerro de Pasco there were excursions to La Quinhua and to Goyllarisquisca. Cuzco was reached by railroad from Mollendo. Collections were made at Mollendo, Arequipa, the experiment station at Chuquibambilla and Cuzco, and in the Urubamba Valley to the north at Ollantaytambo.

Four sections in Bolivia were visited. The first trip was from La Paz to Illimani, one of the highest peaks in Bolivia. The mountain lies about 30 miles east of the city and rises to the height of 6,619 meters (21,700 feet). The ascent was made to one of the large glaciers (about 5,000 meters). The second trip was to the Yungas in company with Dr. Otto Buchtien, the well-known German botanist, long resident in Bolivia. Collections were made at Pongo, at that time the terminus of the railroad from La Paz, and at various points in the Provinces of Sur-Yungas and Nor-Yungas. The journey led through San Felipe, La Florida, Chulimani, Coripata, Coroico, Bella Vista and back to Pongo. The third trip was to Cochabamba; the fourth from Atocha to La Quiaca in northern Argentina. Atocha was the terminus of the railroad under construction to connect the Bolivian system with the terminus of the Argentine system at La Quiaca.

GRASS MATERIAL AVAILABLE FOR STUDY

The United States National Herbarium is unusually rich in Andean grasses. Aside from the grasses collected during the expedition outlined above, there is the original Buchtien Herbarium recently acquired by the National Museum. This contains the best collections of grasses ever made in Bolivia. In addition to the specimens collected by Buchtien, there are many collected by Asplund and a few by Pflanz. Other notable collections are those of Francis Macbride and his assistants in central Peru, made under the auspices of the Field Museum, Chicago; the sets distributed by Dr. H. H. Rusby, including the collections of Miguel Bang and those of the Mulford biological exploration, made chiefly by Rusby, White, and Cárdenas; a series of grasses from several South American countries, including Ecuador, Peru, and Bolivia, collected by E. W. D. and Mary M. Holway, chiefly to aid in identifying the hosts of fungi obtained at the same time. The large and important sets mentioned above are complete or nearly so. Among the smaller sets are those made in Ecuador and Peru by Dr. J. N. Rose, in the vicinity of Quito by Brother Harteman, in central western Peru by the Wilkes exploring expedition, in the Urubamba Valley, Peru,

by Cook and Gilbert, and in the vicinity of Juliaca, Peru, by Dr. H. V. Harlan, of the United States Department of Agriculture.

While in Quito the author had the privilege of consulting the herbarium assembled by Prof. Luis Sodiro, the well-known Ecuadorean botanist. The herbarium is at the Colegio de San Gabriel. At the time of the author's visit Father Luis Mille was in charge of the collection. Father Mille has collected extensively in Ecuador himself. He courteously permitted the author to select a series of duplicates from the Sodiro Herbarium and from his own collections.

The National Herbarium contains less complete sets of the grasses collected in Ecuador by Jameson, Spruce, Eggers, Lehmann, Anthony and Tate, and Stübel; in Peru by Lechler; and in Bolivia by Mandon, Herzog, Steinbach, and Fiebrig.

The herbarium of Prof. E. Hackel, the eminent Austrian agrostologist, was acquired a few years ago by the Natural History Museum of Vienna. This contains the types of the large number of species described by Professor Hackel from all parts of the world. In 1922 Agnes Chase, associate in systematic agrostology, visited Vienna for the purpose of studying this collection. With the permission of the director of the department of botany, Dr. A. Zahlbruckner, Mrs. Chase obtained a series of duplicates and fragments of the type specimens. Among these were many having a special bearing on the present work, especially the types of species described from the collections of Sodiro in Ecuador and of Buchtien in Bolivia.

Dr. R. Pilger, of the Berlin Herbarium, has very courteously contributed to the National Herbarium portions of the type specimens of nearly all the species he has described, based on the collections of Weberbauer in Peru.

The directors of several European herbaria have contributed fragments of type specimens. The most important collection from Ecuador of which no duplicates are in the United States National Herbarium is that made by Humboldt and Bonpland in their famous journey of exploration through northern South America. Many of the types of new species based upon this collection have been examined in Paris by the writer and by Mrs. Chase, and Dr. H. Lecomte, director of the department of botany of the Museum of Natural History, has cooperated by examining others.

The director of the Royal Botanic Gardens at Kew, England, Dr. Arthur W. Hill, kindly lent for study a large series of mounted specimens of grasses from Ecuador, Peru, and Bolivia, contained in the Kew Herbarium. This series contained the collections of Jameson, Spruce, and André from Ecuador, and of Ball and Mathews from Peru. There was also a good representation of the collec-

tions of Lechler from Peru and of Mandon from the vicinity of Sorata, Bolivia.

Prof. Carl Mez, of Königsberg, has described many grasses from various parts of the world, including Ecuador, Peru, and Bolivia. In his studies he has used many European herbaria, but unfortunately he has not stated in what herbaria his cited specimens are to be found. Many of his types have been located but several are still unplaced. Some of his species can not be identified from the descriptions alone.

The most important early collection of plants made in Peru was that of Haenke, the grasses of which were described by Presl.² The author examined the types of the grasses of this collection in 1907. These types were in part at the herbarium of the National Museum at Prague and in part at the herbarium of the German University in the same city.

Altogether the material at hand for a study of the grasses of the central Andes is fairly abundant and representative as compared with that from other parts of South America.

SCOPE OF THE WORK

As stated above, information has been collated from many sources, but the list of grasses is based primarily upon the specimens in the United States National Herbarium. A few specimens from other herbaria have been examined, but in all cases where the specimen is not in the National Herbarium its location is indicated.

An attempt has been made to account for all the species described from Ecuador, Peru, and Bolivia. The synonymy includes all such species and in addition the more important synonyms as given in the works bearing upon the botany of the Andes.

The geographical limits of the three Andean countries are accepted as commonly given on our standard maps, such as those of the Century Atlas, in which Tacna is included in Chile. There are many disputed boundary lines, and much territory is claimed by more than one country. The disputed areas have not been given consideration because the specimens cited were not collected in these parts.

The range of each species is given, but the detailed citation of specimens is limited to Ecuador, Peru, and Bolivia.

It has been found advisable to exclude from consideration the Galápagos Islands, a dependency of Ecuador. The flora is largely endemic and not closely related to the flora of Ecuador; moreover, it has been rather intensively studied and recorded in several publications.³

² *Reliquiae Haenkeanae*. 1830.

³ Alban Stewart. *A Botanical Survey of the Galápagos Islands*, Proc. Calif. Acad. ser. 4. 1: 7-288. 1911. This includes a bibliography.

In order to aid in identification the keys have been supplemented by brief descriptions of the species.

To conserve space, the localities in most cases have been cited by name only, without giving the province or department. The larger places are given on standard maps. The smaller places are to be found only on large or specialized maps, and some localities found on the labels of plants have not yet been identified. The localities cited have been brought together for ready reference and will be found at the end of the list of species (p. 511).

For species described originally from Ecuador, Peru, or Bolivia the type is indicated in the paragraph on range. The type specimens of the synonyms are given after the formal bibliographic citation if the type is from one of the countries mentioned. If the type is from some other country no specimen is given.

BOTANICAL EXPLORATION IN THE CENTRAL ANDES

The first important botanical exploration of Ecuador was made by Humboldt during his famous journey through Venezuela, Colombia, Ecuador, and Northern Peru. The botanical collections were made chiefly by Bonpland, and the plants were described by Kunth.⁴ From Colombia Humboldt's party passed through the central valley of Ecuador and into Peru as far south as Cajamarca.⁵

Jameson, a professor in the University of Quito, collected for many years and sent his plants to Kew. He published a flora⁶ of the region, but the work does not contain the grasses.

The next collection of importance was made by Spruce. After having spent several years in the Amazon Valley, he ascended into Ecuador from the east, by way of the Pastaza Valley. He collected mostly in the vicinity of Baños, Ambato, Riobamba, Quito, and Chanduy. He also visited northern Peru, making his headquarters at Tarapoto. His collections are at Kew. Wallace published his life and letters.⁷

The botanical exploration in Peru is very fully outlined by Weberbauer in his account of the vegetation of the Peruvian Andes⁸ and

⁴ Voyage de Humboldt et Bonpland. Sixième Partie. Botanique. Nova Genera et Species Plantarum. Kunth.

⁵ The itinerary of the party in Ecuador and Peru has been worked out at Kew. See Kew Bull. Misc. Inf. 1926: 181. 1926.

⁶ William Jameson. Synopsis Plantarum Quitoensium. 1865.

⁷ A. R. Wallace. Notes of a Botanist on the Amazon and Andes, by Richard Spruce. 2 volumes, 1908.

⁸ Die Pflanzenwelt der peruanischen Anden (Die Vegetation der Erde, vol. 12). A. Weberbauer, 1911. A history of botanical collecting in Peru is given.

in Bolivia by Herzog in his account of the vegetation of the Bolivian Andes.⁹

PHYSIOGRAPHIC AREAS

The distribution of the vegetation as modified by altitude and rainfall has been discussed by Weberbauer for Peru and by Herzog for Bolivia, in their accounts of the vegetation of the Peruvian and Bolivian Andes referred to above. A corresponding account for Ecuador has not been published. A good account of the physiographic features of that country has been given by Wolf,¹⁰ but this author gave no special attention to the vegetation.

In the area under consideration there are three primary divisions. Along the Pacific there is a coastal plain, from 25 to 100 miles wide, rising gradually to the foot of the Andes or Cordillera. In northern Ecuador the rainfall is heavy and the climate humid. The rainfall decreases rapidly southward and the coastal region of Peru is a desert. The valleys of the numerous rivers flowing from the mountains to the sea are utilized for agricultural purposes, the crops thriving under irrigation.

Approximately parallel to the coast runs the mighty mountain backbone of the continent, the Andes or Cordillera. The western slope is for the most part steep, and there is only a very narrow region of foothills. In Ecuador there are two main ranges of the Cordillera with a high valley between, this broken by several cross ranges. The interior valley is from 2,000 to 3,000 meters altitude. There are numerous high peaks, Chimborazo (6,310 meters) and Cotopaxi (5,943 meters) being the best known.

In Peru the western range continues southward to the southern border and then forms the boundary line between Bolivia and Chile. The eastern range is less marked and has numerous branches. In a general way it continues parallel to the western range through Peru to the east of Lake Titicaca, then turns eastward and southward, gradually merging into the general slope in Argentina. Thus there is a series of high valleys in Peru, in the southern part becoming plateaus 3,500 to 4,000 meters in altitude. In Bolivia the ranges spread so as to form a great central plateau 400 miles long and 200 to 300 miles wide, broken by many spurs, branches, and peaks. The altitude here is 3,600 to 4,200 meters (12,000 to 14,000 feet).

The eastern slope of the Cordillera merges into the valleys of the Amazon and Paraguay Rivers. In Ecuador and Peru the slope is

⁹ Die Pflanzenwelt der bolivischen Anden (Die Vegetation der Erde, vol. 15), Th. Herzog, 1923. A history of botanical exploration in Bolivia is given.

¹⁰ Geografía y Geología del Ecuador. Teodoro Wolf, 1892. See also Naturalists' Guide to the Americas, 666 (1926), a short account of Ecuador by Wilson Popenoe.

precipitous and heavily forested and has a high rainfall. In Bolivia south of the Beni region the slope is more gradual and has a meager rainfall. The forest changes to scrub and finally gives way to grassy plains.

The high valleys and plateaus are for the most part treeless. Except in protected places crops are not grown above about 3,500 meters. In Ecuador and Peru the uplands have sufficient rainfall for stock raising. In Bolivia much of the plateau is arid and in the southern part is a desert. Vegetation in the mountains extends to snow line, which is at about 5,000 meters.

ECONOMIC GRASSES

Only three grasses are cultivated for forage in the lowlands. Para grass (*Panicum barbinode*) and Guinea grass (*Panicum maximum*) are widely grown in tropical regions. A native grass (*Axonopus scoparius*) has been brought into cultivation, and gives promise of much value. It is called "gamalote" in Ecuador, "maicillo" in Peru, and "cachi" in the Yungas region of Bolivia.

In the temperate regions of the Cordillera are often grown the European forage grasses, such as ryegrass (*Lolium multiflorum*) and bluegrass (*Poa pratensis*). Maize (*Zea mays*) is commonly used for forage. The chief forage plant of these regions, however, is alfalfa (*Medicago sativa*).

In the uplands of Peru the native grasses produce abundant forage, which is increasingly utilized for sheep and cattle. Over large areas the dominant grass is ichu grass (*Stipa ichu*), a bunch grass with stiff involute leaves. This is grazed by stock only when the leaves are young. Sheep confine themselves mostly to the small species, such as *Muhlenbergia ligularis*, that grow between the bunches of ichu. The forage at high altitude is derived from a great number of native species belonging chiefly to *Festuca*, *Calamagrostis*, and *Poa*.

DESCRIPTIVE LIST, WITH KEYS

KEY TO THE TRIBES

Series 1. POATAE

Spikelets 1 to many-flowered, the reduced florets, if any, above the perfect florets (except in Phalarideae; 1 or more sterile lemmas below in Bambuseae and in *Urtola*); articulation usually above the glumes.

Plants woody (scarcely so in *Neurolepis*), low or tall shrubs, often clambering, rarely tall trees. Spikelets 1 to many-flowered, 1 to several sterile lemmas below the perfect ones.-----BAMBUSEAE (p. 299).

Plants herbaceous (somewhat woody in *Arundo*).

Stigmas 3. Stamens 6; spikelets 1-flowered; lemma with a long, much-contorted awn.....6. **STREPTOCHAETA**^{10a} (p. 313).

Stigmas 2.

Spikelets with 2 staminate, neuter, or rudimentary lemmas unlike and below the fertile lemma; no sterile or rudimentary florets above.

PHALARIDEAE (p. 303).

Spikelets without sterile lemmas below the perfect floret or these rarely present and like the fertile ones.

Spikelets unisexual, 1-flowered; plants monoecious.

Lemma terete; fruit adhesive by hooked hairs; blades elliptic, broad.

81. PHARUS^{10a} (p. 420).

Lemma globular, smooth; blades linear, narrow...**ZIZANIEAE** (p. 304).

Spikelets perfect (rarely unisexual but then not as above), usually articulate above the glumes.

Spikelets articulate below the glumes, 1-flowered, very flat, the lemma and palea about equal, both keeled; glumes small or wanting.

ORYZEAE (p. 303).

Spikelets articulate above the glumes (rarely below, but the glumes, at least one, well developed).

Spikelets 1-flowered in groups (short spikes) of 2 to 5, the groups racemose along a main axis, falling entire; lemma and palea thinner than the glumes.....**NAZIEAE** (p. 303).

Spikelets not as above.

Spikelets sessile on a usually continuous rachis (short-pedicellate in *Leptochloa*; the rachis disarticulating in *Hordeum*).

Spikelets on opposite sides of the rachis; spike terminal, single.

HORDEAE (p. 301).

Spikelets on one side of the rachis; spikes usually more than 1, digitate or racemose.....**CHLORIDEAE** (p. 303).

Spikelets pedicellate in open or contracted, sometimes spike-like, panicles.

Spikelets 1-flowered.....**AGROSTIDEAE** (p. 302).

Spikelets 2 to many-flowered.

Glumes as long as the lowest floret, usually as long as the spikelet; lemmas awned from the back (spikelets awnless in *Dissanthellum*, awn from between lobes in *Danthonia*).

AVENEAE (p. 301).

Glumes shorter than the lowest floret; lemmas awnless or awned from the tip or from a bifid apex.

FESTUCEAE (p. 299).

Series 2. PANICATAE

Spikelets with 1 perfect terminal floret (disregarding the few monoecious genera and the staminate and neuter spikelets) and a sterile or staminate floret below, usually represented by a sterile lemma only, 1 glume sometimes (rarely both glumes) wanting; articulation below the spikelets (except in *Melinideae*), either in the pedicel, in the rachis, or at the base of a cluster of spikelets, the spikelets falling entire, either singly, in groups, or together

^{10a}*Streptochaeta* and *Pharus* are anomalous genera that are not here assigned to tribes.

with joints of the rachis; spikelets, or at least the fruits, more or less dorsally compressed. (*Panicum quadriglume* has 2 sterile lemmas; *Isachne* has 2 perfect florets.)

Glumes membranaceous; fertile lemma and palea indurate or at least as firm as the glumes; sterile lemma like the glumes in texture.

Fertile lemma and palea scarcely firmer than the glumes; lower floret staminate or neuter, awnless, the perfect floret awned (except in *Melinis*).

MELINIDEAE (p. 304).

Fertile lemma and palea indurate or subindurate, usually much firmer than the glumes; perfect floret usually awnless.....PANICEAE (p. 304).

Glumes indurate; fertile lemma and palea hyaline or membranaceous, the sterile lemma like the fertile one in texture.

Inflorescence not monoecious, the fertile spikelets perfect, each usually paired with a sterile spikelet.....ANDROPOGONEAE (p. 305).

Inflorescence monoecious, the pistillate spikelets below, the staminate above on the same rachis.....TRIPSACEAE (p. 306).

KEY TO THE GENERA

1. BAMBUSEAE

Stamens 6. Spikelets several-flowered.....1. GUADUA (p. 306).

Stamens 3.

Spikelets few to several-flowered.....2. ABUNDINARIA (p. 307).

Spikelets 1-flowered.

Spikelets in a 1-sided spike.....4. MEROSTACHYS (p. 312).

Spikelets in open or spike-like panicles.

Culms woody; blades jointed at base, mostly not more than 20 cm. long and 2 cm. wide, commonly much smaller...3. CHUSQUEA (p. 308).

Culms scarcely woody; blades continuous with the sheath, 30 to 100 cm. long and more than 2 cm. wide.....5. NEUROLEPIS (p. 312).

2. FESTUCEAE

Lemmas divided at summit into 9 or more awns or awnlike lobes.

Awns unmixed with awned teeth; all florets falling attached, their awns forming a pappuslike crown, only the lowest floret fertile; panicles narrow.....28. PAPPOPHORUM (p. 351).

Awns mixed with awned teeth; florets not falling attached, the rachilla disarticulating between them; panicles somewhat open.

27. COTTEA (p. 351).

Lemmas not divided into several lobes, awnless, with a single awn, or, if 3, the lateral awns minute.

Tall stout reeds (or stout bunch grasses in *Cortaderia*; *C. sericantha* dwarf) with large plumelike panicles; lemmas or rachilla with long silky hairs as long as the lemmas (staminate spikelets glabrous in *Gynerium*).

Blades crowded at the base of the culms.....19. CORTADERIA (p. 346).

Blades distributed along the culms.

Spikelets unisexual; plants dioecious; culms very tall, short-jointed, the sheaths conspicuously imbricate (the blades commonly fallen from the lower sheaths); staminate spikelets glabrous, the panicle very different in appearance from that of the pistillate spikelets.

20. GYNERIUM (p. 348).

Spikelets perfect; plants moderately tall.

Lemmas hairy; rachilla naked.....17. ARUNDO (p. 345).

Lemmas naked; rachilla hairy.....18. PHRAGMITES (p. 346).

Low or rather tall grasses, if more than 1 meter not stout bunch grasses.

Plants dioecious, perennial from creeping rhizomes. Lemmas glabrous; grasses of salt or alkaline soils.....15. **DISTICHLIS** (p. 344).

Plants not dioecious (except in species of *Poa*) not as above.

Blades broad, ovate to elliptic, showing transverse veins between the nerves.

Spikelets 3 to 5-flowered; glumes broad, truncate; panicles small.

25. **ZEUGITES** (p. 350).

Spikelets 1 or 2-flowered, the second floret commonly obsolete, only the elongate rachilla present; glumes acuminate; panicle large, diffuse.

24. **ORTHOCLADA** (p. 350).

Blades linear, no transverse veins showing.

Spikelets in 1-sided dense clusters, these at the ends of a few stiff panicle branches.....21. **DACTYLIS** (p. 349).

Spikelets not in 1-sided clusters.

Lemmas 3-nerved, the nerves prominent, often hairy.

Inflorescence a few-flowered head or capitate panicle overtopped by the leaves or partly concealed in them. Lemmas toothed or cleft; low plants of the arid regions (Chlorideae).

74. **MUNBOA** (p. 418).

Inflorescence an exserted open or spikelike panicle.

Lemmas glabrous.

Glumes longer than the lemmas (Aveneae).

34. **DISSANTHELIUM** (p. 356).

Glumes shorter than the lemmas...14. **ERAGROSTIS** (p. 335).

Lemmas pubescent on the nerves.

Panicle condensed, few-flowered.....26. **TRIODIA** (p. 351).

Panicle open, many-flowered (Chlorideae).

64. **GOUINIA** (p. 410).

Lemmas 5 to many-nerved, the nerves sometimes obscure.

Spikelets with 1 to 4 empty lemmas below the fertile florets; nerves obscure; lemmas firm.....16. **UNIOLA** (p. 345).

Spikelets with no empty lemmas below the fertile florets; nerves usually prominent; lemmas membranaceous (firm in a few species of *Bromus* and *Festuca*).

Lemmas flabellate; glumes wanting; inflorescence dense, cylindrical. Low annual.....23. **ANTHOCHLOA** (p. 350).

Lemmas not flabellate; glumes present; inflorescence not cylindrical.

Internodes of rachilla elongate. Glumes minute.

10. **APHANELYTRUM** (p. 325).

Internodes of rachilla not conspicuously elongate.

Glumes with conspicuous thin translucent margins; upper florets much reduced, forming a stalked rounded mass.

22. **MELICA** (p. 349).

Glumes not conspicuously margined; upper florets sometimes reduced but not forming a stalked mass.

Lemmas as broad as long, the margins outspread; florets closely imbricate, horizontally spreading (less so in *B. mandontana*)13. **BRIZA** (p. 334).

Lemmas longer than broad, the margins clasping the palea; florets not horizontally spreading.

Lemmas awnless, obtuse or acutish.

Lemmas more or less keeled on the back.

12. *POA* (p. 326).

Lemmas rounded on the back.

11. *PUCCINELLIA* (p. 325).

Lemmas awned or acuminate.

Spikelets terete, short-pedicel along the main axis,
forming a simple raceme

8. *BRACHYPODIUM* (p. 318).

Spikelets laterally compressed in an open or condensed panicle.

Awn from between 2 short teeth (sometimes nearly wanting in *B. unioloides*)—7. *BROMUS* (p. 314).

Awn terminal. (See also *Gouinia*.)

9. *FESTUCA* (p. 318).

3. HORDEAE

Spikelets solitary at each node of the rachis, several-flowered.

Spikelets placed edgewise to the rachis.....32. *LOLIUM* (p. 355).

Spikelets placed flatwise to the rachis.....29. *AGROPYRON* (p. 352).

Spikelets more than one at each node of the rachis.

Spikelets 2 at each node of the rachis. Glumes narrow, acuminate or awned.

30. *ELYMUS* (p. 353).

Spikelets 3 at each node of the rachis.

Glumes narrow, awned or awnlike.....31. *HORDEUM* (p. 353).

Glumes broad and rounded, awnless.....33. *PARIANA* (p. 356).

4. AVENEAE

Spikelets awnless. Glumes equal, longer than the florets; dwarf subalpine grasses with small few-flowered panicles...34. *DISSANTHELIUM* (p. 356)

Spikelets awned.

Awn of the lemma from between the teeth of a bifid apex, flattened.

Plants robust, with large many-flowered plumelike panicles; awn spreading from near the scarcely twisted base, flexuous or loosely twisted above.

43. *LAMPROTHYRSUS* (p. 362).

Plants not robust; panicles not large and plumelike; awn twisted below the bend, nearly straight above.....42. *DANTHONIA* (p. 362).

Awn dorsal.

Spikelets 2-flowered, the lower floret perfect, awnless; upper floret staminate, bearing a hooklike dorsal awn.....41. *NOTHOLCUS* (p. 362).

Spikelets 2 to several-flowered, the florets all fertile.

Awn short, near the apex of the lemma.....35. *KOELERIA* (p. 357).

Awn inserted near the base or toward the middle of the lemma.

Plants perennial.

Lemmas keeled, the awn from above the middle.

36. *TRISETUM* (p. 358).

Lemmas rounded on the back, the awn from below the middle.

38. *AIRA* (p. 361).

Plants annual.

Awn club-shaped, with a circle of short stiff hairs at the point of articulation.....40. *WEINGAERTNERIA* (p. 362).

Awn without hairs, not club-shaped.

Inflorescence a small erect divergently branched panicle; spikelets
2 mm. long-----39. **ASPRIS** (p. 361).

Inflorescence a rather large drooping few-flowered panicle; spike-
lets 10 to 30 mm. long-----37. **AVENA** (p. 360).

5. AGROSTIDEAE

Rachilla articulate below the glumes, the spikelet deciduous.

Spikelets in pairs in a spikelike panicle, one perfect, the other staminate or
neuter, the pair falling together-----49. **LYCURUS** (p. 385).

Spikelets all alike.

Glumes awned-----48. **POLYPOGON** (p. 384).

Glumes awnless.

Inflorescence a dense spikelike panicle-----47. **ALOPECURUS** (p. 383).

Inflorescence an open panicle-----46. **CINNA** (p. 383).

Rachilla articulate above the glumes.

Fruit indurate, terete or short and globose or ovoid (then sometimes some-
what compressed).

Awn trifid (the lateral awns obsolete in *A. schiedeana*).

59. **ARISTIDA** (p. 403).

Awn simple.

Spikelets on short peduncles among the acicular leaves. Lemma extend-
ing into a hard awnlike point; plants mosslike, forming dense cush-
ions-----53. **ACIACHNE** (p. 390).

Spikelets in exserted panicles.

Fruit terete, two to several times as long as wide; awn persistent or
tardily deciduous-----58. **STIPA** (p. 396).

Fruit one to two times as long as wide; awn readily deciduous, more
or less eccentrically attached.

Lemma entirely inclosing the palea.

Fruit oblong or elliptic, not gibbous----55. **ORYZOPSIS** (p. 394).

Fruit obovoid, gibbous at summit, somewhat flattened.

56. **NASSELLA** (p. 394).

Lemma not quite inclosing the lemma, leaving a sulcus on the palea
side, fruit globose, somewhat flattened, strongly asymmetric at
summit-----57. **PIPTOCHAETIUM** (p. 396).

Fruit thin or firm but scarcely indurate, if firm, the nerves evident; callus
not well developed.

Perfect spikelet surrounded by several sterile spikelets in the form of
bristles or delicate bracts-----50. **PEREILEMA** (p. 385).

Perfect spikelet not accompanied by sterile spikelets.

Rachilla prolonged behind the palea---41. **CALAMAGROSTIS** (p. 363).

Rachilla not prolonged (except in *Agrostis trichodes*).

Lemma shorter than the glumes, thin and delicate.

45. **AGROSTIS** (p. 378).

Lemma as long as or longer than the glumes, not more delicate than
these.

Lemma awnless, obtuse or acutish; 1 glume, sometimes both glumes,
shorter than the lemma-----54. **SPOROBOLUS** (p. 391).

Lemmas awned or acuminate, if only acute the acute glumes about
equal.

Awn dorsal, geniculate, the lemma bifid at apex.

52. **TRINIOCHLOA** (p. 390).

Awn terminal, not geniculate---51. **MUHLENBERGIA** (p. 386).

6. NAZIEAE

Spikelets bearing hooked spines on the second glume, the group forming a little bur.....60. NAZIA (p. 407).

Spikelets not bearing hooked spines.

Groups of spikelets in a close cylindric spike...61. ANTHEPHORA (p. 407).

Groups of spikelets nodding along 1 side of the delicate axis.

62. AEGOPOGON (p. 407).

7. CHLORIDEAE

Inflorescence a few-flowered head or capitate panicle hidden among the sharp-pointed leaves. A low spreading annual.....74. MUNROA (p. 418).

Inflorescence exserted.

Spikes solitary or racemosely arranged.

Spike solitary (see also *Bouteloua simplex* with pectinate spikelets, the lemmas 3-awned).

Spikelets 1-flowered.....69. MICROCHLOA (p. 412).

Spikelets several-flowered.....65. TRIPOGON (p. 410).

Spikes several.

Spikelets with 1 perfect floret and a rudiment above; spikes short and thick.....73. BOUTELOUA (p. 416).

Spikelets 1 to several-flowered; spikes long and slender.

Spikelets 1 or 2-flowered, the upper floret reduced or rudimentary.

70. GYMNOPOGON (p. 412).

Spikelets several-flowered.

Lemmas awnless or short-awned; upper floret reduced to an awnless small lemma.....63. LEPTOCHLOA (p. 408).

Lemmas with awns as long as the body; upper floret reduced but awned.....64. GOUINIA (p. 410).

Spikes more or less digitate.

Spikelet 1-flowered, the rachilla prolonged as an inconspicuous bristle.

68. CYNODON (p. 411).

Spikelets 1-flowered, with a rudimentary floret above, or 2 to several-flowered.

Lemmas 3-awned.....72. TRICHLORIS (p. 415).

Lemmas 1-awned or awnless.

Spikelets with 1 perfect floret and 1 or more rudimentary florets.

71. CHLORIS (p. 413).

Spikelets 3 to several-flowered.

Rachis prolonged beyond the spikelets.

67. DACTYLOCTENIUM (p. 411).

Rachis not prolonged.....66. ELEUSINE (p. 411).

8. PHALARIDEAE

Lower florets staminate; spikelets brown and shining...75. TORRESIA (p. 418).

Lower florets neuter; spikelets green or yellowish.

Lower florets reduced to small awnless scalelike lemmas; spikelet much compressed laterally; glumes equal.....77. PHALARIS (p. 419).

Lower florets consisting of awned hairy sterile lemmas exceeding the fertile floret; spikelet terete; first glume much shorter than the second.

76. ANTHOXANTHUM (p. 419).

9. ORYZEAE

Glumes minute; lemma often awned.....78. ORYZA (p. 419).

Glumes wanting; lemma awnless.....79. LEERSIA (p. 420).

10. ZIZANIEAE

A single genus in our area-----80. LUZIOLA (p. 420).

11. MELINIDEAE¹¹

Spikelets in clusters of 3; awns 4 to 6 cm. long---84. TRISTACHYA (p. 423).

Spikelets solitary on distinct pedicels.

Lower floret staminate-----83. TRICHOPTERYX (p. 422).

Lower floret neuter-----82. ARUNDINELLA (p. 422).

12. PANICEAE

Spikelets unisexual; plants monoecious.

Pistillate spikelets above, the staminate below on the branches of the same panicle. Blades broad, elliptic or lanceolate (smaller in *O. laterale*).

107. OLYRA (p. 489).

Pistillate and staminate spikelets in distinct small panicles.

108. RADDIA (p. 491).

Spikelets all of one kind.

Spikelets subtended or surrounded by 1 to many distinct or more or less connate bristles, forming an involucre.

Bristles persistent, the spikelets deciduous--104. CHAETOCCHLOA (p. 476).

Bristles or spines falling with the spikelets at maturity.

Bristles not united, slender, sometimes plumose.

105. PENNISETUM (p. 481).

Bristles united into a burlike involucre (united at base only in *C. myosuroides*), the bristles retrorsely barbed (antrorsely barbed in *C. pilosus*)-----106. CENCHRUS (p. 487).

Spikelets not subtended by bristles.

Glumes or sterile lemma awned (awn reduced to a point in *Echinochloa colonum*). Spikelets racemose on the branches.

Blades lanceolate, broad and thin; glumes 2-lobed, awned from between the lobes-----102. OPLISMENUS (p. 474).

Blades long and narrow; glumes awned from the tip.

103. ECHINOCHLOA (p. 475).

Glumes and sterile lemma awnless (somewhat caudate in *Ichnanthus*).

Spikelets in open or condensed panicles.

Spikelets globose, oblique on the pedicels. Culms usually woody.

97. LASIACIS (p. 470).

Spikelets usually not globose, not obliquely set on the pedicels.

Spikelets with 2 perfect florets-----101. ISACHNE (p. 474).

Spikelets with 1 perfect floret.

Fertile lemma with wings or broad scars at base; glumes often somewhat caudate-----96. ICHNANTHUS (p. 468).

Fertile lemma not winged nor broadly scarred at base.

First glume wanting; spikelets silky-hairy.

85. LEPTOCORYPHIUM (p. 423).

First glume present.

Fruit indurate, its margin inrolled. First glume usually shorter than the spikelet-----95. PANICUM (p. 456).

¹¹ In *Melinis* and its allies the sterile lemma is awned; in *Arundinella* and its allies the sterile lemma is awnless and the fertile lemma is usually awned. Until all the allied genera are studied *Arundinella* may be retained in Melinideae.

Fruit cartilaginous or membranaceous, the margin not inrolled.

First glume as long as the spikelet.

100. **HOMOLEPIS** (p. 473).

First glume shorter than the spikelet.

Second glume inflated-saccate; blades narrow, linear, not cordate-clasping.....98. **SACCIOLEPIS** (p. 473.)

Second glume not inflated-saccate; blades broad, cordate-clasping.....99. **HYMENACHNE** (p. 473).

Spikelets in 1-sided racemes, the racemes digitate or racemose. (See also *Ichnanthus minarum*.)

Rachilla joint and adnate rudimentary first glume forming a swollen ringlike callus at the base of the spikelet.

91. **EBIOCHLOA** (p. 428).

Rachilla joint not forming a ringlike callus.

Blades ovate-lanceolate; racemes loose; mature spikelets burlike with hooked hairs.....89. **PSEUDECHINOLAENA** (p. 427).

Blades linear to lanceolate.

First glume wanting (present in a few species of *Paspalum*).

Spikelets in 2 to 4 rows in close 1-sided racemes.

Spikelets (or the primary one of a pair) placed with the back of the fertile lemma (hence the second glume) turned away from the rachis.....93. **AXONOPUS** (p. 430).

Spikelets placed with the back of the fertile lemma (hence the second glume) turned toward the rachis.

94. **PASPALUM** (p. 434).

First glume present.

Spikelets placed with the first glume toward the rachis. Spikelets in close 1-sided racemes.

Racemes several.....92. **BRACHIARIA** (p. 430).

Racemes solitary, spikelike.

Racemes erect, the rachis slender; spikelets swollen on the side toward the rachis and fitting into alternate hollows.

90. **MESOSETUM** (p. 428).

Racemes curved, the rachis broad-winged; spikelets not fitting into hollows.....88. **THRASYA** (p. 427).

Spikelets placed with the first glume away from the rachis.

Racemes loose, in a flabellate panicle; spikelets conspicuously silky.....86. **TRICHACHNE** (p. 423).

Racemes close, 1-sided, solitary, digitate or racemose.

Racemes racemosely arranged on the main axis.

95. **PANICUM** (p. 456).

Racemes digitate or fascicled, rarely solitary.

87. **SYNTHESISMA** (p. 424).

13. ANDROPOGONEAE

Spikelets all perfect.

Inflorescence of digitate racemes.....121. **ISCHAEMUM** (p. 505).

Inflorescence a densely flowered hairy panicle.

Spikelets awned.....112. **ERIANTHUS** (p. 493).

Spikelets awnless.

Rachis continuous.....109. **IMPERATA** (p. 491).

Rachis disarticulating.

Panicle large, pale, plumelike; spikelets all alike.

110. **SACCHARUM** (p. 492).

Panicle narrow or subcylindric, tawny or golden brown; upper of the pair of spikelets cleistogamous.....111. **ERIOCHRYSIS** (p. 493).
Spikelets not all perfect, the sessile usually perfect, the pedicellate usually staminate or rudimentary.

Fertile spikelet with a hairy-pointed callus formed of the attached supporting rachis joint or pedicel; awns well developed.

Awn plumose or pubescent; rachis continuous.

118. **TRACHYPOGON** (p. 503).

Awn scabrous, not pubescent; rachis disarticulating.

117. **HETEROPOGON** (p. 502).

Fertile spikelet without a callus, the rachis disarticulating immediately below the spikelet; awns relatively small or wanting.

Pedicel of the sterile spikelets thickened, appressed to the thickened rachis joint or adnate to it.

Sessile spikelets sunken in cavities of the thickened rachis, the first glume covering the opening. Sterile spikelet obscure.

120. **MANISURIS** (p. 505).

Sessile spikelet not sunken in the rachis.

Plant annual; sessile spikelet globose.

122. **HACKELOCHLOA** (p. 506).

Plant perennial; sessile spikelet lanceolate.

119. **ELYONURUS** (p. 504).

Pedicel of the sterile spikelet distinct, this and the rachis joint usually slender.

Spikelets in reduced racemes of 1 to 5 (rarely 7) joints, these peduncled in open panicles. Awns, if present, commonly deciduous.

Pedicellate spikelets staminate.....115. **HOLCUS** (p. 501).

Pedicellate spikelets wanting, the pedicel only present.

116. **SORGHASTRUM** (p. 501).

Spikelets in evident racemes of several to many joints.

Margins of the first glume of the sessile spikelet involute, the sides rounded instead of sharply keeled; awn rather stout, geniculate and twisted, about 2 cm. long....114. **HYPARRHENIA** (p. 500).

Margins of the first glume of the sessile spikelet inflexed, the glume sharply 2-keeled, the back flat or grooved between the keels.

113. **ANDROPOGON** (p. 494).

14. TRIPSACEAE

Pistillate spikelets sunken in recesses in the thickened joints of the rachis.

Inflorescence of solitary or digitate spikes....123. **TRIPSACUM** (p. 506).

Pistillate spikelets inclosed in a bony beadlike involucre...124. **COIX** (p. 507).

DESCRIPTIVE LIST

1. **GUADUA** Kunth

Spikelets several-flowered, subterete, mostly elongate, sessile or nearly so; stamens 6; palea winged. Our species spiny.

Spikelets glabrous, falcate, 3 to 7 cm. long.....1. *G. angustifolia*.

Spikelets pubescent, 1.5 to 2 cm. long.....2. *G. weberbaueri*.

1. *Guadua angustifolia* Kunth, Syn. Pl. Aequin. 1: 253. 1822.

Bambusa guadua Humb. & Bonpl. Pl. Aequin. 168. pl. 20. 1808.

A stout bamboo, as much as 10 meters tall and 15 cm. in diameter; blades about 15 cm. long and 12 to 18 mm. wide; spikelets often curved, at maturity 3.5 to 7 cm. long.

Forests, Colombia to Peru and Guiana. Originally described from Colombia.
 PERU: Lima, *Wükes Expl. Exped.*

Since botanists are not in agreement on the validity of duplicate binomials, no new binominal is here made on the basis of the specific name *guadua*.

2. *Guadua weberbaueri* Pilger, *Repert. Nov. Sp. Fedde* 1: 152. 1905.

A bamboo as much as 10 meters tall, the spreading branches climbing; blades elliptic-lanceolate, 12 to 14 cm. long, 2 to 3.5 cm. wide, pilose beneath, the summit of the sheath long-fimbriate.

Dry shrubby slopes, Peru. Known only from the type collection.

PERU: Moyobamba, *Weberbauer* 4562. A sterile specimen from Colonia Perené (*Hitchcock* 22121) may belong to this species.

GUADUA PARVIFLORA Presl, *Rel. Haenk.* 1: 257. 1830.

Bambusa parviflora Roem. & Schult. *Syst. Veg.* 7: 1350. 1830.

Arthrostylidium maculatum Rupr. *Mém. Acad. St. Pétersb. VI. Sci. Nat.* 3¹: 28. *pl.* 5. 1839.

This third species was described from the mountains of Huánuco, Peru. No other collections have been made. Munro¹² includes the species in his monograph of the Bambusaceae as *Arthrostylidium maculatum*, quoting the descriptions of Presl and Ruprecht without having seen a specimen. Camus¹³ does the same, but the figure is different from that of Ruprecht, indicating that it may have been drawn from another specimen of the same collection. In the U. S. National Herbarium is a fragment (single branch of the inflorescence) from the type at the German University, Prague. In this fragment the spikelets are distant and appressed to the axis and appear to be only partially developed. They show two glumes with awns as long as the body and a lemma with a shorter awn. The spots on the lemma (emphasized by Presl and by Ruprecht) are very faint. The branch resembles Ruprecht's figure, but the awns are longer than there shown. It does not accord so well with the figure shown by Camus.

On the basis of the data at hand, the genus to which this species should be referred is uncertain. It appears to belong to *Arthrostylidium*, but I have refrained from taking up the specific name first published (*parviflora*) until the species is better known. *Arthrostylidium cubense* Rupr. is accepted as the type species of the genus *Arthrostylidium*.

2. ARUNDINARIA Michx.

Spikelets compressed, few to many-flowered; stamens 3.

Lemmas about 5 mm. long, 0.5 mm. thick.....1. *A. humillima*.

Lemmas larger, more than 1 mm. wide.

Lemmas short-awned.

Panicle large and diffuse; spikelets long-pediceled; blades 5 to 8 cm. wide.

2. *A. patula*.

Panicle condensed; lateral pedicels shorter than the spikelets; blades 2 to 3 cm. wide.....3. *A. herzogiana*.

Lemmas awnless.

Panicle open, the spikelets long-pediceled; blades triangular-ovate, about 4 cm. long, 12 mm. wide.....4. *A. haenkei*.

Panicle condensed, the lateral pedicels shorter than the spikelets; blades linear-lanceolate, about 10 cm. long, 9 mm. wide.....5. *A. hirtula*.

¹² *Trans. Linn. Soc.* 26: 40. 1868.

¹³ *Les Bambusées* 63. *pl.* 40. *f. c.* 1913.

1. *Arundinaria humillima* Pilger, Verh. Bot. Ver. Brand. 47:100. 1905.

Culms 50 cm. tall; panicle open, 10 cm. long, 2.5 cm. wide; sheaths ciliate with long hairs wrapped around the culm; blades 15 cm. long, 1 cm. wide; spikelets very slender, 1 cm. long, the florets distant.

Represented in the U. S. National Herbarium by only a fragment from the type.

PERU: Cerro de Escaler, Dept. Loreto, *Ule* 6598.

2. *Arundinaria patula* Pilger, Bot. Jahrb. Engler 25: 719. 1898.

Arundinaria sodiroana Hack. Oesterr. Bot. Zeitschr. 53: 70. 1903. (Mount Atacatzo, *Sodiro*.)

A tall bamboo, the culms as much as 3 cm. thick at base; blades ovate lanceolate, as much as 20 cm. long and 7 cm. wide, the mouth and margin of the sheath long-fimbriate; panicle very open and diffuse, as much as 40 cm. long, the branchlets slender, bearing a single spikelet as much as 2 cm. long; lemmas bearing an awn as much as 4 mm. long.

Forested slopes, Colombia to Peru. Originally described from Colombia.

ECUADOR: Mount Atacatzo, *Sodiro*. Mount Corazón, *Mille* 321.

PERU: Playapampa, *Macbride* 4512.

3. *Arundinaria herzogiana* Henr. Med. Rijks Herb. Leiden 40: 75. 1921.

Shrubby; blades gradually narrowed from an asymmetrically rounded base, 15 to 25 cm. long, 2 to 3 cm. wide; mouth of sheath long-fimbriate, the hairs 1 to 2 cm. long; panicle rather lax, as much as 30 cm. long; spikelets 2 to 2.5 cm. long.

Known only from the type collection.

BOLIVIA: Río Saujana, in mountain woods, alt. 3,200 meters, *Herzog* 2396.

4. *Arundinaria haenkei* (Presl) Hack, Oesterr. Bot. Zeitschr. 53: 63. 1903.

Arthrostylidium haenkei Rupr. Mém. Acad. St. Pétersb. VI. Sci. Nat. 3¹: 27 (117). 1839.

Arundinaria setifera Pilger, Repert. Nov. Sp. Fedde 1: 145. 1905. (*Weberbauer* 3387.)

A divaricately branched shrub; blades triangular-ovate, gradually narrowed from a rounded base, 3 to 5 cm. long, 12 to 15 mm. wide; panicles terminating all the branches, diffuse, 15 cm. long, the branches long, slender, naked; spikelets as much as 3 cm. long.

Known only from Peru. Originally described from a collection made by Haenke in Peru, the exact locality not known.

PERU, Monzón, Dept. Huánuco, *Weberbauer* 3387. Without locality, *Haenke*.

5. *Arundinaria hirtula* Pilger, Repert. Nov. Sp. Fedde 17: 445. 1921.

Culms as much as 10 meters tall and 5 cm. thick; blades 8 to 13 cm. long, 7 to 11 mm. wide; panicle about 13 cm. long; spikelets 2.5 cm. long.

Known only from the type collection, from thickets at 3,100 meters.

PERU: Prov. Pataz, *Weberbauer* 7031.

3. CHUSQUEA Kunth

Spikelets small, with 1 perfect floret and 2 empty lemmas below it; stamens 3; blades disarticulating from the persistent sheaths.

Inflorescence an open panicle, not more than twice as long as wide.

Glumes minute; blades pubescent beneath.....1. *C. uniflora*.

Glumes obsolete; blades glabrous beneath.....2. *C. delicatula*.

Inflorescence narrow, more than twice as long as wide, usually condensed, the branches short, appressed, or spreading.

Panicles dense and spikelike, terminating erect branches. Low, upright plants; glumes about 1 mm. long; sterile lemmas acuminate, more than half as long as the spikelet.

Panicle pale -----3. *C. spicata*.

Panicle dark -----4. *C. weberbaueri*.

Panicles narrow but not spikelike, borne on the ends of short, usually fascicled, branches.

Glumes obsolete -----5. *C. depauperata*.

Glumes evident, usually short, sometimes minute.

Inflorescence and branchlets more or less waxy-whitened Spikelets 1 cm. or more long -----6. *C. huatensis*.

Inflorescence and branchlets not waxy-whitened.

Blades pubescent beneath.

Spikelets pubescent; blades lanceolate -----7. *C. dombeyana*.

Spikelets glabrous; blades linear, mostly less than one-twentieth as wide as long -----8. *C. peruviana*.

Blades glabrous beneath.

Spikelets about 11 mm. long. Sterile lemmas long-acuminate, nearly as long as the spikelet -----9. *C. picta*.

Spikelets mostly not over 7 mm. long.

Panicle branches appressed -----10. *C. serrulata*.

Panicle branches spreading, the pedicels sometimes reflexed.

11. *C. scandens*.

1. *Chusquea uniflora* Steud. Syn. Pl. Glum. 1: 327. 1854.

Culms 4 mm. thick; fertile branches several in a cluster at the nodes, 10 to 15 cm. long; blades lanceolate, as much as 5 cm. long and 1 cm. wide, glabrous above, pubescent beneath, subulate-pointed; panicles open, loosely flowered, about 5 cm. long; spikelets glabrous, rather broad, 6 to 7 mm. long; glumes minute; sterile lemmas less than half as long as spikelet, acute, slightly mucronate but not subulate-pointed.

Colombia to Bolivia. Originally described from Colombia.

ECUADOR: Quito, *Spruce* 5940.

BOLIVIA: Bella Vista, *Hitchcock* 22753. Doubtfully referred here; blades glabrous beneath.

CHUSQUEA LONGIPENDULA Kuntze, Rev. Gen. Pl. 3²: 348. 1898. Cochabamba, Bolivia, 2,000 meters alt. The type specimen, in the herbarium of the New York Botanic Garden, appears to belong to *C. uniflora*. The spikelets are old and in an unsatisfactory condition for study.

2. *Chusquea delicatula* Hitchc., sp. nov.

A graceful shrub with long, slender, branching, drooping or trailing fertile culms as much as 3 meters long, 3.5 mm. thick at base, less than 0.5 mm. thick at the flower-bearing tip, usually depending from banks; culms reddish, glabrous, the flowering branches numerous in clusters along the mid culm, as much as 8 cm. long, bearing 4 or 5 leaves, gradually shorter and toward the very slender tip of the culm only 2 cm. long with 1 or 2 reduced leaves; sheaths somewhat keeled toward the summit, hispidulous or glabrate, striate, the summit at each side of the petiole fimbriate with hairs 2 mm. long; ligule thin, 1 mm. long, somewhat pubescent; blades rather thin, narrowly lanceolate, 2 to 3.5 cm. long, 3 to 4 mm. wide, gradually narrowed to a very short petiole, the acuminate tip subulate-pointed, scaberulous on the margin, glabrous beneath, hispidulous on the upper surface along the mid-nerve, rather strongly striate-nerved on upper surface, two pairs of lateral nerves somewhat prominent

beneath; panicles few-flowered, about 2 to 3 cm. long, the axis and branches scabrous-pubescent; spikelets glabrous, slender-fusiform, 5 to 6 mm. long; glumes wanting or represented by slight callosities at the summit of the pedicel; sterile lemmas about equal, about half as long as the spikelet, the strong mid nerve extending into a short subulate point; fertile lemma rather obscurely nerved, acutish but not subulate-pointed; palea obtuse, shorter than the lemma.

Type in the U. S. National Herbarium, no. 1,164,911, collected on moist shady banks at Bella Vista, Nor-Yungas, Bolivia, December 26, 1923, by A. S. Hitchcock (no. 22748).

This differs from other species of the Central Andes in the slender, comparatively delicate culms. The collector was unable definitely to connect the fertile phase with the sterile plants growing in the vicinity. In the fertile plants all the culms were floriferous from near the base to the very apex. The following sterile specimens collected in the vicinity of the fertile plants appear to belong to the same species, since they have the same leaf characters, though the blades are larger (as much as 7 cm. long and 8 mm. wide): Bella Vista, *Hitchcock* 22748, 22749. Another collection of sterile plants made by Buchtien in the same general region appears to be the same species, though the blades are proportionately wider (as much as 7 cm. long and 1 cm. wide): Charopampa, near Mapiri, *Buchtien* 1154.

3. *Chusquea spicata* Munro, *Trans. Linn. Soc.* 26: 60. 1868.

Chusquea simplicissima Pilger, *Repert. Nov. Sp. Fedde* 1: 145. 1905. (*Weberbauer* 2217.)

Plants low, erect; blades firm, erect; panicles spike-like, dense, interrupted below, 10 to 15 cm. long.

Among shrubs, Peru and Bolivia. Originally described from Peru, *Lechler* 2154, 2640, 2694, being cited.

PERU: Sachapata, *Lechler* 2154, 2640, 2694 (last two in Kew Herb.). Prov. Tarma, *Weberbauer* 2217.

BOLIVIA: Mapiri, *Rusby* 196.

4. *Chusquea weberbaueri* Pilger, *Repert. Nov. Sp. Fedde* 1: 146. 1905.

Plants erect, as much as 2 meters tall, with appressed firm blades 8 to 12 cm. long and 5 to 6 mm. wide, and spike-like panicles 15 to 30 cm. long; spikelets glabrous, usually dark colored.

Mountain meadows, Colombia to Peru. Originally described from Peru. (Type, *Weberbauer* 4415.)

PERU: Chachapoyas, *Weberbauer* 4415.

5. *Chusquea depauperata* Pilger, *Repert. Nov. Sp. Fedde* 1: 149, 1905.

Blades 4 to 6 cm. long, 3 to 3.5 mm. wide, firm, rigid, the apex subulate, the summit of the sheath without fimbriae; panicle narrow, spike-like, rather dense, 6 to 9 cm. long.

Marshy thickets, Peru. Known only from the type collection.

PERU: Monzón, *Weberbauer* 3709.

Pilger does not give the height of the plant but states that it is "suffrutescens."

6. *Chusquea huatensis* Pilger, *Bot. Jahrb. Engler* 56: Beibl. 123: 29. 1920.

A high-climbing shrub; blades firm, smooth and glabrous except the scabrous margin, gradually narrowed from a rounded base, the apex extending into a long fine point, 8 to 11 cm. long, 11 to 18 mm. wide, sessile; panicle con-

tracted, loosely spikelike; spikelets about 1 cm. long; foliage and inflorescence more or less waxy-whitened.

Mountain thickets, Peru. (Type, *Weberbauer* 5581.)

PERU: Prov. Huanta, Dept. Ayacucho, *Weberbauer* 5581. San Miguel, Uru-bamba Valley, *Cook & Gilbert* 965 (sterile).

7. *Chusquea dombeyana* Kunth, Rév. Gram. 2: 553. pl. 191. 1832.

Chusquea pubispicula Pilger, Repert. Nov. Sp. Fedde 1: 148. 1905. (*Weberbauer* 688.)

Culms 5 mm. thick; blades as much as 8 cm. long and 6 mm. wide, slightly pubescent beneath; panicles narrow, interrupted, 8 to 15 cm. long, the axis and branches densely pubescent; spikelets pubescent.

Mountain thickets, Peru, whence originally described. (*Dombey*.)

PERU: Sandía, *Weberbauer* 688. Without locality, *Dombey*, a fragment from the type.

8. *Chusquea peruviana* E. G. Camus, Bamb. Monogr. 88. pl. 53. f. B. 1913.

Chusquea ramosissima Pilger, Repert. Nov. Sp. Fedde 1: 149. 1905. Not *C. ramosissima* Lindm. 1900.

Chusquea sandiensis Pilger, Bot. Jahrb. Engler 56: Beibl. 123: 29. 1920.

Blades linear, 7 to 9 cm. long, 2.5 to 3.5 mm. wide, sparsely long-pilose beneath, the apex produced into a setaceous point; panicle narrow, few-flowered, 8 to 10 cm. long, the rachis scabrous.

Mountain thickets, Ecuador to Bolivia. Originally described from Sandía, Peru. (Type, *Weberbauer* 694.)

ECUADOR: Chanchán River, *Spruce* 6093. Huigra, *Hitchcock* 20741 (sterile); *Rose* 22292 (sterile).

PERU: Sandía, *Weberbauer* 694. Torontoy, *Heller* 2180 (sterile).

BOLIVIA: Bella Vista, *Hitchcock* 22746; fertile culms 7 meters tall, erect, the flowering branches very numerous in large tufts at the nodes. Sterile specimens that appear to belong to this species: Bella Vista, *Hitchcock* 22744, 22745.

9. *Chusquea picta* Pilger, Repert. Nov. Sp. Fedde 1: 151. 1905.

Blades 5 to 7 cm. long, 3 to 3.5 mm. wide, setaceous-pointed; panicle 5 to 9 cm. long, narrow, few-flowered; spikelets about 11 mm. long, glabrous, the glumes very short.

Known only from the type collection.

PERU: "In andina nemoribus," *Ruiz*. Specimen in the Berlin Herbarium.

10. *Chusquea serrulata* Pilger, Bot. Jahrb. Engler 25: 719. 1898.

Chusquea spadicea Pilger, Bot. Jahrb. Engler 27: 35. 1899.

Differing from *C. scandens* in the narrow, more distinctly striate blades and in the narrow panicle with appressed branches.

Along trails in forest, Colombia, whence originally described, to Bolivia.

ECUADOR: Mount Corazón, *Sodirol* in 1891. Mount Atacatzto, *Mille* 320. Between La Toma and Loja, *Hitchcock* 21388.

PERU: Mito, *Macbride & Featherstone* 1687.

BOLIVIA: Coroico, *Bang* 2348. Bella Vista, *Hitchcock* 22750. La Paz, *Rusby* 10.

11. *Chusquea scandens* Kunth, Syn. Pl. Aequin. 1: 254. 1822.

*Nastus chusquea*¹⁴ H. B. K. Nov. Gen. & Sp. 1: 201. 1816.

Chusquea jamesoni Steud. Syn. Pl. Glum. 1: 337. 1854. (Andes, Peru, *Jameson* 631).

¹⁴ Since botanists are not in agreement on the use of duplicate binomials, the specific name *chusquea* is not taken up.

Chusquea quitensis Hack. Oesterr. Bot. Zeitschr. 53: 154. 1903. (Mount Pichincha, Sodiro.)

Chusquea quitensis var. *patentissima* Hack. Repert. Nov. Sp. Fedde 6: 161. 1908. (Buchtien 839.)

Chusquea meyeriana var. *patentissima* E. G. Camus, Bamb. Monogr. 94. 1913.

Blades linear-lanceolate, as much as 18 cm. long, 1 to 2.5 cm. wide, smaller on the branches, narrowed to a fine point; panicle narrow, rather dense, mostly 8 to 12 cm. long but sometimes as much as 20 cm. long, the branches spreading, the pedicels often reflexed.

Forests, Colombia to Peru. Originally described from Bogotá, Quito, and Loja.

ECUADOR: Quito, Jameson 630. Mount Pichincha, Mille 319. Between Otavalo and Malchinguí, Hitchcock 20825. Mount Corazón, Lehmann 473. Zaragura, Rose 23149. Las Juntas, Rose 23201.

PERU: Panao, Macbride & Featherstone 2212. Yanano, Macbride 3778.

BOLIVIA: Bella Vista, Hitchcock 22742, 22747, 22750. Coroico, Hitchcock 22725. Río Saujana, Herzog 2383. Unduavi, Buchtien 839, 4185. Without locality, Bang 1826.

Four other species of *Chusquea* have been described from our region by Doctor Pilger, who has kindly sent the writer fragments from the type specimens. From the material at hand they can not be satisfactorily distinguished from *C. serrulata*, to which they would lead in the key. The species are:

CHUSQUEA POLYCLADOS Pilger, Repert. Nov. Sp. Fedde 1: 147. 1905. (Near Hualgayoc Weberbauer 4021.)

CHUSQUEA STRAMINEA Pilger, Repert. Nov. Sp. Fedde 1: 147. 1905. (Chachapoyas, Weberbauer 4408.)

CHUSQUEA INAMOENA Pilger, Repert. Nov. Sp. Fedde 1: 150. 1905. (Prov. Tarma, Weberbauer 2295.)

CHUSQUEA TARMENSIS Pilger, Repert. Nov. Sp. Fedde 1: 151. 1905. (Prov. Tarma, Weberbauer 2129.)

4. MEROSTACHYS Spreng.

Spikelets with 1 perfect floret and 1 or 2 sterile lemmas, the rachilla prolonged behind the many-nerved palea; stamens 3; inflorescence a 1-sided spike.

1. *Merostachys brevispica* Munro, Trans. Linn. Soc. 26: 49. 1868.

Sheaths densely fimbriate; blades oblong-lanceolate, those of the branches 7 to 10 cm. long, 10 to 15 mm. wide; inflorescence arcuate, 4 to 5 cm. long; spikelets about 1 cm. long, the rachis velvety-pubescent.

Forests, known only from the type collection.

PERU: Tarapoto, Spruce in 1856.

5. NEUROLEPIS Melsn.

(*Platonia* Kunth, 1830. Not *Platonia* Mart. 1829. *Planotia* Munro.)

Spikelets with 2 glumes, 2 sterile lemmas and a terminal perfect floret, in elongate panicles; stamens 3. Culms erect, herbaceous or somewhat woody at base, the blades elongate, mostly more than 50 cm. long and 6 cm. wide.

Sheaths (at least the lower) pubescent; panicles pale; spikelets 3 mm. long.

1. *N. stuebelii*.

Sheaths glabrous; panicles dark; spikelets 4 mm. long-----2. *N. aristata*.

1. *Neurolepis stuebelii* (Pilger) Pilger in Engl. & Prantl, Pflanzenfam. Ergänz. 2: 21. 1906.

Planotia stuebelii Pilger, Bot. Jahrb. Engler 25: 720. 1898.

An erect bamboo, 2 to 3 meters tall, with a loose rhizomatous base; sheaths more or less pubescent; blades as much as 1 meter long and 6 cm. wide, sometimes sparsely pilose; panicle as much as 50 cm. long, rather open, the branches rather distant, densely flowered; glumes long-acuminate.

Forested slopes, Colombia, whence originally described, and Ecuador.

ECUADOR: Tungurahua, *Sodi* in 1901. Lake Colta, *Mille* 318.

2. *Neurolepis aristata* (Munro) Hitchc.

Chusquea aristata Munro, Trans. Linn. Soc. 26: 61. 1868.

A stout erect bamboo, 2 to 3 meters tall, the culms about 1 cm. thick at base; sheaths ciliate; blades glabrous, somewhat tessellate, 30 to 40 cm. long, 3 cm. wide; panicle dark colored, dense, 30 to 40 cm. long, the branches ascending or appressed, the lower as much as 15 cm. long, the rachis strongly sulcate and scabrous-pubescent; glumes glabrous, long-acuminate.

Forested slopes, Ecuador.

ECUADOR: Between Malchinguí and Pomasqui, *Hitchcock* 20863, Santa Bárbara, *André* 4499 (Kew Herb.). Without locality, *Jameson* 92 (Kew Herb.).

The type specimen (*Jameson* 92) in the Kew Herbarium, kindly submitted by the director for examination, is only the upper part of the culm, including panicle and a few upper leaves. Munro seems to have referred the species to *Chusquea* largely because of the short blades (about 15 cm. long). Hitchcock's no. 20863, which is evidently the same as Jameson's no. 92, has the characteristic habit of *Neurolepis*, with elongate lower blades as much as 4 cm. wide.

NEUROLEPIS ELATA (Kunth) Pilger in Engl. & Prantl, Pflanzenfam. Ergänz. 2: 21. 1906. *Platonia elata* Kunth, Rév. Gram. 1: 139. 1829; 2: 327. pl. 76. 1830. This species has not been identified. The plate shows a narrow open panicle, narrow blades 2 cm. wide, and acute but awnless glumes and lemmas. Originally described from Loja, Ecuador.

NEUROLEPIS WEBERBAUERI Pilger, Repert. Nov. Sp. Fedde 17: 446. 1921. This species is said to differ from *N. elata* (Kunth) Pilger in the wider panicle, shorter first glume, and the much broader second glume and sterile lemmas. Known only from the type collection, Dept. Libertad, Prov. Pataz, Peru, *Weberbauer* 7030. A fragment of this is in the U. S. National Herbarium.

6. STREPTOCHAETA Schrad.

Spikelets 1-flowered, terete, disarticulating below the glumes; empty bractlets (probably glumes and sterile lemmas) 4, much shorter than the spikelet, more or less toothed; lemma coriaceous, gradually narrowed into a long much contorted awn; palea shorter than the lemma, bifid nearly to the base, coriaceous; inner bracts (lodicules) 3, less coriaceous than the lemma, longer than the palea, imbricate; stamens 6, monadelphous, the tube about as long as the lemma; style 1, as long as the stamen tube, the slender stigmas 3.—Broad-leaved perennials with the spikelets in elongate spikes. The long contorted awns are implicate, remaining attached at the apex of the axis, the spikelets hanging down.

This anomalous genus is not closely related to any other and can not be placed in any of the recognized tribes.

Spikelets about 14 mm. long (excluding awns).....1. *S. sodiroana*.
Spikelets about 22 mm. long.....2. *S. spicata*.

1. *Streptochaeta sodiroana* Hack. Oesterr. Bot. Zeitschr. 40: 113. 1890.

A rather stout perennial about 1 meter tall, with elliptic tessellate blades 15 to 20 cm. long and 6 to 7 cm. wide, and a many-flowered dense spike about 30 cm. long.

Forests, 2,000 to 3,000 meters altitude, Costa Rica to Ecuador. Originally described from San Miguel, on the Peripa River. (*Sodiro*.)

ECUADOR: Peripa River, *Sodiro*. Mount Chimborazo, *Lehmann* 4400 (Kew Herb.).

2. *Streptochaeta spicata* Schrad.; Nees, Agrost. Bras. 537. 1829.

Lepideilema lancifolium Trin. Mém. Acad. St. Pétersb. VI. Math. Phys. Nat. 1: 93. 1830.

Differing from *S. sodiroana* in the few-flowered slender spike of larger spikelets.

Forests, Brazil, whence originally described, to Trinidad and Ecuador.

ECUADOR: El Recreo, *Eggers*, 14863.

7. BROMUS L. BROMEGRASS

Spikelets several to many-flowered; glumes unequal, shorter than the florets; lemmas convex or keeled, 5 to 9-nerved, awnless or awned from between two minute teeth.

Awn twisted; teeth of lemma prominent, 2 to 3 mm. long. Plant annual.

1. *B. trinitii*.

Awn straight, sometimes obsolete; teeth of lemma minute.

Culms mostly less than 10 cm. tall; lemmas densely woolly. A dwarf perennial.....2. *B. villosissimus*.

Culms normally much more than 10 cm. tall; lemmas glabrous or pubescent but not densely woolly.

Spikelets strongly compressed-keeled; lemmas glabrous, scabrous or sparsely pilose along the principal nerves, not pubescent or villous, 1 to 2 cm. long, gradually narrowed above, awnless or awned, striate-nerved, the nerves 9 to 11.

Awn not more than 5 mm. long, sometimes wanting.....3. *B. unioloides*.

Awn 1 to 1.5 cm. long.....4. *B. striatus*.

Spikelets not strongly compressed-keeled; lemmas pubescent. Panicle branches slender and flexuous.

Branches villous-pubescent; lemmas densely pubescent on the margins.

5. *B. lanatus*.

Branches scabrous; lemmas somewhat pubescent on the margins or short-pubescent all over.....6. *B. pitensis*.

1. *Bromus trinitii* Desv. in Gay, Fl. Chil. 6: 441. 1853.

Trisetum barbatum Steud. Syn. Pl. Glum. 1: 229. 1854.

An erect annual 20 to 60 cm. tall, with flat, sparsely villous blades and narrow, more or less open panicles, the lower branches in whorls, slender, naked below, often flexuous, sometimes with shorter ones intermixed.

Fields and waste places, Chile to California. Originally described from southern Chile.

PERU: Obrajillo, *Wilkes Expl. Exped.* Matucana, *Macbride & Featherstone* 227, 231, 378a. Cuzco, *Hitchcock* 22495.

BOLIVIA: Sorata, *Mandon* 1370.

2. *Bromus villosissimus* Hitchc. Proc. Biol. Soc. Washington 36: 195. 1923.

A dwarf caespitose perennial, with ascending culms mostly less than 10 cm. tall, loosely involute, pubescent blades mostly less than 5 cm. long, and simple condensed panicles 1 to 2 cm. long, of 3 to 8 broad woolly spikelets.

Alpine slopes, Peru. (Type, *Macbride & Featherstone* 854.)

PERU: Casapalca, *Macbride & Featherstone* 854. Between Casa Cancha and Culnai, *Wilkes Expl. Exped.*

3. *Bromus unioloides* H. B. K. Nov. Gen. & Sp. 1: 151. 1816.

Bromus catharticus Vahl, Symb. Bot. 2: 22. 1791. (Lima.)

Festuca unioloides Willd. Hort. Berol. 3. pl. 3. 1816.

Bromus willdenovii Kunth, Rév. Gram. 1: 134. 1829.

Ceratochloa haenkeana Presl, Rel. Haenk. 1: 285. 1830.

Ceratochloa secunda Presl, Rel. Haenk. 1: 285. 1830.

Bromus preslii Kunth, Rév. Gram. 1: Suppl. XXXII. 1830.

?*Bromus mathewsii* Steud. Syn. Pl. Glum. 1: 323. 1854. (*Mathews* 54, Peru.)

Ceratochloa simplex Nees; Steud. Syn. Pl. Glum. 1: 323. 1854, as synonym of *Bromus mathewsii*.

Bromus angustatus Pilger, Bot. Jahrb. Engler 25: 719. 1898. (*Stübel* 60e.)

An erect, spreading, or prostrate annual or short-lived perennial with culms 50 to 100 cm. tall (dwarf alpine plants sometimes only 10 to 15 cm.), flat, mostly glabrous blades and simple or open, spreading panicles as much as 30 cm. long. Very variable in size of plant and of panicle, the awn from 1 to 5 mm. long, or sometimes wanting.

Moist soil, fields, ditches, and grassy slopes, Colombia to Argentina and Chile; introduced in southern United States. Originally described from near Quito. (*Bonpland.*)

ECUADOR: Tulcán, *Hitchcock* 20974, 21027. Quito, *Harteman* 8, 47; *Holway* 901; *Rose* 23573. Mount Pichincha, *Harteman* 3, 17. Quebrada Chalán, *Anthony & Tate* 435. Riobamba, *Mille* 51; *Holway* 864; *Spruce* 5815, 5816; Alausí, *Hitchcock* 20689. Between Loja and San Lucas, *Hitchcock* 21488. Cuenca, *Rose* 22915. Tixán, *Rose* 22404. Cumbe, *Rose* 22958.

PERU: Goyllarisquisca, *Hitchcock* 22290, 22324. Cerro de Pasco, *Hitchcock* 22230. Hacienda Atocsaico, *McKenzie* in 1924; *Hitchcock* 22210. Tarma, *Hitchcock* 22159. Yanahuanca, *Macbride & Featherstone* 1253. Río Blanco, *Macbride & Featherstone* 647, 651. Matucana, *Macbride & Featherstone* 253. Lima, *Hitchcock* 22324. Cuzco, *Hitchcock* 22467, 22478, 22489; *Holway* 747. Arequipa, *Hitchcock* 22430. Juliaca, *Harlan* in 1914.

BOLIVIA: Lake Titicaca, *Stübel* 60e. Sorata, *Rusby* 225; *Mandon* 1367 (*Kew Herb.*). La Paz, *Buchtien*, 843, 844, 845, 2476, 2478, 2480, 2481; *Holway* 429, 456, 471; *Rose* 18868. Unduavi, *Buchtien* 6414. Palca, *Buchtien* 2532, 2543; *Hitchcock* 22561, 22562, 22582. La Florida, *Hitchcock* 22611. Cotaña *Buchtien* 3130. Achacache, *Mandon* 1369. Cochabamba, *Holway* 415; *Hitchcock* 22810. Calderillo, *Fiebrig* 2904. Atocha, *Hitchcock* 22877. Oploca, *Hitchcock* 22894, 22899.

This species is very variable in the size of the spikelet and in the length of the awn. Different forms have been given different names, but it seems impossible to coordinate the variations so as definitely to distinguish distinct species.

The form cultivated in the southern United States as rescue grass has large, strongly striate, awnless or short-awned spikelets. This was named *Festuca unioloides* Willd. The plants from which the species was described were grown in the Berlin Botanic Garden from seed said to come from Carolina. The type specimen of *Festuca unioloides* has been examined. The lemmas are about 1.5 cm. long, acuminate, awnless or with a mucro about 1 mm. long, and puberulent especially toward the margin. Lemmas in specimens of rescue grass vary from glabrous to scabrous or puberulent, in length from 1 to 2 cm., and in length of awn from awnless to 4 mm.

In South America there is in Argentina and Chile the form described in the preceding paragraph and in addition forms with longer awns. Throughout the Andes within the range of this flora at altitudes up to 4,500 meters the common form agrees with the type of *Bromus unioloides*, which appears to have been described independently of *Festuca unioloides*. The type, at the Paris Herbarium, collected near Quito, has been examined. The spikelets are about 2.5 cm. long and 5 mm. wide. The lemmas are about 1.5 cm. long, scaberulous all over but not pubescent, the awns of the lower lemmas about 2 mm. long and of the upper ones about 4 mm. long. The Andean specimens have on the average, as compared with rescue grass of the United States, shorter lemmas (1 to 1.5 cm.), the surface scaberulous or glabrous, and longer awns (1 to 5 mm.).

The Andean form gradually merges with those found in Argentina and Chile. Under the circumstances it would appear best to consider all these forms as belonging to a polymorphous species. The name to be used presents another problem. *Bromus catharticus*, described from Lima in 1791, has precedence over *B. unioloides* (1816). From the plate and description of *B. catharticus* one is uncertain as to the form, but it evidently is conspecific with *Bromus unioloides* in the broad sense.

The name *B. catharticus* is not here taken up because it does not seem advisable to replace the well-known name *B. unioloides* until all the forms and allies have been more thoroughly studied and the type of *B. catharticus* can be examined and its identity with one of the forms can be established.

4. *Bromus* (Sect. CERATOCHLOA) *striatus* Hitchc., sp. nov.

Annual; culms glabrous or slightly pubescent below the nodes, erect, about 4-noded, 50 to 80 cm. tall; sheaths retrorsely pilose or the upper nearly glabrous, striate, the upper shorter than the internodes; ligule ovate-truncate, lacerate-toothed pubescent, 2 to 3 mm. long; blades flat, rather lax, sparsely short-pilose, mostly 10 to 15 cm. long, 4 to 8 mm. wide; panicle open, nodding, 10 to 15 cm. long, the axis glabrous below, scabrous above, the branches mostly in pairs, distant, slender, flexuous or drooping, scabrous, 2 to 6 cm. long, bearing 1 or 2 spikelets, the rachilla joints about 3 mm. long, scaberulous; spikelets oblong, strongly compressed, mostly 5 or 6-flowered, without the awns 2.5 to 3 cm. long, rather conspicuously striate; glumes acuminate, glabrous, scabrous on the keel, hyaline-margined, the first 3-nerved, about 1 cm. long, the second with 5 strong nerves and a faint additional pair near the margin, about 14 mm. long; lemmas about 1.5 cm. long, rather narrow, glabrous or scaberulous, scabrous on the keel, 7-nerved, narrowly hyaline-margined, gradually narrowed to the minutely toothed apex, the awn slender, erect, mostly 12 to 18 mm. long; palea a little shorter than the lemma, strongly compressed, gradually narrowed to a fine point, the keels hispidulous with strong rather distant hairs, the apex with 2 slender awnlike teeth.

Type in the U. S. National Herbarium, no. 1,164,908, collected on sandy hills near Mollendo, Peru, November 17, 1923, by A. S. Hitchcock (no. 22386).

No other collection has been seen. The species is allied to *Bromus unioloides*, especially the longer-awned form described as *Ceratochloa secunda* Presl, but differs in the more strongly compressed spikelets, the more strongly nerved lemmas, the longer awns, and the coarser ciliation on the keels of the palea. *Bromus striatus* is also allied to *B. carinatus* of California. The latter species rarely has awns as long as in *B. striatus*, nor are the spikelets usually so strongly compressed nor the lemmas so conspicuously nerved. In *B. carinatus* the branches of the panicle are usually stiffer and in the larger panicles more than 2 at a node. The specimens of *B. carinatus* do not possess the combination of characters shown by *B. striatus*, especially the slender flexuous or drooping pedicels, the broad strongly compressed spikelets, the strongly nerved lemmas, and the long, slender awns.

The region around Mollendo is a sandy desert, but at the time the collection was made the hills were green with vegetation from recent rains.

5. *Bromus lanatus* H. B. K. Nov. Gen. & Sp. 1: 150. 1816.

Festuca mollis Kunth, Rév. Gram. 1: 132. 1829.

Bromus oliganthus Pilger, Bot. Jahrb. Engler 25: 718. 1898. (Originally described from Ecuador, *Stübel* 20c, 61b, 207a, 230a, being cited; *Stübel* 1202 from Colombia is also cited.)

Bromus pflanzii Pilger, Bot. Jahrb. Engler 49: 189. 1912. (Palca, Bolivia, *Pflanz* 272, 274; Takapaya, *Pflanz* 349.)

An erect, loosely tufted perennial, with glabrous or more or less pubescent culms 30 to 60 cm. tall, flat blades, villous on the upper surface and sometimes also beneath, and loose, open, rather few-flowered, nodding panicles, the axis and slender flexuous branches velvety-pubescent.

Paramos and alpine slopes, Colombia to Bolivia. Originally described from Antisana, Ecuador. (*Bonpland.*)

ECUADOR: Tulcán, *Hitchcock* 20922, 21039. Mount Pichincha, *Sodi* in 1874; *Mille* 237; *Holmgren* 166, 298. Chillogallo, *Sodi* in 1887. Mount Atacazo, near Quito, *Harteman* 78. Mount Chimborazo, *Hitchcock* 21958, 21979, 22003. Prov. Imbabura, *Stübel* 61b.

PERU: Río Blanco, *Macbride & Featherstone* 801. Huarón, *Macbride & Featherstone* 1150. Lagunillas, *Harlan* in 1914. Without locality, *Wilkes Expl. Exped.* Sumbay, *Weberbauer* 6902 (Field Mus.).

BOLIVIA: Comanche, *Asplund* 6459. Rinconada, *Asplund* 6458. Cochabamba, *Holway* 346½, 382.

6. *Bromus pitensis* H. B. K. Nov. Gen. & Sp. 1: 152. 1816.

Bromus lenis Presl, Rel. Haenk. 1: 262. 1830. (Huánuco, Peru.)

Bromus tenuis Presl; Steud. Syn. Pl. Glum. 1: 319. 1854, error for *B. lenis*.

Bromus frigidus J. Ball, Journ. Linn. Soc. Bot. 22: 63. 1885. (Casapalta, Peru.)

Bromus buchtienii Hack. Repert. Nov. Sp. Fedde 11: 30. 1912. (*Buchtien* 2538.)

An erect or spreading perennial as much as 1.5 meters tall, with flat, glabrous or more or less pilose blades, and open, drooping, or nodding panicles as much as 30 cm. long, the branches slender and somewhat flexuous, naked below, bearing 1 to few spikelets.

Fields, banks, and grassy slopes, Ecuador to Bolivia. Originally described from the Pita River near Quito, Ecuador. (*Bonpland.*)

ECUADOR: Tulcán, *Hitchcock* 21018, 21028. La Rinconada Ranch, *Hitchcock* 20799. Between Otovalo and Malchinguf, *Hitchcock* 20829. Between Malchinguf and Pomasqui, *Hitchcock* 20864. Pifo, *Mille* 240. Mount Pichincha, *Sodi* in 1887; *Harteman* 4, 15. Quito, *Mille* 238; *Sodi* in 1890. Ambato, *Hitchcock* 21711, 21718; *Pachano* 96. Riobamba, *Mille* 55, 240½, 246. Huigra, *Hitchcock* 20760; *Rose* 22473. Between Loja and San Lucas, *Hitchcock* 21468.

PERU: Goyllarisquisca, *Hitchcock* 22312, 22325, 22326. La Quinhua, *Hitchcock* 22268, 22272. Cerro de Pasco, *Hitchcock* 22231. Ollantaytambo, *Hitchcock* 22530, 22531. Río Blanco, *Macbride & Featherstone* 643. Baños, *Wilkes Expl. Exped.* Casapalta, *Ball* in 1882 (Kew Herb.).

BOLIVIA: Sorata, *Mandon* 1365, 1366, 1368 (Kew Herb.); *Holway* 552. Pongo, *Hitchcock* 22762, 22776. Unduavi, *Buchtien*. La Paz, *Buchtien* 518. Palca, *Buchtien* 2538.

The specimens assigned to each of the last two species are rather diverse among themselves. The material could not be satisfactorily separated by distinctive characters.

BROMUS CALDASII H. B. K. Nov. Gen. & Sp. 1: 151. 1816. Vicinity of Quito. Doctor Lecomte kindly sent me a spikelet from the type specimen at Paris. I have not been able to identify it with any of the species described above. The glumes are narrow, the first 4 mm., the second 6 mm. long; the lemmas narrow, scaberulous, 1.5 cm. long., with a mucro 0.5 to 1 mm. long.

BROMUS SEGETUM H. B. K. Nov. Gen. & Sp. 1: 151. 1816. Vicinity of Quito. Doctor Lecomte also sent a spikelet from the type specimen of this species. The lemmas are scabrous all over and bear an awn about as long as the body. The spikelet is on a slender flexuous scabrous pedicel about 4 cm. long. It appears to be the same as some of the specimens assigned to *B. pitensis*.

8. BRACHYPODIUM Beauv.

Spikelets many-flowered, narrow, nearly terete, short-pedicel in a simple raceme; lemmas usually awned from the tip, 7 to 9-nerved; palea with stiffly ciliate keels.

1. *Brachypodium mexicanum* Link, Hort. Berol. 1: 41. 1827.

Festuca scabra Lag. Gen. & Sp. Nov. 4. 1816. Not *F. scabra* Vahl, 1791.

A slender wiry straggling perennial, with flat blades and racemes about 5 cm. long, the spikelets 1.5 to 2 cm. long, rather distant, at first appressed, finally spreading or reflexed.

Shady banks, Mexico to Bolivia. Originally described from Mexico.

ECUADOR: Tulcán, *Hitchcock* 21009. Quito, *Harteman* 41; *Holway* 886; *Sodi* in 1896; *Mille* 294. Latacunga, *Sodi* in 1891. Without locality, *Spruce* 5917 (Kew Herb.).

PERU: Baños, *Wilkes Expl. Exped.* Goyllarisquisca, *Hitchcock* 22298. La Quinhua, *Hitchcock* 22259. Cuzco, *Hitchcock* 22482, 22488.

BOLIVIA: Sorata, *Holway* 544. Cochabamba, *Hitchcock* 22855; *Holway* 409.

9. FESTUCA L. FESCUE

Spikelets few to several-flowered; glumes small; lemmas firm, convex, or keeled toward the summit only, awned from the tip (rarely from between minute teeth), sometimes acuminate or mucronate only.

Plants annual. Panicles narrow; florets narrow, long-awned.

Lemmas ciliate toward the apex; first glume very short, usually less than 1 mm. Panicles usually more than 10 cm. long-----1. *F. megalura*.

Lemmas not ciliate; first glume mostly 2 mm. long or more.

Lemmas about 5 mm. long; panicles usually less than 6 cm. long.

2. *F. australis*.

Lemmas about 1 cm. long; panicles 5 to 10 cm. long-----3. *F. bromoides*.

Plants perennial.

Panicles open, more than 10 cm. long.

Lemmas villous-----4. *F. dasyantha*.

Lemmas glabrous or scabrous.

Blades thin and lax, flat; lemmas awned, the awn about as long as the body.

Second glume 3-nerved, lemmas compressed, the nerves distinct; awn from between the minute teeth of the bifid apex of the lemma, straight-----5. *F. presliana*.

Second glume 1-nerved, narrow; lemmas nearly terete, the nerves obscure; awn terminal, becoming flexuous and implicate.

6. *F. ulochaeta*.

Blades firm, flat or involute; lemmas awnless or if awned the awn shorter than the body.

Lemmas 10 to 12 mm. long. Plants robust, 1 to 3 meters tall.

Ligule about 1 cm. long-----7. *F. dichoclada*.

Ligule 1 to 3 mm. long.

First glume 2 to 4 mm. long; ligule about 3 mm. long.

8. *F. eminens*.

First glume 5 to 6 mm. long; ligule about 1 mm. long.

9. *F. quadridentata*.

Lemmas 5 to 7 mm. long.

Basal sheaths becoming fibrous-----10. *F. compressifolia*.

Basal sheaths not becoming fibrous.

Blades flat-----11. *F. procera*.

Blades involute, or sometimes some of the culm blades flat.

12. *F. sublimis*.

Panicles contracted, or, if somewhat open, less than 10 cm. long.

Panicles short, mostly less than 5 cm. long, few-flowered, the lower branches naked for 1 to 2 cm.

Culms and panicle branches becoming flexuous or S-shaped in fruit, the panicle as a whole finally deciduous from the plant; glumes awn-pointed; lemmas toothed at the base of the awn.

13. *F. casapaltensis*.

Culms and panicle branches remaining straight or nearly so, the panicle not deciduous; glumes acute; lemmas not toothed.

14. *F. parvipaniculata*.

Panicles narrow, many-flowered, mostly more than 5 cm. long, the branches appressed, some of each fascicle floriferous nearly to base.

Panicles spikelike, mostly less than 8 cm. long, the leaves in a short basal cluster.

Culm scabrous; glumes 7 mm. long-----15. *F. breviaristata*.

Culm smooth; glumes 1 to 5 mm. long.

First glume 1 to 2 mm. long-----16. *F. andicola*.

First glume 3 to 4 mm. long-----17. *F. rigescens*.

Panicles narrow, usually elongate, if as short as 8 cm. scarcely spikelike.

Lemmas pubescent on the margins-----18. *F. orthophylla*.

Lemmas not pubescent on the margins.

Lemmas thin, scarious at the summit-----19. *F. glyceriantha*.

Lemmas not thin and scarious-tipped-----20. *F. dolichophylla*.

1. *Festuca megalura* Nutt. Journ. Acad. Phila. II. 1: 188. 1848.

An erect or spreading annual, with narrow panicles mostly more than 10 cm. long; lemmas ciliate.

Open ground and waste places, British Columbia to Chile. Originally described from California.

ECUADOR: Quito, *Arcade* 15. Baños, *Hitchcock* 21923; *Lehmann* 5286a (Kew Herb.). Huigra, *Hitchcock* 20762. Pomasqui, *Sodi*ro in 1894; *Mille* 279. Rionbamba, *Spruce* 5958.

PERU: Tarma, *Hitchcock* 22144. La Quinhua, *Macbride & Featherstone* 2032. Baños, *Wilkes Expl. Exp.* Mito, *Macbride & Featherstone* 1729. Matucana, *Macbride & Featherstone* 226. Río Blanco, *Macbride & Featherstone* 653. Ollantaytambo, *Cook & Gilbert* 478. Cuzco, *Hitchcock* 22474, 22506. Mollendo, *Hitchcock* 22387. Juliaca, *Harlan* in 1914.

BOLIVIA: Sorata, *Mandon* 1363. Pongo, *Hitchcock* 22760. La Paz, *Buchtien* 854. Talca Chugiaguilla, *Bang* 807. Bolivian Plateau, *Bang* 1105. Pasña, *Asplund* 6416. Calderillo, *Fiebrig* 3159. Cochabamba, *Hitchcock* 22829.

2. *Festuca australis* Nees; Steud. Syn. Pl. Glum. 1: 304. 1854.

An erect or spreading annual, with slender culms 10 to 30 cm. tall and narrow densely flowered panicles mostly not over 6 cm. long.

Fields, open ground, and waste places throughout South America at temperate altitudes. Originally described from Brazil.

ECUADOR: La Rinconada Ranch, *Hitchcock* 20938. Between Malchinguf and Pomasqui, *Hitchcock* 20865. Urbina, *Hitchcock* 22028. Alausí, *Hitchcock* 20707. Quito, *Hurtweg* 1454 (Kew Herb.); *Jameson* 257, 304 (both Kew Herb.).

PERU: Goyllarisquisca, *Hitchcock* 22287, 22309.

3. *Festuca bromoides* L. Sp. Pl. 75. 1753.

An erect annual as much as 50 cm. tall with densely flowered panicles mostly 7 to 10 cm. long.

Open ground, introduced from Europe in several places in South America.

ECUADOR: Quito, *Arcade* 1, 4; *Harteman* 50, 71; *Sodi*ro 278.

4. *Festuca dasyantha* H. B. K. Nov. Gen. & Sp. 1: 154. 1816.

A rather slender perennial about 1 meter tall, with flat blades and narrow, somewhat open panicles 15 to 25 cm. long, the branches ascending.

Grassy alpine slopes, Ecuador. Originally described from Cotopaxi.

ECUADOR: Near Quito, *Sodi*ro in 1904, 280.

5. *Festuca presliana* Hitchc.

Bromus depauperatus Presl, Rel. Haenk. 1: 263. 1830. Not *Festuca depauperata* Bertol, 1834.

While at Prague the writer examined the type specimen of *Bromus depauperatus* at the herbarium of the National Museum. The species is published as from Nootka Sound (Vancouver Island). It is evidently a species of *Festuca*, but neither the specimen nor the description corresponds with any species of *Festuca* in North America. It is allied to *F. elmeri* Scribn. & Merr. but is distinct from that species. The label accompanying the type specimen bears no data other than the name, and there would appear to be no reason for having assigned Nootka Sound as the locality.

In the U. S. National Herbarium there is a specimen from Baños, Peru, collected by the Wilkes exploring expedition, which agrees with *Bromus depauperatus*. Baños is in the central Andes and is in the general region of Huánuco, where Haenke made large collections. It seems very probable that the type came from Peru and that the locality as published is an error.

The species is tall and slender, characterized by flat blades, large open panicle and awned spikelets. The awn is nearly or quite as long as the 5-nerved scaberulous lemmas, and proceeds from between two slender, minute but well-defined teeth at the apex. In this last character it agrees with *Festuca elmeri*.

6. *Festuca ulochaeta* Steud. Syn. Pl. Glum. 1: 305. 1854.

Festuca leptothrix Trin.; Doell in Mart. Fl. Bras. 2^o: 115. 1878.

A lax perennial about 1 meter tall, with thin flat blades 5 mm. wide and open panicles 15 to 20 cm. long.

Shady slopes, Ecuador to Bolivia and Brazil, whence originally described.

ECUADOR: Mount Pichincha, *Sodiro* in 1887. Tulcán, *Hitchcock* 21042.

PERU: Ollantaytambo, *Hitchcock* 22532.

BOLIVIA: Unduavi, *Buchtien* 6415.

7. *Festuca dichoclada* Pilger, Bot. Jahrb. Engler 37: 514. 1906.

Culms as much as 2 meters tall, stout, the blades 6 to 7 mm. wide, more or less involute; ligule as much as 1 cm. long; panicle large and spreading, the branches naked at the base; first glume 5 to 6 mm. long, the second 7 to 8 mm. long; lemmas about 1 cm. long, scaberulous, acute, 5-nerved. Differing from *F. eminens* in the longer glumes, shorter lemmas, and longer ligule.

Mountain sides, Ecuador and Peru, whence originally described. (Type, *Weberbauer* 3230.)

ECUADOR: Gualea, *Sodiro* in 1890; *Mille* 287.

PERU: Caraz, *Weberbauer* 3230. Ollantaytambo, *Cook & Gilbert* 510. Río Blanco, *Macbride* 3045.

8. *Festuca eminens* Kunth, Rév. Gram. 1: 132. 1829.

Bromus procerus H. B. K. Nov. Gen. & Sp. 1: 150. 1816. Not *Festuca procera* H. B. K. 1816.

A rather stout perennial 1 to 2 meters tall, with scabrous sheaths, flat blades, and open panicles 10 to 20 cm. long, the slender spreading branches naked below.

Dry thickets, Colombia and Ecuador. Originally described from Quito. (*Bonpland*.)

ECUADOR: Huigra, *Hitchcock* 20746. Quito, *Sodiro*.

9. *Festuca quadridentata* H. B. K. Nov. Gen. & Sp. 1: 154. 1816.

A tall stout perennial, with culms 2 to 3 meters tall, flat blades, and large open panicles 30 to 50 cm. long, the spreading branches naked below.

Ecuador. Originally described from Guamote, between Riobamba and Alausí. (*Bonpland*.)

ECUADOR: Tungurahua, *Sodiro* in 1901.

10. *Festuca compressifolia* Presl, Rel. Haenk. 1: 259. 1830.

Festuca fibrifera Pilger, Bot. Jahrb. Engler 37: 509. 1906. (*Weberbauer* 2462.)

An erect cespitose perennial 50 to 100 cm. tall, with firm involute scabrous blades and open panicles 10 to 20 cm. long, the branches spreading, naked below.

Rocky slopes, Peru. Originally described from Huánuco. (*Haenke*.)

PERU: Chinche, *Macbride & Featherstone* 1282. Goyllarisquisca, *Hitchcock* 22313. Oroya, *Hitchcock* 22173; *Macbride & Featherstone* 949. Matucana, *Macbride & Featherstone* 334. Mito, *Macbride & Featherstone* 1695; *Macbride* 3258, 3317. Tarma, *Macbride & Featherstone* 1066; *Weberbauer* 2462. Huánuco, *Haenke* (fragment from type at German University at Prague).

11. *Festuca procera* H. B. K. Nov. Gen. & Sp. 1: 154. 1816.

Festuca fiebrigii Pilger, Bot. Jahrb. Engler 37: 510. 1906. (*Fiebrig* 3117.)

A slender perennial 1 to 2 meters tall, with flat blades and open panicles 10 to 30 cm. long.

Wooded slopes, Colombia to Bolivia. Originally described from near Quito. (*Bonpland.*)

ECUADOR: La Rinconada Ranch, *Hitchcock* 20798. Mount Pichincha, *Karsten*; *Sodi*ro 282. Tulcán, *Hitchcock* 21094. Quito, *Harteman* 39; *Mille* 281, 286, *Sodi*ro. Baños, *Hitchcock* 21926; *Sodi*ro. El Altar, *Sodi*ro. Between San Lucas and Oña, *Hitchcock* 21512. Riobamba, *Sodi*ro in 1891. Tungurahua, *Spruce* 5938.

BOLIVIA: Tarija, *Fiebrig* 3117, 3118.

12. *Festuca sublimis* Pilger, Bot. Jahrb. Engler 25: 718. 1898.

An erect cespitose perennial as much as 1 meter tall, with involute glabrous blades and open panicles 15 to 25 cm. long.

Alpine slopes, Ecuador, whence originally described, to Bolivia. (Type, *Stübel* 297.)

ECUADOR: Mount Pichincha. *Sodi*ro; *Mille* 283, 285; *Jameson* 191 (*Kew Herb.*); *Harteman* 7a. Riobamba, *Sodi*ro. Pucará de Chisalo, *Stübel* 297. Mount Altar, *Sodi*ro in 1890. Between Cuenca and Huigra, *Hitchcock* 21682.

PERU: Paucartambo, *Weberbauer* 6922 (*Field Mus.*).

BOLIVIA: Ingenio del Oro, *Rusby* 204. Near Yungas, *Rusby* 44. Sorata, *Mandon* 1362. Rinconado, *Asplund* 6534. Pongo, *Hitchcock* 22775.

The Ecuador specimens are awnless; the Bolivia specimens awned or awn-pointed. The latter are somewhat diverse among themselves, and until more material is at hand they are referred rather doubtfully to *F. sublimis*. Though the blades, especially of the Bolivia specimens, are in the main involute, some of them may be only loosely so or even flat.

13. *Festuca casapaltensis* J. Ball, Journ. Linn. Soc. Bot. 22: 62. 1885.

Bromus weberbaueri Pilger, Bot. Jahrb. Engler 37: 517. 1906. (*Weberbauer* 2814.)

A dwarf perennial growing in dense tussocks as much as 10 cm. in diameter, with slender culms 10 to 15 cm. long, bearing a single leaf below the middle, numerous involute arcuate basal blades 1 to 2 cm. long, and small open few-flowered panicles 2 to 3 cm. long, the branches with age becoming recurved-spreading and the culm somewhat spiral.

Dry subalpine slopes, Peru. Originally described from Casapalta. (*Ball.*)

PERU: Cerro de Pasco, *Hitchcock* 22227, Baños, *Wilkes Expl. Exped.* Ocos, *Weberbauer* 2814. Casapalta, at 4,200 to 4,290 meters, *Ball* in 1882. (*Kew Herb.*).

14. *Festuca parvipaniculata* Hitchc., sp. nov.

A cespitose perennial; culms erect, glabrous, 15 to 30 cm. tall; sheaths glabrous; ligule less than 1 mm. long; blades involute, glabrous, mostly less than 10 cm. long, sometimes as much as 15 cm. long, one blade at or below the middle of the culm, 1 to 5 cm. long; panicle narrow, few-flowered, 3 to 5 cm. long, the branches ascending or appressed, the lower 1 to 3 cm. long, naked below; spikelets mostly 3-flowered; glumes somewhat unequal, the first acuminate, 1-nerved, about 5 mm. long, the second acute, 3-nerved, about 7 mm. long; lemmas obscurely nerved, scaberulous, about 7 mm. long, tapering into an awn 2 to 3 mm. long; rachilla scaberulous.

Type in the U. S. National Herbarium, no. 1,164,489, collected on slope of a railroad cut through a dry hill, Cerro de Pasco, Department of Junin, Peru. altitude 4,200 meters, November 1, 1923, by A. S. Hitchcock (no. 22244).

Dry hills at high altitudes, Peru.

PERU: Cerro de Pasco, *Hitchcock* 22244, 22245. Hacienda Atocsaico, *Hitchcock* 22193.

This species has somewhat the aspect of *F. casapaltensis*, from which it differs in the straight rather than S-shaped panicle branches, the entire rather than toothed lemma, and the acute rather than awn-pointed glumes. The panicle is not deciduous.

15. *Festuca breviaristata* Pilger, Bot. Jahrb. Engler 25: 717. 1898.

An erect glabrous caespitose perennial 30 to 50 cm. tall, with firm involute blades much shorter than the culm crowded toward the base and one 1 to 2 cm. long, at about the middle of the culm, and narrow spikelike panicles 5 to 15 cm. long.

Paramos, Ecuador, whence originally described, and Bolivia. (Type, *Stübel* 207.)

ECUADOR: Mount Pichincha, *Lehmann* 495; *Hitchcock* 21058. Mount Chimborazo, *Hitchcock* 22019; *Sodi*. Mount Puntas, *Stübel* 207.

16. *Festuca andicola* H. B. K. Nov. Gen. & Sp. 1: 153. 1816.

A low caespitose perennial 10 to 20 cm. tall, with firm, folded or involute, glabrous blades mostly less than 5 cm. long, the single culm blade below the middle 1 to 2 cm. long; panicles narrow, few-flowered, about 5 cm. long, the branches appressed.

Paramos, Ecuador. Originally described from near Tulcán. (*Bonpland.*)

ECUADOR: Mount Chimborazo, *Hitchcock* 21981.

17. *Festuca rigescens* (Presl) Kunth, Rév. Gram. 1: Suppl. XXXI. 1830.

Diplachne rigescens Presl, Rel. Haenk. 1: 260. 1830.

Diplachne brevifolia Presl, Rel. Haenk. 1: 261. 1830. (Huánuco, Peru.)

Festuca haenkei Kunth, Rév. Gram 1: Suppl. XXXII. 1830.

Festuca humilior Nees & Mey. Nov. Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 35. 1841; 167. 1843. (Mountains of Peru.)

Festuca dissitiflora Steud.; Griseb. Abh. Ges. Wiss. Göttingen 24: 287. 1879. (*Lechler* 1829.)

Festuca stuebelii Pilger, Bot. Jahrb. Engler 25: 717. 1898. (*Stübel* 60.)

An erect caespitose perennial 20 to 40 cm. tall, with stiff glabrous involute blades, and narrow, pale, rather few-flowered panicles 5 to 10 cm. long; spikelets mostly 3 or 4-flowered; lemmas somewhat indurate, nerveless, rather turgid.

Dry plains and hills, Peru and Bolivia. Originally described from Huánuco, Peru. (*Haenke.*)

PERU: Cerro de Pasco, *Hitchcock* 22232, 22234, 22235, 22239, 22252. Hacienda Atocsaico, *Hitchcock* 22191, 22197; *McKenzie* in 1924. Obrajillo, *Wilkes Expl. Exped.*; Mountains of Huánuco, *Haenke*. Juliaca, *Harlan* in 1914. La Quinhua, *Hitchcock* 22282. Macusani, *Lechler* 1829 (Kew Herb.). San José, *Macbride & Featherstone* 1112. Oroya, *Macbride & Featherstone* 981; *Hitchcock* 22179. Goyllarisquisca, *Hitchcock* 22300. Cuzco, *Hitchcock* 22453. Chasqui, *Macbride & Featherstone* 2461.

BOLIVIA: Yungas, *Bang* 173. La Paz, *Holway* 483, 491, 604; *Stübel* 60; *Bang* 173 (a specimen under same number from Yungas). Palca, *Hitchcock* 22560. Chacaltaya, *Buchtien* 1191. Comanche, *Asplund* 6537, 6538, 6578. Isla del Sol, *Asplund* 6536. South of Atocha, *Hitchcock* 22930.

18. *Festuca orthophylla* Pilger, Bot. Jahrb. Engler 25: 717. 1898.

Festuca orthophylla var. *glabrescens* Pilger, Bot. Jahrb. Engler 37: 507. 1906. (Pucará, *Weberbauer* 408.)

Festuca orthophylla var. *boliviana* Pilger, Bot. Jahrb. Engler 37: 508. 1906. (*Fiebrig* 3192.)

An erect cespitose perennial 30 to 50 cm. tall, with firm involute glabrous blades often as long as the culms, and narrow panicles 10 to 15 cm. long, the branches ascending; lemmas pubescent along the margins.

Dry hills and plains, Peru and Bolivia. Originally described from Arequipa. (Type, *Stübel* 87.)

PERU: Cuzco, *Hitchcock* 22455. Between Arequipa and Puno, *Weberbauer* 4842. Arequipa, *Stübel* 87. Chivay, *Weberbauer* 6892 (Field Mus.). Sumbay, *Weberbauer* 6897 (Field Mus.).

BOLIVIA: Puna Patanca, southern Bolivia, *Fiebrig* 3192. Pasña, *Buchtien* 1186. Cochabamba, *Hitchcock* 22786. South of Oruro, *Hitchcock* 22871. Chugana, *Asplund* 6531.

19. *Festuca glyceriantha* Pilger, Bot. Jahrb. Engler 37: 516. 1906.

About 1 meter tall; blades folded, firm, smooth; panicle narrow, 20 to 25 cm. long, the main branches appressed, few-flowered, the spikelets appressed to the main rachis, 12 to 14 mm. long.

Known only from the type collection.

PERU: Yungay, *Weberbauer* 3275.

20. *Festuca dolichophylla* Presl, Rel. Haenk. 1: 258. 1830.

Poa dactyloides H. B. K. Nov. Gen. & Sp. 1: 163. 1816. Not *Festuca dactyloides* Sibth. & Smith, 1806. (Antisana, Ecuador, *Bonpland*.)

Diplachne scirpifolia Presl, Rel. Haenk. 1: 261. 1830.

Festuca scirpifolia Kunth, Rév. Gram. 1: Suppl. XXXI. 1830.

Festuca subulifolia Benth. Pl. Hartw. 262. 1847. (Hacienda de Antisana.)

Festuca setifolia Steud.; Griseb. Abh. Ges. Wiss. Göttingen 19: 251. 1874.¹⁵
(*Lechler* 1826, from Peru.)

Festuca lasiorachis Pilger, Bot. Jahrb. Engler 37: 508. 1906. (Cuyo-cuyo *Weberbauer* 904 and 907; Sandía, *Weberbauer* 589.)

Festuca laetiviridis Pilger, Bot. Jahrb. Engler 37: 510. 1906. (*Fiebrig* 2955.)

Festuca carazana Pilger, Bot. Jahrb. Engler 37: 511. 1906. (*Weberbauer* 3106.)

Festuca distichovaginata Pilger, Bot. Jahrb. Engler 37: 511. 1906. (*Weberbauer* 3317.)

Festuca weberbaueri var. *foliosa* Pilger, Bot. Jahrb. Engler 37: 513. 1906. (*Weberbauer* 4872.)

Festuca horridula Pilger, Bot. Jahrb. Engler 37: 514. 1906. (*Weberbauer* 2588.)

Festuca tarmensis Pilger, Bot. Jahrb. Engler 37: 515. 1906. (*Weberbauer* 2233.)

Festuca inarticulata Pilger, Bot. Jahrb. Engler 37: 516. 1906. (*Weberbauer* 3218.)

Festuca buchtienii Hack. Repert. Nov. Sp. Fedde 6: 160. 1908. (*Buchtien* 870.)

Festuca pflanzii Pilger, Bot. Jahrb. Engler 49: 188. 1912. (*Pflanz* 292.)

An erect cespitose perennial 40 to 100 cm. tall, with slender, involute, glabrous or scabrous blades and narrow panicles 5 to 15 cm. long, the branches ascending or appressed; lemmas awnless or mucronate, rarely short-awned.

Paramos, Ecuador to Bolivia. Originally described from Huánuco, Peru. (*Haenke*.)

ECUADOR: Mount Pichincha, *Sodirol*; *Spruce* 5509. Mount Guanamí, *Mille* 284. Mount Atacatzo, *Harteman* 67. Mount Chimborazo, *Hitchcock* 21944, 21951, 21978, 21994, 22030.

¹⁵ Also in *Lechler*, *Berb. Amer. Austr.* 56. 1857, name only.

PERU: Mito, *Macbride* 3362. Caraz, *Weberbauer* 3106, 3218. Monzón, Dept. Huánuco, *Weberbauer* 3317. Tambo de Vaca, *Macbride* 4904. Oroya, *Macbride & Featherstone* 950; *Weberbauer* 2586. Hualgayoc, Dept. Cajamarca, *Weberbauer* 3974. Obrajillo, *Wilkes Expl. Exped.* Carumas, *Weberbauer* 7346. Huánuco, *Macbride & Featherstone* 2172. Goyllarisquisca, *Hitchcock* 22328. La Quinhua, *Hitchcock* 22270, 22276, 22281. Tarma, *Weberbauer* 2233. Río Blanco, *Macbride & Featherstone* 649. Torontoy, *Bingham* 728. Cuyo-cuyo, *Weberbauer* 907. Huánuco, *Haenke* (fragments of *F. dolichophylla* and *Diplachne solrpifolia* at the German University, Prague).

BOLIVIA: La Paz, *Holway* 460, 473, 477; *Hitchcock* 22568; *Buchtien* 870, 2546, 3131, 3966, 3967, 4486, 4488; *Rusby* 50; *Bang* 33; *Asplund* 6533. Sorata, *Mandon* 1361; *Rusby* 224; *Holway* 519. Pongo, *Hitchcock* 22778. Chalapata, *Asplund* 6530. Cochabamba, *Holway* 346. Cerro Sipascoya, *Herzog* 2052. Tupiza, *Fiebrig* 2955.

The specimens here assigned to *F. dolichophylla* may belong to more than one species. The types of Pilger's species, of most of which we have seen but fragments kindly sent by Doctor Pilger, show slight differences, but it is impossible to sort the above-cited specimens into these species and distinguish them by definite characters.

10. APHANELYTRUM Hack.

Spikelets 2 or 3-flowered, the rachilla joints capillary, flexuous, from half to three-fourths as long as the erect or spreading florets, prolonged beyond the uppermost floret; glumes minute.

1. *Aphanelytrum procumbens* Hack. Oesterr. Bot. Zeitschr. 52: 13. 1902.

Aphanelytrum decumbens Hack.; Sodiro, Anal. Univ. Quito 7. 1889, name only.

Brachyelytrum procumbens Hack. in Engl. & Prantl, Pflanzenfam. 2¹: Nachtr. 42. 1897.

A weak decumbent branching straggling grass, apparently a perennial, with culms 40 to 80 cm. long, flat blades, and loose panicles 10 to 20 cm. long, the distant branches slender, bearing 1 or 2 spikelets at the extremities.

Moist banks, Colombia to Bolivia. Originally described from the mountains of Ecuador. (*Sodiro*, without exact locality.)

ECUADOR: Mount Pichincha, *Jameson* 168 (Kew Herb.), 269. Nono, *Sodiro*; *Holmgren* 649.

BOLIVIA: Unduavi, *Buchtien* 4268. Bella Vista, *Hitchcock* 22756.

The type specimen in the Hackel Herbarium is labeled "Ecuador, in silvis opac. 2000 m., leg. A. Sodiro." The specimen in the Sodiro Herbarium at Quito, presumably of the type collection, is from Nono, near Quito.

11. PUCCINELLIA Parl.

Spikelets several-flowered, differing from those of *Poa* chiefly in the rounded, scarcely compressed, obtuse or acutish, obscurely nerved lemmas, the nerves not approaching at the apex, glabrous or puberulent at the base only.

Second glume about 1 mm. long; lemmas about 1.5 mm. long---1. *P. parvula*.

Second glume 1.5 to 2 mm. long; lemmas about 2.5 mm. long---2. *P. oresigena*.

1. *Puccinellia parvula* Hitchc., sp. nov.

A pale, dwarf, densely caespitose, glabrous perennial, forming small tussocks 5 to 10 cm. in diameter; culms mostly less than 10 cm. tall; ligule truncate, about 1 mm. long; blades of the culm leaves flat or loosely involute, those of the innovations slender or capillary, involute, mostly less than 3 cm. long; panicles narrow, congested, 2 to 4 cm. long, more or less inclosed in the uppermost inflated sheath; spikelets 2 or 3-flowered, about 2 mm. long, the pedicels

about 0.5 mm. long; first glume ovate, acutish, 0.5 mm. long; second glume oval or somewhat obovate, obtuse, 1 mm. long; lemmas oblong or elliptic, a little more than 1 mm. long, obtuse, lacerate or somewhat toothed at apex, the upper third whitish, the marginal nerves distinct, the intermediate nerves faint; palea about as long as the lemma.

Type in the U. S. National Herbarium, no. 1,164,915, collected in moist gravelly river bed at Atocha, Sur-Chichas, southern Bolivia, altitude about 3,500 meters, January 9, 1924, by A. S. Hitchcock (no. 22878).

This species is distinguished by its small spikelets and florets. No specimens besides the type collection have been seen.

2. *Puccinellia oresigena* (Phil.) Hitchc.

Poa oresigena Phil. Anal. Mus. Nac. Chile Bot. 8: 87. 1891.

A spreading glabrous perennial, with decumbent culms 10 to 20 cm. long, decurrent ligules 3 to 4 mm. long, flat or loosely involute blades, and narrow, rather dense panicles as much as 10 cm. long; spikelets mostly about 3-flowered, 4 to 5 mm. long; first glume ovate, more or less notched at the obtuse apex, about 1 mm. long; second glume obtuse, about 2 mm. long; lemmas acutish, about 2.5 mm. long.

Moist soil, southern Bolivia and northern Chile, whence originally described.

BOLIVIA: Moist gravelly river bed, Atocha, *Hitchcock* 22879. Oruro, *Asplund* 6474.

12. POA L. BLUEGRASS

Spikelets small, few-flowered; glumes keeled, acute; lemmas herbaceous with scarious tips, keeled, 5-nerved, awnless.

Panicles narrow, more or less condensed, the branches short, floriferous to the base or nearly so. (Branches naked below but appressed in *P. brevis*.)

Plants dioecious. Pistillate lemmas villous; staminate lemmas glabrous.

1. *P. buchtienii*.

Plants hermaphrodite.

Lemmas pubescent on the keel and lateral nerves.

Lemmas about 2 mm. long; plants annual.....2. *P. scaberula*.

Lemmas 3 to 4 mm. long; plants perennial.....3. *P. subspicata*.

Lemmas glabrous or scabrous.

Plants dwarf, the relatively stout naked culms not more than 5 cm. tall, with a capitate panicle of few to several spikelets.

Lemmas firm, not lacerate; spikelets 2-flowered...4. *P. chamaeclinos*.

Lemmas rather thin, obtuse, and lacerate; spikelets 3 to 4-flowered.

5. *P. humillima*.

Plants 10 cm. or more tall (if dwarf the culm leafy and the panicle oblong and at least 15 mm. long).

Panicle slender, loosely flowered. Spikelets elliptic, 2-flowered (the lemma tips approaching), culms 7 to 12 cm. tall.....6. *P. brevis*.

Panicles compact.

Spikelets about 8-flowered. First glume narrow, acute.

7. *P. remota*.

Spikelets about 3 or 4-flowered.

Lemmas acuminate, thin and whitish, somewhat shining, scabrous all over.....8. *P. vaginalis*.

Lemmas acutish, broad, usually bronze-tinted, glabrous or somewhat scabrous.....9. *P. gymnantha*.

Panicles more or less open, the branches spreading, the lower naked at base.
(Branches appressed in *P. nigriflora*.)

Panicles very loose, more than 30 cm. long, with long distant capillary branches spikelet-bearing toward the ends. Sheaths retrorsely scabrous.

10. *P. myriantha*.

Panicles not so loose nor so large (sometimes nearly so in *P. horridula*).

Lemmas glabrous or scabrous.

Branches of panicle appressed. Lemmas scabrous on upper part.

11. *P. nigriflora*.

Branches of panicle spreading.

Lemmas scabrous. Glumes much shorter than the first lemma.

12. *P. carazensis*.

Lemmas smooth or nearly so.

Creeping rhizomes present; sheaths smooth: lowermost sheaths finally fibrous.....13. *P. fibrifera*.

Creeping rhizomes wanting; sheaths scabrous; lowermost sheaths not becoming fibrous.

First lemma 5 to 6 mm. long.....14. *P. gilgiana*.

First lemma 3 to 4 mm. long.

Lower branches of panicle reflexed, naked below.

15. *P. pardoana*.

Lower branches of panicle short, some naked, some floriferous to base.....16. *P. illoii*.

Lemma pubescent on back or nerves or with a few long fine-tangled hairs at base (cobweb).

Cobweb present.

Sheaths scabrous. Culms decumbent and creeping at base.

17. *P. trivialis*.

Sheaths glabrous.

Culms lax and decumbent. Spikelet 2-flowered.

18. *P. aequatoriensis*.

Culms erect.

Spikelets mostly 2-flowered; lower branches of panicle mostly solitary or in pairs.....19. *P. cucullata*.

Spikelets 3 to 6-flowered; lower branches of panicle mostly in fours or fives.

Creeping rhizomes present.....20. *P. pratensis*.

Creeping rhizomes wanting.....21. *P. leioclada*.

Cobweb wanting.

Blades involute, scabrous.....22. *P. asperiflora*.

Blades flat or folded.

Plants annual. Blades flat; panicle pyramidal, open, mostly not more than 5 cm. long.....23. *P. annua*.

Plants perennial.

First glume 1 to 1.5 mm. long, the second often toothed.

24. *P. denticulata*.

First glume about 3 mm. long.

Panicle mostly 15 to 30 cm. long.....25. *P. horridula*.

Panicle mostly 5 to 10 cm. long.....26. *P. candamoana*.

1. *Poa buchtienii* Hack. Repert. Nov. Sp. Fedde 11: 29. 1912.

Poa buchtienii var. *subacuminata* Hack. Repert. Nov. Sp. Fedde 11: 30. 1912.

(*Buchtien* 2523.)

An erect caespitose dioecious perennial 50 to 80 cm. tall, with slender, elongate, flat, or loosely involute blades and condensed, interrupted, or lobed panicles 8 to 15 cm. long; pistillate spikelets densely pilose, the staminate glabrous.

Dry shaded banks, Bolivia, whence originally described, the specimens cited being *Buchtien* 2467, 2468, 2469, 2470, 2466, the first four staminate, the last pistillate.

BOLIVIA: Sorata, *Rusby* 223; *Mandon* 1338 (Kew Herb.). La Paz, *Buchtien* 869, 2466, 2467, 2468, 2469, 2470; *Hitchcock* 22559, 22567, 22570, 22571. Palca, *Buchtien* 2523. Challapata, *Asplund* 6479.

2. *Poa scaberula* Hook. f. Fl. Antarct. 378. 1847.

Dasympoa tenuis Pilger, Bot. Jahrb. Engler 25: 716. 1898. Not *Poa tenuis* Ell. 1816. (*Stübel* 60f.)

An erect caespitose annual 20 to 50 cm. tall, with lax slender flat blades and condensed narrow panicles 3 to 15 cm. long, the branches appressed, more or less imbricate, 1 to 2.5 cm. long, densely flowered to base.

Grassy slopes, Peru to Argentina. Originally described from Straits of Magellan.

PERU: Oroya, *Hitchcock* 22186. Ollantaytambo, *Hitchcock* 22540. Lake Titicaca, *Stübel* 60f.

BOLIVIA: Sorata, *Mandon* 1336. La Paz, *Buchtien* 2496. San Felipe, *Hitchcock* 22598. Pongo, *Hitchcock* 22761; *Asplund* 6466. Cochabamba, *Hitchcock* 22859, 22860, 22865. Tarija, *Fiebrig* 2936. Challapata, *Asplund* 6478.

3. *Poa subspicata* (Presl) Kunth, Rév. Gram. 1: Suppl. XXVIII. 1830.

Brizopyrum subspicatum Presl, Rel. Haenk. 1: 281. 1830.

Poa pubiflora Benth. Pl. Hartw. 261. 1847. (Hacienda Antisana, Ecuador, *Hartweg* 1451.)

Poa jelskii Hack. Oesterr. Bot. Zeitschr. 52: 454. 1902. (*Jelski* 392.)

A caespitose perennial 20 to 30 cm. tall, with flat, rather lax blades 10 cm. long and 2 mm. wide, and narrow dense spikelike panicles 6 to 9 cm. long.

Paramos and alpine slopes, Ecuador and Peru, whence originally described. (*Haenke*.)

ECUADOR: Chillo, *Sodi* in 1890. Mount Chimborazo, *Hitchcock* 21999 $\frac{1}{3}$, 22026. Antisana, *Anthony & Tate* 279. Riobamba, *Mille*.

PERU: Cutervo, *Jelski* 392. Hacienda Atocsaico, *Hitchcock* 22195, 22201.

4. *Poa chamaeclinos* Pilger, Bot. Jahrb. Engler 37: 379. 1906.

A dwarf caespitose perennial a few centimeters tall, with short firm involute blades and few-flowered panicles about 1 cm. long, scarcely exceeding the leaves; spikelets 2-flowered, the lemmas firm, acute.

Alpine slopes, Peru. Known only from the type collection.

PERU: Andes above Lima, alt. 4,500 meters, *Weberbauer* 5118.

5. *Poa humillima* Pilger, Bot. Jahrb. Engler 37: 378. 1906.

A dwarf caespitose perennial 2 to 3 cm. tall, resembling *P. chamaeclinos*, differing in the 3 or 4-flowered spikelets and in the thinner obtuse lemmas.

Alpine slopes, Peru and Bolivia. Originally described from Peru. *Weberbauer* 2602 and 5113 (Andes above Lima) being cited.

PERU: Oroya, *Weberbauer* 2602. Casa Cancha, *Wilkes Expl. Exped.*

BOLIVIA: Sorata, *Mandon* 1353. Chacaltaya, *Buchtien* 1201. Potosí, *D'Orbigny* 194.

6. *Poa brevis* Hitchc., sp. nov.

A low, lax perennial; culms caespitose, erect or ascending, glabrous, 5 to 10 cm. tall; sheaths glabrous; ligule rounded, about 0.5 mm. long; blades flat, lax, as much as 1 mm. wide on the culm, slender, folded, as much as 6 cm.

long on the innovations, the tip boat-shaped; panicles narrow, few-flowered, 2 to 3 cm. long, the branches appressed, the lower as much as 2 cm. long, bearing 2 or 3 spikelets, the axis and branches glabrous; spikelets 2-flowered, about 3 mm. long; glumes nearly equal, broad, acutish, glabrous, 3-nerved, about 2 mm. long; lemmas glabrous, the two nearly the same height, the second smaller, the first 2.5 mm. long, acutish, very minutely scabrous on the keel, the intermediate nerves obsolete; palea nearly as long as the lemma, the rachilla extended beyond the base of the upper floret about 0.3 mm.

Type in the herbarium of the Field Museum, no. 535441, collected on wet, mossy, rocky, open upland at Tambo de Vaca, Peru, altitude 4,000 meters, June 10 to 24, 1923, by J. Francis Macbride (no. 4356).

No specimens other than the type collection have been seen. In the spikelet character this species resembles *P. chamaeclinos* Pilger, but the blades are lax and flat instead of involute, and the glumes are broad, equal, and shorter than the two florets, while in the other species they are unequal, narrower, and nearly as long as the spikelet.

7. *Poa remota* H. B. K. Nov. Gen. & Sp. 1: 163. 1816.

An erect perennial 60 to 100 cm. tall, with flat blades and erect narrow panicles 10 to 15 cm. long; spikelets oblong, about 8-flowered; first glume 2.5 mm., the second 3.5 mm. long; lemmas 6 mm. long, glabrous, acuminate but not awned, rounded on the back below, keeled toward the scaberulous tip; palea as long as the lemma.

Described from high plains near Latacunga, Ecuador. (*Bonpland.*)

I have been unable to place this species with any other collections seen. Doctor Lecomte kindly sent me a spikelet from the type specimen at Paris. It appears to belong to *Festuca* rather than to *Poa*. Rather than make a new name, the species is retained in *Poa* until it is better known.

8. *Poa vaginalis* Benth. Pl. Hartw. 261. 1848.

A glabrous erect caespitose perennial 30 to 50 cm. tall, with short, folded, rather firm, falcate blades, and narrow whitish panicles about 10 cm. long; spikelets about 3-flowered, the rachilla scabrous; first glume narrow, acute, 7 mm. long; second glume broader, rather obtuse, 8 mm. long; lemmas acuminate, finely scabrous all over, 7 to 8 mm. long.

Known only from the type collection, from Hacienda de Antisana. *Hartweg* 1450.

Doctor Hill, director of the herbarium at Kew, very kindly lent the type specimen for examination.

9. *Poa gymnantha* Pilger, Bot. Jahrb. Engler 56: Beibl. 123: 28. 1920.

An erect caespitose pale perennial, mostly 15 to 20 cm. tall, with firm erect glabrous involute blades, and narrow, rather condensed panicles 2 to 5 cm. long or rarely as much as 8 cm.

Alpine slopes, Peru and Bolivia. Originally described from Peru, *Weberbauer* 6905 and 5440 being cited.

PERU: Sumbay, *Weberbauer* 6905. Occa Pampa, *Shepard* 59.

BOLIVIA: Sorata, *Mandon* 1350, 1351. La Paz, *Buchtien* 6471. Rinconada, *Asplund* 6465. La Cumbre, *Asplund* 6495. La Paz, *Mandon* 1347. Comanche, *Asplund* 6488. Chacaltaya, *Buchtien* 1203.

10. *Poa myriantha* Hack.; Stuck. Anal. Mus. Nac. Buenos Aires 13: 517. 1906.

A tall slender perennial, with solitary, rather lax culms as much as 2 meters tall, scabrous sheaths, flat blades, and very loose, open panicles as much as 40 cm. long, the slender verticillate distant branches bearing spreading capillary branchlets with a few spikelets toward the ends.

Moist banks, Bolivia to Argentina. Originally described from Tucumán, Argentina.

BOLIVIA: Sorata, *Mandon* 1342 (Kew Herb.). Bella Vista, *Hitchcock* 22759. Tablas, *Herzog* 2182.

11. *Poa nigriflora* Hitchc., sp. nov.

A densely caespitose perennial; culms firm, glabrous, erect, 50 to 60 cm. tall; sheaths glabrous; ligule truncate, about 1 mm. long, minutely ciliolate; blades firm and hard, 10 to 15 cm. long, involute, glabrous, somewhat curved or falcate, ending in a hard blunt point, about 1 mm. thick when rolled, the uppermost at or below the middle of the culm, 5 to 10 cm. long; panicles narrow, strict, 10 to 12 cm. long, the branches ascending or appressed, the longer ones as much as 5 cm. long, naked at base, somewhat imbricate but loosely flowered, the axis and branchlets glabrous or the latter scabrous on one angle; spikelets appressed to the branchlets, 5 to 8 mm. long, mostly 2 or 3-flowered; glumes greenish, the first narrow, 2.5 mm. long, the blunt point ciliolate, the second oblong, 3.5 mm. long, 3-nerved, scabrous on the keel, the obtuse apex ciliolate; lemmas glabrous on the lower half, scabrous above, firm, obscurely nerved, not much compressed, dark brown or almost black, with rufous tips, the lowermost about 5 mm. long, the rachilla glabrous; palea narrow, a little longer than the lemma, glabrous below and scabrous above like the lemma.

Type in the U. S. National Herbarium, no. 1,161,474, collected on rocky lake shore, forming tough clumps, at an altitude of 4,200 meters, at Huarón, Peru, June 12, 1922, by Macbride & Featherstone (no. 1135).

This species is recognized by its firm foliage and strict dark-colored panicles. No other specimens than those of the type collection have been seen.

12. *Poa carazensis* Pilger, Bot. Jahrb. Engler 37: 380. 1906.

An erect caespitose perennial 30 cm. tall, with flat, mostly basal blades and open panicles about 4 cm. long.

Alpine slopes, Peru. Known only from the type collection.

PERU: Caraz, *Weberbauer* 3073.

13. *Poa fibrifera* Pilger, Bot. Jahrb. Engler 37: 380. 1906.

A lax perennial, with fiber-covered base, flat blades, and narrow open panicle about 8 cm. long, the branches naked below, ascending.

Alpine slopes, Peru. (Type, *Weberbauer* 2662.)

PERU: Ocos, *Weberbauer* 2662. Matucana, *Macbride & Featherstone* 367, 440. Baños, *Wilkes Expl. Exped.* Oroya, *Hitchcock* 22176. Tambo de Vaca, *Macbride* 4354, 4365. Mito, *Macbride* 3363.

14. *Poa gilgiana* Pilger, Bot. Jahrb. Engler 37: 507. 1906.

An erect caespitose perennial about 80 cm. tall, with firm flat blades folded below, and open panicles 15 to 18 cm. long.

Alpine slopes, Peru. Known only from the type collection.

PERU: Azángaro, *Weberbauer* 477.

15. *Poa pardoana* Pilger, Bot. Jahrb. Engler 37: 379. 1906.

An erect, glabrous, rather loosely caespitose perennial, with erect, narrow, folded or involute blades, and loose, rather narrow, nodding panicles 10 to 20 cm. long, the slender branches mostly twos, distant on the axis, finally reflexed, the axis glabrous, the branches scabrous.

Alpine slopes and paramos, Ecuador and Peru, whence originally described. (Type, *Weberbauer* 3975.)

ECUADOR: Tulcán, *Hitchcock* 20919. Mount Pichincha, *Hitchcock* 21083; *Harteman* 76, 85; *Jameson* in 1859. Mount Chimborazo, *Hitchcock* 21948.

21986, 22004. Between Oña and Cuenca, *Hitchcock* 21630. Páramo de Atacazo, *Holmgren* 598. Mount Azuay, *Spruce* 6098 (Kew Herb.).

PERU: Hualgayoc, *Weberbauer* 3975.

16. *Poa lilloi* Hack.; Stuck. Anal. Mus. Nac. Buenos Aires 21: 153. 1911.

An erect cespitose perennial 20 to 30 cm. tall with folded or involute blades and open panicles 2 to 4 cm. long.

Dry hills, southern Bolivia and northern Argentina. Originally described from Tucumán, Argentina.

BOLIVIA: Atocha, *Hitchcock* 22931.

17. *Poa trivialis* L. Sp. Pl. 67. 1753.

Poa trachyphylla Hack. Oesterr. Bot. Zeitschr. 52: 379. 1902. Not *P. trachyphylla* Pilger, 1898. (Pichincha, Ecuador, *Sodi*ro.)

A lax, decumbent or spreading perennial, with somewhat roughened sheaths, flat blades, and open pyramidal panicles 3 to 8 cm. long.

Along streams and ditches, the decumbent sterile shoots and culms sometimes extending into the water and floating, temperate regions; introduced from Europe, whence originally described.

ECUADOR: Quito, *Harteman* 13.

PERU: La Quinhua, *Hitchcock* 22266, 22277, 22279.

Professor Hackel differentiates *P. trachyphylla* from *P. trivialis* chiefly on the development of branching stolons and the greater number of nodes of the culm. The type of *P. trachyphylla* Hack. has not been examined since it is not in the Hackel Herbarium. The specimens cited from La Quinhua grew near the water of mountain brooks and the decumbent sterile shoots extended into the water. Except for these stolons, the plants agree with *Poa trivialis*. Since the name given by Hackel is untenable, the plants are referred to *Poa trivialis* until more material is at hand.

18. *Poa aequatoriensis* Hack. Oesterr. Bot. Zeitschr. 52: 450. 1902.

A lax decumbent perennial 40 to 80 cm. tall, with flat lax blades, and open nodding panicles 10 to 15 cm. long, the capillary branches naked below.

Molst banks, Ecuador, whence originally described. (*Sodi*ro, without exact locality.)

ECUADOR: Subandean region, *Sodi*ro in 1876. Mount Pichincha, *Sodi*ro in 1888. Between San Lucas and Oña, *Hitchcock* 21557. Between La Toma and Loja, *Hitchcock* 21369. Huataxi, *Spruce* 6095 (Kew Herb.). Tungurahua, *Spruce* 5929 (Kew Herb.).

19. *Poa cucullata* Hack. Oesterr. Bot. Zeitschr. 52: 377. 1902.

Poa depauperata H. B. K. Nov. Gen. & Sp. 1: 162. 1816. Not *P. depauperata* Kit. 1813. (Near Quito.)

An erect, smooth, somewhat succulent, loosely cespitose perennial, with slender deep-creeping rhizomes, culms 20 to 40 cm. tall, folded obtuse blades 1 to 3 mm. wide (folded), and usually dark, nodding panicles 5 to 8 cm. long, the branches 1 to 2 cm. long, naked below, closely flowered or glomerate above.

Alpine slopes near snow line, Ecuador, whence described. (Mount Pichincha, *Sodi*ro.)

ECUADOR: Mount Pichincha, *Sodi*ro in 1885; *Mille* 277; *Harteman* 83; *Karsten*; *Jameson* in 1859; *Hitchcock* 21048; *Lehmann* 491a, 8025 (Kew Herb.). Mount Chimborazo, *Hitchcock* 21956, 21967, 21984, 22017; *Hans Meyer* 437. Mount Antisana, *Stübel* 230.

20. *Poa pratensis* L. Sp. Pl. 67. 1753.

Poa boliviensis Hack. Repert. Nov. Sp. Fedde 11: 25. 1912. (*Buchtien* 2536.)

An erect perennial, with creeping rhizomes, glabrous culms 30 to 50 cm. tall, and open panicles 4 to 10 cm. long, the lower branches 3 to 5, spreading.

Commonly cultivated in temperate regions; originally from Europe; escaped in mountains of South America.

PERU: Tarma, *Hitchcock* 22171.

BOLIVIA: Palca, *Buchtien* 2536; *Hitchcock* 22572. La Paz, *Buchtien* 236.

21. *Poa leioclada* Hack. Oesterr. Bot. Zeitschr. 52: 452. 1902.

A loosely caespitose perennial 30 to 50 cm. tall, with narrow, flat or loosely folded blades and ovate spreading panicles, the branches glabrous.

Grassy slopes, at 3,000 to 4,000 meters, Ecuador. Originally described from Mount Pichincha. The collector is not mentioned in the original description but the type specimen in the Hackel Herbarium was collected by *Sodi*ro.

ECUADOR: Mount Pichincha, *Sodi*ro in 1887. Panacillo, *Sodi*ro in 1904.

22. *Poa asperiflora* Hack. Repert. Nov. Sp. Fedde 11: 28. 1912.

Poa pflanzii Pilger, Bot. Jahrb. Engler 49: 187. 1912. (*Pflanz* 266 and 360, both from Palca.)

An erect caespitose perennial 20 to 50 cm. tall, with involute scabrous erect blades and open nodding panicles, the slender branches finally reflexed, naked below.

Alpine slopes, Peru and Bolivia, whence originally described. (Type, *Buchtien* 2549.)

PERU: Viso, *Macbride* & *Featherstone* 629. Rio Blanco, *Macbride* 3001. Oroya, *Hitchcock* 22175.

BOLIVIA: Isla del Sol, *Buchtien* 2549. Sorata, *Mandon* 1341. Palca, *Pflanz* 360. Mount Illimani, near snow line, *Hitchcock* 22589. La Paz, *Bang* in 1890. Pilaya, *Hitchcock* 22587. Pongo, *Hitchcock* 22774. General Campero, *Asplund* 6529.

23. *Poa annua* L. Sp. Pl. 68. 1753.

Poa infirma H. B. K. Nov. Gen. & Sp. 1: 158. 1816.

Poa aestivalis Presl, Rel. Haenk. 1: 272. 1830. (Mountains of Peru, corrected in the Addenda to Monterey, Calif.)

Poa algida Trin. Linnaea 10: 306. 1836. (Cerro de Pasco, Peru.)

Poa meyeri Nees & Mey. Nov. Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 31. 1841; 163. 1843. (Lake Titicaca.)

A low tufted soft smooth annual, the culms decumbent at base, the pale open panicles commonly about 5 cm. long.

Open and waste ground and grassland throughout the temperate regions of North America and extending southward in the mountains; introduced from Europe, whence originally described.

ECUADOR: Tulcán, *Hitchcock* 21036. Quito, *Arcade* 14; *Harteman* 45. Mount Chimborazo, *Hitchcock* 22011. Riobamba, *Spruce* 6096 (Kew Herb.). Luisa, *Rose* 22402, 23577, 23909. Cañar, *Rose* 22745.

PERU: Cerro de Pasco, *Hitchcock* 22248. Hacienda Atocsaico, *Hitchcock* 22190; *McKenzie* in 1924. Mito, *Macbride* & *Featherstone* 1712. Lima, *Hitchcock*, 22344; *Macbride* 5906. Cuzco, *Hitchcock* 22495½. Chuquibambilla, *Hitchcock* 22451. Juliaca, *Harlan* in 1914. Occa Pampa, *Shepard* 90. Arequipa, *Hitchcock* 22436.

BOLIVIA: La Paz, *Buchtien* 2464, 2465; *Rose* 18865, 18867; *Holway* 421. Palca, *Buchtien* 2534; *Hitchcock* 22574. Cochabamba, *Hitchcock* 22864. Hacienda Casana, *Buchtien* 7139. Comanche, *Asplund* 6501. Carabuco, *Buchtien* 6528.

24. *Poa denticulata* Hack. Repert. Nov. Sp. Fedde 11: 27. 1912.

A loosely caespitose perennial, with creeping rhizomes, soft culms 15 to 20 cm. tall, flat blades 3 mm. wide, and open panicles 3 to 5 cm. long, the branches 2 to 5, spreading, naked below, few-flowered toward the ends.

Sunny slopes, Bolivia. Known only from the type collection.

BOLIVIA: Unduavi, *Buchtien* 2584.

25. *Poa horridula* Pilger, Bot. Jahrb. Engler 37: 506. 1906.

Melica expansa Steud.; Lechl. Berb. Amer, Austr. 56. 1857, name only
(*Lechler* 1734.)

Poa androgyna Hack. Repert. Nov. Sp. Fedde 6: 159. 1908. (*Buchtien* 846.)

Poa dumetorum Hack. Repert. Nov. Sp. Fedde 11: 26. 1912. (*Buchtien* 2582.)

Poa dumetorum var. *unduavensis* Hack. Repert. Nov. Sp. Fedde 11: 27. 1912.
(*Buchtien* 2583.)

An erect perennial, often growing in large clumps, with culms 1 to 1.5 meters tall, sometimes decumbent at base, flat blades as much as 8 mm. wide, and open oblong-pyramidal panicles 10 to 20 cm. long, the branches slender, verticillate, widely spreading, sometimes drooping or reflexed, naked below, the spikelets glomerate on the branches.

Moist banks and cliffs, Ecuador to Bolivia. Originally described from Peru. (Type, *Weberbauer* 3113.)

ECUADOR: Guaranda, *Jameson* 163 (Kew Herb.). Mount Guaminí, *Jameson* 694 (Kew Herb.).

PERU: Goyllarisquisca, *Hitchcock* 22302, 22316, 22322. La Quinhua, *Hitchcock* 22260, 22265, 22280. Cerro de Pasco, *Hitchcock* 22251. Río Blanco, *Macbride & Featherstone* 646, 707. Chavinillo, *Macbride & Featherstone* 1970. Obrajillo, *Wilkes Expl. Exped.* Cuzco, *Hitchcock* 22458, 22459, 22477, 22479, 22513. Chuquibambilla, *Hitchcock* 22443. Azángaro, *Lechler* 1734 (Kew Herb.). Macusani, *Lechler* 2682 (Kew Herb.). Tabina, *Lechler* 2058 (Kew Herb.).

BOLIVIA: Sorata, *Mandon* 1339. Bella Vista, *Hitchcock* 22754. Pongo, *Hitchcock* 22782. Unduavi, *Buchtien* 2582, 2583. La Paz, *Buchtien* 846, 2482; *Rusby* 13; *Holway* 496. Comanche, *Asplund* 6508. Challapata, *Asplund* 6473.

POA MULALENSIS H. B. K. Nov. Gen. & Sp. 1: 162. 1816. "Crescit in scopulis, montanis Andium Quitensium prope Mulalo (1590 hexap.) et juxta nivis perpetuae limitem in monte ignivomum Cotopaxi, inter Pumaucu et Suniguaicu, alt. 226 hexap." This species has not been identified. It may be the same as *P. horridula* Pilger. Doctor Lecomte informs me that the type can not be found in the Paris Herbarium.

26. *Poa candamoana* Pilger, Bot. Jahrb. Engler 37: 381. 1906.

Differing from *P. horridula* in being smaller, with narrower blades, and smaller, less open panicles. May be a small form of that species.

Plains, grassy slopes and rocky cliffs. Peru and Bolivia. Originally described from Peru. (Type, *Weberbauer* 472.)

PERU: Goyllarisquisca *Hitchcock* 22288, 22289, 22335. Hacienda Atocsaico, *Hitchcock* 22196, 22212, 22213, 22216; *McKenzie* in 1924. Río Blanco, *Macbride* 2969. Oroya, *Hitchcock* 22188. Between Casa Cancha and Culnai, *Wilkes Expl. Exped.* Chicla, *Rose* 18683. Cuzco, *Hitchcock* 22469, 22501. Chuquibambilla, *Hitchcock* 22442. Juliaca, *Harlan* in 1914. Azángaro, *Weberbauer* 472. Carumas, *Weberbauer* 7310.

BOLIVIA: Near Yungas, *Rusby* 27. Pongo, *Hitchcock* 22765, 22769. La Paz, *Asplund* 6482; *Buchtien* 2472. Palca, *Buchtien* 2528, 2542.

POA ADUSTA Presl, Rel. Haenk. 1: 271. 1830. "Hab. in Peruvia." This species has not been identified. In the herbarium of the German University at Prague, when the writer visited it, there was a cover marked *Poa adusta*, but there was no specimen within.

13. BRIZA L.

Spikelets several to many-flowered, the florets crowded, almost horizontal; glumes and lemmas broad, subchartaceous, the margins scarious; palea much smaller than its lemma.

Plants annual. Spikelets triangular-ovate, 4 to 5 mm. long, in a loose open panicle.....1. *B. minor*.

Plants perennial.

Spikelets oblong or elliptic, 2 to 3 mm. long, in an open nodding panicle.

2. *B. mandoniana*.

Spikelets nearly orbicular, 4 to 5 mm. wide, in a narrow rather strict panicle.

3. *B. stricta*.

1. *Briza minor* L. Sp. Pl. 70. 1753.

A weak-stemmed annual 30 to 50 cm. tall, with thin flat scabrous blades and loosely flowered panicles, the branchlets subcapillary but stiffly spreading, the spikelets triangular-ovate, nodding.

Open ground, sparingly introduced in America. Originally described from Europe.

ECUADOR: Quito, *Harteman* 52; *Arcade* 3. Riobamba, *Mille* 274.

PERU: Lima, *Hitchcock* 22427.

2. *Briza mandoniana* (Griseb.) *Henr. Med. Rijks Herb. Leiden* 40: 70. 1921.

Calotheca stricta var. *mandoniana* Griseb. *Abh. Ges. Wiss. Göttingen* 24: 289. 1879.

Poa monandra Hack. *Oesterr. Bot. Zeitschr.* 52: 376. 1902.

Briza lilloi Parodi, Univ. Nac. Buenos Aires, *Rev. Agron.* 3: 133. f. 6¹, 7¹, 1920.

Briza mandoniana var. *tuberculata* *Henr. Med. Rijks Herb. Leiden* 40: 71. 1921. (*Mandon* 1355 in part.)

Briza mandoniana var. *herzogiana* *Henr. Med. Rijks Herb. Leiden* 40: 71. 1921. (*Herzog* 3017.)

Briza mandoniana var. *vallegrandensis* *Henr. Med. Rijks Herb. Leiden* 40: 71. 1921. (*Vallegrande, Bolivia, Herzog* 1879.)

A slender delicate erect perennial 20 to 60 cm. tall, with flat, mostly basal blades, and loose nodding panicles 5 to 10 cm. long, the branches few, capillary, few-flowered, naked below; spikelets ovate, not very turgid, sometimes tuberculate, about 5 mm. long; aspect that of a species of *Poa*. The Huarón specimen (*Macbride & Featherstone* 1154) cited below differs in having condensed panicles and stouter culms.

Paramos, wooded slopes, and moist cliffs, Colombia to Argentina. Originally described from Bolivia. (Type, *Mandon* 1356.)

ECUADOR: Tulcán, *Hitchcock* 21041. Quito, *Harteman* 25, 42; *Mille* 276; *Holway* 953; *Sodi*; *Jameson* 779 (Kew Herb.). Mount Chimborazo, *Hitchcock* 21948½. Baños, *Hitchcock* 21909. Between Oña and Cuenca, *Hitchcock* 21628, 21639. Between La Toma and Loja, *Hitchcock* 21384, 21430. Between San Lucas and Oña, *Hitchcock* 21531. Between Loja and San Lucas, *Hitchcock* 21462, 21487.

PERU: Huarón, *Macbride & Featherstone* 1154. Mito, *Macbride & Featherstone* 1433, 1728; *Macbride* 3316. Chachapoyas, *Mathews* 3237 (Kew Herb.).

BOLIVIA: Sorata, *Rusby* 238; *Mandon* 1355 (Kew Herb.), 1356. Pongo, *Hitchcock* 22773. Unduavi, *Buchtien* 4280. Choquetanga, *Herzog* 3017.

3. *Briza stricta* (Hook. & Arn.) *Steud. Nom. Bot. ed. 2. 1: 225. 1840.*

Calotheca stricta Hook. & Arn. *Bot. Beechey Voy.* 50. 1841.

An erect slender cespitose perennial 40 to 80 cm. tall, with elongate slender blades and narrow, somewhat congested panicles, more or less interrupted,

especially below, the branches erect, few-flowered, the pedicels shorter than the ovoid spikelets, these about 5 mm. long.

Sandy fields and dry slopes, Bolivia, Argentina, and Chile. Originally described from Concepción, Chile.

BOLIVIA: Cochabamba, *Holway*, 383.

CHASCOLYTRUM SPICIGERUM, C. RUFUM, CALOTHECA MACROSTACHYA, C. BENIFORMIS, C. MICROSTACHYA, and PANICUM POAEMORPHUM are described by Presl as coming from the mountains of Peru (vicinity of Huánuco). Since these species, now referred to *Briza*, have not been collected in Peru by other botanists, it may be that, as in the case of several other species described by Presl, there is an error in the locality. They may have come from Chile, where Haenke made a collection. In the list of errata Presl gives the locality of *Calotheca macrostachya* as Monterey, Calif., but no such species is known from that State.

14. ERAGROSTIS Host

Spikelets few to many-flowered, strongly compressed; glumes and lemmas keeled, the lemmas 3-nerved; rachilla often continuous with the paleas persisting after the fall of the fruit.

Palea ciliate on the keels, the cilia usually as long as the width of the lemma.

Plants annual.

Panicle close and spikelike, more or less interrupted. (See also *E. peruviana*.)

1. *E. ciliaris*.

Panicle oblong or narrowly pyramidal, open.

Axis and branches not viscid, the branches rather lax.....2. *E. amabilis*.

Axis and branches of panicle viscid, the branches stiffly spreading.

3. *E. viscosa*.

Palea not conspicuously ciliate on the keels.

Plants creeping, forming mats.....4. *E. hypnoides*.

Plants not creeping.

Plants annual.

Lemmas glandular on the keel, 1 mm. wide (as folded)....5. *E. cilianensis*.

Lemmas not glandular, mostly less than 1 mm. wide (as folded).

Panicle elongate (as much as 40 cm.), contracted, the minute spikelets crowded or glomerate.....6. *E. glomerata*.

Panicle not elongate and dense.

Panicles oval or oblong, dense, 1 to 5 cm. long.....7. *E. peruviana*.

Panicles more or less open.

Blades pilose.

Spikelets sessile or nearly so; axils of branches conspicuously pilose; lemmas acuminate.....8. *E. maypurensis*.

Spikelets pediceled; axils glabrous or slightly pilose; lemmas acutish.....9. *E. articulata*.

Blades glabrous or pilose near base only.

Panicles dark purple, the branches implicate at maturity.

10. *E. nigricans*.

Panicles green or lead color, not implicate.

Spikelets about 1 mm. wide.....11. *E. pilosa*.

Spikelets nearly 2 mm. wide.

Panicles somewhat pilose in the axils.....12. *E. mexicana*.

Panicles glabrous in the axils.....13. *E. limbata*.

Plants perennial.

Panicles dense and spikelike.

Panicles 3 to 6 cm. long, attenuate or interrupted below.

14. *E. weberbaueri*.

Panicles elongate.

Panicles slender, about 3 mm. wide; blades less than 10 cm. long.

15. *E. attenuata*.

Panicles 1 cm. wide; blades as much as 1 meter long---16. *E. tenax*.

Panicles open or narrow but not dense and spikelike.

Panicles narrow, the branches appressed or ascending or, if spreading, short and closely flowered.

Branches of panicle somewhat distant, usually stiffly spreading or ascending, densely flowered, sometimes naked at base for as much as 1 cm., usually less than 5 cm. long-----17. *E. lurida*.

Branches of panicle ascending or appressed-----18. *E. pastoensis*.

Panicles open, sometimes diffuse.

Branches spreading, naked at base for 2 to 5 cm., rather closely flowered toward the end-----19. *E. montufari*.

Branches of panicle rather evenly flowered throughout.

Culms robust, as much as 1.5 meters tall and 6 mm. thick at base.

20. *E. magna*.

Culms comparatively low and slender, rarely as much as 1 meter tall.

Spikelets mostly more than 8-flowered.

Lemmas somewhat remote, only slightly overlapping the next one above, the keel nearly straight-----23. *E. patula*.

Lemmas closely imbricate, the keel curved.

Lemmas 1.5 mm. long, 0.5 mm. wide (as folded).

22. *E. expansa*.

Lemmas 2 mm. long, about 1 mm. wide (as folded).

21. *E. bahiensis*.

Spikelets mostly 3 to 5-flowered.

Rachilla conspicuously pilose-----24. *E. pilgeriana*.

Rachilla glabrous.

Lemmas 3 mm. long-----27. *E. carazensis*.

Lemmas about 2 mm. long.

Sheaths and blades more or less pilose or nearly glabrous.

25. *E. lugens*.

Sheaths and blades strongly hirsute----26. *E. polytricha*.

1. *Eragrostis ciliaris* (L.) Link, Hort. Berol. 1: 192. 1827.

Poa ciliaris L. Syst. Nat. ed. 10. 2: 875. 1759.

An erect to prostrate annual, with slender wiry culms 10 to 40 cm. tall, flat blades, and dense, narrow, interruptedly spikelike panicles 5 to 15 cm. long.

Waste places, at low altitudes, tropics of both hemispheres. Originally described from Jamaica.

ECUADOR: Oil Camp between Guayaquil and Salinas, *Hitchcock* 20015. Milagro, *Hitchcock* 20176. Chanduy, *Spruce* 6431a, 6433 (both Kew Herb.).

PERU: Lima, *Wilkes Expl. Exped.* Colonia Perené, *Hitchcock* 22074. Piura, *Spruce* 6431b (Kew Herb.).

BOLIVIA: Huachi, *White* 915 (Kew Herb.).

2. *Eragrostis amabilis* (L.) Wight & Arn.; Hook. & Arn. Bot. Beechey Voy. 251. 1841.

Poa amabilis L. Sp. Pl. 68. 1753.

Eragrostis plumosa Link, Hort. Berol. 1: 192. 1827.

A low, tufted, branching annual, with slender, ascending or spreading culms, linear blades, and handsome oblong panicles, the minute spikelets mostly borne along the lower side of the ascending branches.

Open ground and waste places, warmer regions of both hemispheres, at low altitudes. Originally described from India.

ECUADOR: Milagro, *Hitchcock* 20179.

3. *Eragrostis viscosa* (Retz.) Trin. Mém. Acad. St. Pétersb. VI. Math. Phys. Nat. 1: 397. 1830.

Poa viscosa Retz. Obs. Bot. 4: 20. 1786.

Differing from *E. amabilis* in the viscid stiffer panicles and larger spikelets.

Fields and open ground, introduced from Asia. Originally described from India.

ECUADOR: Chanduy, *Spruce* 6432. Oil Camp between Guayaquil and Salinas. *Hitchcock* 20092. Portovelo, *Hitchcock* 21268.

4. *Eragrostis hypnoides* (Lam.) B. S. P. Prel. Cat. N. Y. 69. 1888.

Poa hypnoides Lam. Tabl. Encycl. 1: 185. 1791.

Plant much-branched, spreading, forming mats, the flowering culms mostly 5 to 10 cm. tall; blades 1.5 to 2 cm. long, spreading; panicles small, more or less capitate, the pale, many-flowered spikelets commonly 1 cm. long.

Moist open ground along streams throughout the United States and southward to Argentina. Originally described from tropical America.

ECUADOR: Milagro, *Hitchcock* 20168. Balao, *Eggers* 14558. Guayaquil, *Spruce* 6430 (Kew Herb.), Portovelo, *Rose* 23399.

BOLIVIA: Guanay, *Rusby* 230. Mapiri, *Rusby* 243. Beni River, *Rusby* 227. Reyes, *White* 1232.

5. *Eragrostis cilianensis* (All.) Link; Vign. Lut. Malpighia 18: 386. 1904.

Poa cilianensis All. Fl. Pedem. 2: 246. 1785.

Eragrostis major Host, Icon. Gram. Austr. 4: 14. 1809.

Eragrostis megastachya Link, Hort. Berol. 1: 187. 1827.

Culms erect or often spreading; panicles rather compact, 2 to 10 cm. long, greenish or often whitish, the spikelets many-flowered, larger than in the other annual species; plant giving off a disagreeable odor.

A European species, introduced in America, fields and waste places. Originally described from Europe.

ECUADOR: Between La Toma and Loja, *Hitchcock* 21401. Chanduy, *Spruce* 6427 (Kew Herb.).

PERU: Obrajillo, *Wilkes Expl. Exped.* Moquegua, *Weberbauer* 7438.

BOLIVIA: Cochabamba, *Hitchcock*, 22844. Bolivian Plateau, *Bang* 1078. Tarija, *Fries* 1061.

6. *Eragrostis glomerata* (Walt.) L. H. Dewey, Contr. U. S. Nat. Herb. 2: 543. 1894.

Poa glomerata Walt. Fl. Carol. 80. 1788.

Eragrostis conferta Trin. Mém. Acad. St. Pétersb. VI. Math. Phys. Nat. 1: 409. 1830.

Robust, sometimes as much as 2 meters tall and appearing like a perennial, freely branching, the branches sometimes fasciated; blades elongate; panicles as much as 40 cm. long, narrowly contracted, densely flowered, pale, the spikelets minute.

Moist low ground, southeastern United States to Uruguay. Originally described from South Carolina.

ECUADOR: Panigón Plantation, *Hitchcock* 20570. Guayaquil, *Jameson* 541.

PERU: Piura, *Spruce* 6429 (Kew Herb.).

BOLIVIA: Covendo, *White* 915, 1000. Espía, *White* 613.

7. *Eragrostis peruviana* (Jacq.) Trin. Mém. Acad. St. Pétersb. VI. Math. Phys. Nat. 1: 396. 1830.

Poa peruviana Jacq. Coll. Bot. 1: 107. 1786.

Eragrostis deserticola R. A. Phil. Fl. Atac. 55. 1860.

Eragrostis peruviana var. *brachythyrso* Pilger, Bot. Jahrb. Engler 37: 375. 1906. (*Weberbauer* 1462.)

A spreading pubescent annual, with decumbent culms 10 to 40 cm. tall, flat blades, and dense, ovoid, oblong, or club-shaped panicles 1 to 5 cm. long.

Sandy soil, southern Peru and northern Chile. No locality cited with the original description. A portion of the type, presumably from Peru, is in the U. S. National Herbarium.

PERU: Chorrillos, *Macbride* 5874. Lurin, *Macbride* 5925. Mollendo, *Hitchcock* 22351; *Cook & Gilbert* 56; *Rose* 18980, 18981. Arequipa, *Holway* in 1920; *Cokerell* in 1925.

8. *Eragrostis maypurensis* (H. B. K.) Steud. Syn. Pl. Glum. 1: 276. 1854.

Poa maypurensis H. B. K. Nov. Gen. & Sp. 1: 161. 1816.

Eragrostis vahlîi Nees, Agrost. Bras. 499. 1829.

Eragrostis amoena Presl, Rel. Haenk. 1: 275. 1830.

Eragrostis panamensis Presl, Rel. Haenk. 1: 277. 1830.

Culms erect from a spreading base, 10 to 30 cm. tall, the narrow blades mostly near the base; panicles brownish or yellowish, narrow, the short branches somewhat distant, stiffly ascending, spikelet-bearing from the base; spikelets linear, as much as 15 mm. long.

Open ground, especially in sandy soil, western Mexico to Brazil. Originally described from Venezuela.

BOLIVIA: Guanay, *Rusby* 192.

9. *Eragrostis articulata* Nees, Agrost. Bras. 502. 1829.

An erect or decumbent annual 10 to 40 cm. tall, with papillose-hispid sheaths and blades, and narrow open panicles about half the length of the entire plant, the branches ascending, the spikelets pediceled and about equally distributed along the branches.

Open dry ground, Brazil to Bolivia. Originally described from Brazil.

BOLIVIA: Buena Vista, *Steinbach* 5182, 6991. Charagua, *Herzog* 1236. Gran Chaco, *Fries* 1463.

ERAGROSTIS ARTICULATA VAR. GLABRESCENS *Heur.* Med. Rijks Herb. Leiden 40: 69. 1921. This is based on *Herzog* 1309a, and is differentiated by having glabrous foliage. Doctor *Heurard* has kindly sent to the U. S. National Herbarium a spikelet from the type specimen. This spikelet is more slender and has more florets than those of *E. articulata*, and appears to belong to a distinct species.

10. *Eragrostis nigricans* (H. B. K.) Steud. Nom. Bot. ed. 2. 1: 563. 1840.

Poa nigricans H. B. K. Nov. Gen. & Sp. 1: 159. 1816.

Eragrostis subatra *Jedw.* Bot. Archiv Mez 5: 202. 1924. (*Bang* 80, cited as *Rusby* 80.)

A spreading annual, with decumbent culms as much as 50 cm. tall, and narrow dark panicles as much as 20 cm. long, the short main branches spreading but rather densely flowered and more or less implicate.

Open ground, fields, and waste places, Ecuador, whence originally described, to Bolivia. (Near Quito, *Bonpland.*)

ECUADOR: Quito, *Harteman* 1, 44; *Sodi*; *Arcade* 5; *Hitchcock* 21932; *Jameson* 249 (Kew Herb.). Riobamba, *Mille* 54; *Spruce* 5813. Ambato, *Hitchcock* 21742; *Pachano* 64. Quebrada Chalan, *Anthony & Tate* 441.

PERU: La Merced, *Hitchcock* 22130. Matucana, *Macbride & Featherstone* 223. Ollantaytambo, *Hitchcock* 22551. Cuzco, *Hitchcock* 22497, 22498. Chachapoyas, *Mathews* 3242 (Kew Herb.). Arequipa, *Cockerell* in 1925. Torata, *Weberbauer* 7405. Moquegua, *Weberbauer* 7447a.

BOLIVIA: Sorata, *Holway* 539. La Paz, *Bang* 21, 80; *Buchtien* 2, 562, 562a, 820, 6421. Palca, *Buchtien* 2535. Atocha, *Asplund* 6524. Oploca, *Hitchcock* 22889, 22928.

11. *Eragrostis pilosa* (L.) Beauv. Ess. Agrost. 162. 1812.

Poa pilosa L. Sp. Pl. 68. 1753.

A tufted weedy annual, pilose at the summit of the sheaths and in the axils of the lower panicle branches, otherwise glabrous; culms ascending, mostly 20 to 30 cm. tall; panicles oblong, loosely many-flowered, commonly about one-third the entire height of the plant; spikelets 4 to 6 mm. long.

Open ground, fields, and waste places, warm and temperate regions of both hemispheres. Originally described from Italy.

ECUADOR: Quito, *Arcade* 6. Baños, *Hitchcock* 21903. Alausí, *Hitchcock* 20690. Huigra, *Hitchcock* 20613. Chanduy, *Spruce* 6428 (Kew Herb.).

PERU: Obrajillo, *Wilkes Expl. Exped.* Matucana, *Macbride & Featherstone* 164, 225, 393, 451. Chosica, *Macbride & Featherstone* 551.

BOLIVIA: Sorata, *Mandon* 1329. La Paz, *Buchtien* 820. Cotafía, *Buchtien* 3135. La Florida, *Hitchcock* 22644. Yanacachi, *Buchtien* 428. Cochabamba, *Buchtien* 2515, 2516; *Hitchcock* 22804, 22846, 22867; *Holway* 356, 372. Oploca, *Hitchcock* 22900. Tupiza, *Hitchcock* 22922. Tarija, *Fries* 1100. Padcaya, *Fiebrig* 2528 (Kew Herb.).

12. *Eragrostis mexicana* (Lag.) Link, Hort. Berol. 1: 190. 1827.

Poa mexicana Lag. Gen. & Sp. Nov. 3. 1816.

Differing from *E. pilosa* in the larger spikelets, nearly 2 mm. wide.

Fields and waste places, southwestern United States to Chile. Originally described from Mexico.

ECUADOR: Guayaquil, *Mille* 19. Azogues, *Rose* 22798. Huataxi, *Spruce* 6092. Guaranda, *Jameson* 162 (Kew Herb.).

PERU: Lurin, *Macbride* 5954.

BOLIVIA: Sirupaya, *Buchtien* 428 in part.

13. *Eragrostis limbata* Fourn. Mex. Pl. 2: 116. 1886.

Similar to *E. pilosa* and *E. mexicana*, but the panicle erect, often purplish, and the axils glabrous.

A weed in cultivated ground or waste places. Mexico, whence originally described, to northern South America.

PERU: Matucana, *Macbride & Featherstone* 224; *Savatier* in 1877 (Kew Herb.). Moquegua, *Weberbauer* 7447.

14. *Eragrostis weberbaueri* Pilger, Bot. Jahrb. Engler 37: 375. 1906.

An erect perennial, with slender culms 20 to 30 cm. tall, slender fine-pointed blades 3 to 10 cm. long, and pale spikelike panicles 3 to 6 cm. long, interrupted below.

Rocky slopes, Peru, whence originally described. (Type, *Weberbauer* 3189.)

PERU: Between Samanco and Caraz, *Weberbauer* 3189. Arequipa, *Weberbauer* 6836; *Cockerell* in 1925. Matucana, *Macbride & Featherstone* 303. Puruchuca, *Mathews* 770 (Kew Herb.). Cotahuasi, *Weberbauer* 6870 (Field Mus.).

15. *Eragrostis attenuata* Hitchc., sp. nov.

A caespitose perennial; culms slender, glabrous, prostrate or ascending, 20 to 60 cm. long; sheaths glabrous or sparsely pilose, longer than the internodes, densely pilose at the throat, those of the culm 2 to 4; ligule densely pilose with hairs about 1 mm. long; blades conspicuously papillose-pilose on both surfaces, flat or those of the innovations involute, mostly 2 to 4 cm. long, sometimes as much as 7 cm., about 1 mm. wide, rarely as much as 3 mm., mostly spreading, sharp-pointed; panicles very slender, straight or somewhat flexuous, spikelike, somewhat interrupted, purplish, as much as 40 cm. long, usually more than half the length of the entire culm, the branches short and appressed, the lower as much as 3 cm. long, usually less than 1 cm. long; spikelets mostly 3 or 4-flowered, about 2 mm. long, the pedicel less than 1 mm. long, the rachilla at maturity disarticulating between the florets; glumes narrow, unequal, the first about 1 mm. long, the second a little longer, scaberulous on the keels; first lemma somewhat compressed, ovate, acutish, scaberulous all over the back, a little more than 1 mm. long, the lateral nerve distinct but not conspicuous, the second and third lemmas similar to the first but shorter; palea a little shorter than the lemma, minutely scaberulous on the keels; caryopsis oblong, about 0.6 mm. long.

Type in the U. S. National Herbarium, no. 1,164,909, collected on sandy slopes of hills about three kilometers back of Mollendo, Peru, November 17, 1923, by A. S. Hitchcock (no. 22424).

This species is distinguished by the attenuate panicles and the scaberulous lemmas. It was abundant in the type locality but no other specimens have been seen. The region around Mollendo is a desert, and vegetation thrives only after light rains that fall at long intervals.

16. *Eragrostis tenax* (H. B. K.) Steud. Nom. Bot. ed. 2. 1: 564. 1840.

Poa tenax H. B. K. Nov. Gen. & Sp. 1: 160. 1860.

Eragrostis lehmannii Pilger, Bot. Jahrb. Engler 27: 32. 1899. (*Lehmann* 5823, cited as 5283.)

Eragrostis densissima Hack, Oesterr. Bot. Zeitschr. 52: 304. 1902. (Tumbaco, *Sodi*ro in 1886.)

An erect caespitose perennial 1 to 2 meters tall, with more or less pubescent sheaths, elongate narrow blades, and contracted, almost spikelike panicles as much as 50 cm. long.

Sandy plains, Ecuador. Originally described from near Quito. (*Bonpland*.)

ECUADOR: Tumbaco and Pomasqui, *Sodi*ro in 1886. Cotacallao, *Mille* 271.

Baños, *Lehmann* 442a. Quito, *Jameson* (Kew Herb.).

17. *Eragrostis lurida* Presl, Rel. Haenk. 1: 276. 1830.

Eragrostis contristata Nees & Mey. Nov. Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 31. 1841; 163. 1843. (Lake Titicaca.)

Eragrostis bahiensis var. *boliviensis* Henr. Med. Rijks Herb. Leiden 40: 68. 1921. (*Mandon* 1332.)

An erect or prostrate perennial, from a few centimeters to as much as 1 meter tall, with narrow dark panicles as much as 30 cm. long in large plants, the spikelets short-pedicel and congested along the stiffly ascending or spreading primary branches, these distant or sometimes contiguous, forming a dense panicle.

Fields and waste places, Ecuador to Bolivia. Originally described from Peru.

ECUADOR: Quito, *Sodi*ro. Pomasqui, *Mille* 273. Ambato, *Rose* 22334; *Hitchcock* 21724, 21728. Alausí, *Hitchcock* 20691, 20713. Riobamba, *Mille* 52; *Spruce* 5808 (Kew Herb.).

PERU: Matucana, *Macbride & Featherstone* 251, 252. Tarma, *Hitchcock* 22162, 22163; *Macbride & Featherstone* 987. Ollantaytambo, *Hitchcock* 22486, 22518, 22519, 22554. Cuzco, *Hitchcock* 22463, 22500. Baños, *Wilkes Expl. Exped.*

BOLIVIA: La Paz, *Buchtien* 847; *Rusby* 49. Summit between Oruro and Cochabamba, *Hitchcock* 22869. Sorata, *Mandon* 1332.

18. *Eragrostis pastoensis* (H. B. K.) Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 2¹: 71. 1836.

Poa pastoensis H. B. K. Nov. Gen. & Sp. 1: 160. 1816.

Poa setifolia Benth. Pl. Hartw. 262. 1846.

Eragrostis contracta Pilger, Bot. Jahrb. Engler 37: 376. 1906. (*Weberbauer* 2841.)

An erect or spreading, caespitose perennial, 20 to 50 cm. or as much as 1 meter tall, with erect blades, long involute-setaceous at tip, and narrow, contracted, almost spikelike panicles as much as 30 cm. long, long-pilose in the axils.

Dry hills and fields, Colombia, whence originally described, to Bolivia.

ECUADOR: Quito, *Sodiro*; *Mille* 272; *Spruce* 5407 (*Kew Herb.*); *Hartweg* 1452 (*Kew Herb.*). Between Malchinguí and Pomasquí, *Hitchcock* 20897, 20902. Baños, *Hitchcock* 21901. Between La Toma and Loja, *Hitchcock* 21407. Between Loja and San Lucas, *Hitchcock* 21484. Between Oña and Cuenca, *Hitchcock* 21591.

PERU: Ocos, *Weberbauer* 2663. Ollantaytambo, *Hitchcock* 22522.

19. *Eragrostis montufari* (H. B. K.) Steud. Nom. Bot. ed. 2. 1: 563. 1840.

Poa montufari H. B. K. Nov. Gen. & Sp. 1: 159. 1816.

Eragrostis buchtienii Hack. Repert. Nov. Sp. Fedde 6: 157. 1908. (*Buchtien* 428.)

Eragrostis boliviensis Jedw. Bot. Archiv Mez 5: 205. 1824. (*Mandon* 1330.)

An erect or spreading perennial 30 to 60 cm. tall, with more or less villous or sometimes glabrous sheaths, flat blades, and open panicles 10 to 25 cm. long, the main branches spreading, distant, naked below, the spikelets appressed along the upper half.

Dry plains and slopes, Ecuador to Bolivia. Originally described from Chillo, Ecuador. (*Hacienda Montufar, Bonpland.*)

ECUADOR: Huigra, *Hitchcock* 20758. Alausí, *Hitchcock* 20718. Between La Toma and Loja, *Hitchcock* 21410.

PERU: Mito, *Macbride & Featherstone* 1425. La Merced, *Hitchcock* 22131. Tarma, *Hitchcock* 22150. Cuzco, *Hitchcock* 22490.

BOLIVIA: Prov. Larecaja, *Mandon* 1329. Hacienda Casana, *Buchtien* 7140. Cotaña, *Buchtien* 3138. La Paz, *Bang* 201; *Buchtien* 848. La Florida, *Hitchcock* 22623. Coripata, *Hitchcock* 22684. Coroico, *Buchtien* 3638. Cochabamba, *Hitchcock* 22798, 22835, 22861; *Holway* 377. Sorata, *Mandon* 1328, 1329, 1330 (all in *Kew Herb.*). Without locality, *Cárdenas (Mulford Biol. Expl.)* 2144.

20. *Eragrostis magna* Hitchc., sp. nov.

Perennial; culms caespitose in large clumps, erect, stout, glabrous, about 3-noded, 1.5 meters tall, the lower internodes as much as 6 mm. thick; sheaths glabrous, somewhat villous on each side at the throat; ligule a ciliate line, less than 0.5 mm. long; blades elongate, flat or more or less involute, glabrous beneath, villous on the upper surface, 40 to 60 cm. long, as much as 7 mm. wide, tapering to a fine point; panicle narrow, rather loose, 30 to 50 cm. long, the main axis glabrous, densely villous in the axils of the main branches, more or less pilose in the axils of the branchlets, the main branches ascending,

as much as 20 cm. long, the branchlets bearing ascending branchlets, the lower of these as much as 5 cm. long, the secondary branchlets sometimes bearing few-flowered branchlets; pedicels, except the terminal ones, shorter than the spikelets, slender, flexuous, scabrous; spikelets brown or lead-color, 7 to 10 mm. long, mostly 7 to 10-flowered; glumes about equal, narrow, acute, 2.5 mm. long, glabrous, the second minutely scabrous on the keel; lemmas 2 to 2.5 mm. long, loosely imbricate, not hiding the rachilla, about 0.5 mm. wide (as folded), elliptic, scarcely flattened, the apex acutish; rachilla flexuous, disarticulating between the florets, minutely pilose at the base of the lemmas; palea as long as the lemma, obtuse, very minutely scabrous on the keels.

Type in the herbarium of the Field Museum, no. 535136, collected on steep rocky grasslands at Huacachi Estación near Muña, Peru, altitude 2,000 meters, May 20 to June 1, 1923, by J. Francis Macbride (no. 4069).

No other specimens than the type collection have been seen. The species has the aspect of *E. macrothyrsa* Hack. of Paraguay, but the lemmas are larger and the panicle less open.

21. *Eragrostis bahiensis* Schrad.; Schult. Mant. 2: 318. 1824.

An erect perennial 30 to 80 cm. tall, with open or somewhat contracted, lead-colored panicles, the branches ascending or spreading, 5 to 15 cm. long, rather distant, naked below, the spikelets appressed along the upper part, or the whole panicle contracted (*Steinbach* 6889).

Sandy fields and grassy hills and plains, Brazil, whence originally described, to Bolivia and Argentina.

BOLIVIA: Samaipata, *Herzog* 1705. Coripata, *Hitchcock* 22681. Buena Vista, *Steinbach* 5184, 6881. Río Perdiz, *Steinbach* 6889.

22. *Eragrostis expansa* Link, Hort. Berol. 1: 190. 1827.

An erect or spreading perennial, with slender culms 40 to 80 cm. tall, flat or loosely involute blades, and open gray-black panicles 10 to 15 cm. long, the branches ascending or spreading; spikelets short-pedicel, 8 to 15-flowered.

Open ground Brazil to Argentina and Bolivia. Originally described from Uruguay.

BOLIVIA: Río Perdiz, *Steinbach* 6899.

23. *Eragrostis patula* (H. B. K.) Steud. Nom. Bot. ed. 2. 1: 564. 1840.

Poa patula H. B. K. Nov. Gen. & Sp. 1: 158. 1816.

A spreading perennial, with decumbent culms 30 to 50 cm. tall, and open dark panicles 8 to 12 cm. long, the branches and branchlets spreading, somewhat flexuous.

Open ground, Ecuador. Originally described from Conocoto, near Quito. (*Bonpland.*)

ECUADOR: Quito, *Harteman* 5, 29, 55; *Mille* 371; *Hitchcock* 21931. Between Malchingui and Pomasqui, *Hitchcock* 20904. Alausí, *Hitchcock* 20773.

PERU: Matucana, *Macbride* 2926. Huánuco, *Macbride* 3516.

24. *Eragrostis pilgeriana* Hitchc.

Eragrostis andicola Pilger, Bot. Jahrb. Engler 37: 377. 1906. Not *E. andicola* Fries, 1905.

Eragrostis andicola forma *humilior* Pilger, Bot. Jahrb. Engler 37: 377. 1906. (*Weberbauer* 3036, same locality as 3114.)

Eragrostis andicola var. *robustior* Pilger, Bot. Jahrb. Engler 37: 377. 1906. (Ocros, *Weberbauer* 2746.)

An erect perennial with slender culms 30 to 50 cm. long, setaceous-involute blades, and an open elliptic-oblong panicle 10 to 15 cm. long; spikelets 3 to

8-flowered, lead-color, on slender flexuous pedicels; lemmas spreading, 3 mm. long; rachilla pilose.

Rocky slopes, Peru. Known only from Peru. (Type, *Weberbauer* 3114.)

PERU: Between Samanco and Caraz, *Weberbauer* 3114.

25. *Eragrostis lugens* Nees, *Agrost. Bras.* 505. 1829.

Eragrostis soratensis Jedw. *Bot. Archiv Mez* 5: 213. 1924. (*Mandon* 1331.)

An erect caespitose perennial 30 to 50 cm. tall, with more or less pilose sheaths, flat or involute blades, and open, rather diffuse, fragile panicles usually more than half the entire length of the culms, the axils somewhat pilose or the upper glabrous.

Dry plains and hills, southwestern United States to Argentina. Originally described from Brazil.

ECUADOR: Baños, *Hitchcock* 21914. Without locality, *Spruce* 5609.

PERU: Ollantaytambo, *Hitchcock* 22517. Juliaca, *Harlan* in 1914.

BOLIVIA: Sorata, *Rusby* 234, 239; *Mandon* 1331. Yungas, *Bang* 307. Coripata, *Hitchcock* 22680. La Paz, *Rusby* 45; *Holway* 463; *Buchtien* 849. Pasña, *Asplund* 6524. Coroico, *Hitchcock* 22727. Hacienda Casana, *Buchtien* 7121. Chulumani, *Hitchcock* 22708, 22710. Milluhuaya, *Buchtien* 4277. Cochabamba, *Hitchcock* 22821, 22853.

Much of our material agrees with *Mandon* 1331 (*E. soratensis*) in having the primary branches of the panicle stiffer, the axils glabrous or sparsely pilose, and somewhat larger spikelets. This form appears to intergrade with typical *E. lugens* from Brazil.

26. *Eragrostis polytricha* Nees, *Agrost. Bras.* 507. 1829.

An erect perennial as much as 1 meter tall, with hirsute sheaths, flat or loosely involute, hirsute blades, and open diffuse panicles about half the length of the entire plant; axils of panicles with a few long hairs; spikelets about 3-flowered.

Sandy plains, Brazil to Argentina and Bolivia. Originally described from Uruguay.

BOLIVIA: Buena Vista, *Steinbach* 6980.

27. *Eragrostis carazensis* Pilger, *Bot. Jahrb. Engler* 56: Beibl. 123: 27. 1920.

An erect perennial, with long, slender, more or less involute blades and an open elliptic panicle about 25 cm. long; spikelets yellowish green, 4 to 6 mm. long, 3 to 7-flowered; lemmas obtuse, 2.5 mm. long.

Open ground, Peru. Known only from the type collection.

PERU: Caraz, *Weberbauer* 2999.

The following species of *Eragrostis* have not been identified and the types have not been examined:

ERAGROSTIS ALBA Presl, *Rel. Haenk.* 1: 279. 1830. Described from Monterey, Calif. The type specimen at the National Museum, Prague, is labeled "Regio montana." It appears to be *E. virescens* Presl of Chile. Scribner¹⁴ examined a duplicate in the Bernhardt Herbarium at the Missouri Botanical Garden, and referred it doubtfully to *E. pastoensis*.

POA OLMEDI H. B. K. *Nov. Gen. & Sp.* 1: 159. 1816. "Crescit in montibus Peruanis et Loxae ad vias, juxta domum botanici hispani Don Vicente Olmedo." This is a species of *Eragrostis* which, from the description, may be the same as

¹⁴ *Rep. Mo. Bot. Gard.* 10: 43. 1899.

E. montufari. Doctor Lecomte informs me that the type specimen can not be found in the Paris Herbarium.

ERAGROSTIS TRISTIS Jedw. Bot. Archiv Mez 5: 205. 1924. "Bolivia, ad Huanacapamba (*Pflanz* nr. 359). Quechisla (*Bender* nr. 19); Peruvia, prope Tacna (*Meyen*)." From the description it may be *E. nigricans*.

ERAGROSTIS VILLAMONTANA Jedw. Bot. Archiv Mez 5: 197. 1924. "Bolivia, prov. Tarija, ad Villamontes (*Pflanz* nr. 632)."

ERAGROSTIS STENOCLADA Presl, Rel. Haenk. 1: 278. 1830. Published from mountains of Peru but the locality corrected in the Addenda to Monterey, California. The specimen in the National Museum at Prague is labeled "Luzon." It is *E. elongata* (Willd.) Jacq.

15. DISTICHLIS Raf. SALTGRASS

Plants dioecious; spikelets compressed, several-flowered, the glumes and lemmas firm, keeled, the lemmas faintly many-nerved.

Panicles of 1 to 3 spikelets; plants mostly only a few centimeters tall.

1. *D. humilis*.

Panicles usually with more than 3 spikelets; plants erect, mostly 10 to 20 cm. tall.

2. *D. spicata*.

1. *Distichlis humilis* R. A. Phil. Anal. Mus. Nac. Chile Bot. 8: 86. 1891.

Culms mostly only a few centimeters tall, with crowded, spreading, folded, or involute blades about 1 cm. long, and small, scarcely exerted panicles of 1 to 3 spikelets.

Moist places, southern Peru to northern Argentina and Chile. Originally described from Antofagasta, Chile.

PERU: Chuquibambilla, *Hitchcock* 22450. Puno, *Shepard* 128.

BOLIVIA: Guaqui, *Herzog* 2515. Lake Titicaca, *Mandon* 1854. La Paz, *Buchtien* 860. Uyuni, *Asplund* 6525. Atocha, *Hitchcock* 22874, 22876.

2. *Distichlis spicata* (L.) Greene, Bull. Calif. Acad. 2: 415. 1887.

Uniola spicata L. Sp. Pl. 71. 1753.

Poa thalassica H. B. K. Nov. Gen. & Sp. 1: 157. 1816. (Peru.)

Distichlis maritima Raf. Journ. de Phys. 89: 104. 1819.

Uniola thalassica Trin. Mém. Acad. St. Pétersb. VI. Math. Phys. Nat. 1: 359. 1830.

Distichlis thalassica Desv. in Gay, Fl. Chil. 6: 397. 1853.

Culms erect from stout creeping rhizomes mostly 10 to 20 cm. tall, with conspicuously distichous leaves, the sheaths overlapping, the sharp-pointed blades spreading; panicles condensed, usually with more than 3 spikelets.

Moist, especially alkali, soil, seacoasts of the warmer parts of America, and in the interior of South America from Peru to Argentina. Originally described from the Atlantic coast of North America.

ECUADOR: Huano Valley, *Spruce* 5919.

PERU: Salaverry, *Macbride & Featherstone* 47. Pacasmayo, *Rose* 18518. Lima, *Wilkes Expl. Exped.* Arequipa, *Hitchcock* 22429.

BOLIVIA: La Paz, *Bang* 108; *Buchtien* 6417. Cochabamba, *Holway* 350; *Hitchcock* 22791, 22840, 22841. Uyuni, *Asplund* in 1921. Chiguana, *Asplund* 6527. Peña Blanca, *Hitchcock* 22921. Oploca, *Hitchcock* 22883, 22884, 22885, 22886, 22888, 22897.

16. UNIOLA L.

Spikelets strongly compressed, few to many-flowered, the lower 1 to 4 florets empty; glumes and lemmas keeled, firm, the glumes small, the lemmas faintly many-nerved; paleas rigid, the keels broadly winged.

Spikelets 1 to 2 cm. long; plant extensively stoloniferous-----1. *U. pittleri*.
Spikelets 5 mm. long or less; plant erect, cespitose-----2. *U. condensata*.

1. *Uniola pittleri* Hack. Oesterr. Bot. Zeitschr. 42: 309. 1902.

A stout, glabrous, extensively stoloniferous perennial, with large contracted panicles 10 to 30 cm. long, the very flat spikelets 1 to 2 cm. long, about 1 cm. wide.

Sandy sea beaches, Mexico to Ecuador. Originally described from Costa Rica.

ECUADOR: Bahía de Caraquez, Rowlee & Mixer 1295. Guayaquil, Jameson (Kew Herb.).

2. *Uniola condensata* Hitchc., sp. nov.

An erect cespitose perennial; culms glabrous, 1 to 1.5 meters tall; sheaths glabrous; blades elongate, about as long as the culm, as much as 8 mm. wide, flat below, gradually attenuate to a fine point, glabrous, scabrous on the margins; panicle narrow, condensed, strict or somewhat nodding, 30 to 40 cm. long, 2 to 3 cm. wide, the axis scabrous to scabrous-pilose, the stiff 1-sided branches ascending or appressed, floriferous to base, closely imbricate or somewhat distant at base, 1 to 4 cm. long, densely flowered; spikelets on very short pedicels, flat, ovate or oblong, as much as 5 mm. long, 3 to 6-flowered; glumes narrow, acuminate, scabrous on the keel, the first 1 mm. long, the second 1.5 mm. long; lemmas firm smooth shining, acuminate, compressed-keeled, especially on upper half, rather obscurely 5-nerved toward the tip, about 3 mm. long, the lower 2 or 3 empty and smaller; palea a little shorter than the lemma.

Type in the U. S. National Herbarium, no. 1,164,907, collected on dry grassy slopes at Huigra, Province of Chimborazo, Ecuador, altitude 1,200 meters, July 4, 1923, by A. S. Hitchcock (no. 20333).

The only other collection seen is a fragment from a specimen in the Vienna Museum. This was collected by Spruce and bears the label, "Andes Quitenses. Huatasis in declivibus, frequens." The locality is probably Guatazi, mentioned by Spruce,²⁷ a ranch below Chunchi and consequently not far from Huigra, the type locality.

Uniola condensata has somewhat the aspect of *U. virgata* (Poir.) Griseb. of the West Indies. It differs in the elongate erect flat blades, those of *U. virgata* being involute and curled or tortuous, and in the larger spikelets and more strongly nerved lemmas.

17. ARUNDO L.

Spikelets perfect, 2 to several-flowered; glumes about equaling the spikelet; lemmas bidentate, cuspidate between the teeth, bearing copious long silky hairs on the back; rachilla naked.

1. *Arundo donax* L. Sp. Pl. 81. 1753.

GIANT REED.

Tall reeds, with strong, sparingly branching culms, elongate scabrous-margined flat blades, and densely flowered, slightly drooping panicles 30 to 60 cm. long, the spikelets about 1 cm. long.

²⁷ Wallace, Notes of a Botanist 2: 237, 1908.

River banks and moist ground, warmer parts of the Old World. Cultivated in America for ornament and occurring from Texas to California and southward to Argentina as an escape. Originally described from southwestern Europe.

ECUADOR: Panigón Plantation, *Hitchcock* 20577. Mount Pichincha, *Jameson*. Riobamba, *Holway* 867. Ambato, *Rose* 22385.

BOLIVIA: Gran Chaco, *Fries* 1622. Coroico, *Hitchcock* 22724.

The stems are used for many purposes, such as laths and interlacing for the framework of huts. Called "carrizo."

18. PHRAGMITES Trin.

Spikelets 2 to several-flowered, the lowest floret staminate or neuter, its lemma elongate; glumes shorter than the florets; lemmas acuminate; rachilla densely clothed with long silky hairs.

1. *Phragmites communis* Trin. Fund. Agrost. 134. 1820. REED.

Arundo phragmites L. Sp. Pl. 81. 1753.

Phragmites phragmites Karst. Deutsch. Fl. 378. 1883.

A stout erect reed usually 2 to 4 meters tall, stoloniferous and rhizomatous, gregarious, sometimes covering large areas; blades flat, 30 to 40 cm. long, 1 to 3 cm. wide; panicle plumelike, 20 to 40 cm. long.

Swamps throughout the temperate regions of the world, extending into the Tropics. Originally described from Europe.

ECUADOR: El Recreo, *Eggers* 15813. Guayaquil, *Hitchcock* 21099½.

PERU: Obrajillo, *Wilkes Expl. Exped.* (Kew Herb.). Piura, *Spruce* 6434 (Kew Herb.).

BOLIVIA: Camataquí, *Fiebrig* 2954 (Kew. Herb.).

19. CORTADERIA Stapf. PAMPASGRASS

Mostly large tussock grasses, the leaves generally crowded at the base, the blades long and narrow, tapering to a slender point, usually very rough on the margins; spikelets several-flowered, the rachilla disarticulating near the base of the internodes, the lower shorter part glabrous, the upper longer part bearded, forming a stipe to the floret; rachilla and florets clothed with long hairs; glumes longer than the first floret (excluding awn), sometimes longer than all the florets; lemma tapering into a slender point or awn, or awned from between the slender teeth of a bifid apex; inflorescence a panicle, sometimes large and plumelike.—In all the species except *C. sericantha* the old sheaths become flattened and coiled at the base of the plant. The genus has been described as dioecious, but some of the species have perfect florets, though the anthers are small and the flowers appear to be cleistogamous.

Spikelets unisexual; plants dioecious; lemmas tapering to a soft slender scarcely awned point. A large reed with silvery or purplish panicles 30 to 60 cm. long.....1. *C. rudiuscula*.

Spikelets perfect; lemmas awned.

Apex of lemma bifid, the teeth ending in capillary awns.....2. *C. bifida*.

Apex of lemma entire or with 1 or 2 short teeth at base of awn.

Blades not villous; old sheaths becoming flat and spiral at base of culm; plants mostly 1 to 2 meters tall.....3. *C. nitida*.

Blades densely villous at base; old sheaths not coiled; plants mostly 20 to 40 cm. tall.....4. *C. sericantha*.

1. *Cortaderia rudiuscula* Stapf, Gard. Chron. III. 22: 396. 1897.

A large reed with a great basal mass of long narrow blades as much as 1.5 long and mostly less than 1 cm. wide, firm and tough, very scabrous on

the margins and under side of midrib, the flowering culm stout, 1 to 2 meters tall, the yellowish or purple-tinged panicle 30 to 60 cm. long, dense, but the branches drooping.

Slopes and gullies and along streams, Ecuador to Argentina and Chile, in the mountains. Originally described from Argentina.

ECUADOR: Alausí, *Hitchcock* 20700. Mount Pichincha, *Harteman* 19. Antisanilla, *Anthony & Tate* 328. Without locality, *Spruce* 6451 (Kew Herb.). Ambato, *Rose* 22381. Nabón, *Rose* 22997.

PERU: Goyllarisquisca, *Hitchcock* 22306, 22336. Río Marañón below Chavainillo, *Macbride & Featherstone* 2307. Ollantaytambo, *Cook & Gilbert* 1910; *Hitchcock* 22521. Cuzco, *Hitchcock* 22475. Matucana, *Macbride* 2936.

BOLIVIA: La Paz, *Shepard* 167; *Buchtien* 850; *Bang* 26. Palca, *Hitchcock* 22573. San Felipe, *Hitchcock* 22607. Chulumani, *Hitchcock* 22701. Cochabamba, *Hitchcock* 22828, 22852. Oploca, *Hitchcock* 22890, 22895, 22896. Tarija, *Fiebrig* 2656, 3043 (both Kew Herb.).

This includes *C. quila* (Nees & Mey.) Stapf, as described by Stapf in the article cited above. The specific name, however, goes back to *Arundo quila* Mol.,¹⁸ a species of bamboo. *Chusquea quila* Kunth,¹⁹ also, is based on *Arundo quila* Mol.

Cortaderia rudiuscula differs from *C. selloana* (Schult.) Aschers. & Graebn. (*C. argentea* Stapf) of Argentina and Chile in the looser, yellowish or purplish panicle, the panicle of the latter being dense, woolly, and silvery white. The rachilla of *C. selloana* is more slender, so that the spikelets appear more open and the florets more distant. *Cortaderia selloana* appears not to occur within our range.

2. *Cortaderia bifida* Pilger, Bot. Jahrb. Engler 37: 374. 1906.

Cortaderia aristata Pilger, Bot. Jahrb. Engler 37: 375. 1906. (*Weberbauer* 3349.)

Cortaderia bifida var. *grandiflora* Henr. Med. Rijks Herb. Leiden 40: 67. 1921. (*Herzog* 2194.)

Culms mostly 1 to 1.5 meters tall, with tawny or purplish, rather loose panicles mostly 10 to 20 cm. long.

Rocky or partially wooded slopes, Ecuador to Bolivia. Originally described from Peru. (Type, *Weberbauer* 1328.)

ECUADOR: Tablón de Oña, *Rose* 23102.

PERU: Mito, *Macbride & Featherstone* 1822. Prov. Huamalies, Dept. Huánuco, *Weberbauer* 3349. Sandía, *Weberbauer* 1328.

BOLIVIA: Unduavi, *Buchtien* 2576; *Rusby* in 1886. Pongo, *Hitchcock* 22780; *White* 190. Mapiri, *Rusby* in 1886. Tablas, *Herzog* 2194.

3. *Cortaderia nitida* (H. B. K.) Pilger, Bot. Jahrb. Engler 37: 375. 1906.

Arundo nitida H. B. K. Nov. Gen. & Sp. 1: 149. 1816.

Danthonia hapalotricha Pilger, Bot. Jahrb. Engler 25: 715. 1898.

Gynerium nitidum Pilger, Bot. Jahrb. Engler 27: 31. 1899.

Gynerium columbianum Pilger, Bot. Jahrb. Engler 27: 31. 1899.

Cortaderia sodiroana Hack. Oesterr. Bot. Zeitschr. 52: 238. 1902. (Ecuador, *Sodiro*.)

Cortaderia columbiana Pilger, Bot. Jahrb. Engler 37: 374. 1906.

Differing from *C. bifida* in the entire or slightly toothed lemma.

Paramos and mountain slopes, Venezuela to Peru. Originally described from Colombia.

¹⁸ Ess. Hist. Nat. Chili 279. 1789.

¹⁹ Rév. Gram. 1: 138. 1829.

ECUADOR: "In regione silvatica subandina," *Sodiro* in 1872. Between Malchingui and Pomasqui, *Hitchcock* 20855, 20862. Mount Pichincha, *Sodiro* in 1875; *Mille* 322. Between Oña and Cuenca, *Hitchcock* 21619. Between La Toma and Loja, *Hitchcock* 21439. Between San Lucas and Oña, *Hitchcock* 21506. Between Cuenca and Huilgra, *Hitchcock* 21690.

PERU: Between Culnal and Obrajillo, *Wilkes Expl. Exped.* Paucartambo, *Weberbauer* 6924 (Field Mus.).

Cortaderia nitida and *C. bifida* may be different forms of the same species. In habit and general aspect they are very much alike. While the writer was collecting in the Andes he distinguished only two species (aside from the little *C. sericantha*), basing the separation on the aspect of the plants. These two were the large species (*C. rudiuscula*) with large silvery panicles a half meter long, and the smaller species (*C. nitida*) with much smaller, tawny or purplish, not silvery panicles.

4. *Cortaderia sericantha* (Steud.) Hitchc.

Danthonia sericantha Steud. Syn. Pl. Glum. 1: 246. 1854.

An erect perennial growing in tussocks, with culms 15 to 30 cm. tall, firm involute blades flat at base, the lower part and the summit of the sheath densely felty-villous, the panicles ovoid or oblong, dense and spikelike, 3 to 6 cm. long, more or less included in the upper sheath, scarcely rising above the stiff blades.

Paramos, Colombia to Peru. Originally described from Mount Antisana, Ecuador, the type collected by *Jameson*.

ECUADOR: Mount Chimborazo, *Hitchcock* 21983. Mount Pichincha, *Mille* 288. Mount Cotopaxi, near snow line, *Stübel* 292. Without locality, *Sodiro* (Cotopaxi, in Kew Herb.). "Eastern Cordillera, alt. 13,000 feet," *Jameson* 93 (Kew Herb.).

PERU: Mito, *Macbride & Featherstone* 1890.

This species is allied to the other species of *Cortaderia* in the structure of the spikelet, but does not have the ensiform, strongly serrate blades of those species. It is also much smaller in all its parts except the spikelets. The glumes are longer than all the florets, as in *Danthonia*, but otherwise the structure is that of *Cortaderia*. The rachilla disarticulates above the base of each joint, leaving a villous point below each floret and a glabrous prolongation above. The lemmas are long-villous, bifid at the apex, the teeth short, the mid vein extending into a straight, flattish, somewhat contorted awn, as in *C. nitida*.

20. GYNERIUM Humb. & Bonpl.

Plants dioecious; spikelets several-flowered; pistillate spikelets with long-attenuate glumes and smaller long-silky lemmas; staminate spikelets with shorter glumes and glabrous lemmas.

1. *Gynerium sagittatum* (Aubl.) Beauv. Ess. Agrost. 138. pl. 24. f. 6. 1812. UVA GRASS.

Saccharum sagittatum Aubl. Pl. Guian. 1: 50. 1775.

Gynerium saccharoides Humb. & Bonpl. Pl. Aequin. 2: 112. pl. 115. 1809.

Stout reeds, often 10 meters tall, the culms clothed below with old sheaths, the blades having fallen, the sharply serrulate blades commonly 2 meters long and 4 to 6 cm. wide (forming a great fan-shaped summit to the sterile culms), and pale, plummy, densely flowered panicles 1 meter long or more, the main axis erect, the branches drooping.

River banks and low ground, forming dense colonies, West Indies and southern Mexico to Paraguay, at low altitudes. Originally described from French Guiana.

ECUADOR: Teresita, *Hitchcock* 20517. Panigón Plantation, *Hitchcock* 20556. Bucay, *Rose* 22435. Ventura, *Rose* 23510.

PERU: Colonia Perené, *Hitchcock* 22123. La Merced, *Macbride* 5251. Callao, *Wilkes Expl. Exped.*

BOLIVIA: Coripata, *Hitchcock* 22683. Mapiri, *Buchtien* 1177. Covendo, *White* 901, 984. Huachi, *White* 297.

21. DACTYLIS L.

Spikelets 2 to 5-flowered, strongly compressed, sessile in dense fascicles, these at the ends of stiff naked panicle branches; glumes and lemmas keeled, mucronate or the lemma awn-tipped.

1. *Dactylis glomerata* L. Sp. Pl. 71. 1753. ORCHARD GRASS.

A rather coarse roughish perennial, commonly about 1 meter tall, with flat blades and panicles of few to several branches naked at base, bearing toward the ends clusters of densely crowded, sparsely pilose spikelets, these 0.8 to 1 cm. long.

A native of Europe, now common in the temperate parts of North America; occasionally escaped from cultivation at temperate altitudes in the Andes.

ECUADOR: Near Quito, *Harteman* 49, 73.

22. MELICA L.

Spikelets 2 to few-flowered, in our species falling entire, the upper 2 or 3 lemmas sterile, smaller and convolute together in a club-shaped mass (called the rudiment); glumes somewhat unequal, thin, papery, with conspicuous scarious margins; lemmas convex, several-nerved, awnless in our species.

Blades flat, 2 to 6 mm. wide-----1. *M. scabra*.

Blades involute, narrow-----2. *M. adhaerens*.

1. *Melica scabra* H. B. K. Nov. Gen. & Sp. 1: 164. 1816.

Melica pallida H. B. K. Nov. Gen. & Sp. 1: 164. 1816. (Quito, *Bonpland.*)

Melica pyrifera Hack. Oesterr. Bot. Zeitschr. 52: 307. 1902. (*Jelski* 590.)

Melica majuscula Pilger, Notizbl. Bot. Gart. Berlin 8: 453. 1923. (Cuzco, *Weberbauer* 4877; Ocos, *Weberbauer* 2750.)

Melica cajamarcensis Pilger, Notizbl. Bot. Gart. Berlin 8: 454. 1923. (Dep. Cajamarca, *Weberbauer* 3864, 4138.)

Melica weberbaueri Pilger, Notizbl. Bot. Gart. Berlin 8: 455. 1923. (Dept. Libertad, *Weberbauer* 7198.)

Melica weberbaueri var. *decolorata* Pilger, Notizbl. Bot. Gart. Berlin 8: 455. 1923. (Caraz, *Weberbauer* 3034.)

Melica weberbaueri var. *violascens* Pilger, Notizbl. Bot. Gart. Berlin 8: 455. 1923. (Matucana, *Weberbauer* 110.)

A weak, decumbent, straggling, branching perennial, with culms as much as 1 meter long, retrorsely scabrous sheaths, flat blades, and narrow open panicles 10 to 20 cm. long, the branches ascending or spreading, floriferous to the base, the spikelets on flexuous pedicels, pale or purple, mostly with 2 perfect florets.

In rocky places among shrubs, Ecuador to Bolivia. Originally described from Ecuador. (Pomallacta, southeast of Alausí, *Bonpland.*)

ECUADOR: Pifo, *Mille* 289. Huigra, *Hitchcock* 20344, 20738; *Rose* 22540. Cuenca, *Rose* 24032.

PERU: Matucana, *Macbride & Featherstone* 281, 365, 454. Llata, *Macbride & Featherstone* 2232. Yanahuanca, *Macbride & Featherstone* 1223. Callacate, *Jelski* 590. Obrajillo, *Wilkes Expl. Exped.* Cuzco, *Hitchcock* 22461; *Holway* 746.

BOLIVIA: Sorata, *Mandon* 1343 (Kew Herb.).

The types of the species and varieties described by Pilger have not been examined, and the names are referred to *M. scabra* as synonyms from the descriptions.

2. *Melica adhaerens* Hack. Repert. Nov. Sp. Fedde 6: 158. 1908.

Resembling *M. scabra*, but blades narrow, mostly involute; spikelets on the average shorter, with 1 perfect floret.

Shady banks, Bolivia. (Type, *Buchtien* 851.)

BOLIVIA: Sorata, *Mandon* 1357. La Paz, *Buchtien* 505, 851; *Rusby* 52; *Bang* 30; *Holway* 457; *Hitchcock* 22565. Cochabamba, *Holway* 384.

23. ANTHOCHLOA Nees

Spikelets few-flowered, subsessile and imbricate on a simple axis, the rachilla disarticulating above the glumes and between the florets; glumes (in our species) similar to the lemmas but much smaller; lemmas thin-membranaceous, flabelliform, whitish, petal like; palea narrower than the lemma, hyaline.

1. *Anthochloa lepidula* Nees & Mey. in Meyen, Reis. Erd. 2: 14. 1835.

Anthochloa lepida Nees & Mey. Nov. Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 33. 1841; 165. 1843.

Anthochloa rupestris Remy, Ann. Sci. Nat. III. Bot. 6: 347. 1846. (Lagunas de Potosi, *D'Orbigny*.)

A dwarf caespitose soft lax perennial, mostly less than 10 cm. tall, with pale papery ovoid condensed panicles 1 to 1.5 cm. long, shorter than the flat or folded blades.

Alpine regions, Peru and Bolivia. Originally described from Lake Titicaca, Peru. (*Meyen*.)

PERU: Casapalca, *Macbride & Featherstone* 825.

BOLIVIA: Comanche, *Asplund* 6526. Cerro de Palca. *Herzog* 2100. Sorata, *Mandon* 1272. Chacaltaya, *Buchtien* 1196.

24. ORTHOCLADA Beauv.

Spikelets articulate below the glumes, 1-flowered with a prolongation of the rachilla, or 2-flowered, the florets distant; glumes and lemmas acuminate.

1. *Orthoclada laxa* (Rich.) Beauv.; Nees, Agrost. Bras. 522. 1829.

Aira laxa Rich. Act. Soc. Hist. Nat. Paris 1: 106. 1792.

Orthoclada rariflora Beauv. Ess. Agrost. 69. pl. 14, f. 9. 1812.

A stoloniferous perennial; flowering culms ascending, leafy, simple, commonly 1 meter long; blades slender-petioled, lanceolate, mostly 12 to 15 cm. long, about 2.5 cm. wide; panicle large, as broad as long, the long slender naked branches and capillary branchlets at first erect, finally stiffly divergent, bearing 1 to few spikelets at the extremities.

Rich woods, southern Mexico to Brazil and Peru. Originally described from Guiana.

ECUADOR: Balao, *Eggers* 14724.

PERU: San Gaván, *Lechler* 2432 (Kew Herb.).

25. ZEUGITES Schreb.

Spikelets few to several-flowered, the lowest floret perfect, the others staminate, the rachilla joint between the perfect and staminate florets elongate; glumes and fertile lemma herbaceous, broad, with transverse veins between the nerves, obtuse or truncate, the glumes about half as long as the lemma; sterile lemmas membranaceous, narrower, acute.

1. *Zeugites mexicana* (Kunth) Trin.; Steud. Nom. Bot. ed. 2. 2: 798. 1841.*Despretzia mexicana* Kunth, Rév. Gram. 2: 485. pl. 157. 1831.*Senites mexicana* Hitchc. Contr. U. S. Nat. Herb. 17: 370. 1913.

A slender branching perennial, with smooth, wiry, dark brown culms resembling fern stipes, ovate petioled blades 1 to 3 cm. long, and open few-flowered panicles 2 to 4 cm. long, the spikelets falling entire.

Moist shady banks, Mexico to Bolivia. Originally described from Mexico.

PERU: Panao, *Macbride* 3621.

BOLIVIA: Bella Vista, *Hitchcock* 22751. Coripata, *Bang* 2131. Yungas, *Rusby* 18. Yanacachi, *Buchtien* 433.

26. TRIODIA R. Br.

Spikelets several-flowered; lemmas broad, rounded on the back, 2-lobed at apex, 3-nerved, the nerves pubescent below, produced as teeth at the summit.

1. *Triodia avenacea* H. B. K. Nov. Gen. & Sp. 1: 156. pl. 48. 1816.

A low caespitose perennial 10 to 20 cm. tall, with folded, falcate, mostly basal blades 1 to 2 cm. long, and ovoid, few-flowered, rather dense panicles 1 to 3 cm. long, of large pale spikelets.

Dry plains and hills, southwestern United States and Mexico; Bolivia and Argentina. Originally described from Mexico.

BOLIVIA: Uyuni, *Asplund* 6500. Atocha, *Asplund* 8466.

URALEPIS ANDERSSONII Areschoug, Svensk. Freg. Eugenes Resa 119. 1910; Repert. Nov. Sp. Fedde 10: 301. 1912. Described from "Ecuador: circa Guajaquil et in insula Puna." I have not been able to identify this species.

27. COTTEA Kunth

Spikelets several-flowered; lemmas rounded on the back, villous below, prominently 9 to 11-nerved, the nerves extending partly into awns of irregular size and partly into awned teeth.

1. *Cottea pappophoroides* Kunth, Rév. Gram. 1: 84. 1829.

An erect caespitose perennial 30 to 60 cm. tall, with flat blades and narrow, purplish, rather loose panicles 10 to 15 cm. long.

Dry plains, southwestern United States and Mexico; Ecuador to Argentina. Originally described from Peru, no collector nor definite locality being given.

ECUADOR: Chanduy, *Spruce* 6444.PERU: Chosica, *Macbride* 2876. Huánuco, *Macbride* 3240.

28. PAPPOPHORUM Schreb.

Spikelets 1 to 3-flowered, the upper sterile; glumes thin, subequal; lemma subindurate, dissected at the summit into about 13 slender awns, the second and third florets reduced, closely appressed to the palea, the awns of all the florets together forming a pappuslike crown, falling attached to the fruit.

Culms mostly 1 meter or more tall; panicle pale, mostly 20 to 30 cm. long.

1. *P. alopecuroideum*.

Culms mostly less than 50 cm. tall; panicles 2 to 10 cm. long.

Nodes pilose; awns plumose----- 2. *P. wrightii*.Nodes glabrous; awns scabrous----- 3. *P. mucronulatum*.1. *Pappophorum alopecuroideum* Vahl, Symb. Bot. 3: 10. 1794.*Pappophorum laguroideum* Schrad.; Schult. Mant. 2: 342. 1824.

A tufted glabrous perennial, with erect culms 1 meter tall or more, long involute blades, and pale, elongate, spikelike, densely flowered panicles, softly bristly from the numerous delicate awns.

Rocky soil, southern Mexico and West Indies to Argentina. Originally described from the West Indies.

PERU: Huánuco, *Macbride* 3238.

2. *Pappophorum wrightii* S. Wats. Proc. Amer. Acad. 18: 178. 1883.

A caespitose perennial, with slender, erect or decumbent culms 20 to 40 cm. tall, narrow involute blades, and dense spikelike lead-covered panicles 2 to 5 cm. long.

Dry plains and rocky hills, southwestern United States and Mexico; Peru and Bolivia. Originally described from Texas.

PERU: Cotahuasi, *Weberbauer* 6869 (Field Mus.). Moquegua, *Weberbauer* 7439.

BOLIVIA: Tarija, *Fries* 1221.

3. *Pappophorum mucronulatum* Nees, Agrost. Bras. 412. 1829.

Pappophorum vaginatum Buckl. Prel. Rep. Geol. Agr. Surv. Tex. App. 1. 1866.

Pappophorum apertum Munro; Scribn. Bull. Torrey Club 9: 148. 1882.

An erect caespitose perennial, with wiry culms 30 to 50 cm. tall, narrow, flat, or loosely involute blades, and pale or purplish, spikelike panicles 5 to 10 cm. long.

Dry plains and hills, southwestern United States to Mexico; Brazil, whence originally described, to Argentina and Bolivia.

BOLIVIA: Tarija, *Fries* 1099. Cochabamba, *Holway* 367.

29. **AGROPYRON** Gaertn. WHEATGRASS

Spikelets few to several-flowered, solitary (or rarely in pairs), sessile, placed flatwise at each joint of a continuous rachis, the rachilla disarticulating above the glumes and between the florets; glumes two, equal, firm, several-nerved, usually shorter than the first lemma, acute or awned, rarely obtuse or notched; lemmas convex on the back, rather firm, 5 to 7-nerved, usually acute or awned from the apex.

Lemmas awnless; glumes prominently several-nerved, more than 1 cm. long.

1. *A. attenuatum*.

Lemmas short-awned; glumes inconspicuously few-nerved, less than 1 cm. long.

2. *A. breviaristatum*.

1. *Agropyron attenuatum* (H. B. K.) Roem. & Schult. Syst. Veg. 2: 751. 1817.

Triticum attenuatum H. B. K. Nov. Gen. & Sp. 1: 180. 1816.

An erect, loosely tufted perennial with culms as much as 1 or 2 meters tall, the base decumbent or sending out more or less well-marked rhizomes; blades mostly 2 to 4 mm. wide, flat or loosely involute; spike erect, usually dense, sometimes 1-sided, 10 to 15 cm. long; lemmas awnless or mucronate.

Grassy or shrubby slopes, Ecuador to Bolivia. Originally described from near Quito. (*Bonpland*.)

ECUADOR: Tulcán, *Hitchcock* 21093. Between Malchinguf and Pomasqui, *Hitchcock* 20856. Between Otavalo and Malchinguf, *Hitchcock* 20818. Mount Pichincha, *Harteman* 18, 61. Quito, *Mille* 264; *Jameson* 305, 306 (both Kew Herb.). Ambato, *Hitchcock* 21714. Riobamba, *Sodi* in 1891; *Mille* 25, 263; *Holway* 869. Alausí, *Hitchcock* 20722. Without locality, *Spruce* 5925 (Kew Herb.).

PERU: Chinche, *Macbride & Featherstone* 1281. La Quinhua, *Hitchcock* 22263. Goyllarisquisca, *Hitchcock* 22297. Oroya, *Hitchcock* 22185; *Macbride & Featherstone* 957.

BOLIVIA: Pongo, *Hitchcock* 22766. La Paz, *Holway* 427; *Buchtien* 871; *Asplund* 6460. Palca, *Buchtien* 2537. Sorata, *Mandon* 1375 (Kew Herb.).

2. *Agropyron brevilaristatum* Hitchc., sp. nov.

Perennial, loosely cespitose, the bases of the culms decumbent and branched, forming short rhizomes; culms glabrous, as much as 1 meter tall; sheaths glabrous, or sometimes puberulent on the innovations, the auricles short; ligule ovate, thin, pale, soon lacerate, about 3 mm. long; blades flat, scaberulous, sometimes puberulent on the innovations, 10 to 20 cm. long, 2 to 4 mm. wide; spike slender, nodding or drooping, rather dense, sometimes interrupted below, 10 to 20 cm. long, the rachis scabrous on the angles; spikelets 3 to 5-flowered, 1 to 1.5 cm. long; glumes 3-nerved, scabrous on the nerves, acuminate or short-awned, the first 7 to 9 mm. long, the second a little longer and wider; lemmas 5-nerved, more or less scaberulous on the back, 8 to 9 mm. long, gradually narrowed into an awn 2 to 3 mm. long, the joints of the rachilla scaberulous; palea narrow, obtuse, scabrous on the keels, about as long as the lemma.

Type in the U. S. National Herbarium, no. 1,164,910, collected on the side of a ravine, north of Cuzco, Peru, November 30, 1923, by A. S. Hitchcock (no. 22462).

Differing from *A. attenuatum*, the common species of the Andes region, in the acuminate glumes, awned lemmas, drooping spike, and the long ligule.

Moist banks, Peru and Bolivia.

PERU: Goyllarisquisca, *Hitchcock* 22329. Cuzco, *Hitchcock* 22462. Ollantaytambo, *Hitchcock* 22538.

BOLIVIA: Isla del Sol, *Asplund* 6461.

30. ELYMUS L. WILD RYE

Spikelets 2 to 6-flowered, sessile in pairs at each node of a continuous rachis; lemmas rounded on the back or nearly terete, obscurely 5-nerved, usually awned from the tip.

1. *Elymus angulatus* Presl, Rel. Haenk. 1: 264. 1830.

Elymus andinus Trin. Linnaea 10: 304. 1836.

An erect glabrous perennial as much as 1 meter tall, with culms erect from a spreading base, flat blades 2 to 6 mm. wide, and an erect or somewhat nodding spike 7 to 15 cm. long, the awns 5 to 15 mm. long, often divergently curved with age.

Cliffs and grassland, Peru to Argentina. Originally described from Peru. (*Haenke*.)

PERU: Goyllarisquisca, *Hitchcock* 22319. Cerro de Pasco, *Hitchcock* 22267. La Quinhua, *Hitchcock* 22278. Oroya, *Hitchcock* 22180. Río Blanco, *Macbride & Featherstone* 650. Baños, *Wilkes Expl. Exped.*

BOLIVIA: Tupiza, *Hitchcock* 22923. Oploca, *Hitchcock* 22892.

31. HORDEUM L. BARLEY

Spikelets 1-flowered, in clusters of 3 at each joint of an articulate rachis, the middle spikelet sessile, perfect, the lateral spikelets stipitate, reduced to the awnlike glumes; glumes and lemmas awned.—In cultivated barley the rachis is continuous and in most varieties the lateral spikelets are developed.

Plants annual.

Culms erect; glumes not ciliate.....1. *H. vulgare*.

Culms spreading; some of the glumes ciliate.....2. *H. murinum*.

Plants perennial.

Awns of fertile florets less than 1 cm. long.

Fertile lemma acuminate or short-awned.....3. *H. muticum*.

Fertile lemma with an awn about 5 mm. long.....4. *H. nodosum*.

Awms of fertile florets more than 1 cm. long.

Keels of palea close together; prolongation of rachilla inconspicuous.

5. *H. halophilum*.

Keels of palea distant; prolongation of rachilla conspicuous, half as long as palea.....6. *H. comosum*.

1. *Hordeum vulgare* L. Sp. Pl. 84. 1753.

BARLEY.

An erect annual with flat blades and erect spikes with long erect awns (in beardless barley the awns reduced and crumpled).

Commonly cultivated in temperate regions; occasionally escaped or persistent in old fields. Originally described from cultivated specimens.

ECUADOR: Huigra, *Rose* 22221.

PERU: Mito, *Macbride* 3429. Cuzco, *Hitchcock* 22457. Aguas Calientes, *Cook & Gilbert* 189. Between Sicuani and Tinta, *Cook & Gilbert* 222.

2. *Hordeum murinum* L. Sp. Pl. 85. 1753.

A spreading annual 10 to 20 cm. tall, with bushy spikes 2 to 4 cm. long and 1 to 2 cm. wide; awns 2 to 3 cm. long.

Waste places, introduced from Europe, whence originally described.

PERU: Matucana, *Macbride & Featherstone* 221; *Rose* 18644.

3. *Hordeum muticum* Presl, Rel. Haenk. 1: 327. 1830.

Hordeum andicola Griseb. Abh. Ges. Wiss. Göttingen 24: 285. 1879.

Hordeum chilense var. *muticum* Hauman, Anal. Mus. Nac. Buenos Aires 28: 273. 1916. Hauman gives the synonymy of several species of *Hordeum*. See also Thellung, Viertelj. Nat. Ges. Zurich 64: 715. 1919.

An erect or prostrate perennial, mostly 20 to 40 cm. tall, with narrow flat blades and slender, dense, often purple spikes 2 to 5 cm. long, the awns mostly not exceeding the acuminate fertile floret.

Open ground Peru to Argentina and Chile. Originally described from Huánuco, Peru. (*Haenke*.)

PERU: Cerro de Pasco, *Hitchcock* 22224, 22261. Atocsaico Ranch, *McKenzie* in 1924. Juliaca, *Harlan* in 1914. Occa Pampa, *Shepard* 58.

BOLIVIA: La Paz, *Buchtien* 862; *Holway* 474, 495. *Rusby* 8, 54, 179. Palca, *Hitchcock* 22566; *Pflanz* in 1910. Tupiza, *Hitchcock* 22924. Oploca, *Hitchcock* 22887. Achacache, *Mundon* 1379. (Kew Herb.).

4. *Hordeum nodosum* L. Sp. Pl. ed. 2. 126. 1762.

Hordeum secalinum Schreb. Spic. Fl. Lips. 148. 1771.

Similar to *H. muticum* but with longer awns.

Fields and open ground, temperate regions; introduced from Europe, whence originally described.

ECUADOR: Pifo, *Mille* 200.

BOLIVIA: La Paz, *Pearce* in 1868 (Kew Herb.).

5. *Hordeum halophilum* Griseb. Abh. Ges. Wiss. Göttingen 19: 249. 1874.

A caespitose perennial, with the aspect of *H. muticum* and *H. nodosum*, but with awns about 1 cm. long.

Cliffs and open ground, Peru to Argentina. Originally described from Catamarca, Argentina.

PERU: Río Blanco, *Macbride & Featherstone* 751.

BOLIVIA: La Paz, *Buchtien* 506.

6. *Hordeum comosum* Presl, Rel. Haenk. 1: 327. 1830.

An erect or spreading perennial 20 to 40 cm. tall, with bristly spikes 3 to 5 cm. long, the awns 2 to 3 cm. long; continuation of the rachilla prominent.

Open ground, Chile and Argentina; Ecuador. Originally described from Chile.

ECUADOR: Ibarra, *Mille* 260.

32. LOLIUM L. RYEGRASS

Spikelets several-flowered, solitary and sessile, placed edgewise to the continuous rachis, one edge fitting to the alternate concavities, the rachilla disarticulating above the glumes and between the florets; first glume wanting (except on the terminal spikelet), the second outward, strongly 3 to 5-nerved, equaling or exceeding the second floret; lemmas rounded on the back, 5 to 7-nerved, obtuse, acute, or awned.

Plants annual; glume 1 to 1.5 cm. long, mostly longer than the remainder of the spikelet.....1. *L. temulentum*.

Plants perennial; glume less than 1 cm. long, mostly shorter than the remainder of the spikelet.

Lemmas awnless.....2. *L. perenne*.

Lemmas awned.....3. *L. multiflorum*.

1. *Lolium temulentum* L. Sp. Pl. 83. 1753. DARNEL.

An erect annual as much as 1 meter tall, with flat blades and stiff spikes as much as 25 cm. long; lemmas awned.

Fields and waste places in temperate regions; introduced from Europe, whence originally described.

ECUADOR: Huigra, *Rose* 24021.

PERU: Lima, *Hitchcock* 22426.

BOLIVIA: La Paz, *Buchtien* 237.

1a. *Lolium temulentum arvense* (With.) Bab. Man. Brit. Bot. 377. 1843.

Lolium arvense With. Bot. Arr. Veg. Brit. ed. 3. 2: 168. 1796.

Differing in having awnless lemmas.

Fields and waste places; introduced from Europe, whence originally described.

ECUADOR: Between Oña and Cuenca, *Hitchcock* 21602.

PERU: Cuzco, *Hitchcock* 22472.

BOLIVIA: Cochabamba, *Hitchcock* 22837. Sorata, *Mandon* 1377 (Kew Herb.)

2. *Lolium perenne* L. Sp. Pl. 83. 1753. PERENNIAL RYEGRASS.

An erect or spreading, tufted perennial 20 to 40 cm. tall, with flat blades and slender spikes 5 to 15 cm. long, the lemmas awnless.

Grassland in temperate regions; introduced from Europe, whence originally described.

BOLIVIA: La Paz, *Hitchcock* 22575; *Buchtien* 4487.

3. *Lolium multiflorum* Lam. Fl. Franc. 3: 621. 1778. ITALIAN RYEGRASS.

Lolium italicum A. Br. Flora 17: 241. 1834.

Lolium scabrum Presl, Rel. Haenk. 1: 267. 1830. (Described from the mountains of Peru, but the type specimen at the German University, Prague, is labeled "Luzon," *Haenke*.)

Differing from *L. perenne* in having awned lemmas, the awn about as long as the lemma.

Grassland of temperate regions; introduced from Europe, whence originally described.

BOLIVIA: La Paz, *Asplund* 6462.

33. *PARIANA* Aubl.

Spikelets in opposite clusters of 3 at each joint of a readily disarticulating rachis, forming a spike, the center spikelet of the cluster pistillate, the other 2 staminate; stamens numerous.—A genus of doubtful affinity, placed tentatively in *Hordeae*.

Sheaths naked.....1. *P. zingiberina*.
 Sheaths long-fimbriate at summit.....2. *P. lunata*.

1. *Pariana zingiberina* Doell in Mart. Fl. Bras. 2: 337. 1877.

An erect broad-leaved perennial, with the aspect of ginger, with one vegetative and one fertile culm, the vegetative culm 50 to 80 cm. tall, naked below, bearing several oblong-elliptic blades 12 to 15 cm. long, 3 to 5 cm. wide, the lower 1 or 2 smaller; fertile culm naked, shorter than the sterile one, bearing a single terminal dense spike 5 to 8 cm. long, somewhat resembling beardless wheat.

Floor of rain forest, Venezuela to Brazil. Originally described from Brazil.
 PERU: La Merced, *Macbride* 5475 (Field Mus.).

BOLIVIA: Zongo, *Bang* 847a. Mapiri, *Rusby* 232. San Buena Ventura, *Oárdenas* (*Mulford Biol. Expl.*) 1889.

2. *Pariana lunata* Nees, Agrost. Bras. 295. 1829.

Blades oblong-lanceolate, 15 to 20 cm. long, 4 to 5 cm. wide, asymmetrically cuneate at base; sheaths sparsely papillose-roughened, the summit with densely fimbriate auricles, the hairs 1 cm. long.

Sterile shoots frequent on shady banks near Bella Vista appear to be this species.

Guiana to Brazil. Originally described from Brazil.

PERU: Yanano, *Macbride* 3779 (sterile).

BOLIVIA: Bella Vista, *Hitchcock* 22758 (sterile).

34. *DISSANTHELIUM* Trin.

Spikelets small, mostly 2-flowered; glumes equal, longer than the obtuse or acutish awnless 3-nerved lemmas.

Plants annual; panicles oblong, rather narrow.....1. *D. minimum*.
 Plants perennial; panicles oval.

Glumes about 3 mm. long.....2. *D. calycinum*.

Glumes 5 to 6 mm. long.....3. *D. peruvianum*.

1. *Dissanthelium minimum* Pilger, Bot. Jahrb. Engler 56: Beibl. 123: 28. 1920.

Vilfa macusaniensis Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only.
 (*Lechler* 1836.)

Graminastrum (§ *Fussia*) *macusaniense* Krause, Beih. Bot. Centralbl. 32: 348. 1914.

An erect annual 2 to 10 cm. tall, usually growing in tufts, panicle 1 to 2 cm. long, dense, oblong; glumes acute; lemmas acute or mucronate.

Open ground on punas and alpine slopes, Peru and Bolivia. Originally described from Peru. (Type, *Weberbauer* 5451.)

PERU: Cerro de Pasco, *Hitchcock* 22240. Viso, *Macbride & Featherstone* 628. Between Pisco and Ayacucho, *Weberbauer* 5451. Chicla, *Ball* in 1882 (Kew Herb.).

BOLIVIA: Sorata, *Mandon* 1346. La Paz, *Buchtien* 6420. Challapata, *Asplund* 6477. Copacabana, *Asplund* 6499. Potosí, *D'Orbigny* 136. Without locality (presumably Macusani), *Lechler* 1836.

2. *Dissanthelium calycinum* (Presl) Hitchc. Journ. Washington Acad. Sci. 13: 224. 1923.

Brizopyrum calycinum Presl, Rel. Haenk. 1: 281. 1830.

Dissanthelium supinum Trin. Linnaea 10: 305. 1836. (Cerro de Pasco, Pöppig.)

Deschampsia mathewsii Ball, Journ. Linn. Soc. Bot. 22: 60. 1885. (Casapalta, Peruvian Andes, Mathews.)

A low, densely caespitose perennial, with culms mostly less than 10 cm. tall, folded or involute blades, and ovoid, dense or finally somewhat open panicles 1 to 3 cm. long; glumes 2.5 to 3.5 mm. long.

Punas and alpine slopes, Peru and Bolivia. Original locality not known, but probably Peru. (Haenke.)

PERU: Cerro de Pasco, Hitchcock 22228, 22233, 22242, 22246. Hacienda Atocsaico, Hitchcock 22203, 22204, 22207, 22214. Casa Cancha, Wilkes Expl. Exped. Huarón, Macbride & Featherstone 1153. Huánuco, Macbride & Featherstone 2183. Yauli, Macbride & Featherstone 933. Panticalla Pass, Cook & Gilbert 1297, 1305. Casapalta, Ball in 1882 (Kew Herb.). Macusaní, Lechler 1832 (Kew Herb.).

BOLIVIA: Rinconada, Hitchcock 22596½; Asplund 6464. La Paz, Buchtien 1197; Asplund 6481. General Campero, Asplund 6505. Potosí, D'Orbigny 186, 191. "Bolivian Plateau," Bang 1873. Sorata, Mandon 1292 (Kew Herb.).

3. *Dissanthelium peruvianum* (Nees & Mey.) Pilger, Bot. Jahrb. Engler 37: 378. 1906.

Phalaridium peruvianum Nees & Mey. Nov. Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 29. 1841; 161. 1843.

Differing from *D. calycinum* in having larger spikelets, about 5 mm. long. Our specimens referred to this species are more loosely caespitose.

Rocky slopes or cliffs, Peru and Bolivia. Originally described from Lake Titicaca, Peru. (Meyen.)

PERU: Huarón, Macbride & Featherstone 1155.

BOLIVIA: Sorata, Mandon 1345. Chacaltaya, Buchtien 1194.

35. KOELERIA Pers.

Spikelets 2 to 4-flowered, glumes unequal, slightly shorter than the florets; lemmas awned (in our species).

Plants perennial-----1. *K. cristata*.

Plants annual-----2. *K. trachyantha*.

1. *Koeleria cristata* (L.) Pers. Syn. Pl. 1: 97. 1805.

Aira cristata L. Sp. Pl. 63. 1753.

An erect caespitose perennial 30 to 50 cm. tall, with flat, mostly basal blades, and dense spike-like panicles 5 to 10 cm. long, often interrupted toward the base.

Plains, prairies, and grassy slopes in the temperate parts of both hemispheres, in South America extending north in the mountains to Peru. Originally described from Europe.

PERU: Oroya, Hitchcock 22184. Yanahuanca, Macbride & Featherstone 1280a.

BOLIVIA: Palca, Buchtien 2524; Hitchcock 22564. La Paz, Buchtien 6418, 6469, 6470. Lake Titicaca, Asplund 6492. Pongo, Hitchcock 22767. Sorata, Mandon 1359 (Kew Herb.). Without locality, Bang 2589½.

The specimens here cited are more or less pubescent and have slender short straight awns just below the apex of some of the lemmas. This form has been described as *K. bergii* Hieron.*

* Bol. Acad. Cienc. Córdoba 3: 376. 1881.

2. *Koeleria trachyantha* R. A. Phil. Fl. Atac. 55. 1860.

An erect slender annual as much as 40 cm. tall, with flat blades and spike-like, somewhat interrupted panicles 2 to 5 cm. long.

Sand hills, northern Chile and southern Peru. Originally described from Atacama, Chile.

PERU: Mollendo, *Hitchcock* 22423. San Gallán Island, *Murphy* 3477. Chorillos, *Macbride* 5871. Without locality, *Maclean* (Kew Herb.).

The sandy hills back of Mollendo are ordinarily a desert waste, but after the occasional showers they support a vigorous vegetation for a short period. The specimens cited from Mollendo were collected November 17 at one of these periods. The species was common, growing between other plants on the upper slopes of the hills.

36. TRISETUM Pers.

Spikelets with 2 or 3 perfect florets; glumes usually unequal; lemmas bidentate, bearing a slender dorsal awn.

Panicle narrow but rather loose and somewhat nodding.

Lemmas smooth, nearly terete, the nerves obscure; awn attached about the middle of the lemma.....1. *T. deyeuxioides*.

Lemmas scabrous and somewhat roughened or wrinkled, compressed, the nerves evident; awn attached about one-fourth below the tip of the lemma.

2. *T. scabriflorum*.

Panicle dense and spikelike.

Glumes attenuate-pointed, 1 cm. long.....3. *T. floribundum*.

Glumes acute or acuminate, not attenuate, less than 1 cm. long.

Glumes about equal in size and shape, 8 mm. long.....4. *T. macbridei*.

Glumes unequal, 4 to 5 mm. long, the first shorter and narrower than the second.

Panicles 5 to 12 cm. long, often lobed or interrupted, mostly 8 to 10 times longer than wide, green or tawny.....5. *T. spicatum*.

Panicles oval or oblong, dense, 2 to 3 cm. long, about half as wide, bronze or brown-purple.....6. *T. andinum*.

1. *Trisetum deyeuxioides* (H. B. K.) Kunth, Rév. Gram. 1: 102. 1829.

Avena deyeuxioides H. B. K. Nov. Gen. & Sp. 1: 147. 1816.

A lax perennial about 1 meter tall, with flat blades and narrow, rather open or interrupted, nodding panicles 10 to 20 cm. long.

Moist grassland and open woods at medium altitudes, Mexico, whence originally described, to Ecuador.

ECUADOR: Huigra, *Hitchcock* 20759.

2. *Trisetum scabriflorum* Hitchc., sp. nov.

A lax perennial; culms more or less decumbent or spreading, glabrous, 60 to 120 cm. tall; sheaths pubescent or the upper ones glabrous; ligule thin, 1 to 2 mm. long; blades flat, sparsely pilose on both surfaces, mostly 2 to 3 mm. wide; panicle narrow, somewhat loose and interrupted, nodding, greenish or purplish, 15 to 20 cm. long, the branches ascending, rather lax, some of them floriferous to base, the longer as much as 5 cm. long, the axis glabrous; spikelets 2 or 3-flowered, 5 to 8 mm. long, the florets extending above the glumes, the rachilla joints long-pilose, 1 to 2 mm. long; glumes scabrous on the keels, mostly on the upper half, or toward the apex only, the first rather narrow, acuminate, 1-nerved, 4 to 5 mm. long, the second broader and rather abruptly acuminate, 3-nerved, 5 to 6 mm. long; lemmas compressed, lanceolate, slightly toothed, obscurely 5-nerved, scabrous all over the back and somewhat wrinkled

or roughened, the lower 5 to 6 mm. long, the others a little shorter, the callus hairs about 0.5 mm. long; awn inserted one-third below the apex, loosely twisted and flexuous for about 2 mm., the terminal part spreading, 5 to 7 mm. long; palea a little shorter than the lemma.

Type in the U. S. National Herbarium, no. 531631, collected below Pitayó, Río Palo Basín, Tierra Adentro, State of Cauca, Colombia, altitude 2,400 meters, February, 1906, by H. Pittier (no. 1435).

Open woods and grassy slopes, at 2,000 to 4,000 meters, Panama to Ecuador. PANAMA: Chiriquí Volcano, *Hitchcock* 8209, 8221, 8224.

COLOMBIA: Las Escaleratas, Moras Valley, Río Paez Basín, Tierra Adentro, *Pittier* 1353. Pitayó, *Pittier* 1435.

ECUADOR: Tulcán, *Hitchcock* 20958, 21040. Quito, *Arcade* 20.

This species is allied to *T. fournieranum* Hitchc., of Mexico, which has smaller spikelets, and differs in numerous details.

3. *Trisetum floribundum* Pilger, Bot. Jahrb. Engler 37: 505. 1906.

Trisetum weberbaueri Pilger, Bot. Jahrb. Engler 37: 506. 1906. (*Weberbauer* 3078.)

Bromus mandonjanus Henr. Repert. Nov. Sp. Fedde 23: 177. 1926. (*Mandon* 1321.)

A densely caespitose perennial 10 to 30 cm. tall, with short involute blades and dense oval panicles 2 to 6 cm. long.

Rocky slopes, at high altitudes, Peru and Bolivia. Originally described from Peru. (Type, *Weberbauer* 1028.)

PERU: Between Culnai and Obrajillo, *Wilkes Expl. Exped. Casapalca, Macbride & Featherstone* 851. Huarón, *Macbride & Featherstone* 1130. Araranca, Prov. Sandía, *Weberbauer* 1028. Ocos, *Weberbauer* 2811. Caraz, *Weberbauer* 3078.

BOLIVIA: Sorata, *Mandon* 1371. Comanche, *Asplund* 6507.

4. *Trisetum macbridei* Hitchc., sp. nov.

Perennial; culms caespitose, erect, glabrous, 20 to 40 cm. tall; leaves mostly basal; sheaths puberulent or the upper glabrate, loose or slightly inflated; ligule membranaceous, pubescent, 1 to 2 mm. long, or the uppermost as much as 5 mm.; blades flat, puberulent, especially the lower, mostly less than 10 cm. long, the uppermost 4 to 5 cm. long, mostly 4 to 6 mm. wide; panicle dense, spikelike, interrupted below, purplish, shining, long-exserted, 7 to 8 cm. long, the axis glabrous below, scaberulous above; spikelets 2-flowered, about 8 mm. long, the pedicels scaberulous; glumes longer than the florets, equal in length and width, rather broad, glabrous even on the keel, shining, 1-nerved; rachilla between florets about 1 mm. long, sparsely pilose with hairs about 1 mm. long, continued above the second floret about 1 mm.; lemmas minutely scaberulous, the first 5 mm., the second 4 mm. long, the apex acute, slightly 2-toothed, the callus somewhat hispid with hairs about 0.5 mm. long; awn from above the middle of the lemma, loosely twisted and flexuous for about 2 mm., geniculate, the terminal straight part 3 to 4 mm. long; palea about 3 mm. long, obtuse, minutely ciliate on the keels.

Type in the U. S. National Herbarium, no. 1,161,510, collected on rocky northeastern slope, altitude 4,200 meters, at Huarón, Peru, June 12, 1922, by Macbride and Featherstone (no. 1131). No other specimen has been seen.

This species is allied to *T. spicatum*, which differs in the smaller spikelets, dissimilar glumes, awn-pointed lemmas, and the longer palea.

5. *Trisetum spicatum* (L.) Richt. Pl. Eur. 1: 59. 1890.

Aira spicata L. Sp. Pl. 64. 1753.

Trisetum tolucense Kunth, Rév. Gram. 1: 101. 297. pl. 60. 1829.

An erect, cespitose, glabrous or puberulent perennial 10 to 30 cm. tall, rarely as much as 1 meter tall, with flat, mostly basal blades and a dense or somewhat interrupted, spikelike panicle.

Mountain meadows and slopes, widely distributed in arctic, antarctic, and alpine regions; in South America from Colombia to southern Chile. Originally described from Europe.

ECUADOR: Vicinity of Quito, *Arcade* 19; *Harteman*, 7, 11; *Jameson*; *Sodi*; *Mille* 268. Urbina, *Hitchcock* 22029. Without locality, *Spruce* 5934, 5935 (both Kew Herb.).

PERU: San Gallán Island, *Murphy* 3481. Baños, *Wilkes Expl. Exped.* Goyllarisquisca, *Hitchcock* 22294, 22323. Cerro de Pasco, *Hitchcock* 22254. La Quinhua, *Hitchcock* 22269, 22271. Hacienda Atocsaico, *Hitchcock* 22199. Oroya, *Hitchcock* 22184 $\frac{1}{3}$. Ollantaytambo, *Hitchcock* 22535. Cuzco, *Hitchcock* 22471, 22480.

BOLIVIA: La Paz, *Hitchcock* 22563; *Buchtien* 6468; *Holway* 478. Unduavi *Buchtien* 2587. Challapata, *Asplund* 6476. La Cumbre, *Asplund* 6497.

6. *Trisetum andinum* Benth. Pl. Hartw. 261. 1847.

Aspect of *T. spicatum*, but the dense and spikelike panicle oval or oblong, mostly 2 to 3 cm. long, 1.5 to 2 cm. broad; whole plant canescently puberulent.

Alpine slopes, Ecuador. Originally described from Antisana. (Type, *Hartweg* 1449.)

ECUADOR: Mount Pichincha, *Hitchcock* 21059; *Holmgren* 553; *Jameson*; *Couthouy* in 1855 (Columbia Coll.); *André* 3907 (Kew Herb.). Hacienda Antisana, *Hartweg* 1449.

This species is allied to *Trisetum spicatum*. The cited specimens all coming from one region, though differing only slightly, appear to represent a distinct species.

37. AVENA L. OAT

Spikelets large. 2 to 4-flowered; glumes equal, many-nerved, papery, exceeding the florets; lemmas bidentate, bearing a dorsal awn, the awn sometimes rudimentary.

Lemmas 5 to 6 mm. long.....1. *A. scabrivalvis*.

Lemmas more than 1 cm. long.

Teeth of lemma awned.....4. *A. barbata*.

Teeth of lemma acute or acuminate but not awned.

Glumes 3 cm. long; awn 5 to 6 cm. long.....5. *A. sterilis*.

Glumes 2 to 2.5 cm. long; awn about 3 cm. long (sometimes reduced or wanting in *A. sativa*).

Lemmas strongly pilose.....2. *A. fatua*.

Lemmas glabrous.....3. *A. sativa*.

1. *Avena scabrivalvis* Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 2¹: 28. 1836.

Bromus holciformis Steud. & Hochst.; Steud. Syn. Pl. Glum. 1: 324. 1854.

An erect perennial 30 to 50 cm. tall, with flat blades and open few-flowered panicles with spikelets about 12 mm. long.

Open ground, Chile, whence originally described, to Argentina and Peru.

PERU: Occa Pampa, *Shepard* 57.

BOLIVIA: La Paz, *Buchtien* 6422.

2. *Avena fatua* L. Sp. Pl. 80. 1753.

WILD OAT.

A rather stout annual with long flat blades and large open panicles of large nodding spikelets.

Occasional in waste places; introduced from Europe, whence originally described.

BOLIVIA: Cochabamba, *Hitchcock* 22836.

3. *Avena sativa* L. Sp. Pl. 79, 1753.

CULTIVATED OAT.

Differing from *A. fatua* chiefly in the glabrous florets.

Occasionally cultivated and sometimes found in waste places. Originally described from Europe.

ECUADOR: Quito, *Arcade* 10.

4. *Avena barbata* Brot. Fl. Lusit. 1: 108. 1804.

Differing from *A. fatua* in the somewhat smaller spikelets, in the slender teeth of the lemma, and in the flexuous pedicels.

Waste ground; introduced from Europe, whence originally described.

PERU: Matucana, *Macbride & Featherstone* 136.

BOLIVIA: Palca, *Pflanz* 2541.

5. *Avena sterilis* L. Sp. Pl. ed. 2. 118. 1762.

ANIMATED OAT.

Differing from *A. fatua* in the larger spikelets and stouter longer awn; glumes 3 cm. long; awn about 2 cm. long below bend, about 4 cm. long above bend.

Waste ground, introduced from Europe, whence originally described.

PERU: Mito, *Macbride* 3428, Cuzco, *Hitchcock* 22454, 22496.

38. AIRA L.

Spikelets 2-flowered, the rachilla prolonged behind the upper floret; glumes equal; lemmas thin, truncate, 2 to 4-toothed or lobed, bearing a slender awn from or below the middle.

1. *Aira conferta* (Pilger) Hitchc.

Trisetum confertum Pilger, Bot. Jahrb. Engler 25: 714. 1898.

A slender perennial, 50 to 100 cm. tall, with glabrous sheaths, flat lax scabrous blades 2 to 3 mm. wide, sometimes pubescent on the upper surface, and narrow, rather dense or spikelike panicles about 15 cm. long; glumes about 5 mm. long; lemmas nearly terete, glabrous, 3 mm. long, the callus densely short-pilose, the apex 2-lobed, the lobes about 0.5 mm. long, broad and rounded; awn inserted a little below the middle, erect and twisted for about 2 mm. then geniculate spreading, the terminal part 3 to 4 mm. long.

Moist soil, Ecuador to Bolivia. Originally described from Ecuador. (Type, *Stübel* 152.)

ECUADOR: Prov. Imbabura, near Loma de Canaballa, *Stübel* 152.

BOLIVIA: Cochabamba, *Hitchcock* 22814.

39. ASPRIS Adans.

Spikelets 2-flowered, the rachilla not prolonged; glumes about equal; lemmas firm, bearing on the rounded back a slender, geniculate, twisted, usually exerted awn.

1. *Aspris capillaris* (Host) Hitchc. U. S. Dept. Agr. Bull. 772: 116. 1920.

Aira capillaris Host, Icon. Gram. Austr. 4: 20. pl. 35. 1809.

A delicate spreading branching annual as much as 30 cm. tall, with divaricately branched panicles, the spikelets about 2 mm. long on capillary spreading pedicels 3 to 5 mm. long; both florets awned.²¹

²¹ According to Ascherson and Graebner (Syn. Mitteleur. Fl. 2: 279. 1899) the form with both florets awned is *Aira capillaris* var. *ambigua* (DeNot.) Aschers.

Introduced occasionally in various parts of America. Originally described from Europe.

ECUADOR: Quito, *Sodi* in 1890; *Mille* 270.

40. WEINGAERTNERIA Bernh.

Differing from *Aspris* in the prolongation of the rachilla behind the palea, and in the club-shaped awn with a circle of short stiff hairs at the point of articulation.

1. *Weingaertneria canescens* (L.) Bernh. Syst. Verz. Pflanz. 51. 1800.

Aira canescens L. Sp. Pl. 65. 1753.

An erect branched perennial, with slender culms 30 to 40 cm. tall, and narrow panicles 5 to 10 cm. long.

Occasional in waste places, introduced from Europe, whence originally described.

ECUADOR: Quito, *Sodi*; *Mille* 269.

41. NOTHOLCUS Nash

Spikelets 2-flowered; glumes equal, exceeding the florets; lower floret perfect, awnless, the upper staminate, bearing a hooklike dorsal awn.

1. *Notholcus lanatus* (L.) Nash; Hitchc. in Jepson, Fl. Calif. 1: 126. 1912.

VELVET GRASS.

Holcus lanatus L. Sp. Pl. 1048. 1753.

Perennial, 0.5 to 1 meter tall, grayish-velvety throughout, the pale, rather densely flowered, narrow panicle usually 8 to 10 cm. long.

A European grass that has occasionally escaped from cultivation at higher altitudes.

ECUADOR: Between Malchinguf and Pomasqui, *Hitchcock* 20905. Ambato, *Tate* 546. Baños, *Tate* 599. Quito, *Harteman* 48.

BOLIVIA: La Paz, *Bang* 155.

42. DANTHONIA Lam. & DC.

Spikelets several-flowered; glumes subequal, exceeding all the florets; lemmas bifid, with a twisted awn between the teeth; awn flat, formed by the extension of the 3 middle nerves of the lemma.

1. *Danthonia secundiflora* Presl, Rel. Haenk. 1: 255. 1830.

Danthonia montana Doell in Mart. Fl. Bras. 2^a: 101. 1878.

Danthonia montevidensis Hack. & Arech. Anal. Mus. Nac. Montevideo 1: 369. 1896.

An erect cespitose perennial 30 to 60 cm. tall, with loosely involute blades and narrow, rather few-flowered, purple panicles 5 to 8 cm. long; teeth of lemma ending in long slender awns.

Grassy paramos, Brazil to Venezuela and Ecuador. Originally described from Peru. (*Haenke*.)

ECUADOR: Between San Lucas and Oña, *Hitchcock* 21524, 21530.

PERU: Without locality, *Haenke* (a fragment from the type at the German University, Prague).

43. LAMPROTHYRSUS Pilger

Spikelets several-flowered, pilose, the florets disarticulating at the base of the rachilla joint, the rachilla long-villous; lemmas 2-toothed; awn from between teeth of lemma, slender, slightly twisted, widely spreading, the teeth of the lemma extending into long delicate awns; panicle large and many-flowered.

The genus *Lamprothyrsus* was originally described as dioecious, only the pistillate form being known. An examination of the spikelets shows the presence of small anthers. The flowers are perfect but cleistogamous.

Lamprothyrsus is related on the one hand to *Danthonia*, as shown by the long-awned teeth of the lemma and the twisted spreading awn; and on the other to *Cortaderia*, which it resembles in habit, in the large panicles, and in the disarticulation of the rachilla.

Lemma 4 mm. long to curve of nearly straight awn.....1. *L. peruvianus*.
 Lemma 3 mm. long to curve of flexuous awn.....2. *L. hieronymi*.

1. *Lamprothyrsus peruvianus* Hitchc. Proc. Biol. Soc. Washington 36: 195. 1923.

A robust, densely tufted perennial 1 to 2 meters tall, with long involute blades and rather dense, many-flowered, purple panicles 10 to 40 cm. long and 5 to 8 cm. wide. The old sheaths at the base flatten out, becoming spirally coiled and flexuous.

Rocky slopes and canyons, Peru to Ecuador. Originally described from Peru. (Type, *Macbride & Featherstone* 1205.)

ECUADOR: Between Loja and San Lucas, *Hitchcock* 21478.

PERU: Goyllarisquisca, *Hitchcock* 22302, 22303, 22304. Between Tarma and La Merced, *Hitchcock* 22141, 22146. Torontoy, *Cook & Gilbert* 1189. Yanahuanca, *Macbride & Featherstone* 1205.

2. *Lamprothyrsus hieronymi* (Kuntze) Pilger, Bot. Jahrb. Engler 37: 58. 1906. *Triraphis hieronymi* Kuntze, Rev. Gen. Pl. 3: 373. 1898.

Lamprothyrsus hieronymi var. *pyramidatus* Pilger, Bot. Jahrb. Engler 37: 59. 1906. (*Fiebrig* 2372.)

Lamprothyrsus hieronymi var. *tinctus* Pilger, Bot. Jahrb. Engler 37: 59. 1906. (*Fiebrig* 2099.)

Danthonia hieronymi Hack.; Stuck. Anal. Mus. Nac. Buenos Aires 13: 484. 1906.

Differing from *L. peruvianus* in being taller and stouter and in having a more open pale panicle, the florets smaller, the awns loosely twisted.

Rocky slopes and canyons, Argentina to Bolivia. Originally described from Argentina.

BOLIVIA: Cochabamba, *Hitchcock* 22826, 22856. Sorata, *Mandon* 1360. Bermejo, *Fiebrig* 2099.

44. CALAMAGROSTIS Adans.

Spikelets 1-flowered, the rachilla prolonged behind the palea as a short, commonly hairy bristle; glumes about equal, acute or acuminate; lemma usually shorter and more delicate than the glumes, usually awned, the awn dorsal; callus pilose, the hairs few and short or as long as the lemma.

The central Andean species of *Calamagrostis* (*Deyeuxia*) were studied by Weddell.²² His paper consists of a key to species and an alphabetical list of the species with the specimens assigned to them. There are no formal descriptions. Until the type specimens have been examined the following species of *Deyeuxia* proposed by Weddell must remain uncertain:

D. ANTHOXANTHUM (Bolivia, *Weddell*).

D. BREVIARISTATA (Peru, *Weddell*).

D. CAPITATA (Bolivia, *D'Orbigny* 178; *Weddell*).

²² *Conspectus analyticus specierum generis (s. sectionis) Deyeuxia in regione Andina hucusque obviarum.* Bull. Soc. Bot. France 22: 176-180. 1875.

D. CEPHALOTES (Bolivia, Weddell).

D. FESTUCOIDES (Bolivia, Weddell).

D. GRACILIS (Bolivia, Weddell).

Calamagrostis gracilis Henr. Med. Rijks Herb. Leiden 40: 61. 1921. Not
C. gracilis Seenus, 1805.

D. LAGURUS (Bolivia, D'Orbigny 200; Weddell).

D. LEIPODA (Bolivia, Weddell).

Stylagrostis leiopoda Mez, Bot. Archiv Mez 1: 20. 1922.

D. LONGIARISTATA (Bolivia, Mandon 1298).

Calamagrostis longiaristata Hack.; Sodiro, Anal. Univ. Quito 8. 1889.

D. MUTICA (Bolivia, D'Orbigny 182).

D. NEMATOPHYLLA (Bolivia, Mandon 1300).

D. OBTUSATA (Bolivia, Mandon 1311).

D. PICTA (Bolivia, Mandon 1297).

D. POLYSTACHYA (Peru, Weddell).

Stylagrostis polystachya Mez, Bot. Archiv Mez 1: 20. 1922.

D. SCABRIUSCULA (Peru, Weddell).

D. SETIFLORA (Bolivia, Weddell).

D. SPRUCEANA (Ecuador, Jameson).

Calamagrostis spruceana Hack.; Sodiro, Anal. Univ. Quito 8. 1889.

D. SUBSIMILIS (Bolivia, Weddell).

D. SULCATA (Bolivia, Mandon 1308 bis).

D. TRICHODONTA (Peru, Weddell).

Panicles open, the spreading capillary branches (at least the lower) naked
2 to 5 cm. at base (sometimes less or ascending in *C. eminens*). Plants 70
cm. or more tall.

Blades flat; panicle drooping-----1. *C. leiophylla*.

Blades involute; panicle erect or nearly so.

Spikelets subglomerate at the ends of the branchlets; panicles golden bronze.

2. *C. eminens*.

Spikelets not crowded in clusters; panicles pale or dark, not golden-bronze.

Spikelets 2.5 to 3 mm. long.

Awn scarcely exceeding the glumes; rachilla hairs white---3. *C. lilloi*.

Awn obsolete-----4. *C. calderillensis*.

Spikelets 4 to 5 mm. long.

Callus hairs copious-----5. *C. effusa*.

Callus hairs scant-----6. *C. amoena*.

Panicles narrow, the ascending branches spikelet-bearing from near the base
(one of a fascicle of branches sometimes naked at base).

Blades flat, lax, 3 to 8 mm. wide. Hairs of callus or rachilla about as long
as the floret.

Callus hairs short, scant. Rachilla hairs copious-----7. *C. planifolia*.

Callus with copious long hairs.

Rachilla pubescent, inconspicuous; awn inserted about 0.5 mm. below
apex of lemma; lemma shorter than glumes---8. *C. montevidensis*.

Rachilla with long hairs at apex; awn inserted about the middle of the
lemma; lemma about as long as the glumes-----9. *C. beyrichiana*.

Blades involute or folded or, if flat, not more than 2 mm. wide (culm blades
rarely wider in *C. heterophylla* but basal blades involute).

Blades of basal innovations involute-filiform, those of the culm flat or
loosely involute, all soft, lax. Lemma aristate-toothed; hairs incon-
spicuous-----10. *C. heterophylla*.

Blades all alike.

Sheaths with erect auricles 1 cm. or more long, hyaline at summit; floret raised on a stipe (rachilla joint), this usually disarticulating at the summit and remaining in the glumes.....11. *C. podophora*.

Sheaths not long-auricled; floret sessile.

Rachilla glabrous, very short. Callus hairs less than 0.5 mm. long; dwarf caespitose plants. (See also *C. bogotensis* with obscurely pubescent rachilla.)

Culms mostly less than 10 cm. tall; panicles 1 to 2 cm. long; blades mostly less than 3 cm. long; awn attached about one-fourth above the base of the lemma.....12. *C. preslii*.

Culms 10 to 30 cm. tall; panicles 3 to 8 cm. long; blades mostly 5 to 10 cm. long; awn attached about the middle of the lemma.

13. *C. rigescens*.

Rachilla more or less hairy, often long-villous (obscurely in *C. vicunarium* and allies and in *C. bogotensis*.)

Callus hairs prominent, when as short as 1 mm. the rachilla hairs scant.

Awn exerted, bent, twisted below the bend.

Hairs on rachilla prominent, reaching to about 3 mm.; blades pubescent.....14. *C. mollis*.

Hairs on rachilla scant, reaching to about 1 mm.; blades glabrous.

15. *C. coarctata*.

Awn straight or somewhat bent (if bent, shorter than the lemmas).

Panicles about 15 cm. long, rather loose. Awn bent, shorter than the lemma; callus hairs about 2 mm. long, rachilla 1 mm. long, the rather scant hairs extending to 2 mm.; glumes 5 mm. long.....16. *C. haenkeana*.

Panicles short and dense, or in *C. ligulata* as much as 6 cm. long.

Rachilla 2 mm. long, copiously hairy on the sides to the summit, the hairs not extending upward from the summit; lemma 3 mm. long; panicle 6 cm. long, narrow but less dense than in the next subdivision, some of the pedicels longer than the spikelets.....17. *C. ligulata*.

Rachilla 1 mm. long, the hairs from the summit extending upward 1 to 2 mm., those on the sides shorter or none; lemma 4 to 5 mm. long; panicle dense, oblong or ovate, the pedicels shorter than the spikelets.

Panicle oblong, 5 to 10 cm. long; scaberulous; rachilla naked below summit.....18. *C. chrysantha*.

Panicles oval or ovate, 2 to 4 cm. long; blades on innovations glabrous, on culm slightly scaberulous; rachilla villous below summit, the hairs shorter than those of the summit.

19. *C. ovata*.

Callus hairs scant or obsolete, if as much as 1 mm. long the rachilla hairs prominent.

Rachilla short, its hairs scant, usually not more than about 1 mm. long.

Plants mostly more than 0.5 meter tall; panicle 10 to 15 cm. long; glumes 4 mm. long.....20. *C. bogotensis*.

Plants mostly less than 20 cm. tall; panicles 2 to 4 cm. long; glumes 5 to 6 mm. long.....21. *C. vicunarium*.

Rachilla and its usually copious hairs reaching to 2 mm. or more.

Lemma scaberulous.

Awn attached less than 1 mm. above base of lemma. Glumes 4 mm. long; blades elongate filiform...22. *C. trichophylla*.

Awn attached more than 1 mm. from base of lemma.

Hairs on rachilla rather scant, the rachilla and hairs less than 3 mm. long. Panicle narrow, rather compact; palea about equaling lemma.....23. *C. recta*.

Hairs on rachilla copious, the rachilla and hairs usually 2 to 3 mm. long.

Panicle 2 to 3 cm. long, dense, ovoid....24. *C. spicigera*.

Panicle mostly more than 10 cm. long.

Panicle narrow, pale, rather compact, 10 to 20 cm. long.

Involute blades firm and stiff, 1 mm. thick.

25. *C. rigida*.

Involute blades rather soft and flexuous, 0.5 mm. thick.

26. *C. cryptolopha*.

Panicle somewhat open, purplish.

Blades glabrous.....27. *C. macrophylla*.

Blades scabrous.

Spikelets 5 to 6 mm. long; plants often more than 1 meter tall; panicles mostly 20 to 30 cm. long.

28. *C. humboldtiana*.

Spikelets 7 mm. long; plants about 30 cm. tall; panicles mostly less than 10 cm. long.

29. *C. glacialis*.

Lemma glabrous.

Pedicels villous. Panicle dense, ovoid; plants 10 to 20 cm. tall.

30. *C. jamesoni*.

Pedicels glabrous or scabrous.

Panicle dense, spikelike, sometimes interrupted at base.

Panicle 1 to 2 cm. long.

Panicle narrow, 3 to 4 times longer than wide.

31. *C. curvula*.

Panicle ovoid or globular, about 1 cm. long.

Lemma, glumes, and rachilla hairs about 4 mm. long.

32. *C. cephalantha*.

Lemma 3 to 4 mm. long; glumes 5 to 6 mm. long; rachilla hairs scant, shorter than the lemma.

33. *C. curta*.

Panicle more than 3 cm. long, usually more than 5 cm., often elongate.

Rachilla hairs, lemma, and glumes all about 5 mm. long.

34. *C. densiflora*.

Rachilla hairs and lemma shorter than the glumes.

Summit of lemma toothed; rachilla hairs about as long as lemma.....35. *C. brevifolia*.

Summit of lemma not toothed; rachilla hairs shorter than the lemma.....36. *C. fuscata*.

Panicles narrow but somewhat open.

Panicles mostly less than 5 cm. long, rather loosely flowered.....37. *C. violacea*.

Panicles mostly more than 5 cm. long.

Rachilla hairs shorter than lemma...38. *C. tarmensis*.

Rachilla hairs copious, about as long as the lemma.

Blades glabrous.....39. *C. fiebrigii*.

Blades scabrous.

Blades erect, firm, nearly as long as culms.

40. *C. antoniana*.

Blades slender, flexuous, shorter than the culms.

41. *C. orbignyana*.

1. *Calamagrostis leiophylla* (Wedd.) Hitchc.

Deyeuxia leiophylla Wedd. Bull. Soc. Bot. France 22: 177, 180. 1875.

Calamagrostis toluccensis var. *laxiflora* Kuntze, Rev. Gen. Pl. 3²: 345. 1898.

(Tunari Mountains, Kuntze.)

An erect cespitose perennial 50 to 100 cm. tall, with flat or loosely involute, elongate, glabrous blades, and pale, narrow, rather loose panicles about 20 cm. long; glumes 7 to 8 mm. long; lemma 5 mm. long, the callus glabrous or nearly so; rachilla with its long hairs about 3 mm. long.

Known only from Bolivia. (Type, Mandon 1299.)

BOLIVIA: Sorata, Mandon 1299. Cochabamba, Holway 379.

2. *Calamagrostis eminens* (Presl) Steud. Nom. Bot. ed. 2. 1: 250. 1840.

Deyeuxia eminens Presl, Rel. Haenk. 1: 250. 1830.

Deyeuxia elegans Wedd. Bull. Soc. Bot. France 22: 177, 179. 1875. (Mandon 1309, 1310.)

Calamagrostis eminens γ *tunaricensis* Kuntze, Rev. Gen. Pl. 3²: 344. 1898.

(Tunari, 4,000 meters, Kuntze.)

Calamagrostis eminens δ *sordida* Kuntze, Rev. Gen. Pl. 3²: 344. 1898. (Tunari, 3,600 meters, Kuntze.)

Calamagrostis elegans Henr. Med. Rijks. Herb. Leiden 40: 61. 1921.

Stylagrostis eminens Mez, Bot. Archiv Mez 1: 20. 1922.

Stylagrostis elegans Mez, Bot. Archiv Mez 1: 20. 1922.

A stout erect cespitose perennial about 1 meter tall with long, more or less involute, scabrous blades and beautiful bronze-yellow open nodding panicles 15 to 30 cm. long, the spikelets in glomerules at the ends of the branchlets; glumes about 4 mm. long.

Springy or boggy places, Peru to Bolivia. Originally described from Huánuco, Peru. (Haenke.)

PERU: Goyllarisquisca, Hitchcock 22332. Hacienda Atocsaico, Hitchcock 22221. Huáraz, Macbride & Featherstone 2500. Huarón, Macbride & Featherstone 1134.

BOLIVIA: Sorata, Mandon 1309, 1310. Llavetal, Herzog 2080. Tunari, 4,000 meters, Kuntze in 1892 (N. Y. Bot. Gard.), 3,600 meters (N. Y. Bot. Gard.).

3. *Calamagrostis lilloi* Hack.; Stuck. Anal. Mus. Nac. Buenos Aires 13: 477. 1906.

An erect pale cespitose perennial about 1 meter tall, with slender folded scaberulous blades and open panicles 20 to 30 cm. long, the branchlets and pedicels capillary, flexuous, the spikelets scarcely 3 mm. long.

Rocky slopes, Bolivia and Argentina. Originally described from Tucumán, Argentina.

BOLIVIA: Cochabamba, Hitchcock 22838.

4. *Calamagrostis calderillensis* Pilger, Bot. Jahrb. Engler 42: 72. 1908.

A tall perennial, with flat or loosely convolute blades and open panicles about 15 cm. long; glumes about 4 mm. long; lemma 3 mm. long, minutely scaberulous,

awnless; callus hairs scant, 1 mm. long; rachilla less than 1 mm. long, the hairs rather short and scant; palea scaberulous, nearly as long as lemma.

Known only from the type collection.

BOLIVIA: Calderillo, southern Bolivia, *Fiebrig* 3172.

5. *Calamagrostis effusa* (H. B. K.) Steud. Nom. Bot. ed. 2. 1: 250. 1840.

Deyeuxia effusa H. B. K. Nov. Gen. & Sp. 1: 146. 1816.

Deyeuxia areantha Pilger, Bot. Jahrb. Engler 25: 711. 1898.

Calamagrostis areantha Pilger, Bot. Jahrb. Engler 42: 60. 1908.

A stout caespitose perennial up to 1 meter tall, with firm, folded or loosely involute blades and open, rather diffuse panicles as much as 20 cm. long; glumes 3 to 4 mm. long.

Paramos, Colombia to Ecuador. Originally described from Antisana and Saraguru, Ecuador. (*Bonpland.*)

ECUADOR: Tulcán, *Hitchcock* 20916.

6. *Calamagrostis amoena* (Pilger) Pilger, Bot. Jahrb. Engler 42: 60. 1908.

Deyeuxia amoena Pilger, Bot. Jahrb. Engler 27: 28. 1899. (*Bang* 805.)

Deyeuxia filifolia Wedd. Bull. Soc. Bot. France 22: 178, 179. 1875. (*Mandon* 1301, 1303, 1306.)

Calamagrostis filifolia Pilger, Bot. Jahrb. Engler 42: 67. 1908. Not *C. filifolia* Merr. 1906.

An erect caespitose perennial, with slender culms 20 to 60 cm. tall, slender erect flexuous scabrous involute blades shorter than the culms, and rather loose, purplish panicles commonly 4 to 8 cm. long; glumes 4.5 to 5 mm. long.

Dry hills, Peru and Bolivia, whence originally described. (Type, *Bang* 805.)

PERU: Abaucay, *Stordy* in 1920 (Kew Herb.).

BOLIVIA: Talca Chugiaguillo, *Bang* 805. Sorata, *Mandon* 1301, 1303, 1306. Cerro Sipascoya, *Herzog* 2054. Lake Titicaca, *Asplund* 6535. Comanche, *Asplund* 6509.

Asplund's no. 6509, differing in its narrow panicles with ascending branches, is doubtfully referred to this species.

7. *Calamagrostis planifolia* (H. B. K.) Trin.; Steud. Nom. Bot. ed. 2. 1: 251. 1840.

Deyeuxia planifolia H. B. K. Nov. Gen. & Sp. 1: 145. 1816.

A lax slender perennial about 1 meter tall, with long flat blades and narrow loose nodding panicles 10 to 20 cm. long. The aspect is that of *C. montevidensis*, but the callus hairs are very short and scant and the rachilla is prominent and loose-plumose. The lower sheaths and blades are more or less pubescent.

The specimens cited are referred doubtfully to *C. planifolia*, since they do not agree in all respects with the original description which states that the ligule is elongate, the culms a foot and one-half tall, and the lemma scabrous on the back. The type, from northern Peru, has not been examined.

Open woods and moist banks, Ecuador and Peru, whence originally described. (Guangamarca, near Cajamarca, *Bonpland.*)

ECUADOR: La Rinconada Ranch, *Hitchcock* 20797. Tulcán, *Hitchcock* 20972, 21031. Between Malchinguí and Pomasquí, *Hitchcock* 20875. Between San Lucas and Oña, *Hitchcock* 21532.

8. *Calamagrostis montevidensis* Nees, Agrost. Bras. 401. 1829.

Deyeuxia alba Presl, Rel. Haenk. 1: 248. 1830. (Peru.)

Calamagrostis alba Steud. Nom. Bot. ed. 2. 1: 249. 1840.

Calamagrostis montevidensis var. *linearis* Hack. Repert. Nov. Sp. Fedde 6: 156. 1908. (*Buchtien* 430.)

A lax perennial commonly about one meter tall, with flat blades and narrow loose nodding panicles 20 to 30 cm. long; glumes acuminate, 4 mm. long; lemma shorter than the glumes, rather prominently nerved, the awn inserted about 0.5 mm. below the apex; rachilla pubescent, inconspicuous.

Moist slopes, Peru to Brazil and Argentina. Originally described from Uruguay.

PERU: Hacienda Villcabamba, *Macbride* 5152.

BOLIVIA: San Felipe, *Hitchcock* 22601. Yanacachi, *Buchtien* 431. Coroico, *Buchtien* 6430. Cochabamba, *Hitchcock* 22814½. Sorata, *Mandon* 1304 (Kew Herb.).

9. *Calamagrostis beyrichiana* Nees; Doell in Mart. Fl. Bras. 2^o: 53. pl. 16. 1878.

Calamagrostis rupestris Trin.; Doell in Mart. Fl. Bras. 2^o: 53. 1878.

Resembling *C. montevidensis*; lemma about as long as the glumes, obscurely nerved, the awn inserted about the middle; rachilla with long hairs at apex.

Moist banks and cliffs, Ecuador and Peru to Brazil, whence originally described. The types of the two species cited above have been examined.

ECUADOR: Between La Chorita and Portovelo, *Hitchcock* 21192. Between La Toma and Loja, *Hitchcock* 21385. Without locality, *André* 3483 (Kew Herb.).

PERU: Between Tarma and La Merced, *Hitchcock* 22152.

BOLIVIA: Sirupaya, *Buchtien* 430.

10. *Calamagrostis heterophylla* (Wedd.) Pilger, Bot. Jahrb. Engler 42: 64. 1908.

Muhlenbergia rupestris Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only. (*Lechler* 1809.)

Deyeuxia heterophylla Wedd. Bull. Soc. Bot. France 22: 177, 180. 1875.

Chaetotropis andina Ball, Journ. Linn. Soc. Bot. 22: 58. 1885. (Chicla, Peru.)

Calamagrostis boliviensis Hack. Repert. Nov. Sp. Fedde 6: 156. 1908. (*Buchtien* 866.)

Calamagrostis heterophylla var. *pubescens* Pilger, Bot. Jahrb. Engler 42: 64. 1908. (*Weberbauer* 905.)

Calamagrostis heterophylla var. *robustior* Pilger, Bot. Jahrb. Engler 42: 64. 1908. (*Weberbauer* 474.)

Calamagrostis calvescens Pilger, Bot. Jahrb. Engler 42: 65. 1908. (*Weberbauer* 2842.)

A lax perennial 20 to 100 cm. tall, with flat soft blades (the basal subfiliform) and narrow, dense, interrupted, pale green or tawny panicles 5 to 15 cm. long; glumes 3 to 4 mm. long, or in exceptional specimens as much as 6 mm. long; palea with slender teeth at summit; rachilla scarcely 1 mm. long, short-pilose; callus hairs very short or sometimes as much as 1 mm. long.

Open ground and grassy slopes, Ecuador to Bolivia. Originally described from Bolivia, the specimens cited being *D'Orbigny* 202, *Weddell*.

ECUADOR: Paramos 20 kilometers west of Tulcán, alt. 3,300 meters, *Hitchcock* 20921. Open ground on wooded hills 8 kilometers south of Tulcán, alt. 2,500 meters, *Hitchcock* 21011. Between Otavalo and Malchinguí, *Hitchcock* 20827. Hills south of Quito, alt. 3,300 meters, *Harteman* 62. Mount Pichincha, *Jameson* (Kew Herb.).

PERU: Caraz, *Weberbauer* 3105. Between Samanco and Caraz, *Weberbauer* 2842. La Quinhua, *Hitchcock* 22274. Oroya, *Hitchcock* 22184, 22187. Matucana, *Macbride & Featherstone* 359, 439. Huarón, *Macbride & Featherstone* 998. Río Blanco, *Macbride & Featherstone* 652, 802. Azángaro, *Weberbauer* 474; *Lechler* 1756 (Kew Herb.). Cuyo-cuyo, *Weberbauer* 905. Goyllarisquisca, *Hitchcock* 22284. Baños, *Wilkes Expl. Exped.* Occa Pampa, *Shepard* 60. San Antonio, *Lechler* 1809. Lagunillas, *Harlan* in 1914. Juliaca, *Harlan* in 1914.

Sumbay, *Weberbauer* 6901 (Field Mus.). Paucartambo, *Weberbauer* 6915 (Field Mus.).

BOLIVIA: Sorata, *Holway* 583; *Rusby* 9 (Columbia Coll.), 201½; *Mandon* 1327 (Kew Herb.). La Paz, *Holway* 478½; *Buchtien* in 1908, 866, 3950, 6429. Potosí, *D'Orbigny* 202. Lake Titicaca, *Asplund* 6491. Chalapata, *Asplund* 6480.

The Lechler specimen from San Antonio (no. 1809) has somewhat larger spikelets and longer awns.

11. *Calamagrostis podophora* Pilger, Bot. Jahrb. Engler 42: 66. 1908.

A caespitose erect perennial 40 to 60 cm. tall, with glabrous firm involute blades (the basal several, 10 to 15 cm. long, the cauline 1 or 2, 3 to 5 cm. long), membranaceous ligules 10 to 15 mm. long, and oblong open panicles 10 to 15 cm. long; glumes 5 mm. long; lemma 3 mm. long; callus hairs and rachilla hairs long.

Paramos, Colombia to Peru. Originally described from Peru. (Type, *Weberbauer* 2231.)

ECUADOR: Paramos 20 kilometers west of Tulcán, *Hitchcock* 20914.

PERU: Large bunches near bog. Cerro de Pasco, *Hitchcock* 22250 (panicles more compact). Prov. Tarma, *Weberbauer* 2231.

Pennell & Hazen 9857, 9949, from Colombia, also belong to this species.

12. *Calamagrostis preslii* (Kunth) Hitchc.

Agrostis caespitosa Presl, Rel. Haenk. 1: 237. 1830. Not *A. caespitosa* Salisb. 1796.

Agrostis preslii Kunth, Rév. Gram. 1: Suppl. XVII. 1830.

Bromidium caespitosum Nees, Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 23. 1841; 155. 1843.

Bromidium hygrometricum var. *caespitosum* Kuntze, Rev. Gen. Pl. 3^a: 343. 1898.

Calamagrostis caespitosa Scribn. Rep. Mo. Bot. Gard. 10: 37. pl. 32. f. 1, 2. 1899. Not *C. caespitosa* Steud. 1854.

A densely caespitose dwarf tussock grass mostly less than 10 cm. tall, with short, firm, folded blades and spikelike panicles about 2 cm. long.

Rocky slopes and hills at high altitudes, Peru, whence originally described. (*Haenke*.)

PERU: Cerro de Pasco, *Hitchcock* 22236. Hacienda Atocsaico, *Hitchcock* 22198, 22200. Between Casa Cancha and Culnai, *Wilkes Expl. Exped.*

13. *Calamagrostis rigescens* (Presl) Scribn. Rep. Mo. Bot. Gard. 10: 37. pl. 32. f. 3. 1899.

Agrostis rigescens Presl, Rel. Haenk. 1: 237. 1830.

Agrostis chamaecalamus Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 4^a: 119. 1841.

Bromidium spectabile Nees & Mey. Nov. Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 24. 1841; 156. 1843. (Lake Titicaca, *Meyen*.)

Bromidium rigescens Nees, Nov. Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 22. 1841; 154. 1843.

?*Bromidium rigescens* var. *brevifolium* Nees, Nov. Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 22. 1841; 154. 1843. Lake Titicaca; the type has not been examined.

Chamaecalamus spectabilis Meyen, Nov. Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 24. 1841; 156. 1843, as synonym of *Bromidium spectabile*.

Agrostis jamesoniana Steud. Syn. Pl. Glum. 1; 163. 1854. (Mount Pichincha, *Jameson*.)

Deyeuxia imberbis Wedd. Bull. Soc. Bot. France 22: 177, 180. 1875. (Bolivia, D'Orbigny 218; Weddell; Mandon 1315, 1317.)

Agrostis bromidioides Griseb. Abh. Ges. Wiss. Göttingen 24: 293. 1879.

Bromidium hygrometricum var. *spectabilis* Kuntze, Rev. Gen. Pl. 3²: 342. 1898.

Bromidium hygrometricum var. *rigescens* Kuntze, Rev. Gen. Pl. 3²: 343. 1898.

Calamagrostis cajatambensis Pilger, Bot. Jahrb. Engler 42: 64. 1908. (Weberbauer 2686.)

A caespitose usually pale perennial 10 to 20 cm. tall, with stiff involute blades and spikelike more-or-less interrupted panicles 3 to 8 cm. long; glumes 4 mm. long; awn exerted about 2 mm.; rachilla naked.

Moist soil, Ecuador to northern Argentina. Originally described from Peru. (Haenke.)

ECUADOR: Mount Pichincha, Jameson 159. Alpine region, Jameson 431, 798 (Kew Herb.).

PERU: Cajatambo, Weberbauer 2686. Goyllarisquisca, Hitchcock 22301. Cerro de Pasco, Hitchcock 22238, 22255. Hacienda Atocsaico, Hitchcock 22194, 22222; McKenzie in 1924. Río Blanco, Macbride & Featherstone 786. Oroya, Hitchcock 22140. Ayapata, Lechler 1981 (Kew Herb.).

BOLIVIA: La Paz, Bang 104; Holway 484; Mandon 1292b (Kew Herb.). Comanche, Asplund 6503. Achacache, Mandon 1317 (in part).

The specimens of Mandon 1317 in the U. S. National Herbarium and in the Kew Herbarium consist of two species, *C. rigescens* and *C. vicunarum*. Since Weddell distinguishes his *Deyeuxia imberbis* from his *D. vicunarum* by the characters that distinguish *C. rigescens* from *C. vicunarum*, it is probable that his own specimen of Mandon 1317, cited by him under *D. imberbis*, consisted of that species only.

14. *Calamagrostis mollis* Pilger, Bot. Jahrb. Engler 42: 61. 1908.

A caespitose perennial 5 to 30 cm. tall, with involute pubescent blades and spikelike panicles 4 to 5 cm. long; glumes 6 mm. long; lemma 4 mm. long, the callus hairs about 1 mm. long; awn from the middle of the lemma, geniculate, exerted; palea 3 mm. long; rachilla 2 mm. long, short-pilose.

Known only from the type collection.

ECUADOR: Paramos of Mount Chimborazo, Hans Meyer 148.

15. *Calamagrostis coarctata* (H. B. K.) Steud. Nom. Bot. ed. 2. 1: 250. 1840.

Deyeuxia coarctata H. B. K. Nov. Gen. & Sp. 1: 143. 1816.

A densely caespitose perennial 10 to 30 cm. tall, with slender wiry long-exserted culms, numerous firm glabrous folded obtuse arcuate basal blades, mostly 5 to 10 cm. long, and spikelike panicles 2 to 6 cm. long.

Paramos of Colombia and Ecuador. Originally described from Quito, (Bonpland.)

ECUADOR: Mount Pichincha, Hitchcock 21063. Mount Chimborazo, Hitchcock 21955, 21999½, 22020.

16. *Calamagrostis haenkeana* Hitchc.

Agrostis arundinacea Presl, Rel. Haenk. 1: 238. 1830. Not *Calamagrostis arundinacea* Roth, 1788.

Culms erect, 70 cm. tall; blades involute; panicle oblong-lanceolate, rather loose, pale, 15 cm. long; spikelets 5 mm. long; lemma a little shorter than the glumes, minutely scaberulous; awn attached below the middle, bent, exerted at the side of the glumes, shorter than the lemma.

The only specimen seen is the type in the National Museum at Prague. Presl describes it from the mountains of Huánuco, Peru, but the label has no data as to origin. It is distinct from the other Peruvian species described

herein but may be the same as some other species from another part of the world.

17. Calamagrostis ligulata (H. B. K.) Hitchc.

Deyeuxia ligulata H. B. K. Nov. Gen. & Sp. 1: 145. 1816.

Deyeuxia aurea Munro; Wedd. Bull. Soc. Bot. France 22: 176 (err. typ. 156), 179. 1875. (*Jameson*, Ecuador.)

Calamagrostis aurea Hack.; Sodiro, Anal. Univ. Quito 8. 1884. (Ecuador.)

Calamagrostis longigluma Pilger, Bot. Jahrb. Engler 42: 71. 1908. (*Hans Meyer* 144.)

Stylagrostis longigluma Mez, Bot. Archiv Mez 1: 20. 1922.

An erect cespitose perennial, with stout culms 10 to 30 cm. tall, firm stiff glabrous folded blades, membranaceous ligules 10 to 15 mm. long, and dense, ovoid or oblong, often bronze panicles 6 to 10 cm. long; glumes narrow, long-acuminate; lemma 3 mm. long, erose-truncate, the awn short or exceeding the glumes.

Stony slopes at high altitudes, Ecuador, whence originally described, the type being from near Quito. (*Bonpland*.)

ECUADOR: Quito, *Jameson* 95. Mount Pichincha, snowy summit, *Jameson* 97 (N. Y. Bot. Gard.), 836, *Harteman* 84; *Couthouy* in 1855 (Columbia Coll.), *Sodiro* in 1887. Mount Chimborazo, *Hitchcock* 21968. El Altar, *Hans Meyer* 144.

18. Calamagrostis chrysantha (Presl) Steud. Nom. Bot. ed. 2. 1: 250. 1840.

Deyeuxia chrysantha Presl, Rel. Haenk. 1: 247. 1830.

Deyeuxia chrysostachya Desv. in Gay, Fl. Chil. 6: 323. 1853.

Calamagrostis mutica Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only. (*Lechler* 1965.)

Deyeuxia phalaroides Wedd. Bull. Soc. Bot. France 22: 177, 180. 1875. (Bolivia, *D'Orbigny* 197; *Mandon* 1319.)

Calamagrostis chrysostachya Kuntze, Rev. Gen. Pl. 3: 344. 1898.

Stylagrostis chrysantha Mez, Bot. Archiv Mez 1: 20. 1922.

Stylagrostis chrysostachya Mez, Bot. Archiv Mez 1: 20. 1922.

Stylagrostis phalaroides Mez, Bot. Archiv Mez 1: 20. 1922.

An erect glabrous cespitose perennial 20 to 50 cm. tall, with firm erect sharp-pointed involute blades and dense oblong golden-bronze panicles 2.5 to 5 cm. long.

Bogs at high altitudes, Peru to Bolivia and Chile. Originally described from Huánuco, Peru. (*Haenke*.)

PERU: Casapalca, *Macbride & Featherstone* 864. Ayapata, *Lechler* 1965.

BOLIVIA: La Paz, *Mandon* 1319.

19. Calamagrostis ovata (Presl) Steud. Nom. Bot. ed. 2. 1: 251. 1840.

Deyeuxia ovata Presl, Rel. Haenk. 1: 246. 1830.

Deyeuxia nivalis Wedd. Bull. Soc. Bot. France 22: 176 (err. typ. 156), 180. 1875. (Bolivia, *D'Orbigny* 110; *Weddell*; *Mandon* 1318.)

Calamagrostis pflanzi Pilger, Bot. Jahrb. Engler 49: 184. 1912. (*Pflanz* 305.)

Stylagrostis nivalis Mez, Bot. Archiv Mez 1: 20. 1922.

Stylagrostis ovata Mez, Bot. Archiv Mez 1: 20. 1922.

An erect cespitose perennial 10 to 20 cm. tall, with loose, glabrous, often inflated sheaths, flat or loosely involute blades, and dense, golden-bronze, ovoid or oblong panicles 2 to 5 cm. long, the soft attenuate glumes 10 to 12 mm. long.

Gravelly slopes at high altitudes, Peru and Bolivia. Originally described from Huánuco, Peru. (*Haenke*.)

PERU: Ayapata, *Lechler* 1827 (Kew Herb.). Baños, *Wilkes Expl. Exped.* (Kew Herb.). Tabina, *Lechler* 2057.

BOLIVIA: Sorata, *Mandon* 1320. Illimani, *Hitchcock* 22591. La Paz, *Mandon* 1318. Cerro Tunari, *Herzog* 2107. Chacaltaya, *Buchtien* 1192. Palca, *Pflanz* 305. Aiquile, Cordillera Real, *Knoche* 3.

20. *Calamagrostis bogotensis* (Pilger) Pilger, Bot. Jahrb. Engler 42: 60. 1908. *Deyeuxia bogotensis* Pilger, Bot. Jahrb. Engler 25: 712. 1898.

An erect, glabrous or sometimes pubescent, cespitose perennial 60 to 100 cm. tall, with elongate, firm, involute or sometimes flat blades and narrow, rather compact, sometimes spikelike, often interrupted panicles 10 to 20 cm. long.

Paramos, Colombia to Ecuador. Originally described from Bogotá, Colombia.

ECUADOR: Paramo 20 kilometers west of Tulcán, *Hitchcock* 20920. Between Ofña and Cuenca, *Hitchcock* 21652.

21. *Calamagrostis vicunarum* (Wedd.) Pilger, Bot. Jahrb. Engler 42: 62. 1908. *Deyeuxia vicunarum* Wedd. Bull. Soc. Bot. France 22: 177, 180. 1875.

Calamagrostis pentapogonodes Kuntze, Rev. Gen. Pl. 3²: 344. 1898. (Bolivia, Tunari.)

Calamagrostis vicunarum var. *abscondita* Pilger, Bot. Jahrb. Engler 42: 63. 1908. (*Weberbauer* 312.)

Calamagrostis vicunarum var. *elatior* Pilger, Bot. Jahrb. Engler 42: 63. 1908. (*Weberbauer* 938.)

Calamagrostis vicunarum var. *humilior* Pilger, Bot. Jahrb. Engler 42: 62. 1908. (*Weberbauer* 954.)

Calamagrostis vicunarum var. *minima* Pilger, Bot. Jahrb. Engler 42: 63. 1908. (*Weberbauer* 953.)

Calamagrostis vicunarum var. *setulosa* Pilger, Bot. Jahrb. Engler 42: 63. 1908. (*Weberbauer* 943.)

Calamagrostis vicunarum var. *tenuior* Pilger, Bot. Jahrb. Engler 42: 63. 1908. (*Weberbauer* 2782.)

A low, pale, densely cespitose perennial mostly 5 to 30 cm. tall, with slender glabrous culms, filiform, involute, flexuous or curled, scaberulous, mostly basal blades, and spikelike panicles 2 to 6 cm. long; glumes about 6 mm. long; lemma rather firm, terete, ending in 4 slender teeth, the awn from below the middle; rachilla about 1 mm. long, sparsely pilose.

Hills and slopes at high altitudes, Peru to Bolivia, whence originally described, the specimens mentioned being *D'Orbigny* 185, 187, 222; *Pentland*, *Weddell*.

ECUADOR: Without locality, *Spruce* (Kew Herb.).

PERU: Cerro de Pasco, *Hitchcock* 22225, 22229. Hacienda Atocsaico, *Hitchcock* 22206, 22219, 22220; *McKenzie* in 1924. Oroya, *Hitchcock* 22138, 22139; *Macbride & Featherstone* 948. Between Casa Cancha and Culnai, *Wilkes Expl. Exped.* Río Blanco, *Macbride & Featherstone* 787. Araranca, *Cook & Gilbert* 174, 183. Chuquibambilla, *Hitchcock* 22445. Huarón, *Macbride & Featherstone* 1156.

BOLIVIA: La Paz, *Asplund* 6518; *Buchtien* 26 (N. Y. Bot. Gard.). Achacache, *Mandon* 1317 (in part). Chacaltaya, *Buchtien* 159, 1200, 1202. Carangas, *D'Orbigny* 185, 222. Eucaliptus, *White* 173. La Cumbre, *Asplund* 6511, 6512.

22. *Calamagrostis trichophylla* Pilger, Bot. Jahrb. Engler 42: 67. 1908.

An erect cespitose perennial 30 to 50 cm. tall, with scabrous, involute, capillary somewhat flexuous blades and narrow, rather open panicles; glumes about

4 mm. long; lemma as long as the glumes, scaberulous above, the callus hairs short and scant; awn attached near base of lemma, exerted 1 to 2 mm.; rachilla 2 mm. long, short-pilose.

Dry hills, Peru. (Type, *Weberbauer* 4873.)

PERU: Cuzco, *Weberbauer* 4873. Araranca, *Stordy* in 1920 (Kew Herb.).

23. *Calamagrostis recta* (H. B. K.) Trin.; Steud. Nom. Bot. ed. 2. 1: 251. 1840.

Deyeuxia recta H. B. K. Nov. Gen. & Sp. 1: 144. 1816; 7: pl. 686. 1825.

Deyeuxia pallens Presl, Rel. Haenk. 1: 249. 1830. (Huánuco and Guayaquil.)

Calamagrostis pallens Steud. Nom. Bot. ed. 2. 1: 251. 1840.

A rather robust, erect, closely caespitose perennial 50 to 100 cm. tall, with firm involute scabrous blades about half as long as the culms and narrow, dense, almost spikelike panicles mostly 10 to 20 cm. long.

Paramos, Ecuador and Peru. Originally described from near Quito. (*Bonpland*.)

ECUADOR: Mount Pichincha, *Hitchcock* 21085; *Couthouy* in 1855 (Columbia Coll.). Mount Antisana, *Anthony & Tate* 281; *Hartweg* 1456 (N. Y. Bot. Gard.). *Whymper* 1329 (N. Y. Bot. Gard.). Mount Chimborazo, *Hitchcock* 21980. Mount Tungurahua, *Spruce* 5927. Quito, *Jameson* 190 (Kew Herb.). Nabón, *Rose* 22994.

PERU: Goyllarisquisca, *Hitchcock* 22283, 22314, 22315, 22318. Sachapata, *Lechler* 2695, 3304 (both Kew Herb.).

24. *Calamagrostis spicigera* (Presl) Steud. Nom. Bot. ed. 2. 1: 251. 1840.

Deyeuxia spicigera Presl, Rel. Haenk. 1: 247. 1830.

An erect glabrous perennial 15 cm. tall, with slender involute blades and spikelike panicles about 3 cm. long; glumes 6 mm. long; lemma 5 mm. long, toothed, scaberulous, the callus hairs scarcely 1 mm. long; awn nearly straight, attached just below the middle of the lemma, equaling the glumes; rachilla 2 mm. long, densely long-pilose, the hairs widely spreading on the sides, at the end reaching about to the summit of the glumes.

Known only from the type collection.

PERU: Mountains of Huánuco, *Haenke*.

25. *Calamagrostis rigida* (H. B. K.) Trin.; Steud. Nom. Bot. ed. 2. 1: 251. 1840.

Deyeuxia rigida H. B. K. Nov. Gen. & Sp. 1: 144. 1816.

Calamagrostis nitidula Pilger, Bot. Jahrb. Engler 42: 69. 1908. (*Weberbauer* 960.)

Calamagrostis nitidula var. *elata* Pilger, Bot. Jahrb. Engler 42: 70. 1908. (*Weberbauer* 1014.)

Calamagrostis nitidula var. *macrantha* Pilger, Bot. Jahrb. Engler 42: 70. 1908. (*Weberbauer* 1041.)

An erect caespitose pale perennial 50 cm. tall, with firm stiff involute scabrous blades 1 mm. thick and a narrow, dense, almost spikelike panicle 12 cm. long.

Stony slopes at high altitudes, Ecuador, whence originally described, and Peru.

ECUADOR: Mount Antisana, *Bonpland* (fragment from type).

PERU: Prov. Sandía, *Weberbauer* 960, 1014, 1041.

26. *Calamagrostis cryptolopha* (Wedd.) Hitchc.

Deyeuxia cryptolopha Wedd. Bull. Soc. Bot. France 22: 176 (err. typ. 156), 179. 1875.

A pale erect caespitose perennial 75 cm. tall, with slender involute scabrous blades and narrow, rather dense panicles 15 cm. long, the narrowly ascending branches as much as 5 cm. long; glumes 6 mm. long; lemma 5 mm. long,

scaberulous, the callus hairs short and scant; awn attached a little below the middle of the lemma, bent and exserted a little beyond the glumes; rachilla about 1.5 mm. long, with copious hairs extending to about 3 mm.

Known only from the type collection.

BOLIVIA: Sorata, *Mandon* 1313.

27. *Calamagrostis macrophylla* (Pilger) Pilger, Bot. Jahrb. Engler 42: 60. 1908.

Deyeuxia macrophylla Pilger, Bot. Jahrb. Engler 25: 711. 1898.

Differing from *C. humboldtiana* in the larger spikelets (8 to 9 mm. long) and in the glabrous blades.

Ecuador and Peru. Originally described from Ecuador. (Type, *Stübel* 34.)

ECUADOR: Mount Pichincha, *Stübel* 34.

PERU: Chinche, *Macbride & Featherstone* 1284.

28. *Calamagrostis humboldtiana* Steud. Nom. Bot. ed. 2. 1: 250. 1840.

Deyeuxia stricta H. B. K. Nov. Gen. & Sp. 1: 146. 1816. Not *Calamagrostis stricta* Koel. 1802.

Deyeuxia intermedia Presl, Rel. Haenk. 1: 249. 1830. (Huánuco, Peru.)

Calamagrostis intermedia Steud. Nom. Bot. ed. 2. 1: 250. 1840.

Calamagrostis agapatea Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only. (*Lechler* 1843.)

Deyeuxia mandoniana Wedd. Bull. Soc. Bot. France 22: 179, 180. 1875. (*Mandon* 1308.)

Deyeuxia secunda Pilger, Bot. Jahrb. Engler 25: 712. 1898. (*Stübel* 257.)

Calamagrostis secunda Pilger, Bot. Jahrb. Engler 42: 60. 1908.

An erect pale caespitose perennial with glabrous culms 30 to 100 cm. tall, erect scabrous involute blades, and narrow, rather loose panicles 15 to 35 cm. long; glumes about 6 mm. long; lemma 5 mm. long, scaberulous, toothed, the callus hairs short; awn bent and exserted; rachilla 2.5 to 3 mm. long, pilose with rather short hairs.

Moist grassy places, Colombia, whence originally described, to Argentina.

ECUADOR: Tulcán, *Hitchcock* 20918. Mount Chimborazo, *Hitchcock* 21049; *Sodi* 265, 266. Mount Sangay, *Stübel* 257. Between Cuenca and Huilgra, *Hitchcock* 21689. Nabón, *Rose* 22994. Between San Lucas and Oña, *Hitchcock* 21533, 21535. Without locality, *Sodi* in 1887 and 1896; *Karsten*.

PERU: Mito, *Macbride & Featherstone* 1697, 1875. San José, *Macbride & Featherstone* 1105. Yauli, *Macbride & Featherstone* 903. Oroya, *Macbride & Featherstone* 951. Tarma, *Macbride & Featherstone* 1067. Obrajillo, *Wilkes Expl. Exped.* Goyllarisquisca, *Hitchcock* 22327. Casa Cancha, *Wilkes Expl. Exped.* Ayapata, *Lechler* 1843.

BOLIVIA: Sorata, *Mandon* 1308. Pongo, *White* 238. La Paz, *Buchtien* 2495. Palca, *Buchtien* 123 (N. Y. Bot. Gard.), 2525, 2530. Llavelal, *Herzog* 2079.

29. *Calamagrostis glacialis* (Wedd.) Hitchc.

Deyeuxia glacialis Wedd. Bull. Soc. Bot. France 22: 179. 1875.

A pale, erect, densely caespitose perennial, with scabrous culms 30 to 40 cm. tall, erect scabrous firm sharp-pointed blades nearly as long as culms, and spikelike tawny-purple panicles 5 to 15 cm. long; glumes about 7 mm. long; awn about equaling the glumes; rachilla hairs long and copious.

Rocky slopes below snow line, Bolivia, whence originally described. (Type, *Mandon* 1312.)

BOLIVIA: Sorata, *Mandon* 1312. Illimani, *Hitchcock* 22590.

30. *Calamagrostis jamesoni* Steud. Syn. Pl. Glum. 1: 191. 1854.

Deyeuxia jamesoni Munro; Wedd. Bull. Soc. Bot. France 22: 176 (err. typ. 156). 1875.

Deyeuxia stuebelii Pilger, Bot. Jahrb. Engler 25: 713. 1898. (Stübel 231b.)

Calamagrostis stuebelii Pilger, Bot. Jahrb. Engler 42: 60. 1908.

A low caespitose perennial 10 to 30 cm. tall, with somewhat rhizomatous base, firm glabrous involute falcate basal blades mostly 2 to 5 cm. long, and dense, ovate or oblong, bronze to purple panicles 2 to 3 cm. long; glumes ciliate on the keels; rachilla densely long-pilose.

Rocky slopes at high altitudes, Ecuador to Bolivia. Originally described from Mount Pichincha, Ecuador. (Jameson.)

ECUADOR: Quito, Karsten; Sodiro in 1887. Summit of Pichincha, Jameson 21. Mount Chimborazo, Hitchcock 21985. Mount Atacatzo, Harteman 69. Mount Antisana Stübel 231b; Whymper 1329 (6) (N. Y. Bot. Gard.).

BOLIVIA: Chacaltaya, Buchtien 1193.

The Bolivian specimen differs in having pubescent rather than villous pedicels, and glabrous glumes.

31. Calamagrostis curvula (Wedd.) Pilger, Bot. Jahrb. Engler 42: 60. 1908.

Deyeuxia curvula Wedd. Bull. Soc. Bot. France 22: 178, 179. 1875.

Deyeuxia tenuifolia R. A. Phil. Anal. Mus. Nac. Chile Bot. 8: 83. 1891.

Deyeuxia variegata R. A. Phil. Anal. Mus. Nac. Chile Bot. 8: 83. 1891.

Calamagrostis variegata Kuntze, Rev. Gen. Pl. 3²: 345. 1898. (Tunari, Bolivia.)

Calamagrostis tenuifolia R. E. Fries, Nov. Act. Soc. Sci Upsal. IV. 1: 177. 1905.

A dwarf perennial forming dense tussocks as much as 1 meter in diameter; culm slender, 10 to 20 cm. tall, with several involute filiform arcuate blades and spikelike panicles 1 to 4 cm. long, the glumes purple below and along the keel, with a wide, white or creamy margin.

Dry hills and slopes, Peru to Argentina and Chile. Originally described from "Pérou [now Bolivia] (d'Orb. n. 219; Wedd.)."

BOLIVIA: Atocha, in the gravelly river bed, Hitchcock 22873. "Andes of Bolivia," distributed by Philippi. Carangas, D'Orbigny 219.

The Philippi specimen, labeled *Deyeuxia tenuifolia*, and distributed by Dr. R. A. Philippi, may be from the type collection of that species.

32. Calamagrostis cephalantha Pilger, Bot. Jahrb. Engler 42: 61. 1908.

A dwarf caespitose perennial, with slender culms as much as 15 cm. tall or reduced to a few centimeters, short pubescent folded blades, and ovoid, densely flowered panicles 1 to 2 cm. long; glumes 6 mm. long.

Alpine slopes, Peru and Bolivia. (Type, Weberbauer 1003.)

PERU: Between Poto, Peru, and Suches, Bolivia, Weberbauer 1003. Between Casa Cancha and Culnai, Wilkes Expl. Exped.

BOLIVIA: Chacaltaya, near La Paz, Buchtien 1195, 1205.

33. Calamagrostis curta (Wedd.) Hitchc.

Deyeuxia curta Wedd. Bull. Soc. Bot. France 22: 176 (err. typ. 156), 179. 1875.

A dwarf caespitose perennial less than 15 cm. tall, with short, firm, flat or folded blades and a dense, ovoid, purple and bronze panicle 1 to 2 cm. long.

Rocky slopes at high altitudes, Bolivia. (Type, Mandon 1316.)

BOLIVIA: La Cumbre, Asplund 6516. Sorata, Mandon 1316.

34. Calamagrostis densiflora (Presl) Steud. Nom. Bot. ed. 2. 1: 250. 1840.

Deyeuxia densiflora Presl, Rel. Haenk. 1: 247. 1830.

Resembling *C. humboldtiana*; differing in having panicles on the average shorter and denser, and a shorter long-villous rachilla, the hairs copious and as long as the lemma.

Rocky ledges, Peru. (Type from Huánuco, Haenke.)

PERU: Hacienda Atocsaico, Hitchcock 22223. Oroya, Hitchcock 22136, 22137.

35. Calamagrostis brevifolia (Presl) Steud. Nom. Bot. ed. 2. 1: 249. 1840.*Deyeuxia brevifolia* Presl, Rel. Haenk. 1: 248. 1830.

A caespitose perennial 20 to 40 cm. tall, with a dense cushion of curly foliage at the base, the slender involute glabrous blades much shorter than the culms, and spikelike, bronze to purple panicles 3 to 8 cm. long.

Alpine slopes, Peru and Bolivia. Originally described from Huánuco. (*Haenke.*)

PERU: Cerro de Pasco, *Hitchcock* 22253. La Quinhua, *Hitchcock* 22275. Hacienda Atocsaico, *Hitchcock* 22192, 22209; *McKenzie* in 1924. Río Blanco, *Macbride & Featherstone* 785. Casa Cancha, *Wilkes Expl. Exped.*

BOLIVIA: La Paz, *Asplund* 6519.

36. Calamagrostis fuscata (Presl) Steud. Nom. Bot. ed. 2. 1: 250. 1840.*Deyeuxia fuscata* Presl, Rel. Haenk. 1: 249. 1830.

A caespitose perennial 20 to 40 cm. tall, with numerous slender involute smooth blades nearly as long as the culm and narrow but scarcely spikelike panicles 5 to 10 cm. long.

Alpine slopes, Peru. Originally described from Huánuco. (*Haenke.*)

PERU: Goyllarisquisca, *Hitchcock* 22305. Mito, *Macbride* 3322, 3364. Tabina, *Lechler* 2142 (*Kew Herb.*).

37. Calamagrostis violacea (Wedd.) Hitchc.*Deyeuxia violacea* Wedd. Bull. Soc. Bot. France 22: 179, 180. 1875.

A caespitose perennial 10 to 30 cm. tall, with slender wiry culms, firm, involute, flexuous, mostly basal blades, and rather open, purple panicles 2 to 4 cm. long; anthers 2 mm. long.

Rocky slopes, Peru to Bolivia. Originally described from Bolivia. (*Weddell.*)

PERU: Lagunillas, *Harlan* in 1914. Sumbay, *Weberbauer* 6898, 6900, 6904 (all Field Mus.). Carumas, *Weberbauer* 7317.

BOLIVIA: Achacache, *Mandon* 1307. Huayna-Potosí, *Germann* 51. La Paz, *Buchtien* 6428. Comanche, *Asplund* 6506. Palca, *Buchtien* 2529. Rinconada, *Asplund* 6463. La Cumbre, *Asplund* 6493. Chalapata, *Asplund* 6517. Chacaltaya, *Buchtien* 1199. General Campero, *Asplund* 6520.

38. Calamagrostis tarmensis Pilger, Bot. Jahrb. Engler 42: 70. 1908.*Calamagrostis tarijensis* Pilger, Bot. Jahrb. Engler 42: 71. 1908. (*Fiebrig* 3119 and 3120.)*Calamagrostis rosea* var. *macrochaeta* Hack. in Fries, Ark. für Bot. 8: 40. 1908. (*Fries* 1301.)

An erect slender caespitose perennial 40 to 80 cm. tall, with slender, elongate, rather soft, flat or loosely involute blades and narrow, rather loose panicles 10 to 15 cm. long.

Rocky slopes, Peru and Bolivia. Originally described from Peru. (Type, *Weberbauer* 2460.)

EQUADOR: Between Oña and Cuenca, *Hitchcock* 21654. Tungurahua, *Sodiro* in 1901.

PERU: Palca, *Weberbauer* 2460. La Quinhua, *Hitchcock* 22273.

BOLIVIA: Tarija, *Fiebrig* 3119, 3120; *Fries* 1301 (spikelets smaller than in the *Fiebrig* specimens, the lemma 3 mm. long.)

39. Calamagrostis fiebrigii Pilger, Bot. Jahrb. Engler 42: 68. 1908.

An erect caespitose perennial 20 to 30 cm. tall, with erect, involute, glabrous, rather soft blades, thin ligules 3 to 4 mm. long, and narrow, rather dense, purplish panicles 2 to 4 cm. long.

Known only from the type collection.

BOLIVIA: Puna Patanca, southern Bolivia, *Fiebrig* 3191.

40. Calamagrostis antoniana (Griseb.) Steud.

Calamagrostis antoniana Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only. (Lechler 1800.)

Agrostis antoniana Griseb. Abh. Ges. Wiss. Göttingen 24: 293. 1879. (Lechler 1800.)

Calamagrostis sandiensis Pilger, Bot. Jahrb. Engler 42: 68. 1908. (Weberbauer 906.)

An erect pale caespitose perennial 30 to 60 cm. tall, with long stiff involute scabrous sharp-pointed blades and narrow, rather loose panicles 10 to 15 cm. long.

Dry slopes among shrubs, Peru, whence originally described, to Bolivia. (Type, Lechler 1800.)

PERU: San Antonio, Lechler 1800. Cuyo-cuyo, Weberbauer 906. Casapalta, Ball in 1882 (Gray Herb.).

BOLIVIA: La Cumbre, Asplund 6514.

41. Calamagrostis orbignyana (Wedd.) Hitchc.

Deyeuxia orbignyana Wedd. Bull. Soc. Bot. France 22: 178, 180. 1875.

An erect pale caespitose perennial 30 to 80 cm. tall, with slender flexuous involute blades usually much shorter than the culms, and pale, narrow, rather loose panicles 10 to 20 cm. long; glumes 5 to 6 mm. long; lemma about 4 mm. long, the awn attached below the middle; callus hairs about 1 mm. long; rachilla with its copious hairs extending beyond the lemma.

Moist grassy places, Bolivia to Argentina. Originally described from Bolivia (D'Orbigny 217.)

BOLIVIA: La Paz, Buchtien 501, 6472; Pflanz in 1910. Chalapata, Asplund 6532. Pasña, Asplund 6475. Uyuni, Asplund 6484.

The following varieties have not been identified:

BROMIDIUM HYGROMETRICUM VAR. BREVIARISTATUM Kuntze, Rev. Gen. Pl. 3²: 342. 1898. Tunari Mountains, Bolivia. This is near *Calamagrostis rigescens*.

CALAMAGROSTIS TOLUCCENSIS α DENSIFLORA Kuntze, Rev. Gen. Pl. 3²: 345. 1898. Cochabamba, Bolivia.

45. AGROSTIS L. BENTGRASS

Spikelets 1-flowered; glumes equal, acute or acuminate; lemma delicate, usually shorter than the glumes, awnless or dorsally awned; palea usually minute or wanting.

Palea evident, usually about half as long as the lemma.

Lemma awned.

Panicle diffuse, pale; palea about half as long as the lemma.

1. *A. sodiroana*.

Panicle narrow, somewhat open, purple; palea one-third as long as the lemma.....2. *A. gelida*.

Lemma awnless.

Rachilla prolonged behind the palea; lemma as long as the glumes; spikelets 1 mm. long.....3. *A. trichodes*.

Rachilla not prolonged; lemma shorter than the glumes; spikelets 2 to 3 mm. long.

Panicle somewhat open and spreading.....4. *A. stolonifera*.

Panicle dense, more or less lobed or interrupted.....5. *A. verticillata*.

Palea minute or wanting.

Panicle open, the spikelets not crowded. Blades flat.

Panicle diffuse, the spikelets all long-pedicelated. Lemma awned.

6. *A. montevidensis*.

Panicle open but not diffuse, some of the spikelets rather short-pedicelated.

Lemmas awnless ----- 7. *A. perennans*.

Lemmas awned ----- 8. *A. boliviana*.

Panicle narrow, more or less condensed.

Panicles spikelike, mostly less than 5 cm. long and 0.5 cm. thick. Low alpine plants.

Lemma awned ----- 9. *A. haenkeana*.

Lemma awnless ----- 10. *A. breviculmis*.

Panicles more than 5 cm. long, spikelike or somewhat open.

Glumes very scabrous over the back. Lemma awned; panicle open, the branches naked below, densely spikelet-bearing above.

11. *A. exasperata*.

Glumes glabrous on back (scabrous on the keel) or sometimes slightly scaberulous.

Blades firm, stiff, upright, flat, with a sharp involute point.

12. *A. nigritella*.

Blades laxer, not stiff, upright and sharp-pointed.

Spikelets about 3 mm. long, mostly purple; lemma 2 mm. long; panicles rather loose ----- 13. *A. araucana*.

Spikelets about 2 mm. long, mostly green; lemma 1.5 mm. long; panicles condensed but more or less interrupted.

14. *A. toluensis*.

1. *Agrostis sodiroana* Hack. Oesterr. Bot. Zeitschr. 52: 61. 1902.

A slender perennial, with lax culms about 50 cm. long, flat blades 2 to 4 mm. wide, and few-flowered loose drooping panicles, the branches spikelet-bearing toward the ends.

Thickets, Ecuador. Known only from the type collection.

ECUADOR: Mount Pichincha, *Sodiro* in 1887.

2. *Agrostis gelida* Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 4¹: 343. 1841.

A loosely caespitose, rather lush perennial, with flat blades and rather narrow, loose panicles with verticillate branches; glumes about 3 mm. long; lemma 1.5 mm. long, the awn bent and short-exserted.

Boggy slopes, Peru to Bolivia. Originally described from "Pasco," Peru. (*Pöppig*.)

PERU: Huánuco, *Macbride & Featherstone* 2180. Tambillo, *Macbride* 3584. Goyllarisquisca, *Hitchcock* 22331. Mito, *Macbride & Featherstone* 1847. Ollantaytambo, *Hitchcock* 22533.

BOLIVIA: Pongo, *Hitchcock* 22781. Unduavi, *Buchtien* 841.

3. *Agrostis trichodes* (H. B. K.) Roem. & Schult. Syst. Veg. 2: 361. 1817.

Vilfa trichodes H. B. K. Nov. Gen. & Sp. 1: 139. 1816.

Agrostis bogotensis Hack. Repert. Nov. Sp. Fedde 8: 518. 1910.

A delicate caespitose perennial, with slender culms 10 to 20 cm. tall, slender, soft, involute, mostly basal blades, and delicate oval open panicles 2 to 5 cm. long; glumes broad, equal, 1 mm. long, divergent after the fall of the floret; lemma obtuse, equaling the glumes and like them in texture; rachilla prolonged as a slender bristle behind the palea.

Paramos, Venezuela, Colombia, and Peru. Originally described from Peru, "Crescit in crepidinibus Andium Peruvianum justa Montan, Santa Cruz et

Guambos, alt. 1350 hexap." (*Bonpland.*) Doctor Lecomte kindly sent a fragment from the type specimen in Paris.

ECUADOR: Santa Rosa de Cañar, *Rose* 22682.

PERU: Andes, northern Peru, *Bonpland.*

The following specimens also belong to this species.

VENEZUELA: Mérida, Páramo de la Sol, 3,400 meters, *Jahn* 524a; Sierra Nevada, *Funck & Schlim* 1630. COLOMBIA: Bogotá, *Apollinaire* in 1908 (type of *A. bogotensis*); *Apollinaire & Arthur* 21; *MacDonall* in 1915.

4. *Agrostis stolonifera* L. Sp. Pl. 62. 1753.

A spreading perennial, with erect culms from a creeping base, flat blades, and narrow loose panicles; spikelets awnless, the palea well developed.

A native of Europe, whence originally described; introduced at various places in America in cool climates.

ECUADOR: Mount Pichincha, *Sodiuro; Harteman* 6.

BOLIVIA: Pongo, *Hitchcock* 22784.

4a. *Agrostis stolonifera maritima* (Lam.) Koch, Syn. Deutsch. Schweiz. Fl. 781. 1837.

Agrostis maritima Lam. Encycl. 1: 61. 1783.

Panicle contracted, almost spikelike. A native of Europe.

PERU: Arequipa, *Günther* 13.

5. *Agrostis verticillata* Vill. Prosp. Pl. Dauph. 16. 1779.

A decumbent or spreading perennial, with culms 20 to 40 cm. or even as much as 1 meter long, flat blades, and dense, more or less interrupted or lobed panicles 5 to 10 cm. or sometimes 15 cm. long.

In water and wet places, especially along irrigating ditches, southern United States to Argentina; native in the Old World. Originally described from France.

PERU: Lima, *Hitchcock* 22337½. Goyllarisquisca, *Hitchcock* 22296. Arequipa, *Hitchcock* 22437.

BOLIVIA: La Paz, *Rusby* 40. Cochabamba, *Hitchcock* 22808, 22848; *Buch-tien* 2519.

6. *Agrostis montevidensis* Spreng.; Nees, Agrost. Bras. 403. 1829.

An erect slender tufted perennial 20 cm. tall, with narrow short flat blades and diffuse panicle, the capillary branches widely spreading, the spikelets long-pediceled; spikelets 2 mm. long; lemma awned; palea wanting.

Grassy plains, Brazil to Argentina and Bolivia. Originally described from Uruguay.

BOLIVIA: Guachaca, *Cárdenas (Mulford Biol. Expl.)* 36 S. Tarija, *Fiebrig* 2907 (Kew Herb.).

7. *Agrostis perennans* (Walt.) Tuckerm. Amer. Journ. Sci. 45: 44. 1843.

Cornucopiae perennans Walt. Fl. Carol. 74. 1788.

Vilfa elegans H. B. K. Nov. Gen. & Sp. 1: 139. 1816. (Quito.)

Vilfa fasciculata H. B. K. Nov. Gen. & Sp. 1: 139. 1816. (Quito.)

Agrostis elegans Roem. & Schult. Syst. Veg. 2: 362. 1817. Not *A. elegans* Salisb. 1796.

Agrostis fasciculata Roem. & Schult. Syst. Veg. 2: 362. 1817.

Agrostis pulchella Kunth, Rév. Gram. 1: Suppl. XVII. 1830. Not *A. pulchella* Loisel. 1824.

Agrostis humboldtiana Steud. Nom. Bot. ed. 2. 1: 40. 1840.

Agrostis weberbaueri Mez, Repert. Nov. Sp. Fedde 18: 1. 1922. (Huacapistana and Monsón, Peru, *Weberbauer.*)

A lax, often decumbent perennial 40 to 80 cm. tall, with flat blades and narrow, rather diffuse panicles 10 to 20 cm. long, the capillary branches verticillate; spikelets awnless, the palea none.

Moist shady banks, Ecuador to Bolivia. Originally described from South Carolina.

ECUADOR: La Rinconada Ranch, *Hitchcock* 20800. Quito, *Mille* 250, 251, 253; *Harteman* 70; *Sodi*. Between Oña and Cuenca, *Hitchcock* 21631, 21647. Between San Lucas and Oña, *Hitchcock* 21534. Between Loja and San Lucas, *Hitchcock* 21466. Between La Toma and Loja, *Hitchcock* 21380. Tungurahua, *Spruce* 5926.

PERU: Tambo de Vaca, *Macbride* 4396. Goyllarisquisca, *Hitchcock* 22330. Dept. Huánuco, *Weberbauer* 3719. Sachapata, *Lechler* 2640a (Kew Herb.).

BOLIVIA: Bella Vista, *Hitchcock* 22757. Unduavi, *Buchtien* 2585, 6427. La Paz, *Buchtien* 6426.

The original description of *Vilfa elegans* states that the palea equals the lemma, but in the type in the Paris Herbarium the palea is obsolete.

8. *Agrostis boliviana* Mez, Repert. Nov. Sp. Fedde 18: 1. 1922.

Similar to *A. gelida* but with a looser panicle and laxer habit; lemma awned; palea wanting. Differing from *A. perennans* in the awned lemmas.

Known only from the two Fiebrig collections, cited with the original description.

BOLIVIA: Pinos bei Tarija, alt. 3,000 meters, *Fiebrig* 2821. Calderillo, alt. 3,200 meters, *Fiebrig* 2905. (Both in Kew Herb.).

9. *Agrostis haenkeana* Hitchc.

Agrostis mucronata Presl, Rel. Haenk. 1: 238. 1830. Not *A. mucronata* Spreng. 1825.

Agrostis nana var. *andicola* Pilger, Bot. Jahrb. Engler 37: 505. 1906. (*Hans Meyer* 145, 146.)

A densely caespitose, spreading or erect perennial 5 to 30 cm. tall, with short, erect, narrow, flat or involute, mostly basal blades, and spikelike panicles 3 to 7 cm. long; glumes 2 mm. long; lemma awned; palea minute or wanting.

Rocky slopes at high altitudes, Ecuador to Bolivia. Original locality not stated, probably Peru. (*Haenke*.)

ECUADOR: Mount Pichincha, *Hitchcock* 21082. Mount Chimborazo, *Hans Meyer* 145, 146. Mount Azuay, *Spruce* 6097 (Kew Herb.).

PERU: Hacienda Atoscaico, *Hitchcock* 22202. Sachapata, *Lechler* 2604 (Kew Herb.).

BOLIVIA: Sorata, *Mandon* 1291, 1314 (Kew Herb.). Pongo, *Hitchcock* 22764; *Asplund* 6467. Chacaltaya, *Buchtien* 1204. La Cumbre, *Asplund* 6496. Lake Titicaca, *Asplund* 6490. Unduavi, *Buchtien* 4278. Without locality, *Bang* 2589; *Mandon* 1292.

10. *Agrostis breviculmis* Hitchc. U. S. Dept. Agr. Bur. Pl. Ind. Bull. 68: 36. pl. 18. 1905.

Trichodium nanum Presl, Rel. Haenk. 1: 243. 1830.

Agrostis nana Kunth, Rév. Gram. 1: Suppl. XVIII. 1830. Not *A. nana* Del. 1800.

A densely caespitose, dwarf, tussock-forming perennial, with erect stiff culms mostly less than 10 cm. tall, short involute sharp-pointed blades, and spikelike panicles mostly 1 to 3 cm. long; glumes about 2 mm. long; lemma awnless; palea wanting.

Open ground and rocky slopes at high altitudes, Ecuador to Chile. Originally described from Peru. (*Haenke*.)

ECUADOR: Quito, *Rose* 24028, 23535. Between Malchinguf and Pomasqui, *Hitchcock* 20857. Mount Chimborazo, *Hitchcock* 21982, 21993, 22002; *Anthony & Tate* 366. Urbina, *Hitchcock* 22007, 22014, 22045. Between Loja and San Lucas, *Hitchcock* 21457. Without locality, *Spruce* 5936.

PERU: Goyllarisquisca, *Hitchcock* 22320. Cerro de Pasco, *Hitchcock* 22237, 22247. Baños, *Wilkes Expl. Exped.* Hacienda Atocsaico, *Hitchcock* 22205.

11. *Agrostis exasperata* Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 4¹: 352. 1841.

Vilfa acutiglumis Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only. (Tacna, *Lechler* 1542.)

An erect or somewhat decumbent perennial as much as 1 meter tall, with flat blades and pyramidal, rather dense panicles 10 to 15 cm. long, the lower branches naked at the base, compactly flowered; glumes acuminate or shortly aristate, very scabrous over the back, the lemma short-awned.

Swampy land, Bolivia to Chile, whence originally described.

BOLIVIA: Palca, *Buchtien* 2531. La Paz, *Rusby* 39.

12. *Agrostis nigritella* Pilger, Bot. Jahrb. Engler 25: 713. 1898.

Agrostis stuebelii Pilger, Bot. Jahrb. Engler 25: 714. 1898.

A densely caespitose, rather stout perennial 10 to 20 cm. tall, with flat or somewhat involute blades and dense, narrow, almost spikelike, dark purple panicles 5 to 10 cm. long; glumes 3 to 4 mm. long; lemma with a bent awn from below the middle; palea wanting.

Rocky slopes at high altitudes, Ecuador. Originally described from near Antisana. (Type, *Stübel* 231.)

ECUADOR: Mount Pichincha, *Hitchcock* 21053; *Karsten*; *Harteman* 82. Antisana, *Anthony & Tate* 284; *Stübel* 231. Mount Chimborazo, *Hitchcock* 21950. Between Oña and Cuenca, *Hitchcock* 21642.

The specimen from Oña (*Hitchcock* 21642) has a more open panicle and may represent a distinct species.

13. *Agrostis araucana* Phil. Anal. Univ. Chile 94: 14. 1896.

A loosely caespitose perennial 30 to 50 cm. tall, with flat or loosely involute blades and narrow panicles 8 to 15 cm. long, the branches ascending or appressed; glumes 3 mm. long; lemma with a bent awn; palea wanting.

Moist banks, Colombia to Chile, whence originally described.

ECUADOR: Mount Pichincha, *Jameson* 693 (Kew Herb.), 229; *Sodiño* in 1889 and 1904, 252. Mount Chimborazo, *Hitchcock* 21999.

PERU: Cuzco, *Hitchcock* 22484. Mito, *Macbride & Featherstone* 1800. Goyllarisquisca, *Hitchcock* 22291. Paucartambo, *Weberbauer* 6923 (Field Mus.).

BOLIVIA: Unduavi, *Buchtien* 2581, 2586. Pongo, *Hitchcock* 22779.

14. *Agrostis toluensis* H. B. K. Nov. Gen. & Sp. 1: 135. 1816.

Agrostis virescens H. B. K. Nov. Gen. & Sp. 1: 135. 1816.

Vilfa glomerata Presl, Rel. Haenk. 1: 239. 1830. (Peru.)

Agrostis glomerata Kunth, Rév. Gram. 1: Suppl. XVII. 1830.

An erect or somewhat spreading perennial 10 to 50 cm. tall, with flat or loosely involute blades and narrow, rather dense or spikelike, often interrupted panicles 5 to 20 cm. long; glumes 2 to 3 mm. long, scabrous on the keel, sometimes also sparingly on the back; awn present or wanting; palea wanting. When growing in moist woods or thickets the blades are lax and flat; when growing on high paramos the blades are stiffer and more or less involute.

Shady or open ground, Mexico, whence originally described, to Chile.

ECUADOR: Tulcán, *Hitchcock* 21021, 21045. Vicinity of Quito, *Sodiro* in 1886; *Harteman* 12, 13, 17, 30, 38, 53; *Mille* 248; *Rose* 23534, 24031; *Jameson* 302 (Kew Herb.). Otavalo to Malchingui, *Hitchcock* 20828. Urbina, *Hitchcock* 22015, 22016. Mount Chimborazo, *Anthony & Tate* 370. Between Cuenca and Huigra, *Hitchcock* 21691. Between Oña and Cuenca, *Hitchcock* 21593, 21643. Without locality, *Spruce* 5927. Tungurahua, *Spruce* 5930 (Kew Herb.). Guayrapata, *Spruce* 5957 (Kew Herb.).

PERU: Tambo de Vaca, *Macbride* 4357. Goyllarisquisca, *Hitchcock* 22310, 22321. Between Tarma and La Merced, *Hitchcock* 22145. La Quinhua, *Hitchcock* 22264. Ollantaytambo, *Hitchcock* 22534, 22539. Chachapoyas, *Mathews* 3240 (Kew Herb.).

BOLIVIA: Lake Titicaca, *Asplund* 6489. Pongo, *Hitchcock* 22770. San Felipe, *Hitchcock* 22600. Unduavi, *Bang* 20. Bella Vista, *Hitchcock* 22755.

46. CINNA L.

Spikelets 1-flowered, the disarticulation below the glumes, the rachilla prolonged behind the palea as a minute bristle; glumes equal; lemma about as long as the glumes, bearing a minute straight awn just below the apex.

1. *Cinna poaeformis* (H. B. K.) Scribn. & Merr. U. S. Dept. Agr. Div. Agrost. Bull. 24: 21. 1901.

Deyeuxia poaeformis H. B. K. Nov. Gen. & Sp. 1: 146. 1816.

A rather lax perennial about 1 meter tall, with flat blades as much as 7 mm. wide, and a narrow open panicle as much as 40 cm. long, the branches ascending or spreading, naked below, rather densely flowered above; spikelets 3 mm. long; palea as long as lemma; rudiment slender, glabrous.

Shady moist places in the mountains, Mexico, whence originally described, to Peru.

PERU: Mito, *Macbride* 3365.

47. ALOPECURUS L.

Spikelets 1-flowered, disarticulating below the glumes, strongly compressed laterally; glumes equal, ciliate on the keel; lemma about as long as the glumes, awned on the back.

Panicle 2 to 3 cm. long, 8 mm. thick..... 1. *A. bracteatus*.

Panicle 5 cm. long, 3 to 4 mm. thick..... 2. *A. aequalis*.

1. *Alopecurus bracteatus* Phil. Anal. Univ. Chile 94: 6. 1896.

An erect, smooth, somewhat succulent perennial as much as 1 meter tall, with flat blades (those of the culm inconspicuous) and oblong silky spikelike panicles; spikelets about 3 mm. long, the awn about 2 mm. long. Spikelets smaller than in *A. antarcticus* Vahl, which it resembles. *A. alpinus* J. G. Smith, of the arctic regions, has spikelets more woolly than either of these.

Bogs, Peru to Chile, whence originally described.

PERU: Huarón, *Macbride & Featherstone* 1133. Goyllarisquisca, *Hitchcock* 22334. Occa Pampa, *Shepard* 61.

BOLIVIA: La Paz, *Hitchcock* 22585; *Buchtien* 431 (Kew Herb.), 861. Unduavi, *Buchtien* 2579. Pongo, *Hitchcock* 22768. Sorata, *Mandon* 1244 (Kew Herb.).

2. *Alopecurus aequalis* Sobol. Fl. Petrop. 16. 1799.

Alopecurus aristulatus Michx. Fl. Bor. Amer. 1: 43. 1803.

Alopecurus fulvus J. E. Smith in Sowerby, Engl. Bot. pl. 1467. 1805.

A smooth, erect or decumbent perennial 20 to 50 cm. tall, with flat blades and spikelike panicles, the awns scarcely extending beyond the spikelets; anthers orange.

In water and wet places in the cooler parts of the northern hemisphere, extending in the mountains to Argentina. Originally described from Russia.

ECUADOR: Near Quito, *Sodiro* in 1887; *Holmgren* 570.

PERU: Cerro de Pasco, *Macbride* 3078.

BOLIVIA: Sorata, *Mandon* 1243 (Kew Herb.). La Paz, *Asplund* 6567.

48. POLYPOGON Desf.

Spikelets 1-flowered, the disarticulation below the glumes; glumes equal, awned; lemma delicate, shorter than the glumes, usually awned; inflorescence narrow, interrupted or dense and spikelike.

Glumes, excluding awns, about 3 mm. long, gradually narrowed into the awn.

1. *P. elongatus*.

Glumes, excluding awns, about 2 mm. long, abruptly rounded at summit.

2. *P. lutosus*.

Glumes, excluding awns, about 1.5 mm. long, the awn 6 to 8 mm. long.

3. *P. monspeliensis*.

1. *Polypogon elongatus* H. B. K. Nov. Gen. & Sp. 1: 134. 1816.

Raspailia agrostoides Presl, Rel. Haenk. 1: 239. pl. 80. 1830. (Peru.)

Nowodworskya agrostoides Presl, Rel. Haenk. 1: 351. 1830. (Peru.)

A lax, usually decumbent perennial as much as 1 meter tall, with flat blades and narrow, dense but interrupted, nodding panicles 10 to 20 cm. long.

Moist places, Mexico to Argentina. Originally described from Chillo, Ecuador. (*Bonpland.*)

ECUADOR: Tulcán, *Hitchcock* 21008. Between Malchinguí and Pomasquí, *Hitchcock* 20900. Quito, *Holmgren* 575; *Harteman* 32, 36, 37, 59; *Holway* 928, 958; *Jameson* in 1859, 417. Ambato, *Hitchcock* 21712. Riobamba, *Mille* 262; *Spruce* 5803* (Kew Herb.). Huigra, *Hitchcock* 20350; *Rose* 22472, 22539. Tablón de Oña, *Rose* 23075.

PERU: Lima, *Wilkes Expl. Exped.*; *Hitchcock* 22340; *Mathews* 545 (Kew Herb.). Between Tarma and La Merced, *Hitchcock* 22152½. Cuzco, *Hitchcock* 22487. Arequipa, *Hitchcock* 22431, 22432.

BOLIVIA: Sorata, *Mandon* 1294. San Felipe, *Hitchcock* 22599. San José, *Hitchcock* 22735. Palca, *Hitchcock* 22569. Cotafña, *Buchtien* 3133. Cochabamba, *Hitchcock* 22813.

2. *Polypogon lutosus* (Poir.) Hitchc. U. S. Dept. Agr. Bull. 772: 138. 1920.

Agrostis littoralis With. Bot. Arr. Veg. Brit. ed. 3. 2: 129. 1796. Not *A.*

littoralis Lam. 1791.

Polypogon littoralis Smith, Comp. Fl. Brit. 13. 1800.

Agrostis lutososa Poir. in Lam. Encyl. Suppl. 1: 249. 1810.

Polypogon interruptus H. B. K. Nov. Gen. & Sp. 1: 134. pl. 44. 1816.

A spreading perennial, with decumbent culms from a few centimeters to 1 meter long, usually rooting at the lower nodes, flat blades, and dense, more or less interrupted panicles as much as 15 cm. long.

In water or wet places. Pacific coast, Vancouver Island, southward; apparently introduced, common along irrigating ditches. Native of the Mediterranean region. Originally described from Europe.

ECUADOR: Between Malchinguí and Pomasquí, *Hitchcock* 20899. Quito, *Mille* 261; *Harteman* 51. Mount Chimborazo, *Anthony & Tate* 329, 372, 447. Rio-

bamba, *Spruce* 5803; *Mille* 65. Huilgra, *Hitchcock* 20349; *Rose* 22496, 24019, 24023. Cuenca, *Rose* 22886, 22890, 24026. Quero, *Lehmann* 5284 (Kew Herb.).

PERU: Obrajillo, *Wilkes Expl. Exped.* Lima, *Hitchcock* 22337. Matucana, *Macbride & Featherstone* 377. Goyllarisquisca, *Hitchcock* 22286, 22333. La Quinhua, *Hitchcock* 22262. Oroya, *Hitchcock* 22177. Tarma, *Hitchcock* 22172. Cuzco, *Hitchcock* 22476, 22508. Arequipa, *Hitchcock* 22433; *Rose* 18790, 19000; *Meyen*.

BOLIVIA: La Paz, *Bang* 40 (Coll. Pharmacy Herb.), 47; *Buchtien* 867, 2491; *Rose* 18866; *Mondon* 1295; *Shepard* 160. Cotaña, *Buchtien* 3139. Palca, *Hitchcock* 22576; *Buchtien* 2548. Cochabamba, *Hitchcock* 22792, 22849; *Buchtien* 2518, 2520. Oploca, *Hitchcock* 22893.

3. *Polypogon monspeliensis* (L.) Desf. Fl. Atlant. 1: 67. 1798.

Alopecurus monspeliensis L. Sp. Pl. 61. 1753.

Polypogon flavescens Presl, Rel. Haenk. 1: 234. 1830. (Peru.)

A low spreading weedy annual, with inflated sheaths, flat blades, and dense silky-awned oblong panicles; glumes about 1.5 mm. long, hispidulous, the awn 6 to 8 mm. long from between two rounded lobes.

Waste places in warm countries. Originally described from France.

PERU: Without locality, *Haenke*, a fragment in the U. S. National Herbarium from the herbarium of the German University at Prague.

49. LYCURUS H. B. K.

Spikelets 1-flowered; glumes awned, the first usually 2-awned; lemma narrow, firm, longer than the glumes, terminating in a slender awn.

1. *Lycurus phleoides* H. B. K. Nov. Gen. & Sp. 1: 142. pl. 45. 1816.

A loosely caespitose perennial, with knotty crown, wiry decumbent culms 10 to 30 cm. long, short, crowded, flat or folded blades, and spikelike panicles 2 to 5 cm. long.

Rocky slopes and open ground, southwestern United States to Argentina, Originally described from Mexico.

PERU: Tarma, *Hitchcock* 22169.

BOLIVIA: Sorata, *Mandon* 1284. La Paz, *Buchtien* 4485. Capai, *Bang* 762. Cochabamba, *Hitchcock* 22815, 22822, 22863. Valle Grande, *Herzog* 1790.

50. PEREILEMA Presl

Perfect spikelets 1-flowered, surrounded at base by numerous sterile spikelets in the form of bristles or delicate bracts.

Lemma about 1.5 mm. long-----1. *P. crinitum*.

Lemma 2 to 3 mm. long-----2. *P. beyrichianum*.

1. *Perellema crinitum* Presl, Rel. Haenk. 1: 233. pl. 37. f. a. 1830.

An erect annual 20 to 40 cm. tall, with flat blades and dense panicles, spikelike above, interrupted or lobed below, 5 to 15 cm. long, bristly with awns 1 to 2 cm. long; lemma about 1.5 mm. long.

Cliffs and open ground, Mexico to Venezuela and Ecuador. Originally described from Panama.

ECUADOR: Near Quito, *Jameson* 58.

2. *Perellema beyrichianum* (Kunth) Hitchc.

Muhlenbergia beyrichiana Kunth, Enum. Pl. 1: 200. 1833.

Pereilema brasilianum Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat 4¹: 136. 1841; 382. 1845.

Differing from *P. orinitum* in the looser interrupted panicle, the lower branches spreading or somewhat reflexed, rather distant, 1 to 2 cm. long; sterile spikelets fewer; lemma 2 to 3 mm. long.

Moist slopes, Colombia to Ecuador and Brazil, whence originally described.
 ECUADOR: Huigra, *Hitchcock* 20326, 20635, 20680.

51. MUHLENBERGIA Schreb.

Spikelets 1-flowered, in close or open panicles; glumes usually shorter than the lemma; lemma firm-membranaceous, 3 to 5-nerved, with a very short, usually pilose callus, the apex acute, extending into a straight or flexuous awn or sometimes only mucronate.

Plants annual, the culms branching, delicate. Lemma bearing a delicate awn. Glumes or some of them awned, the awn as long as the body of the glume or longer.

Panicle branches divaricate or recurved, falling entire; lemma 3 to 4 mm. long-----1. *M. diversiglumis*.

Panicle branches not falling entire. Lemma long-ciliate----2. *M. ciliata*.

Glumes not awned, often acute or acuminate.

Second glume broad, 3-toothed; awn flexuous-----3. *M. peruviana*.

Second glume entire; awn straight.

Second glume 2 to 3 mm. long-----4. *M. quitensis*.

Second glume not over 1 mm. long.

Glumes acute or mucronate; body of lemma 1.5 mm. long.

5. *M. tenuissima*.

Glumes obtuse; body of lemma 2 to 3 mm. long----6. *M. microsperma*.

Plants perennial.

Plants low and spreading, the blades less than 3 cm. long; lemma acute or cuspidate but not awned.

Blades flat; culms decumbent-spreading but without scaly rhizomes.

7. *M. ligularis*.

Blades involute, falcate; scaly rhizomes present-----8. *M. fastigiata*.

Plants erect or decumbent, not low and spreading; lemmas acute or awned.

Glumes unequal, 3 and 4 mm. long; blades flat, less than 5 cm. long; awn flexuous -----9. *M. flexuosa*.

Glumes equal or nearly so, 1.5 to 2 mm. long; blades more than 5 cm. long; awn, if present, straight or nearly so.

Panicle dense and spikelike, stiffly erect; glumes more than half as long as the lemma-----10. *M. angustata*.

Panicles narrow but not dense and spikelike; glumes less than half as long as the lemma.

Awn about as long as the lemma; panicle lead-colored.

11. *M. holwayorum*.

Awn 2 to 3 times as long as the lemma; panicle purple.

12. *M. rigida*.

1. *Muhlenbergia diversiglumis* Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 4¹: 298. 1841.

A slender annual, somewhat coarser than *M. ciliata*, the branches of the few-flowered panicle with only 1 to 3 spikelets.

Cliffs and moist slopes, Mexico to Peru. Originally described from Mexico.

ECUADOR: Huigra, *Hitchcock* 20322, 20768. Latacunga, *Sodiño*.

PERU: San Miguel, *Cook & Gilbert* 958.

2. *Muhlenbergia ciliata* (H. B. K.) Kunth, Rév. Gram. 1: 63. 1829.

Podosaemum ciliatum H. B. K. Nov. Gen. & Sp. 1: 128. 1816.

A delicate, usually tufted annual 10 to 20 cm. tall, with short flat spreading blades, and narrow, densely flowered panicles one-third to half as long as the entire culm; lemmas ciliate.

Cliffs and moist banks, often on walls, Mexico to Ecuador. Originally described from Mexico.

ECUADOR: Baños, *Hitchcock* 21921.

PERU: Mito, *Macbride* 3376. Piedra Grande, *Macbride* 3684.

3. *Muhlenbergia peruviana* (Beauv.) Steud. Nom. Bot. ed. 2. 1: 41. 1840.

Olomena peruviana Beauv. Ess. Agrost. 28. 1812.

Muhlenbergia clomena Kunth, Rév. Gram. 1: 64. 1829.

Muhlenbergia nana Benth. Pl. Hartw. 262. 1846. (Mount Cotopaxi.)

Agrostis delicatula Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only. (Lechler 1813b.)

Muhlenbergia herzogiana Henr. Med. Rijks Herb. Leiden 40: 58. 1921. (Herzog 2226.)

A tufted, closely cespitose annual 3 to 20 cm. tall, with erect culms and blades and narrow, rather compact panicles.

Cliff walls and open ground, Mexico to Argentina. Originally described from Peru, the specimen being communicated by Thibaut.

ECUADOR: Mount Pichincha, *Mille* 249. Cotopaxi, *Sodirol* in 1891. Tigua, *Sodirol* in 1897.

PERU: Matucana, *Macbride & Featherstone* 450. Río Blanco, *Macbride & Featherstone* 800. Yauli, *Macbride & Featherstone* 916. Oroya, *Macbride & Featherstone* 984. Huánuco, *Macbride & Featherstone* 2114. Tinta, *Cook & Gilbert* 211. Pucará, *Weberbauer* 415 in part. Cani, *Macbride* 3401. San Antonio, *Lechler* 1813b (Kew Herb.). Carumas, *Weberbauer* 7295.

BOLIVIA: Sorata, *Mandon* 1281, 1283. La Paz, *Buchtien* 160, 865; *Holway* in 1920. Talca Chugiaguilla, *Bang* 806. Capai, *Bang* 773. Potosí, *D'Orbigny* 201. Cuesta San Anaton, *Fiebrig* 3277. Totora, *Herzog* 2038, 2057. Cordillera San Bonito, *Herzog* 2226.

4. *Muhlenbergia quitensis* (H. B. K.) Hitchc. Contr. U. S. Nat. Herb. 17: 292. 1913.

Calamagrostis quitensis H. B. K. Nov. Gen. & Sp. 1: 133. 1816.*

Muhlenbergia calamagrostidea Kunth, Rév. Gram. 1: 63. 1829.

A rather delicate annual, with narrow but rather loose panicles; glumes 2 mm. long.

Cliffs and walls, Mexico, whence originally described, to Bolivia.

BOLIVIA: Without locality, *Bang* 487.

5. *Muhlenbergia tenuissima* (Presl) Kunth, Rév. Gram. 1: Suppl. XVI. 1830.

Podosaemum tenuissimum Presl, Rel. Haenk. 1: 230. 1830.

A delicate annual similar to *M. ciliata*, with narrow loose panicle, the branches spreading, few-flowered. Glumes more distinctly awned than in the Mexican plants.

Cliffs and walls, Mexico to Brazil and Bolivia. Originally described from Panama.

PERU: Between Tarma and La Merced, *Hitchcock* 22154.

BOLIVIA: La Florida, *Hitchcock* 22622. Yungas, *Rusby* 16; *Bang* 680.

6. *Muhlenbergia microsperma* (DC.) Kunth, Rév. Gram. 1: 64. 1829.

Trichochloa microsperma DC. Cat. Hort. Monsp. 151. 1813.

Podosaemum debile H. B. K. Nov. Gen. & Sp. 1: 128. 1816. (Ecuador.)

Trichochloa debilis Roem. & Schult. Syst. Veg. 2: 385. 1817.

Muhlenbergia debilis Kunth, Rév. Gram. 1: 63. 1829.

* This species was described from Mexico. The specific name seems to have been given inadvertently. Kunth changed the name to *M. calamagrostidea*.

A freely branching, weedy, spreading annual, with numerous panicles, the lemmas with a delicate awn 1 to 1.5 mm. long.

Cliffs and walls, Mexico, whence originally described, to Peru.

ECUADOR: Huigra, *Hitchcock* 20399; Rose 22550, 24018. Tumbaco, *Sodi*ro in 1892; *Mille* 246. Quito, *Jameson* 248 (Kew Herb.).

PERU: Obrajillo, *Wilkes Expl. Exped.* Matucana, *Macbride & Featherstone* 392. Huánuco, *Macbride* 3217, 3514.

7. *Muhlenbergia ligularis* (Hack.) Hitchc.

Sporobolus ligularis Hack. Oesterr. Bot. Zeitschr. 52: 57. 1902.

A loosely tufted, mostly decumbent-spreading perennial, with flat blades mostly 1 to 2 cm. long and small panicles of spikelets about 2 mm. long. Resembles *M. fastigiata*, but the culms less tufted and lacking the strong creeping rootstocks, the blades flat instead of involute.

Open ground Ecuador to Bolivia. Originally described from Ecuador. (*Sodi*ro, without definite locality.)

ECUADOR: Pifo, *Sodi*ro in 1899; *Mille* 243. Quito, *Karsten*.

PERU: Hacienda Atocsaico, *Stordy* 27 (Kew Herb.).

BOLIVIA: Sorata, *Mandon* 1286. La Paz, *Rusby* 51; *Bang* 109; *Asplund* 6498, 6510; *Hitchcock* 22586. Pongo, *Hitchcock* 22763. Cochabamba, *Hitchcock* 22818. Rinconada, *Hitchcock* 22596.

8. *Muhlenbergia fastigiata* (Presl) Henr. Med. Rijks Herb. Leiden 40: 59. 1921.

Sporobolus fastigiatus Presl, Rel. Haenk. 1: 241. 1830.

A low tufted perennial, with numerous wiry creeping rootstocks, decumbent culms mostly not over 10 cm. tall, numerous distichous involute falcate blades mostly less than 1 cm. long, and small narrow few-flowered panicles of dark-colored spikelets about 2 mm. long.

Open ground, Peru, whence originally described, to Argentina. (*Haenke*.)

PERU: Between Santa Rosa and Araranca, *Cook & Gilbert* 168. Oroya, *Hitchcock* 22135. Chuquibambilla, *Hitchcock* 22448.

BOLIVIA: Pasña, *Buchtien* 1207. Puna Patanca, southern Bolivia, *Fiebrig* 2633.

9. *Muhlenbergia flexuosa* Hitchc., sp. nov.

Perennial; culms erect or decumbent, loosely cespitose, slender, wiry, glabrous, about 30 cm. tall; ligule truncate, less than 0.5 mm. long, lacerate; blades flat, scattered along the lower part of the stem, scabrous, acuminate, 2 to 3 cm. long, 1 to 2 mm. wide; panicles narrow, rather dense, almost spikelike, 4 to 7 cm. long; glumes unequal, narrow, acuminate, awn-tipped, scabrous on the keel, 1-nerved, pale, the first 3 mm. long, the second 4 mm. long; lemma 3-nerved, about 3.5 mm. long, narrow, villous about the base and for one-third the distance above, awned, the awn slender, flexuous, about 2 cm. long; palea as long as the lemma, acuminate.

Type in herbarium of the Field Museum, no. 534,937, collected at summit of rocky crest, Huacachi Estación near Muña, Peru, altitude 2,000 meters, May 20 to June 1, 1923, by J. Francis Macbride (no. 3874).

The only other specimen seen is from Río Huallaga Canyon below Río Santo Domingo, Peru, altitude 1,200 meters, *Macbride* 4205.

The short flat blades, spikelike panicles, and slender flexuous awns are sufficient to characterize the species. It is allied to *M. flaviseta* Scribn. and *M. scabra* S. Wats., both of Mexico.

10. *Muhlenbergia angustata* (Presl) Kunth, Rév. Gram. 1: Suppl. XVI. 1830.

Crypsis stricta H. B. K. Nov. Gen. & Sp. 1: 140. 1816. Not *Muhlenbergia stricta* Kunth, 1830, nor *Epicampes stricta* Presl, 1830.

Podosaemum angustatum Presl, Rel. Haenk. 1: 229. 1830.

Epicampes kunthiana Griseb. Abh. Ges. Wiss. Göttingen 19: 256. 1874.

Epicampes coerulea Griseb. Abh. Ges. Wiss. Göttingen 19: 256. 1874.

Muhlenbergia coerulea Mez, Repert. Nov. Sp. Fedde 17: 213. 1921.

A densely caespitose erect perennial 40 to 80 cm. tall, with firm folded scabrous blades, drooping forward with a strong circular bend at base, the firm ligule commonly 5 to 10 mm. long, and dense, tawny or lead-colored, spikelike panicles 10 to 15 cm. long; glumes 6 to 7 mm. long, narrow, acuminate or awn-pointed, scaberulous; lemma about as long as glumes, scaberulous, acuminate, or bearing a slender straight awn as much as 6 mm. long.

Rocky slopes and grassy plains, Colombia to Argentina. Originally described from Peru. (*Haenke*.)

ECUADOR: Paramos of Mount Igualata, *Mille* 267. Mount Pichincha, *Jameson* in 1864. Mount Chimborazo, *Mille* in 1920. Quito, *Holway* 952. Between Loja and San Lucas, *Hitchcock* 21461.

PERU: Yanahuanca, *Macbride & Featherstone* 1204. Oroya, *Hitchcock* 22182. Mito, *Macbride & Featherstone* 1721, 1929. Goyllarisquisca, *Hitchcock* 22308.

BOLIVIA: Sorata, *Mandon* 1279. Calderillo, *Fiedrig* 3173.

11. *Muhlenbergia holwayorum* Hitchc., sp. nov.

Perennial, caespitose, erect; culms glabrous, 40 to 60 cm. tall; sheaths glabrous; ligule firm, 3 to 5 mm. long; blades scabrous, flat, becoming involute or those of the innovations closely involute, those of the culm 1 to 3 mm. wide, 10 to 20 cm. long, tapering into a fine point; panicle narrow, tawny or lead-colored, 15 to 20 cm. long, the branches appressed and overlapping, the lower as much as 5 cm. long, these and the main axis scabrous, the pedicels slender, the lateral 1 to 2 mm. long, appressed; glumes nearly equal in length, about 1.5 mm. long, acute, the second broader; lemma narrow, 3 to 4 mm. long, firm, prominently 3-nerved, the callus with a few very short hairs, the apex very minutely toothed, the awn straight, mostly 3 to 4 mm. long; palea as long as the lemma.

Type in the U. S. National Herbarium, no. 1,108,445, collected at Sorata, Bolivia, April 16, 1920, by E. W. D. and Mary M. Holway (no. 530).

Besides the type there are two other specimens in the U. S. National Herbarium, collected by Dr. H. H. Rusby, at Sorata, altitude 3,000 meters, nos. 201 and 206.

This species is closely allied to *M. acuminata* Vasey of Mexico (based on *Wright* 1993 from New Mexico), which may be the same as *M. dubia* Fourn. of Mexico (Chinantla, *Liebmann* 688), though the latter is awnless. *M. holwayorum* differs in the shorter glumes and longer awns. The blades are flat, becoming involute, rather lax, while in *M. acuminata* they are stiffly involute.

12. *Muhlenbergia rigida* (H. B. K.) Kunth, Rév. Gram. 1: 63. 1829.

Podosaemum rigidum H. B. K. Nov. Gen. & Sp. 1: 129. 1816.

Podosaemum elegans H. B. K. Nov. Gen. & Sp. 1: 130. 1816. (Near Mount Chimborazo.)

Trichochloa elegans Roem. & Schult. Syst. Veg. 2: 387. 1817.

An erect caespitose perennial 40 to 80 cm. tall, with firm involute blades and narrow, dark purple panicles 15 to 20 cm. long, the capillary branches ascending or appressed; glumes 1.5 to 2 mm. long; lemma 5 mm. long; awn 1 to 1.5 cm. long.

Rocky or grassy slopes, Mexico, whence originally described, to Argentina.

ECUADOR: Near Mount Chimborazo, *Bonpland*.

PERU: Tarma, *Hitchcock* 22165. Matucana, *Macbride & Featherstone* 358. Viso, *Macbride & Featherstone* 765. Ollantaytambo, *Cook & Gilbert* 514. Mito, *Macbride* 3320.

BOLIVIA: Sorata, *Holway* 514; *Mandon* 1280. La Paz, *Buchtien* 819. Cochabamba, *Hitchcock* 22862.

52. TRINIOCHLOA Hitchc.

Spikelets 1-flowered; glumes membranaceous, thin, papery; lemma narrow, rounded on the back, firmer than the glumes, awned, the awn dorsal, geniculate.

1. *Trinlochloa stipoides* (H. B. K.) Hitchc. *Contr. U. S. Nat. Herb.* 17: 303. 1913.

Podosaemum stipoides H. B. K. *Nov. Gen. & Sp.* 1: 131. 1816.

Trichochloa stipoides Roem. & Schult. *Syst. Veg.* 2: 288. 1817.

A loosely caespitose perennial, with glabrous, somewhat angled culms 50 to 100 cm. tall, sulcate scaberulous sheaths, and open panicles 10 to 20 cm. long, the branches verticillate, distant, ascending or spreading, few-flowered; lemmas terete, slender, about 1 cm. long, the glumes one-third as long; awn about 1 cm. long, attached below the 2-toothed apex.

Grassy paramos and bushy slopes, Mexico to Bolivia. Originally described from Chillo, Ecuador. (*Bonpland.*)

ECUADOR: Quito, *Harteman* 40; *Mille* 245; *Sodi* in 1898. Between Malchinguí and Pomasquí, *Hitchcock* 20886. Huigra, *Hitchcock* 20627. Between Oña and San Lucas, *Hitchcock* 21632. Between Loja and San Lucas, *Hitchcock* 21444.

PERU: Mito, *Macbride & Featherstone* 1696; *Macbride* 3350.

BOLIVIA: San Felipe, *Hitchcock* 22602. Unduavi, *Buchtien* 4172.

53. ACIACHNE Benth. MOSSGRASS.

Spikelets 1-flowered, perfect, solitary on short peduncles among the leaves; glumes obtuse, shorter than the fruit; lemma indurate, fusiform, extending into a sharp firm point.

1. *Aciachne pulvinata* Benth. *Hook. Icon. Pl.* 4: 44. *pl.* 1362. 1881.*

Agrostis delicatula Steud.; *Lechl. Berb. Amer. Austr.* 56. 1857, name only. (*Lechler* 1813.)

A densely tufted, tussock-forming perennial, with numerous firm falcate involute blades mostly about 1 cm. long, and solitary spikelets scarcely raised above the general contour of the tussock.

Hills at high elevations (3,500 to 4,500 meters), Venezuela to Bolivia. Originally described from the "Andes," specimens being cited from Peru and Bolivia.

PERU: Cerro de Pasco, *Hitchcock* 22249, 22256. Hacienda Atocsaico, *Hitchcock* 22218. Huarón, *Macbride & Featherstone* 1157. Panticalla Pass, *Cook & Gilbert* 1828. Araranca, *Cook & Gilbert* 173. San Antonio, *Lechler* 1813. Ayapata, *Lechler* 3234 (*Kew Herb.*). Without locality, *Wilkes Expl. Exped.*

BOLIVIA: Mount Illimani, *Hitchcock* 22592. Chacaltaya, *Buchtien* 1206. Sorata, *Mandon* 1287. La Cumbre, *Asplund* 6494. Pongo, *Hitchcock* 22783. Southern Bolivia, *Piebrig* 3571 (*Kew Herb.*). Without locality, *Bang* 1843.

In the Kew Herbarium there are two specimens of *Aciachne* that appear to represent species different from *A. pulvinata*, but the material is too fragmentary for satisfactory study. One, collected by Jameson (no. 157) at Salinas, Ecuador, is said to be abundant on marshy ground, forming a dense mat. Salinas is on the coast, while *Aciachne pulvinata* is an alpine plant.

* See also Chase, *Aciachne*, a cleistogamous grass of the high Andes: *Journ. Washington Acad. Sci.* 14: 364. 1924.

In the Salinas specimen the glumes are 3 mm. long and the subulate-pointed lemma is 6.5 mm. long (larger than in *A. pulvinata*). The blades are similar to those of *A. pulvinata* but are somewhat thicker and the plant is more loosely cespitose.

The other specimen was collected by Lechler (no. 2599) at Sachapata, Peru. The blades are firm and closely involute but are erect and nearly straight, not falcate as in *A. pulvinata*. The inflorescence is a panicle 3 to 4 cm. long. Nearly all the fruits have fallen away, but the one or two remaining are similar to those of *A. pulvinata*. In *A. pulvinata* the spikelets are solitary and scarcely raised above the leaves.

The Lechler specimen cited above is probably the one referred to by Benthams as being possibly the staminate form of *Aciaohne pulvinata*, though he gives the number as 599 instead of 2599.

54. SPOROBOLUS R. Br.

Spikelets in open or spikelike panicles, awnless; glumes shorter than the floret; palea readily splitting; pericarp of the caryopsis loose, the seed readily falling therefrom.

Plants annual. Panicles delicate, loosely flowered, the spikelets scarcely 1 mm. long-----1. *S. tenuissimus*.

Plants perennial.

Creeping scaly rootstocks present.

Culms decumbent; panicle diffuse-----2. *S. asperifolius*.

Culms erect; panicles condensed or spikelike-----3. *S. virginicus*.

Creeping rootstocks wanting.

Panicle branches in distinct whorls; panicles often more or less pyramidal.

Spikelets about 1.5 mm. long; foliage relatively soft-----4. *S. argutus*.

Spikelets more than 3 mm. long; wiry bunch grasses. Glumes shining.

Panicles narrow, oblong or slightly pyramidal; branches spikelet-bearing nearly to the base.

Spikelets copper-colored; lower sheaths felty; blades folded or involute-----6. *S. aeneus*.

Spikelets greenish brown; lower sheaths not felty; blades flat.

7. *S. purpurascens*.

Panicles open, pyramidal; branches naked at base.

Foliage not crowded at base, the sheaths not felty---5. *S. eximius*.

Foliage crowded at base, the short basal sheaths felty.

8. *S. lasiophyllus*.

Panicle branches not in whorls; panicles narrow or spikelike, as much as 30 cm. long.

Glumes acute, more than half the length of the spikelet--9. *S. mirabilis*.

Glumes obtuse, less than half the length of the spikelet.

Panicle branches slender, rather loosely arranged; blades slender and lax; glumes about 0.3 mm. long-----10. *S. indicus*.

Panicle branches short, contiguous, forming a narrow rather compact spike; blades firm, as much as 5 mm. wide; glumes 0.5 to 1 mm. long-----11. *S. berterianus*.

1. *Sporobolus tenuissimus* (Mart.) Hack. Bull. Herb. Boiss. II, 4¹: 278. 1904.

Panicum tenuissimum Mart.; Schrank, Denkschr. Bot. Ges. Regensb. 2: 26. 1822.²⁵

Agrosticula muralis Raddi, Agrost. Bras. 33. pl 1. f. 2. 1823.

²⁵I have not seen this work. The reference is given on the authority of Hackel.

Sporobolus minutiflorus Link, Hort. Berol. 1: 88. 1827.

Sporobolus muralis Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 368. 1917.

A slender pale glabrous ascending annual 30 to 70 cm. tall, with compressed culms, flat blades 2 to 3 mm. wide, and narrow, loosely flowered panicles about half the entire length of the plant, the delicate branches ascending, the minute spikelets long-pedicelled.

Open ground, Lesser Antilles to Brazil, Bolivia, and Paraguay.

BOLIVIA: Between Río Piray and Río Cuchi, *Herzog* 1446.

2. *Sporobolus asperifolius* Nees & Mey. Nov. Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 9. 1841; 141. 1843.

A decumbent perennial 20 to 40 cm. tall, with numerous creeping rhizomes, short flat blades, and diffuse panicles 10 to 15 cm. long, the branches and long pedicels capillary; spikelets about 2 mm. long.

Moist places, southwestern United States and northern Mexico; southern Bolivia southward. Originally described from Chile.

BOLIVIA: Oploca, *Hitchcock* 22891.

In this specimen some of the spikelets are 2-flowered or even 3-flowered. Such spikelets are not infrequent in this species.

3. *Sporobolus virginicus* (L.) Kunth, Rév. Gram. 1: 67. 1829.

Agrostis virginica L. Sp. Pl. 63. 1753.

Vilfa luxurians Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only. (Arica, *Lechler* 1544.)

Culms 15 to 40 cm. tall, erect from extensively creeping, hard, scaly rhizomes, the numerous leaves conspicuously distichous, the sheaths overlapping, the blades firm, involute-pointed; panicles spikelike, commonly not over 5 cm. long.

Sandy or saline soil, Virginia, whence originally described, to Brazil and Chile. Extensive colonies of sterile plants often found along sandy beaches.

ECUADOR: Puerto Bolívar, *Hitchcock* 21101. Chanduy, *Spruce* 6449 (Kew Herb.).

PERU: Salaverry, *Macbride & Featherstone* 47a. Callao, *Didrichsen* 4383; *Wilkes Expl. Exped.* Mollendo, *Hitchcock* 22353.

4. *Sporobolus argutus* (Nees) Kunth, Enum. Pl. 1: 215. 1833.

Vilfa arguta Nees, Agrost. Bras. 395. 1829.

Vilfa ambigua Steud. Syn. Pl. Glum. 1: 153. 1854. (*Jameson* 578.)

A low tufted glabrous perennial with spreading culms, rather thick subinvolute short blades, and pale many-flowered panicles, at first contracted, at maturity narrowly pyramidal.

Open sandy or alkaline soil, southwestern United States to Argentina. Originally described from Brazil.

ECUADOR: El Recreo, *Eggers* 15701. Chanduy, *Spruce* 6450. Between Otavalo and Malchinguí, *Hitchcock* 20834. Guayaquil, *Hitchcock* 19977; *Jameson* 578 (Kew Herb.). Between Guayaquil and Salinas, *Hitchcock* 20000. Machala, *Hitchcock* 21103.

BOLIVIA: La Paz, *Hitchcock* 22594; *Bang* 79. Cotaña, *Buchtien* 3124. Reyes, *White* 1545. Cochabamba, *Hitchcock* 22787, 22834. Tarija, *Fries* 1093.

5. *Sporobolus eximius* (Nees) Ekman, Ark. för Bot. 13: 41. 1913.

Vilfa eximia Nees; Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 4¹: 77. 1840.

An erect perennial 30 to 50 cm. tall, with firm flat blades 3 to 4 mm. wide, and pyramidal open panicles 10 to 15 cm. long, the branches in whorls, naked below, the dark spikelets 5 to 6 mm. long.

Grassland, Brazil, whence originally described, to Bolivia.

BOLIVIA: Toldos, near Bermejo, *Febbrig* 2384 (Kew Herb.).

6. *Sporobolus aeneus* (Trin.) Kunth. Rév. Gram. 1: Suppl. XVII. 1830.

Vilfa aenea Trin. Gram. Icon. 1: pl. 23. 1826.

Plants in dense bunches with numerous innovations; culms 30 to 60 cm. tall, the basal sheaths (especially of the innovations) woolly or villous; blades long and narrow, firm, folded; panicle narrow but open, the branches ascending, more or less whorled; spikelets 3 mm. long, the first glume about half as long.

Sandy barrens, Brazil, whence originally described, and Bolivia.

BOLIVIA: Hacienda Casana, *Buchtien* 7147.

7. *Sporobolus purpurascens* (Swartz) Hamilt. Prodr. Pl. Ind. Occ. 5. 1825.

Agrostis purpurascens Swartz, Prodr. Veg. Ind. Occ. 25. 1788.

Culms slender, erect, tufted, with numerous short leaves at base, naked above, the blades flat or, especially on the innovations, folded; panicle 10 to 15 cm. long, the short branches in usually rather distinct whorls, spikelet-bearing to the base.

Grassy slopes, southern United States to Brazil and Ecuador. Originally described from Jamaica.

ECUADOR: Between La Toma and Loja, *Hitchcock* 21418. Between Loja and San Lucas, *Hitchcock* 21463.

8. *Sporobolus lasiophyllus* Pilger, Bot. Jahrb. Engler 37: 504. 1906.

A densely tufted perennial from a thick felty caudex with erect culms 20 to 40 cm. tall, loosely involute blades 1 to 5 cm. long, crowded at the base, felty around the sheaths, and long-exserted pyramidal panicles 2 to 5 cm. long; spikelets 3 to 4 mm. long.

Rocky slopes, Colombia to Peru. (Type, *Weberbauer* 2467.)

PERU: Prov. Tarma, *Weberbauer* 2381, 2467. Huacachi, *Macbride* 4073. Mito, *Macbride* 3315.

9. *Sporobolus mirabilis* Pilger, Bot. Jahrb. Engler 56: Beibl. 123: 27. 1920.

A tall stout perennial, with flat blades as much as 60 cm. long and 1.5 cm. wide, the lower sheaths finally flat and spirally curled and weathering to strong fibers; panicle narrow, rather dense, 30 to 35 cm. long, the spikelets 2.5 mm. long.

Known only from the type collection.

PERU: Grassy plains among shrubs, Prov. Jaen, Dept. Cajamarca, alt. 700 to 800 meters, *Weberbauer* 6186.

10. *Sporobolus indicus* (L.) R. Br. Prodr. Fl. Nov. Holl. 1: 170. 1810.

Agrostis indica L. Sp. Pl. 63. 1753.

Sporobolus jacquemontii Kunth, Rév. Gram. 2: 427. pl. 127. 1831.

Resembling *S. berterianus*, but the blades more slender, especially at base, and the branches of the panicle longer, more slender, and more or less spreading.

Grassy slopes and plains at low altitudes, Mexico to Brazil. Originally described from Jamaica.

BOLIVIA: Reyes, *White* 1536, 1658. Buena Vista, *Steinbach* 6701, 6843, 6844, 6852, 6854.

11. *Sporobolus berterianus* (Trin.) Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 370. 1917.

Vilfa berteriana Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 4¹: 100. 1840.

Vilfa familiaris Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only. (*Lechler* 1728.)

An erect tufted perennial as much as 1 meter tall, with flat blades becoming involute, especially at the slender point, and spikelike panicles mostly 10 to 25 cm. long, the branches 1 to 2 cm. long, appressed.

Open ground, southern United States to Argentina. Originally described from Santo Domingo. In South American floras this has been confused with *S. indicus*. It is probably the same as *S. elongatus* R. Br. of Australia.

ECUADOR: Quito, *Sodi* 244. Ambato, *Hitchcock* 21741. Riobamba, *Holway* 862. Alausí, *Hitchcock* 20709. Huigra, *Hitchcock* 20382. Chambo River, *Spruce* 5933 (Kew Herb.).

PERU: Lamas, *Spruce* 4855 (Kew Herb.). Colonia Perené, *Hitchcock* 22108. Tarma, *Hitchcock* 22151; *Macbride & Featherstone* 1031. Mito, *Macbride & Featherstone* 1421. Callao, *Wilkes Expl. Exped.* Ollantaytambo, *Cook & Gilbert* 477, 516, 518; *Hitchcock* 22520. Cuzco, *Hitchcock* 22507. Arequipa, *Hitchcock* 22434. Azángaro, *Lechler* 1728 (Kew Herb.).

BOLIVIA: Sorata, *Rusby* 202; *Mandon* 1285. Corolco, *Buchtien* 3637. San Felipe, *Hitchcock* 22604. La Florida, *Hitchcock* 22628. La Paz, *Rusby* 55; *Cárdenas (Mulford Biol. Expl.)* 695; *Holway* 481; *Buchtien* 503, 2527. Cochabamba, *Holway* 351; *Hitchcock* 22801. Tarija, *Fries* 1105. "Bolivian Plateau," *Bang* 2591. Buena Vista, *Steinbach* 5148.

55. ORYZOPSIS Michx.

Differing from *Stipa* chiefly in the short broad fruit and the short deciduous awn; lemma usually pubescent, the callus short, blunt, oblique; awn short, straight or flexuous, sometimes geniculate and twisted, symmetrically attached.

1. *Oryzopsis florulenta* Pilger, Bot. Jahrb. Engler 27: 26. 1899.

A slender erect perennial 1 meter tall, with flat or loosely involute, erect blades and narrow loose panicles 20 cm. long, the slender branches naked below; glumes 4 to 5 mm. long; fruit about 3 mm. long, the awn about 1.5 cm. long.

Rocky slopes, Mexico to Bolivia. Originally described from Colombia.

BOLIVIA: Sorata, *Mandon* 1270 (in part).

56. NASSELLA Desv.

Similar to *Oryzopsis* but differing in the obliquely obovate fruit, gibbous at the summit, and the excentrically attached awn; palea short, membranaceous, without nerves or keels.

Fruit 2.5 mm. long, villous.....1. *N. asplundii*.
Fruit 1.5 to 2 mm. long, villous or glabrous.....2. *N. pubiflora*.

1. *Nassella asplundii* Hitchc., sp. nov.

Perennial, cespitose; culms erect, glabrous 2-noded, 30 to 60 cm. tall; leaves mostly in a stiff basal cluster, the sheaths glabrous, those of the innovations sparsely villous at the throat; ligule very short on the innovations, 1 to 2 mm. long on the culms; blades involute, mostly less than 5 cm. long, the uppermost on the culm often not over 1 cm. long; panicle open, oblong or pyramidal, 8 to 15 cm. long, the branches few-flowered, capillary, spreading, mostly in pairs, naked below, the lowermost as much as 5 cm. long, the main axis and the branches smooth, the pedicels somewhat hirsute-scabrous; spikelets few to several on the upper half of the branches, rather loosely arranged; glumes nearly equal, broadly lanceolate, acute, about 4 mm. long, 3-nerved, the first ciliate on the keel; lemma oblong, somewhat asymmetric, densely appressed-villous, 2.5 mm. long, including the acute callus, the apex somewhat oblique, slightly crowned or thickened just below the awn, with an apiculation on one side; awn deciduous, about 1.5 cm. long, weakly twice geniculate, villous on the lower part, scabrous above.

Type in the U. S. National Herbarium no. 1,099,355, collected at Uyuni, Bolivia, altitude 3,700 meters, March 25, 1921, by Dr. E. Asplund (no. 6548).

The only other specimen seen was collected by Dr. Asplund at Atocha, altitude 3,700 meters (no. 6549).

2. *Nassella pubiflora* (Trin. & Rupr.) Desv. in Gay, Fl. Chil. 6: 264. 1853.
Urachne pubiflora Trin. & Rupr. Mém. Acad. St. Pétersb. VI. Sci. Nat. 5¹: 21. 1842.
Urachne laevis Trin. & Rupr. Mém. Acad. St. Pétersb. VI. Sci. Nat. 5¹: 20. 1842. (Peru, Meyen.)
Urachne meyeniana Trin. & Rupr. Mém. Acad. St. Pétersb. VI. Sci. Nat. 5¹: 20. 1842.
Calamagrostis anomala Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only. (Lechler 1736.)
Oryzopsis caespitosa var. *peruviana* Ball, Journ. Linn. Soc. Bot. 22: 58. 1885. (Rimac Valley, Ball in 1882.)
Nassella flaccidula var. *humilior* Hack. Repert. Nov. Sp. Fedde 6: 155. 1908. (La Paz, Buchtien 157 in part.)
Nassella corniculata Hack. Repert. Nov. Sp. Fedde 6: 155. 1908. (Buchtien 157 in part.)
Nassella deltoidea Hack. Repert. Nov. Sp. Fedde 11: 23. 1912. (Buchtien 2484.)
Piptochaetium laeve Pilger, Bot. Jahrb. Engler 56: Beibl. 123: 26. 1920.
Nassella trichophylla Henr. Med. Rijks Herb. Leiden 40: 57. 1921. (Herzog 3011.)
Stipa pflanzii Mez, Repert. Nov. Sp. Fedde 17: 206. 1921. (Palca, Bolivia, Pflanz.)

A densely caespitose, erect to spreading perennial 20 to 50 cm. tall, with flat or usually involute blades, and narrow (or sometimes open) panicles 5 to 15 cm. long, the branches mostly appressed, many-flowered, floriferous to base; fruit flattish, pubescent or glabrous, 1.5 to 2 mm. long.

Open ground and grassy hills, Ecuador to Chile. Originally described from Peru. (Meyen.)

ECUADOR: Alausí, Hitchcock 20686. Pifo, Sodiro. Urbina, Hitchcock 22018.

PERU: Obrajillo, Wilkes Expl. Exped. Baños, Wilkes Expl. Exped. Matucana, Macbride & Featherstone 228. Río Blanco, Macbride & Featherstone 731. Oroya, Macbride & Featherstone 956; Hitchcock 22178. Tarma, Macbride & Featherstone 1065; Hitchcock 22164. Arequipa, Hitchcock 22438. Cuzco, Hitchcock 22481, 22503; Holway 744. Chuquibambilla, Hitchcock 22446. Ollantaytambo, Hitchcock 22523. Rimac Valley, Ball in 1882 (Kew Herb.). Azángaro, Lechler 1736 (Kew Herb.). Lake Titicaca, Meyen (Kew Herb.). Carumas, Weberbauer 7339.

BOLIVIA: La Paz, Buchtien 157 (in part), 2484, 2485, 2486, 2487, 2489; in 1913 (Kew Herb.); Rusby 226; Holway 418, 419, 430, 449, 464, 476, 479, 497; Mandon 1270 (in part). Palca, Hitchcock 22578, 22579, 22593, 22595; Buchtien 2522, 2533. Pasña, Buchtien 1190; Asplund 6543. Samaipata, Herzog 3011 (a fragment containing also a fruit of *Stipa obtusa*).

The fruit varies in size from 1.5 mm. to 2 mm. and from glabrous to pubescent. Several species have been differentiated on these variations, but the shape of the fruit, the glumes, panicles, and vegetative characters are so similar that it appears better to unite all under one species. Pilger* unites *Urachne pubiflora* and *U. laevis*.

* Bot. Jahrb. Engler 56: 26. 1920.

57. PIPTOCHAETIUM Presl

Differing from *Nassella* chiefly in the coriaceous palea, with 2 keels and a deep furrow between, the tip projecting beyond the lemma.

Fruit tuberculate.....1. *P. tuberculatum*.
Fruit smooth, minutely striate.....2. *P. setifolium*.

1. *Piptochaetium tuberculatum* Desv. in Gay, Fl. Chil. 6: 272. 1853.

A densely cespitose perennial 10 to 30 cm. tall, with slender erect culms, fine, involute, mostly basal blades, and narrow few-flowered panicles 2 to 4 cm. long; fruit dark brown, papillate-roughened.

Grassy or rocky slopes, Bolivia to Uruguay and Chile, whence originally described.

BOLIVIA: Sorata, *Holway* 547; *Mandon* 1274. Unduavi, *Buchtien* 6431.

2. *Piptochaetium setifolium* Presl, Rel. Haenk. 1: 222. 1830.

Stipa setifolia Kunth, Enum. Pl. 1: 182. 1833.

Urachne simplex var. *peruviana* Trin. & Rupr. Mém. Acad. St. Pétersb. VI. Sci. Nat 5¹: 23. 1842.

Differing from *P. tuberculatum* in the smooth, minutely striate fruit.

Colombia to Peru, whence originally described. (*Haenke*.)

PERU: Without locality, *Haenke*, a fragment in the U. S. National Herbarium, from the type at the German University, Prague.

58. STIPA L.

Spikelets narrow; floret shorter than the membranaceous glumes, articulate obliquely above them, leaving a sharp-pointed callus at the base of the fruit; lemma indurate, terete, convolute, terminating in a prominent twisted awn with a definite line of demarcation between the body of the lemma and the awn.

Awn strongly plumose.

First segment of awn plumose.....1. *S. speciosa*.

First segment of awn villous only; the terminal segment plumose.

2. *S. plumosa*.

Awn not strongly plumose, often pubescent or villous.

Fruiting lemma not more than 3 mm. long; panicle long, narrow, dense, silvery.

Summit of lemma slightly hispidulous but not bearing long hairs.

3. *S. pampagrandsis*.

Summit of lemma bearing a dense ring of ascending or spreading hairs, 3 to 4 mm. long.

Blades closely involute.....4. *S. ichu*.

Blades flat.....5. *S. milleana*.

Fruiting lemma more than 3 mm. long, or if not, the panicle not long and dense.

Upper part of lemma pillose with long hairs (longer than those of the body).

Terminal segment of awn 2 cm. long, flexuous.....6. *S. capilliseta*.

Terminal segment of awn 1 to 1.5 cm. long, straight.

Throat of sheath villous. Ligule short.....7. *S. nardoides*.

Throat of sheath glabrous.

Panicle 5 to 6 cm. long, dense and spikelike.....8. *S. hans-meyeri*.

Panicle 12 to 20 cm. long, narrow but not dense.....9. *S. rosea*.

Upper part of lemma not conspicuously pilose, or the hairs not longer than those of the body.

Summit of lemma smooth, cylindric, forming a crown, usually slightly larger than the neck, often whitish.

Fruit 5 to 8 mm. long.

Fruit pubescent, at least in lines, to the summit, 5 to 6 mm. long.

Awns 1.5 to 3 cm. long-----10. *S. mucronata*.

Fruit pubescent only on lower part, about 8 mm. long.

11. *S. neesiana*.

Fruit less than 5 mm. long.

Fruit obovate, turgid, 2.5 to 3 mm. long-----12. *S. inconspicua*.

Fruit fusiform.

Fruit nearly glabrous above, about 3.5 mm. long--13. *S. mexicana*.

Fruit pubescent with appressed white hairs.

Fruit 2.5 to 3 mm. long-----14. *S. depauperata*.

Fruit 4 mm. long-----15. *S. brachyphylla*.

Summit of lemma not crowned.

Plants annual. Awn with scattered long hairs on the first segment.

16. *S. annua*.

Plants perennial.

Blades involute-filiform, firm.

Lemma villous, the upper hairs 1 to 2 mm. long--17. *S. dasycarpa*.

Lemma smooth on upper part or pubescent only.

Body of lemma pubescent.

Awn villous below with appressed hairs-----18. *S. curviseta*.

Awn not villous.

Fruit 3 mm. long-----19. *S. featherstonel*.

Fruit 5 mm. long-----20. *S. macbridei*.

Body of lemma glabrous.

Fruit 4 mm. long; awn 2 cm. long-----21. *S. peruviana*.

Fruit 3 mm. long; awn 1 cm. long.

Glumes obtuse, 3 mm. long-----22. *S. obtusa*.

Glumes acute, 5 mm. long-----23. *S. rigidiseta*.

Blades flat or loosely involute.

Culms much branched-----24. *S. polyclada*.

Culms simple.

Awn pilose below-----25. *S. ibarrensis*.

Awn not pilose.

Lemma 3.5 mm. long, 0.5 mm. wide; awn 3 cm. long.

26. *S. fillimanica*.

Lemma 5 mm. long, narrow; awn 4 to 5 cm. long.

27. *S. holwayi*.

1. *Stipa speciosa* Trin. & Rupr. Mém. Acad. St. Pétersb. VI. Sci. Nat. 5¹: 45. 1842.

An erect rigid bunch grass 30 to 50 cm. tall, with brown, sometimes pubescent base, firm involute sharp-pointed blades, and narrow, rather dense panicles 5 to 10 cm. long; awn with a single bend, long-plumose on the first section nearly to the bend.

Rocky slopes and desert plains, southwestern United States; southern Bolivia to Argentina and Chile, whence originally described.

BOLIVIA: Pasña, *Buchtien* 1184. Uyuni, *Asplund* 6552.

2. *Stipa plumosa* Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 2¹: 37. 1836.

A woody, erect or straggling perennial 1 to 2 meters long, with loose, wiry, knotty, mostly leafless base, loosely involute blades, and narrow loose feathery panicles 10 to 20 cm. long; awn curved or flexuous, 2 to 4 cm. long, plumose.

Rocky slopes, Peru to Argentina and Chile, whence originally described.

PERU: Obrajillo, *Wilkes Expl. Exped. Matucana, Macbride & Featherstone* 137. Ollantaytambo, *Cook & Gilbert* 684; *Hitchcock* 22557.

BOLIVIA: Comarapa, *Herzog* 1855. Pass between Oruro and Cochabamba, *Hitchcock* 22870.

3. *Stipa pampagrandensis* Speg. Anal. Mus. Nac. Montevideo 4: 158. f. 48. 1901.

A slender, erect bunch grass 50 to 100 cm. tall, with slender involute blades and narrow loose panicles 10 to 20 cm. long, not much exceeding the blades; awn about 5 cm. long, with one bend, the terminal segment very slender and flexuous.

Grassy plains, southern Bolivia and northern Argentina, whence originally described.

BOLIVIA: Junaca, near Tarija, *Fries* 1308.

4. *Stipa ichu* (Ruiz & Pav.) Kunth, Rév. Gram. 1: 60. 1829. ICHU GRASS. *Jarava ichu* Ruiz & Pav. Fl. Peruv. Chil. 1: 5. pl. 6. f. b. 1798.

Stipa eriostachya H. B. K. Nov. Gen. & Sp. 1: 127. 1816. (Ecuador.)

Stipa pungens Nees & Mey. Nov. Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 19. 1841; 151. 1843. (Peru.)

An erect bunch grass as much as 1.5 meters tall, with slender firm involute blades and narrow, silky, white, tawny, or purplish panicles as much as 40 cm. long.

Dry hills and plains, Mexico to Argentina; common in the Andes at upper altitudes; called ichu grass; used for thatching. Originally described from Peru.

ECUADOR: Quito, *Mille* 255; *Spruce* 5923. Ambato, *Pachano* 93. Punín, *Anthony & Tate* 442. Alausí, *Hitchcock* 20701. Baños, *Lehmann* 5392 (Kew Herb.). Azogues, *Rose* 22799. Riobamba, *Rose* 23575.

PERU: Oroya, *Hitchcock* 22174; *Macbride & Featherstone* 952; *Rose* 18694. Goyllarisquisca, *Hitchcock* 22293. Matucana, *Macbride & Featherstone* 254, 335. Río Blanco, *Macbride & Featherstone* 644, 645. Cuzco, *Hitchcock* 22460. Ollantaytambo, *Hitchcock* 22527; *Cook & Gilbert* 676. Chuquibambilla, *Hitchcock* 22447. Occa Pampa, *Shepard* 63. Chivay, *Weberbauer* 6893 (Field Mus.).

BOLIVIA: Sorata, *Holway* 529; *Mandon* 1273. La Paz, *Holway*, 451, 597; *Buchtien* 2492. Palca, *Hitchcock* 22558, 22581; *Buchtien* 2544, 2545. Pasña, *Buchtien* 1185. Cochabamba, *Holway* 330, 342, 345, 362, 387, 389, 399; *Hitchcock* 22785, 22812. Atocha, *Hitchcock* 22872.

5. *Stipa milleana* Hitchc. Contr. U. S. Nat. Herb. 24: 269. 1925.

A slender decumbent perennial as much as 1.5 meters tall, with flat blades as much as 1 cm. wide, and tawny or green, narrow or spikelike, more or less interrupted panicles as much as 30 cm. long.

Open grassland and among shrubs, Ecuador. (Type, *Mille* 256.)

ECUADOR: Quito, *Mille* 256, 259, 392; *Jameson* 251 (Kew Herb.); *Sodi* in 1893. Alausí, *Hitchcock* 20698, 20727. Without locality, *Spruce* 5958 (Kew Herb.).

6. *Stipa capilliseta* Hitchc. Contr. U. S. Nat. Herb. 24: 271. 1925.

An erect, densely caespitose, pale, slender perennial 50 cm. tall, with long slender involute blades, and narrow dense panicles 10 to 15 cm. long.

Known only from the type collection.

BOLIVIA: Chiguana, *Asplund* 6586.

7. *Stipa nardoides* (R. A. Phil.) Hack.; Hitchc. Contr. U. S. Nat. Herb. 24: 271. 1925.

Danthonia nardoides R. A. Phil. Anal. Mus. Nac. Chile Bot. 8: 84. 1891.

Stipa pachypus Pilger, Bot. Jahrb. Engler 56: Beibl. 123: 25. 1920.

(*Weberbauer* 1487.)

A densely caespitose perennial 20 to 40 cm. tall, with short involute blades, closely aggregate, forming a basal tuft or cushion, and narrow, pale or purple panicles 5 to 10 cm. long.

Rocky slopes, Peru to Bolivia and northern Chile. Originally described from Tarapacá, Chile.

PERU: Mollendo, *Hitchcock* 22350; *Rose* 19535; *Weberbauer* 1487.

BOLIVIA: Uyuni, *Asplund* 6539.

8. *Stipa hans-meyeri* Pilger, Bot. Jahrb. Engler 56: Beibl. 123: 24. 1920.

Stipa nivalis Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only.

(*Lechler* 1978.)

Similar to *S. nardoides*, the blades longer, the panicles purple.

Dry slopes, Ecuador to Bolivia. (Type, *Hans Meyer* 139.)

ECUADOR: Mount Chimborazo, alt., 4,500 meters, *Hans Meyer* 139.

PERU: Cerro de Pasco, *Hitchcock* 22241. Río Blanco, *Macbride & Featherstone* 803. Sandía, *Weberbauer* 1025. Between Cuyo-cuyo and Poto, *Weberbauer* 940. Ayapata, *Lechler* 1978 (Kew Herb.). Paucartambo, *Weberbauer* 6966 (Field Mus.).

BOLIVIA: Pongo, *Hitchcock* 22777. Sorata, *Mandon* 1272. La Cumbre, *Asplund* 6513, 6515. Comanche, *Asplund* 6564.

9. *Stipa rosea* Hitchc. Contr. U. S. Nat. Herb. 24: 272. 1925.

An erect, densely caespitose perennial, 50 to 60 cm. tall, with slender stiff involute blades and narrow, rose-tinted, rather loose panicles 12 to 20 cm. long.

Open ground. Known only from the type collection.

ECUADOR: Between San Lucas and Oña, *Hitchcock* 21523.

10. *Stipa mucronata* H. B. K. Nov. Gen. & Sp. 1: 225. 1816.

Stipa setigera Presl, Rel. Haenk. 1: 226. 1830.

Stipa trochlearis Nees & Mey. Nov. Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 19. 1841; 151. 1843.

An erect or geniculate, tufted perennial 60 to 100 cm. tall, with flat or loosely involute blades (those of the innovations involute), and narrow, rather loose, mostly purplish panicles 10 to 30 cm. long.

Dry hills and plains, Mexico, whence originally described, to Argentina and Chile. Common in the Andes in fields, open ground, and along irrigating ditches.

ECUADOR: Tulcán, *Hitchcock* 20975, 20994, 21037, 21092. Between Malchingui and Pomasqui, *Hitchcock* 20901. Quito, *Rose* 24029; *Harteman* 22, 58; *Spruce* 5406; *Mille* 257. Riobamba, *Mille* 57. Huigra, *Hitchcock* 20610, 20743, 20757, 20771. Alausí, *Hitchcock* 20721. Baños, *Hitchcock* 21900, 21920.

PERU: Goyllarisquisca, *Hitchcock* 22299, 22307. Hacienda Chinche, *Macbride & Featherstone* 1283. Baños, *Wilkes Expl. Exped.* Hacienda Atocsaico, *Hitchcock* 22211. Oroya, *Hitchcock* 22181. Matucana, *Macbride & Featherstone* 378. Cuzco, *Holway* 763 (follage pubescent); *Hitchcock* 22483, 22505. Ollantaytambo, *Hitchcock* 22556.

BOLIVIA: Sorata, *Holway* 511; *Mandon* 1276 (Kew Herb.). La Paz, *Holway* 423; *Buchtien* 430 (Kew Herb.), 856, 3962; *Cárdenas (Mulford Biol. Expl.)* 70 S; *Asplund* 6560. Palca. *Hitchcock* 22577, 22580. Cochabamba, *Hitchcock* 22799.

11. *Stipa neesiana* Trin. & Rupr. Mém. Acad. St. Pétersb. VI. Sci. Nat. 5¹: 27. 1842.

Stipa manicata Desv. in Gay, Fl. Chil. 6: 288. 1853.

Resembling *S. mucronata*, but with longer awns and longer lemmas, pubescent only on the lower part.

Open ground, grassy places, and fields, Ecuador to Argentina and Chile. Originally described from Uruguay.

ECUADOR: La Rinconada Ranch, *Hitchcock* 20809. Quito, *Holmgren* 527.

PERU: Cuzco, *Hitchcock* 22502, 22510.

BOLIVIA: Sorata, *Rusby* 237; *Mandon* 1276 (N. Y. Bot. Gard.). Cochabamba, *Holway* 328; *Hitchcock* 22850.

12. *Stipa inconspicua* Presl, Rel. Haenk. 1: 227. 1830.

Urachne haenkeana Trin. & Rupr. Mém. Acad. St. Pétersb. VI Sci. Nat. 5¹: 20. 1842.

Nassella caespitosa Griseb. Abh. Ges. Wiss. Göttingen 19: 258. 1874.

Stipa caespitosa Speg. Anal. Mus. Nac. Montevideo 4: 117. f. 31. 1901.

Stipa sodiroana Hack. Oesterr. Bot. Zeitschr. 52: 10. 1902. (Quito, *Sodiro*.)

Nassella flaccidula Hack. Repert. Nov. Sp. Fedde 6: 154. 1908. (*Buchtien* 157 in part.)

A low, densely caespitose perennial 10 to 20 cm. tall, with flat or involute blades and narrow panicles 5 to 10 cm. long.

Rocky plains and hills, Peru to Argentina. Original locality uncertain, but probably Peru.

ECUADOR: Riobamba, *Mille* 258. Between La Toma and Loja, *Hitchcock* 21381. Between Loja and San Lucas, *Hitchcock* 21455. Between Oña and Cuenca, *Hitchcock* 21605. Santa Rosa, *Rose* 23938.

PERU: Obrajillo, *Wilkes Expl. Exped.* Baños, *Wilkes Expl. Exped.* Río Blanco, *Macbride & Featherstone* 648. La Quinhua, *Hitchcock* 22258; *Macbride & Featherstone* 2033. Goyllarisquisca, *Hitchcock* 22292, 22295, 22311. Cuzco, *Hitchcock* 22452, 22514. Juliaca, *Harlan* in 1914.

BOLIVIA: Sorata, *Holway* 508. Lake Titicaca, *Buchtien* 2550; *Asplund* 6555, 6558. La Paz, *Buchtien* 157 in part; *Holway* 461, 600. Pongo, *Hitchcock* 22771. Unduavi, *Buchtien* 4257. Pasña, *Buchtien* 1188, 1189, Cochabamba, *Holway* 398; *Hitchcock* 22800, 22833, 22854. Atocha, *Hitchcock* 22880. Oro Ingenio, *Hitchcock* 22926. Ingenio del Oro, *Rusby* 247. Oruro, *Rose* 18925. Chiguana, *Asplund* 6553.

13. *Stipa mexicana* Hitchc. Contr. U. S. Nat. Herb. 24: 247. 1925.

A tufted perennial, mostly 20 to 30 cm. tall, erect or sometimes spreading or prostrate, the culms as much as 60 cm. long, with narrow, flat or involute, mostly basal blades, and narrow, rather loose, mostly purple panicles 5 to 15 cm. long.

Grassy slopes, Mexico to Peru. Originally described from the State of Mexico.

PERU: Mito, *Macbride & Featherstone* 1876.

14. *Stipa depauperata* Pilger, Bot. Jahrb. Engler 56: Beibl. 123: 23. 1920.

Stipa leptothera var. *atroviolacea* Hack. Repert. Nov. Sp. Fedde 6: 154. 1908. (*Buchtien* 855.)

Stipa depauperata var. *humilis* Pilger, Bot. Jahrb. Engler 56: Beibl. 123: 23. 1920. (*Weberbauer* 2615.)

Stipa depauperata var. *glabrata* Pilger, Bot. Jahrb. Engler 56: Beibl. 123: 23. 1920. (*Weberbauer* 3076.)

Stipa pumila Mez, Repert. Nov. Sp. Fedde 17: 205. 1921. (*Palea, Pflanz.*)

A spreading caespitose perennial 20 to 50 cm. tall, with short, involute, mostly basal blades, and narrow, loose, brownish or purplish panicles 10 to 15 cm. long.

Grassy slopes, Ecuador to Bolivia. Originally described from Peru. (Type, *Weberbauer* 6903.)

ECUADOR: Alausí, *Hitchcock* 20708, 20712. Cotapaxi Station, *Hitchcock* 20774.

PERU: Sumbay, *Weberbauer* 6903, 6906 (Field Mus.). Caraz, *Weberbauer* 3076. Oroya, *Weberbauer* 2615.

BOLIVIA: La Paz, *Holway* 492. Calacoto, *Asplund* 6565. La Paz, *Buchtien* 855.

15. *Stipa brachyphylla* Hitchc. Contr. U. S. Nat. Herb. 24: 275. 1925.

A caespitose, erect or spreading perennial 20 to 40 cm. tall, with short, involute, mostly basal blades, and narrow, rather few-flowered panicles 5 to 15 cm. long.

Dry plains and rocky slopes, Ecuador to Argentina. Originally described from Bolivia. (Type, *Buchtien* 858.)

ECUADOR: Between Oña and Cuenca, *Hitchcock* 21590.

PERU: Casa Cancha, *Wilkes Expl. Exped.* Río Blanco, *Macbride & Featherstone* 669. Tarma, *Hitchcock* 22161. Oroya, *Hitchcock* 22183. Cerro de Pasco, *Hitchcock* 22226, 22243. Between Juliaca and Cuzco, *Hitchcock* 22444.

BOLIVIA: Isla del Sol, *Asplund* 6557. La Paz, *Holway* 433; *Buchtien* 858.

16. *Stipa annua* Mez, Repert. Nov. Sp. Fedde 17: 204. 1921.

A low spreading annual, 10 to 15 cm. tall.

Mountain slopes, Peru. (Type, *Weberbauer* 5353.)

PERU: Chosica, *Weberbauer* 5353. Moquegua, *Weberbauer* 7442. Mollendo, *Johnston* 3536.

17. *Stipa dasycarpa* Hitchc. Contr. U. S. Nat. Herb. 24: 281. 1925.

An erect, closely caespitose perennial 30 to 40 cm. tall, with slender firm involute blades, and narrow, rather loose, few-flowered panicles 10 to 15 cm. long.

Known only from the type collection.

BOLIVIA: Chiguana, *Asplund* 6562.

18. *Stipa curviseta* Hitchc. Contr. U. S. Nat. Herb. 24: 282. 1925.

A caespitose perennial 30 to 50 cm. tall, with involute blades and loose purple panicles 10 to 15 cm. long, the branches slender, spreading, the lower naked below, as much as 5 cm. long.

Dry hills, southern Bolivia. (Type, *Asplund* 6551.)

BOLIVIA: Atocha, *Asplund* 6547, 6550. Chiguana, *Asplund* 6554. Uyuni, *Asplund* 6551.

19. *Stipa featherstonei* Hitchc. Proc. Biol. Soc. Washington 36: 196. 1923.

An erect caespitose perennial 20 to 40 cm. tall, with slender, involute, rather soft blades, and short dense purplish panicles 3 to 5 cm. long.

Mountain slopes, Peru. Known only from the type collection.

PERU: Río Blanco, *Macbride & Featherstone* 803a.

20. *Stipa macbridei* Hitchc. Proc. Biol. Soc. Washington 36: 197. 1923.

A branched, straggling, rather woody perennial with short blades, flat below and capillary-involute above, and narrow loose panicles 15 to 20 cm. long.

Rocky slopes, Peru. (Type, *Macbride & Featherstone* 452.)

PERU: Matucana, *Macbride & Featherstone* 452. Ambo, *Macbride* 3176.

21. *Stipa peruviana* Hitchc. Contr. U. S. Nat. Herb. 24: 285. 1925.

Stipa lechleriana Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only. (*Lechler* 1735.)

Allied to *S. obtusa* but with larger fruits and longer awns.

Known only from the type collection.

PERU: Azángaro, *Lechler* 1735.

22. *Stipa obtusa* (Nees & Mey.) Hitchc. Contr. U. S. Nat. Herb. 24: 284. 1925.

Helopus obtusus Steud. Nom. Bot. ed. 2. 1: 747. 1840, name only (with *Piptatherum obtusum* Nees & Meyen given as a synonym).

Piptatherum obtusum Nees & Mey. Nov. Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 18. 1841; 150. 1843.

Urachne obtusa Trin. & Rupr. Mém. Acad. St. Pétersb. VI. Sci. Nat. 5: 22. 1842.

Stipa boliviensis Hack. Repert. Nov. Sp. Fedde 11: 21. 1912. (*Buchtien* 2489.)

Oryzopsis neesii Pilger, Bot. Jahrb. Engler 56: 26. 1920.

A densely caespitose, erect bunch grass 20 to 40 cm. tall, with numerous erect stiff slender involute blades, sometimes nearly as long as the culms, and narrow panicles 5 to 15 cm. long, the branches appressed; glumes obtuse, 8 mm. long.

Dry plains, Bolivia and Peru. Originally described from Arequipa. (*Meyen* in 1831.)

PERU: Arequipa, *Meyen* in 1831 (fragment).

BOLIVIA: La Paz, *Buchtien* 184 (N. Y. Bot. Gard.), 2489. Palca, *Buchtien* 2539.

Asplund's no. 6545, from Challapata, the inflorescence affected by fungus, may belong here.

23. *Stipa rigidisetata* (Pilger) Hitchc. Contr. U. S. Nat. Herb. 24: 285. 1925.

Oryzopsis rigidisetata Pilger, Bot. Jahrb. Engler 56: Beibl. 123: 26. 1920.

Differing from *S. obtusa* in the acute glumes 5 mm. long, the shorter fruit (3 mm. instead of 3.5 mm.), and the scabrous instead of scabrous-pubescent awns.

Known only from the type collection.

PERU: Azángaro, *Weberbauer* 475.

24. *Stipa polyclada* Hack.; Stuck. Anal. Mus. Nac. Buenos Aires 21: 80. 1911.

A branched, wiry, rather woody, straggling perennial with fasciated branches, short blades, and loose narrow panicles 5 to 10 cm. long.

Rocky slopes and canyons, southern Bolivia and northern Argentina, whence originally described.

BOLIVIA: Uyuni, *Asplund* 6563.

Asplund's no. 6556, Isla del Sol, the inflorescence affected by fungus, may belong here.

25. *Stipa ibarrensis* H. B. K. Nov. Gen. & Sp. 1: 125. 1816.

Stipa patulifolia Pilger, Bot. Jahrb. Engler 27: 26. 1899. (*Lehmann* 5286.)

A caespitose erect spreading perennial 30 to 60 cm. tall, with flat or involute blades and narrow pale panicles 10 to 20 cm. long.

Cliffs, walls, and grassy slopes, Ecuador, the type being from Ibarra. (*Bonpland*.)

ECUADOR: Between Malchingui and Pomasqui, *Hitchcock* 20898. Quito, *Rose* 23536, 23574, 24066; *Holway* 907. Mount Cotopaxi, *Sodiño* in 1890. Ambato, *Hitchcock* 21709, 21716, 21719, 21745. Baños, *Hitchcock* 21913; *Lehmann* 5286 (Kew Herb.). Riobamba, *Mille* 254; *Spruce* 5817 (Kew Herb.).

26. *Stipa illimánica* Hack. Repert. Nov. Sp. Fedde 11: 22. 1912.

A loosely caespitose, erect, or spreading perennial, with loosely involute blades and narrow pale panicles 10 cm. long.

Rocky slopes. Known only from the type collection.

BOLIVIA: Cotaña, *Buchtien* 3134.

27. *Stipa holwayi* Hitchc. Contr. U. S. Nat. Herb. 24: 287. 1925.

An erect or somewhat geniculate perennial about 1 meter tall, with flat or involute blades and narrow loose panicles 15 to 25 cm. long.

Apparently confined to Bolivia. (Type, *Holway* 380.)

BOLIVIA: Cochabamba, *Holway* 380. Challapata, *Asplund* 6546.

STIPA TULCANENSIS Mez, Repert. Nov. Sp. Fedde 17: 206. 1921. Described from Tulcán, Ecuador (*André*). This species has not been identified.

59. *ARISTIDA* L.

Spikelets in close or open panicles; glumes acuminate; lemma convolute, subindurate, with a pointed callus and bearing from the apex a usually trifid awn.

Plants annual.

Fruit 2 to 3 mm. long; awns united into a column at base...1. *A. capillacea*.

Fruit about 8 mm. long; awns not united into a column...2. *A. adscensionis*.

Plants perennial.

Lateral awns obsolete.....3. *A. schiedeana*.

Lateral awns present, usually as long as the central.

Column 1 to 3 cm. long, twisted.

Awns 3 to 5 cm. long; column 2 to 3 cm. long; base of callus entire.

4. *A. implexa*.

Awns about 2 cm. long; column about 1 cm. long; base of callus 2-toothed.....5. *A. riparia*.

Column short or none.

Glumes very unequal, the first about 9 mm. long, the second 2 to 3 mm. long.....6. *A. mendocina*.

Glumes equal or slightly unequal.

Panicle open, the distant spreading branches naked at base.

7. *A. spadicea*.

Panicle narrow, the branches ascending.

Awns contorted or loosely spiral at base.

Blades involute; plant 10 to 30 cm. tall.....8. *A. setifolia*.

Blades flat; plant 50 to 100 cm. tall.....9. *A. marginalis*.

Awns straight at base.

Blades involute; awns 1 to 1.5 cm. long.....10. *A. enodis*.

Blades flat; awns 1.5 to 3 cm. long.

Glumes about 7 mm. long.....11. *A. circinalis*.

Glumes about 10 mm. long.....12. *A. complanata*.

1. *Aristida capillacea* Lam. Tabl. Encycl. 1: 156. 1791.

Aristida elegans Rudge, Pl. Guian. 22. pl. 30. 1805.

A delicate tufted annual 10 to 20 cm. tall; panicles narrow but somewhat open; fruit (excluding awns) 3 mm. long, the awns equal, about 5 mm. long.

Open ground, southern Mexico to Ecuador and Brazil. Originally described from tropical America.

ECUADOR: Between Portovelo and El Tambo, *Hitchcock* 21294.

BOLIVIA: Guanay, *Rusby* 208.

2. *Aristida adscensionis* L. Sp. Pl. 82. 1753.

Aristida humilis H. B. K. Nov. Gen. & Sp. 1: 121. 1816.

Aristida bromoides H. B. K. Nov. Gen. & Sp. 1: 122. 1816. (Ecuador.)

Aristida mandoniana Henr. Med. Rijks Herb. Leiden 40: 55. 1921. (*Mandon* 1277.)

A densely tufted, glabrous annual, the slender wiry culms ascending or erect from a geniculate base, freely branching from the lower nodes, the narrow blades commonly involute, the nodding or erect panicles about 10 to 15 cm. long, the slender branches short, appressed, or sometimes the lower 5 cm. long or more, spreading and flexuous, the spikelets short-pedicelated, mostly clustered, the equal awns 12 to 20 cm. long. Extremely variable in appearance, ranging from dwarf plants with narrow compact panicles to larger plants, as much as 70 cm. tall, with flexuous panicles.

Open dry ground and waste places, throughout the warmer parts of America and the Old World. Originally described from the island of Ascencion.

ECUADOR: Riobamba, *Mille* 247; *Spruce* 5918 (Kew Herb.). Huigra, *Rose* 22419, 24024. Between Huigra and Naranjapata, *Hitchcock* 20661. Alausí, *Hitchcock* 20687. Between La Toma and Loja, *Hitchcock* 21398, 21404. Between Portovelo and El Tambo, *Hitchcock*, 21293. Chanduy, *Spruce* 6435 (Kew Herb.).

PERU: Obrajillo, *Wilkes Expl. Exped.* Huánuco, *Macbride* 3511, 3513. Ambo, *Macbride* 3177. Matucana, *Macbride & Featherstone* 220, 342. Chosica, *Macbride & Featherstone* 543. Arequipa, *Rose* 18802; *Holway* 770, 771. Tarma, *Hitchcock* 22168. Ollantaytambo, *Hitchcock* 22553; *Cook & Gilbert* 520. Cota-huasi, *Weberbauer* 5938, 6867 (both in Field Mus.). Prov. Plura, *Weberbauer* 5963 (Field Mus.). Torata, *Weberbauer* 7410. Near Pisco, *Weberbauer* 5380 (Field Mus.).

BOLIVIA: La Paz, *Buchtien* 551, 2493; *Holway* 489. Sorata, *Mandon* 1277. Cotaña, *Buchtien* 208, 3129. Cochabamba, *Hitchcock* 22817. Tarija, *Fries* 1065. Chaco, *Fries* 1472. Chiguana, *Asplund* 6540.

3. *Aristida schiedeana* Trin. & Rupr. Mém. Acad. St. Pétersb. VI. Sci. Nat. 5¹: 120. 1842.

An erect perennial as much as 1 meter tall with flat blades (curled or flexuous with age) and open panicles, the distant branches spreading, naked below, the spikelets appressed along the upper part of the branchlets; column twisted; lateral awns obsolete.

Dry grassy slopes, Texas to Ecuador. Originally described from Mexico.

ECUADOR: Huigra, *Hitchcock* 20765. Between La Toma and Loja, *Hitchcock* 21408.

4. *Aristida implexa* Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 2¹: 48. 1836.

A rather stout erect perennial 40 to 60 cm. tall, with flat or loosely involute blades, densely pilose above near base, and dense narrow panicles 15 to 20 cm. long, the twisted column of the awns 2 to 3 cm. long, the awns 3 to 5 cm. long.

Grassy plains, Brazil, whence originally described, to Paraguay and Bolivia.

BOLIVIA: Buena Vista, *Steinbach* 5352, 7029.

5. *Aristida riparia* Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 2¹: 48. 1836.

An erect cespitose perennial about 80 cm. tall with rather thick blades, flat on the main culms, involute on the innovations, and narrow compact panicles 8 to 15 cm. long; glumes about equal, awned; lemma about 6 mm. long, extending into a twisted beak or column about 1 cm. long, the base of callus 2-toothed; awns about equal, 1.5 to 2 cm. long.

Grassy plains, Brazil, whence originally described, to Paraguay and Bolivia.

BOLIVIA: Chulumani, *Hitchcock* 22702.

6. *Aristida mendocina* R. A. Phil. Anal. Univ. Chil. 36: 205. 1870.

Aristida cordobensis Hack.; Stuck. Anal. Mus. Nac. Buenos Aires 11: 91. 1904.

Aristida inversa Hack. in Fries, Ark. för Bot. 8: 37. 1908.

A slender caespitose perennial 30 to 60 cm. tall, with loosely involute blades and narrow, rather loose panicles 10 to 20 cm. long, the branches ascending; glumes obtuse, very unequal, the first about 9 mm. long, the second 2 to 3 mm. long; lemma a little shorter than the first glume, compressed toward the summit; awns nearly equal, about 2 cm. long.

Grassy plains and hills, Argentina to Bolivia. Originally described from northern Argentina.

BOLIVIA: Gran Chaco, Fortin Crevaux ad Río Pilcomayo, *Fries* 1589.

7. *Aristida spadicea* H. B. K. Nov. Gen. & Sp. 1: 123. 1816.

Aristida oligophylla Pilger, Bot. Jahrb. Engler 25: 711. 1898. (*Stübel* 153.)

An erect caespitose perennial 50 to 100 cm. tall, with flat blades becoming flexuous with age, and open panicles with few distant spreading branches, the spikelets appressed along the upper parts of the branchlets; glumes about equal, 8 to 12 mm. long, awn-pointed; lemmas 10 to 15 mm. long, including the twisted summit 3 to 5 mm. long; awns 10 to 15 mm. long, the lateral shorter than the central.

Plains and grassy slopes, Mexico to Ecuador. Originally described from Mexico, Venezuela, and Guayaquil. (*Bonpland.*)

ECUADOR: Alausí, *Hitchcock* 20716. Quito, *Jameson* 107 (Kew Herb.). Prov. Imbabura, *Stübel* 153.

8. *Aristida setifolia* H. B. K. Nov. Gen. & Sp. 1: 122. 1816.

Aristida tarapotana Mez, Repert. Nov. Sp. Fedde 17: 151. 1921. (Tarapoto, *Spruce.*)

An erect or spreading, caespitose perennial, mostly 10 to 30 cm. tall, rather delicate, with short involute sharp-pointed blades, and loose narrow panicles 10 to 15 cm. long; glumes somewhat unequal; lemma about 6 mm. long, the equal awns 10 to 15 mm. long, spirally contorted at base.

Open ground. Colombia to Brazil and Peru. Originally described from Venezuela.

PERU: Paíta, *Safford* 14. Tarapoto, *Spruce* 4526 (Kew Herb.).

The Tarapoto specimen, which is immature, may represent a distinct species. More material is needed to determine this. The awns are longer than usual in *A. setifolia*. Mez cites a *Spruce* specimen from Tarapoto (see *A. tarapotana* above) without number. This is probably no. 4526.

9. *Aristida marginalis* Ekman, Ark. för Bot. 10ⁱⁱ: 23. pl. 3, 6. 1911.

An erect caespitose perennial 50 to 100 cm. tall, with flat blades, flexuous with age, and rather loose and narrow, more or less nodding panicles 10 to 20 cm. long, the branches ascending; glumes about equal, 5 to 7 mm. long; lemma about 8 mm. long, including the narrowed and slightly twisted summit; awns about equal, 8 to 15 mm. long.

Grassy plains and slopes, Colombia to Paraguay. Originally described from Brazil.

ECUADOR: Huigra, *Hitchcock* 20761. Between Portovelo and El Tambo, *Hitchcock* 21305. Between El Tambo and La Toma, *Hitchcock* 21353.

10. *Aristida enodis* Hack. Repert. Nov. Sp. Fedde 11: 21. 1912.

Aristida antoniana Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only. (*Lechler* 1774.)

Aristida pflanzii Mez, Repert. Nov. Sp. Fedde 17: 151. 1921. (*Pflanz*, Bolivia.)

An erect caespitose perennial 10 to 40 cm. tall, with involute blades and compact, mostly purple panicles 3 to 8 cm. long; glumes equal, mucronate, about 1 cm. long; lemma about 1 cm. long, including the short slightly twisted summit; awns spreading, 1 to 1.5 cm. long, the central a little longer than the lateral.

Alpine slopes and punas, Peru and Bolivia, whence originally described. (Type, *Buchtien* 2540.)

PERU: Oroya, *Macbride & Featherstone* 983. Yanahuanca, *Macbride & Featherstone* 1254. Azángaro, *Lechler* 1774 (Kew Herb.).

BOLIVIA: Palca, *Buchtien* 2540. Viacha, *Buchtien* 857. Isla del Sol, *Asplund* 6541. General Campero, *Asplund* 6542. Sorata, *Mandon* 1277 (Kew Herb.). Buena Vista, *Steinbach* 6807.

ARISTIDA ASPLUNDII *Henr. Med. Rijks Herb. Leiden* 54: 42. 1926. Type, *Asplund* 2525, collected at Ullama, near Calacoto, Bolivia. Other specimens cited are *Asplund* 2787 from the same Province, and *Buchtien* 857, included above under *A. enodis*. I have not seen the *Asplund* specimens.

11. *Aristida circinalis* *Lindm. Svensk. Vet. Akad. Handl.* 34^a: 13. pl. 7a. 1900.

An erect slender caespitose perennial 50 to 80 cm. tall, with mostly basal, elongate blades, flat below, ending in a slender involute flexuous point, the panicles narrow but rather loose, 10 to 20 cm. long; glumes about equal, acute or mucronate, about 7 mm. long; lemma about as long as or a little shorter than the glumes, including a thickish scarcely twisted beak of 3 to 4 mm.; awns spreading, slightly spiral or contorted at base, about equal, mostly 1.5 to 2.5 cm. long.

Grassy slopes, Brazil to Bolivia. Originally described from Rio Grande do Sul.

BOLIVIA: Chulumani, *Hitchcock* 22711. Coripata, *Hitchcock* 22876.

ARISTIDA FRIESII *Henr. Med. Rijks Herb. Leiden* 54: 186. 1926. Type, *Fries* 1301a, collected at Junaca near Tarija. I have not seen this specimen. The species appears to be allied to *A. circinalis*.

12. *Aristida complanata* *Trin. Mém. Acad. St. Pétersb. VI. Math. Phys. Nat.* 1: 85. 1830.

Aristida leptochaeta *Hack. Repert. Nov. Sp. Fedde* 6: 344. 1909.

Aristida teretifolia *Arech. Anal. Mus. Nac. Montevideo* 4: 79. pl. 4. 1903.

Aristida longiramea var. *boliviana* *Henr. Med. Rijks Herb. Leiden* 40: 56. 1921. (*Herzog* 1442.)

An erect caespitose perennial 30 to 50 cm. tall, with flat blades becoming flexuous with age, and narrow, somewhat interrupted panicles 10 to 20 cm. long; glumes nearly equal, a little more than 1 cm. long, the lemma a little shorter; awns about equal, 2 to 3 cm. long.

Grassy plains, Brazil, whence originally described, to Paraguay and Bolivia.

BOLIVIA: Cochabamba, *Holway* in 1920. Buena Vista, *Steinbach* 5355. Between Río Piray and Río Cuchi, *Herzog* 1442.

ARISTIDA CRINITA *Presl, Rel. Haenk.* 1: 223. 1830. The habitat of this species is given as "in arenosis Peruviae." The type specimen at the German University, Prague, is *Aristida murina* *Cav.*, and the label bears no data as to locality. *Aristida murina* is found in Uruguay and Argentina but is not known from Peru. The published locality is probably an error.

60. NAZIA Adans.

Spikelets in clusters of 2 (in our species), their flat faces contiguous, their second glumes outermost, strongly convex, covered with stout uncinuate spines.

1. *Nazia aliena* (Spreng.) Scribn. U. S. Dept. Agr. Div. Agrost. Bull. 17: 28. f. 324. 1899.

Lappago aliena Spreng. Neu. Entd. 3: 15. 1822.

A low spreading annual, with flat ciliate blades and spikes of small crowded burs.

Open arid ground, southwestern United States and the West Indies to Argentina; also Asia and Africa. Originally described from Brazil.

ECUADOR: Chanduy, *Spruce* 6441. Without locality, *Spruce* 5802, (both Kew Herb.).

PERU: Matucana, *Macbride & Featherstone* 343. Between Río de los Trancas and Llaxwa, *Hrdlička* in 1913. Mollendo, *Hitchcock* 22352.

BOLIVIA: Milluhuaya, *Buchtien* 4176. Chulumani, *Hitchcock* 22649. Sorata, *Mandon* 1268 (Kew Herb.).

61. ANTHEPHORA Schreb.

Spikelets in clusters of 4, the indurate first glumes united at base, forming a pitcher-shaped pseudo-involucre, the clusters sessile and erect on a slender flexuous continuous axis.

1. *Anthephora hermaphrodita* (L.) Kuntze, Rev. Gen. Pl. 2: 759. 1891.

Tripsacum hermaphroditum L. Syst. Nat. ed. 10. 2: 1261. 1759.

Anthephora elegans Schreb. Besch. Gräs. 2: 105. 1810.

A leafy, ascending or decumbent, branching annual, with flat thin blades, the erect spikes 5 to 10 cm. long.

A common weed in the lowlands of tropical America. Originally described from Jamaica.

ECUADOR: Oil Camp between Guayaquil and Salinas, *Hitchcock* 20032. Chanduy, *Spruce* 6440 (Kew Herb.). Without locality, *Jameson* 350 (Kew Herb.).

PERU: Tarapoto, *Spruce* 4402 (Kew Herb.). Near Piura, *Weberbauer* 5950 (Field Mus.).

62. AEGOPOGON Humb. & Bonpl.

Spikelets short-pedicellate, in groups of 3, the groups short-pedunculate, spreading, the peduncle disarticulating from the axis and forming a pointed stipe below the group, this falling entire; central spikelet short-pedicellate, fertile, the 2 lateral ones longer-pedicellate and staminate or neuter; glumes membranaceous, notched at apex, the mid nerve extending into a point or awn; lemma and palea thinner than the glumes, extending beyond them, the lemma 3-nerved, the central nerve and sometimes also the lateral ones extending into awns, the palea 2-awned.

Spikelets in groups of 3.....1. *A. cenchroides*.

Spikelets in groups of 2.....2. *A. bryophilus*.

1. *Aegopogon cenchroides* Humb. & Bonpl.; Willd. Sp. Pl. 4: 899. 1806.

Aegopogon pusillus Beauv. Ess. Agrost. 122. pl. 22. f. 4. 1812. (Said to be from Peru.)

Aegopogon submuticus Rupr. Mém. Acad. St. Pétersb. VI. Sci. Nat. 4²: 25. 1840. (*Haenke*, Peru?)

A delicate spreading much-branched annual, with flat blades 2 to 4 cm. long and 1 to 2 mm. wide, and 1-sided racemes 2 to 3 cm. long, the clusters of purplish spikelets on short flexuous pedicels.

Damp cliffs, walls, and banks, Mexico to Bolivia. Originally described from Venezuela.

In dry open places the tufts are 10 to 30 cm. tall; in damp shady places the slender culms may be a meter long.

ECUADOR: Tulcán *Hitchcock* 21026. Otavalo, *Hitchcock* 20819. Quito, *Jameson* 630; *Harteman* 26, 56; *Mille* 242; *Holway* 914; *Spruce* 5408 (Kew Herb.). Baños, *Hitchcock* 21922; *Tate* 600. Between La Toma and Loja, *Hitchcock* 21419. Alausí, *Hitchcock* 20717. Cuenca, *Rose* 22887. Between Loja and Portovelo, *Rose* 23318.

PERU: Ollantaytambo, *Cook & Gilbert* 699. Huánuco, *Macbride & Featherstone* 2118. Mito, *Macbride & Featherstone* 1427. Tarma, *Hitchcock* 22155. Cuzco, *Hitchcock* 22465.

BOLIVIA: Sorata, *Holway* 535; *Mandon* 1296 (Kew Herb.); *Rusby* 200. Unduavi, *Buchtien* 2578. Cochabamba, *Hitchcock* 22820, 22843.

2. *Aegopogon bryophilus* Doell in Mart. Fl. Bras. 2¹: 239. 1880.

Aegopogon geminiflorus var. *muticus* Pilger, Bot. Jahrb. Engler 27: 25. 1899. (*Bang* 1307.)

Aegopogon argentinus Mez, Repert. Nov. Sp. Fedde 17: 145. 1921.

Aegopogon fiebrigii Mez, Repert. Nov. Sp. Fedde 17: 145. 1921. (*Fiebrig* 2865.)

Differing from *A. cenchroides* in having but 2 spikelets in the group, one sessile and normally developed, the other pediceled and much reduced.

Moist cliffs, Brazil, whence originally described, to Argentina and Bolivia.

PERU: Matucana, *Macbride & Featherstone* 186.

BOLIVIA: San Felipe, *Hitchcock* 22603. Sorata, *Bang* 1307. Hacienda Casana, *Buchtien* 7144. Camacho, *Fiebrig* 2865.

All the forms of *Aegopogon* are probably to be referred to *A. cenchroides*. The glumes are variable in shape and size. *A. bryophilus* and *A. argentinus* are like *A. geminiflorus muticus*, and *A. geminiflorus* appears to be a form of *A. cenchroides* with 2 spikelets in each cluster. *A. fiebrigii* is still more reduced, both lateral spikelets being absent or reduced. *A. tenellus* (Cav.) DC. of Mexico is more distinct, but the distinctions are not well-marked nor constant.

63. LEPTOCHLOA Beauv.

Spikelets few to many-flowered, short-pedicellate, appressed, loosely imbricate along a narrow rachis, forming slender racemes, these numerous in an elongate panicle; glumes and lemmas keeled, the lemmas 3-nerved, glabrous or sometimes minutely pubescent on the nerves, not villous; uppermost lemma reduced, awnless.

Plants annual; spikelets awnless.

Sheaths at least the upper, papillose-hispid.....1. *L. filiformis*.

Sheaths glabrous, or scabrous only.

Sheaths minutely scabrous; racemes distinctly 1-sided; lemma narrowed at summit.....2. *L. scabra*.

Sheaths glabrous or nearly so; racemes indistinctly 1-sided, lemmas broad and dentate at summit.....3. *L. uninervia*.

Plants perennial; spikelets awned or awnless.

Racemes few, spreading or finally deflexed; lemmas broad, notched at apex, the lateral nerves glabrous.....4. *L. dubia*.

Racemes several to numerous; lemmas acute or awned, the lateral nerves pubescent.

Lemmas awnless or nearly so; plant smooth and glaucous.—5. *L. virgata*.
Lemmas awned; sheaths and blades sparsely pilose, not glaucous.

6. *L. domingensis*.

1. *Leptochloa filiformis* (Lam.) Beauv. Ess. Agrost. 71, 166. 1812.

Festuca filiformis Lam. Tabl. Encycl. 1: 191. 1791.

Leptochloa mucronata Kunth, Rév. Gram. 1: 91. 1829.

Culms ascending or erect, geniculate below, branching at the base, commonly 40 to 70 cm. tall (dwarf specimens 10 to 20 cm. tall); blades thin, flat; racemes very slender, spreading.

Fields and open ground, southern United States to Argentina, at low altitudes. Originally described from tropical America.

ECUADOR: Guayaquil, *Mille* 23. Oil Camp between Guayaquil and Salinas, *Hitchcock* 20107. Milagro, *Hitchcock* 20163. Chanduy, *Spruce* 6442 (Kew Herb.).

2. *Leptochloa scabra* Nees, Agrost. Bras. 435. 1829.

A stout, rather succulent annual as much as 1 meter tall, with scabrous sheaths, flat blades, and narrow panicles as much as 30 cm. long; racemes closely arranged, ascending, somewhat flexuous, 3 to 8 cm. long.

Ditches and shallow marshes, southern United States to Paraguay. Originally described from Brazil.

ECUADOR: Milagro, *Hitchcock* 20172.

3. *Leptochloa uninervia* (Presl) Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 383. 1917.

Megastachya uninervia Presl, Rel. Haenk. 1: 283. 1830.

Diplachne verticillata Nees & Mey. Nov. Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 27. 1841; 158. 1843.

Festuca glycerioides Steud.: Lechl. Berb. Amer. Austr. 56. 1857, name only. (Tacna, *Lechler* 1574.)

Leptochloa imbricata Thurb. in S. Wats. Bot. Calif. 2: 293. 1880.

Diplachne tarapacana Phil. Anal. Mus. Nac. Chile Bot. 8: 88. 1891.

Diplachne carinata Hack. Bol. Acad. Cienc. Córdoba 16: 253. 1900.

A rather stout and somewhat succulent annual, with numerous erect or decumbent culms 30 to 60 or even 100 cm. tall, slightly roughened sheaths, and narrow panicles 7 to 15 cm. long; racemes ascending or finally spreading, rather closely arranged, single or somewhat aggregate, pale or lead-colored, 2 to 5 cm. long or sometimes longer.

Ditches and wet open ground, southwestern United States and Mexico; Peru to Argentina and Chile. Originally described from Mexico.

PERU: Huánuco, *Macbride & Featherstone* 2443. Lima, *Wilkes Expl. Exped.*
BOLIVIA: Milluhuaya, *Buchtien* 4257.

4. *Leptochloa dubia* (H. B. K.) Nees, Syll. Pl. Ratisb. 1: 4. 1824.

Chloris dubia H. B. K. Nov. Gen. & Sp. 1: 169. 1816.

Schismus patens Presl, Rel. Haenk. 1: 269. 1830.

Ipnium mendocinum R. A. Phil. Anal. Univ. Chile 36: 211. 1870.

Diplachne mendocina Kurtz, Bol. Acad. Sci. Córdoba 15: 521. 1897.

A rather slender perennial, 40 to 80 cm. tall, with flat blades and pyramidal lead-colored panicles 8 to 15 cm. long; racemes few, spreading or finally deflexed, 2 to 6 cm. long, rather distant.

Dry plains and hills, southern United States and Mexico; Bolivia to Argentina and Chile. Originally described from Mexico.

BOLIVIA: Comarapa, *Herzog* 1925. Tarija, *Fries* 1094. Cotafía, *Buchtien* 3136, 3137 (Kew Herb.).

5. *Leptochloa virgata* (L.) Beauv. Ess. Agrost. 166. 1812.*Cynosurus virgatus* L. Syst. Nat. ed. 10. 2: 87. 1759.*Chloris poaeformis* H. B. K. Nov. Gen. & Sp. 1: 169. 1816. (Colombia and Guayaquil.)

Culms in small tufts, tall, slender, strong and wiry, sparingly branching; blades flat; racemes commonly about 10 cm. long, lax, ascending, aggregate toward the summit of the culm.

Open ground and grassy slopes, Mexico and the West Indies to Argentina. Originally described from Jamaica.

ECUADOR: Portovelo, *Hitchcock* 21252, *Rose* 23441. Milagro, *Hitchcock* 20285.
BOLIVIA: Río Surutú, *Steinbach* 6834.

6. *Leptochloa domingensis* (Jacq.) Trin. Fund. Agrost. 133. 1820.*Cynosurus domingensis* Jacq. Misc. Austr. 2: 363. 1781.

Resembling *L. virgata*, the panicles more elongate, the racemes shorter and more numerous.

Open ground and grassy banks, Florida and Mexico to Paraguay. Original locality not given, presumably Santo Domingo.

PERU: Colonia Perené, *Hitchcock* 22100, 22078.

BOLIVIA: Santa Cruz, *Herzog* 1464. Milluhuaya, *Buchtien* 4266. Coripata, *Hitchcock* 22692. Buena Vista, *Steinbach* 5222, 6868.

64. *GOUINIA* Fourn.

Spikelets few-flowered, short-pedicellate, appressed, in slender elongate racemes, these racemosely arranged; glumes and lemmas keeled, the lemmas densely villous on the nerves, awned, the uppermost much reduced but awned.

Racemes floriferous to base.....1. *G. virgata*.Racemes naked at base for several centimeters.....2. *G. latifolia*.1. *Gouinia virgata* (Presl) Scribn. U. S. Dept. Agr. Div. Agrost. Bull. 4: 10. 1897.*Bromus virgatus* Presl, Rel. Haenk. 1: 263. 1830.*Pogochloa brasiliensis* Moore, Trans. Linn. Soc. Bot. II. 4: 509. pl. 37. f. 9-23. 1895.

An erect wiry perennial about 1 meter tall, with flat blades and large open panicles of 5 to 8 distant spreading racemes at much as 15 cm. long, floriferous to base, the spikelets appressed and somewhat imbricate.

Dry plains and hills, Mexico to Colombia; Bolivia to Brazil. Originally described from Peru and Mexico (*Haenke*).

PERU: Mountains of Huánuco, *Haenke* (fragment from the type).BOLIVIA: Gran Chaco, *Fries* 1470.2. *Gouinia latifolia* (Griseb.) Vasey, Contr. U. S. Nat. Herb. 1: 365. 1895.*Tricuspis latifolia* Griseb. Abh. Ges. Wiss. Göttingen 19: 259. 1874.

An erect robust tufted perennial 1 to 1.5 meters tall, with flat blades 1 to 1.5 cm. wide and open panicles 20 to 30 cm. long, the racemes slender, distant, spreading, as much as 15 cm. long, naked on the lower half.

Grassy slopes, Bolivia to Argentina, whence originally described.

BOLIVIA: Chulumani, *Hitchcock* 22650.65. *TRIPOGON* Roem. & Schult.

Spikelets several to many-flowered, sessile, erect in a single spike; glumes shorter than the lowermost floret; lemmas awned from between the lobes of the minutely two-lobed summit.

1. *Tripogon spicatus* (Nees) Ekman, Ark. för Bot. 11': 36. 1912.*Bromus spicatus* Nees, Agrost. Bras. 471. 1829.*Tricuspis simplex* Griseb. Mem. Amer. Acad. n. ser. 8: 532. 1862.

A low, densely tufted perennial, the subfiliform leaves aggregate at the base, the slender culms erect, the spike about half the entire height of the plant.

Sterile hills, Texas to Mexico; Peru to Brazil and Argentina. Originally described from Brazil.

PERU: Matucana, *Macbride & Featherstone* 329. San Bartolomé, *Weberbauer* 5311 (Field Mus.).

BOLIVIA: Between Río Piray and Río Cuchi, *Herzog* 1449.

66. ELEUSINE Gaertn.

Spikelets several-flowered, densely imbricate in thick spikes, these subdigitate; glumes and lemmas with thickened 5-nerved keels, acute; caryopsis with a thin pericarp marked with fine transverse lines.

1. *Eleusine indica* (L.) Gaertn. Fruct. & Sem. 1: 8. 1788.*Cynosurus indicus* L. Sp. Pl. 72. 1753.

A weedy annual, with spreading or ascending, flattened, branching culms, thin flat linear blades, and 2 to several spikes (sometimes one spike 1 to 3 cm. below) 5 to 10 cm. long.

Open ground and waste places. A common weed of warm and warm-temperate regions. Introduced in America; originally described from India.

ECUADOR: Guayaquil, *Mille* 292. Milagro, *Hitchcock* 20171.

PERU: Colonia Perené, *Hitchcock* 22065. La Merced, *Macbride* 5230.

BOLIVIA: Mapiri, *Rusby* 221; *Buchtien* 1163. Beni River, *Rusby* 207. Rurrenabaque, *Rusby (Mulford Expl. Exped.)* 818. Coroico, *Buchtien* 6419. Mulluhuya, *Buchtien* 4194. Yanacachi, *Buchtien* 421. Near Tipuani, *Buchtien* 5332. Río Piray, *Herzog* 1434. Buena Vista, *Steindach* 5149, 6837.

67. DACTYLOCTENIUM Willd.

Spikelets as in *Eleusine*, but the glumes and lemmas mucronate or awn-tipped; apex of the rachis extending as a point beyond the spikelets.

1. *Dactyloctenium aegyptium* (L.) Richt. Pl. Eur. 1: 68. 1870.*Cynosurus aegyptius* L. Sp. Pl. 72. 1753.

A weedy, stoloniferous, more or less pilose annual, often forming dense mats, the flat culms 10 to 50 cm. long, the blades flat, usually short, the spikes 2 to 4, short, thick, radiate.

Open ground and waste places. A common weed in warm countries. Introduced in America. Originally described from "Africa, Asia, America."

ECUADOR: Oil Camp between Guayaquil and Salinas, *Hitchcock* 20006. Chanduy, *Spruce* (Kew Herb.).

BOLIVIA: Tarija, *Fries* 1091.

68. CYNODON L. Rich.

(Capriola Adans.)

Spikelets 1-flowered, sessile, imbricate, in slender unilateral spikes; glumes unequal, narrow, acute; lemma broad, boat-shaped, inclosing a palea of equal length.

⁷⁷ Under the provisions of the Type-basis Code *Capriola* is not effectively published.

1. *Cynodon dactylon* (L.) Pers. Syn. Pl. 1: 85. 1805. BERMUDA GRASS.
Panicum dactylon L. Sp. Pl. 58. 1753.
Cynodon maritimus H. B. K. Nov. Gen. & Sp. 1: 170, 1816. (Seacoast of Peru.)
Digitaria maritima Spreng. Syst. Veg. 1: 272. 1825.
Cynodon erectus Presl, Rel. Haenk. 1: 290. 1830. (Mexico and Huánuco.)
Capriola dactylon Kuntze, Rev. Gen. Pl. 2: 764. 1891.
Cynodon dactylon var. *maritimus* Hack. in Fries, Ark. för Bot. 8: 40. 1909.
Capriola dactylon maritima Hitchc. U. S. Dept. Agr. Bull. 772: 179. 1920.

A low, extensively creeping perennial, with compressed wiry culms, narrow, usually short blades, and 3 to 5 slender arcuate-spreading spikes aggregate at the apex of the culms.

Common in open, rather dry ground in the warmer parts of both hemispheres; apparently introduced in America. Originally described from southern Europe. Often called hierba de la Virgen.

ECUADOR: Guayaquil, *Mille* 50, 291; *Sodiro* 241.

PERU: Lima, *Hitchcock* 22343; *Wilkes Expl. Exped.* Pacasmayo, *Rose* 18520. Chosica, *Macbride & Featherstone* 524.

BOLIVIA: Quebrada de Charagua, *Herzog* 1211.

69. MICROCHLOA R. Br.

Spikelets 1-flowered, awnless, in a single slender spike.

1. *Microchloa indica* (L. f.) Kuntze, Rev. Gen. Pl. 3²: 356. 1898.
Nardus indicus L. f. Suppl. Pl. 105. 1781.
Microchloa setacea R. Br. Prodr. Fl. Nov. Holl. 1: 208. 1810.

A low tufted annual mostly not over 15 cm. tall, with narrow, flat or folded, glabrous blades and slender, solitary, flexuous, or falcate spikes usually less than 10 cm. long.

Open ground, Colombia to Argentina; also in the tropics of the Old World. Originally described from India.

ECUADOR: Quito, *Sodiro* in 1894.

PERU: Matucana, *Macbride & Featherstone* 448.

BOLIVIA: La Paz, *Holway* 490. Cochabamba, *Holway* 361; *Hitchcock* 22824. Between Río Piray and Río Cuchi, *Herzog* 1448.

70. GYMNOPOGON Beauv.

Spikelets with 1 perfect floret and 1 to 3 sterile florets (mostly reduced to single awns) above it, or sometimes with 2 perfect florets; glumes equaling or exceeding the florets; fertile lemma narrow, long-awned; spikelets distant or approximate, appressed along a slender axis.

Spikes about 5 cm. long, aggregate near the summit of the culm; spikelet 2-flowered, the second floret similar to the first but smaller.

1. *G. jubiflorus*.

Spikes 15 to 25 cm. long, distant along the upper part of the culm; spikelet with 1 perfect floret and a much-reduced second floret (rarely a rudimentary third) -----

2. *G. spicatus*.

1. *Gymnopogon jubiflorus* Hitchc., sp. nov.

A slender, rather wiry perennial; culms glabrous, about 80 cm. tall; sheaths firmly clasping the culm; ligule membranaceous, less than 0.5 mm. long; blades firm, flat, narrowly lanceolate, the larger along the middle of the culm as much as 5 cm. long and 4 mm. wide, the upper and lower reduced; panicle brownish, somewhat nodding, about 8 cm. long, consisting of about 10 slender spikes 5 to

6 cm. long, floriferous to the base, on an axis about 2 cm. long; spikelets in 2 rows, rather closely imbricate, 2-flowered, the second floret somewhat reduced; glumes narrowly lanceolate, acuminate, slightly curved outward, scabrous on the keels, 3.5 to 4 mm. long, the second slightly longer than the first; first floret about 2 mm. long, the lemma nerveless, slightly compressed, with a tuft of fine hairs about 1.5 mm. long at the tip, otherwise glabrous, the margin inrolled and partially inclosing the rachilla joint; awn slender, flexuous, about 8 mm. long; palea obtuse, about as long as the lemma; rachilla joint slender, glabrous, about 1 mm. long; second floret similar to the first, a little more than 1 mm. long, the hairs at summit about 1 mm. long, the awn nearly as long as that of the first floret.

Type in the U. S. National Herbarium, no. 879400, collected at Guanay, northern Bolivia, altitude 600 meters, May, 1886, by H. H. Rusby (no. 215).

This species is allied to *Monochaete fastigiata* Doell (*Gymnopogon fastigiatus* Nees). In that the rachilla joint is nearly as long as the floret, the hairs at the summit of the lemma are scarcely 0.5 mm. long, the blades are narrower, and the spikes fewer, shorter, and more slender. In the specimens of *M. fastigiata* examined there is no second floret.

The descriptions of *Monochaete fastigiata* state that the rachilla is not prolonged behind the floret, but in the specimens examined the prolongation is very evident, though partially concealed by the keels of the palea. It is doubtful if *Monochaete* should be maintained as a distinct genus.

2. *Gymnopogon spicatus* (Spreng.) Kuntze, Rev. Gen. Pl. 3^o: 354. 1898.

Polypogon spicatus Spreng. Syst. Veg. 1: 243. 1825.

Gymnopogon laevis Nees, Agrost. Bras. 428. 1829.

A loosely caespitose perennial from knotty crowns, with slender, wiry, erect or spreading culms 30 to 50 cm. tall, rigid spreading blades 2 to 4 cm. long, and slender, rather distant spikes 10 to 15 cm. long; spikelets usually rather distant, especially below, 2-flowered, with the second floret reduced to an awned rudiment, or 3-flowered, the second floret somewhat reduced, the third an awned rudiment; awns about 1 cm. long.

Open slopes, Colombia and Venezuela to Argentina. Originally described from Brazil.

BOLIVIA: Buena Vista, *Steinbach* 5386, 6977.

71. CHLORIS Swartz. FINGERGRASS

Spikelets with 1 perfect floret, sessile along a slender rachis, forming unilateral spikes, these digitate or nearly so; glumes unequal; lemma awned or mucronate; rachilla prolonged behind the palea and bearing 1 to few rudimentary awned sterile lemmas.

Lemmas awnless; spikes dark brown. (EUSTACHYS).....1. *C. distichophylla*.

Lemmas awned; spikes pale or purplish.

Sterile floret broadest at the summit, truncate.

Plants perennial; spikes flexuous.....2. *C. polydactyla*.

Plants annual; spikes straight.....3. *C. virgata*.

Sterile floret narrow, the apex acute or subacute.

Plants perennial, stoloniferous; spikes finally spreading or reflexed.

4. *C. beyrichiana*.

Plants annual, not stoloniferous; spikes erect or ascending.

Florets 2 to 3 mm. long, compressed.....5. *C. radiata*.

Florets 4 mm. long, terete, very narrow.....6. *C. angustiflora*.

1. *Chloris distichophylla* Lag. Gen. & Sp. Nov. 4. 1816.

?*Chloris paytensis* Steud. Syn. Pl. Glum. 1:207. 1854. (Payta, Peru.)

An erect, rather stout perennial as much as 1 meter tall, with compressed keeled sheaths, short obtuse flat blades as much as 1 cm. wide, and numerous flexuous spikes 7 to 14 cm. long.

Open ground, fields, and waste places, Brazil to Argentina, whence originally described, and Peru.

PERU: Tarapoto, *Spruce* 4911. Santa Ana, *Cook & Gilbert* 1532, 1576.

BOLIVIA: Reyes, *Rusby* (*Mulford Biol. Expl.*) 1319. Coroico, *Buchtien* 3633. Milluhuaya, *Buchtien* 4195. Coripata, *Hitchcock* 22677. San José, *Hitchcock* 22736. Sirupaya, *Buchtien* 6424. La Florida, *Holway* 677; *Hitchcock* 22635. Chulumani, *Hitchcock* 22663. Yungas, *Bang* 267. Buena Vista, *Steinbach* 5359, 6867.

2. *Chloris polydactyla* (L.) Swartz, Prodr. Veg. Ind. Occ. 26. 1788.

Andropogon polydactylon L. Sp. Pl. ed. 2. 1483. 1763.

An erect perennial as much as 1 meter tall, with scarcely compressed or keeled sheaths, flat acuminate blades, and several (as many as 20) flexuous spikes mostly 8 to 12 cm. long.

Grassy slopes, fields and open ground, Florida and the West Indies to Paraguay. Originally described from Jamaica.

BOLIVIA: Guanay, *Rusby* 194. Cañamina, *Cárdenas* (*Mulford Biol. Expl.*) 299. Hacienda Anacuri, *Holway* 721. Milluhuaya, *Buchtien* 4279. Coripata, *Hitchcock* 22689, 22690. Chulumani, *Hitchcock* 22698. Cotaña, *Buchtien* 6423. Cochabamba, *Hitchcock* 22796, 22797.

3. *Chloris virgata* Swartz, Fl. Ind. Occ. 1: 203. 1797.

Chloris pubescens Lag. Var. Cienc. 2^t: 143. 1805. (Peru.)

Chloris elegans H. B. K. Nov. Gen. & Sp. 1: 166. pl. 47. 1816.

Culms ascending, 20 to 40 cm. tall, scarcely compressed, the upper sheaths slightly inflated, glabrous in the throat; spikes mostly 5 or 6, suberect, somewhat flexuous in age, 3 to 5 cm. long; fertile lemma villous on the keel to a little below the summit.

Open, mostly sterile ground, West Indies to Argentina. Originally described from the island of Antigua.

ECUADOR: Between La Toma and Loja, *Hitchcock* 21403. Chanduy, *Spruce* 6437, 6439 (both Kew Herb.).

PERU: Obrajillo, *Wilkes Expl. Exped.* Matucana, *Macbride & Featherstone* 222. Prov. Piura, *Weberbauer* 5964 (Field Mus.).

BOLIVIA: Cochabamba, *Buchtien* 2512; *Hitchcock* 22788, 22842. Tarija, *Fries* 1059.

4. *Chloris beyrichiana* Kunth, Rév. Gram. 1: 89, 289. 1829; 2: pl. 56. 1830.

A stoloniferous perennial, with erect flowering culms 20 to 40 cm. tall, short, flat or folded, obtuse blades, and 6 to 10 spikes 5 to 8 cm. long in 1 or 2 whorls.

Open ground, Ecuador to Argentina. Originally described from Brazil.

ECUADOR: Between La Toma and Loja, *Hitchcock* 21409.

PERU: Mito, *Macbride* 3331. Ollantaytambo, *Hitchcock* 22552. Cuzco, *Hitchcock* 22492.

BOLIVIA: Sorata, *Mandon* 1323. La Paz, *Bang* 82; *Rusby* 14; *Buchtien* 573. Palca, *Pflanz* 2526; *Hitchcock* 22584. Cochabamba, *Hitchcock* 22789, 22811, 22816, 22845; *Holway* 322. Samaipata, *Herzog* 1669. Tarija, *Fries* 1060.

5. *Chloris radiata* (L.) Swartz, Prodr. Veg. Ind. Occ. 26. 1788.

Agrostis radiata L. Syst. Nat. ed. 10. 2: 879. 1759.

A weedy branching decumbent-ascending annual, the sheaths broad, compressed, the blades thin, flat or folded, scaberulous or sparsely pilose, the slender spikes somewhat flexuous.

Ditches and waste places, southern Mexico and the West Indies to Paraguay. Originally described from Jamaica.

ECUADOR: Balao, *Eggers* 14630. Guayaquil, *Hitchcock* 19917. Milagro, *Hitchcock* 20178. Between Guayaquil and Salinas, *Hitchcock* 19990. Cashurco, *Hitchcock* 21895. San Nicolás, *Sodirol* 290. Alausí, *Hitchcock* 20695. Without locality, *Jameson* 349 (Kew Herb.).

PERU: Piura, *Spruce* 6438 (Kew Herb.). Lima, *Hitchcock* 22345; *Wilkes Expl. Exped.* Santa Clara, *Rose* 18617. Chosica, *Macbride & Featherstone* 552. Colonia Perené, *Hitchcock* 22097. Without locality, *Lechler* 2478.

BOLIVIA: Coripata, *Hitchcock* 22679; *Bang* 2173. Coroico, *Buchtien* 3631.

6. *Chloris angustiflora* Areschoug, Svensk. Freg. Eugenies Resa 118. 1910; Repert. Nov. Sp. Fedde 10: 300. 1912.

Chloris leptantha Hitchc. in Urban, Symb. Antill. 7: 166. 1912.

Chloris luetzelburgii Hitchc. Proc. Biol. Soc. Washington 36: 197. 1923.

A slender tufted annual as much as 1 meter tall, with short flat acuminate blades and 5 to 8 slender spikes 6 to 12 cm. long, scattered on an axis as much as 5 cm. long; slender cleistogamous panicles also borne in the sheaths.

Open ground, fields, and waste places, West Indies to Ecuador and Brazil. Originally described from Guayaquil. (*Andersson*.)

ECUADOR: Oil Camp between Guayaquil and Salinas, *Hitchcock* 20056, 20064. Chanduy, *Spruce* 6436. Guayaquil, *Jameson* 393 (Kew Herb.).

The Brazilian specimens, described as *C. luetzelburgii*, are as much as 1 meter tall with spikes as much as 10 cm. long, while the original specimens of *C. leptantha* from the island of Bonaire are about 30 cm. tall with spikes about 5 cm. long. The Ecuador specimens are intermediate. The variation of the spikes and spikelets appears to be sufficient to warrant the inclusion of the two forms in one species.

72. TRICHLORIS Fourn.

Spikelets 2 to 5-flowered, similar to those of *Chloris*; fertile lemma 3-awned, the lateral awns sometimes reduced. Perennials with several erect spikes feathery with the numerous awns.

Spikelets 2-flowered, both lemmas with 3 long awns-----1. *T. mendocina*.

Spikelets 3 to 5-flowered, the lateral awns of the lemmas more or less reduced, sometimes wanting-----2. *T. pluriflora*.

1. *Trichloris mendocina* (Phil.) Kurtz, Mem. Fac. Cienc. Exact. Univ. Córdoba 1897: 37. 1897.

Chloris mendocina R. A. Phil. Anal. Univ. Chile 36: 208. 1870.

A tufted perennial with erect or decumbent culms 40 to 60 cm. tall, narrow, flat or folded blades, and several erect purplish feathery spikes 6 to 12 cm. long.

Dry slopes, southwestern United States and Mexico; Bolivia to Argentina. Originally described from Mendoza, Argentina.

BOLIVIA: Mataral, *Herzog* 1804.

2. *Trichloris pluriflora* Fourn. Mex. Pl. 2: 142. 1886.

A sometimes rather woody perennial 1 meter or more tall, with flat blades and several erect spikes 5 to 10 cm. long on an axis 2 to 4 cm. long.

Dry slopes, Texas and Mexico; Ecuador to Argentina. Originally described from Mexico.

ECUADOR: Between La Toma and Loja, *Hitchcock* 21400.

BOLIVIA: Comarapa, *Herzog* 1928.

73. *BOUTELOUA* Lag.²⁸ GRAMA

Spikelets with 1 perfect floret, crowded along one side of a narrow rachis, forming short spikes (rarely but a single spikelet to a spike); glumes unequal; fertile lemma rather broad, usually 3 to 5-toothed, commonly mucronate or awned; sterile lemmas usually with 3 awns; spikes racemose, often drooping.

Spike solitary, persistent, the florets falling. A low spreading annual.

1. *B. simplex*.

Spikes few to many, falling entire.

Spikes 2 to 4 with numerous purple awns 2 to 3 cm. long. Plants perennial.

2. *B. megapotamica*.

Spikes several to many.

Rachis with a sharp retrorsely bearded point at base.....3. *B. aristidoides*.

Rachis not sharp-pointed at base.

Plants perennial, erect.....4. *B. curtipendula*.

Plants annual.

Spikes 5 to 20, about 1 cm. long, excluding the awns, these about as long as the spikelets.....5. *B. disticha*.

Spikes usually more than 20 in well-developed plants, about 5 mm. long, excluding the awns, these mostly less than 5 mm. long, sometimes very short.....6. *B. pilosa*.

1. *Bouteloua simplex* Lag. Var. Cienc. 2⁴: 141. 1805.

Chondrosium humile H. B. K. Nov. Gen. & Sp. 1: 175. pl. 56. 1816,²⁹
(Ecuador.)

Chondrosium simplex Kunth, Rév. Gram. 1: 94. 1829.

Bouteloua simplex var. *actinochloides* Henr. Med. Rijks Herb. Leiden 40: 65.
1921. (Cochypata, Bolivia, *Mandon* in Herb. Balansa, Leiden.)

A spreading annual, with decumbent culms mostly 10 to 20 cm. long, short narrow flat blades, and a single falcate spike about 1 to 3 cm. long.

Open ground, fields, and waste places, Ecuador to Argentina. Originally described from Peru.³⁰

ECUADOR: Alausí, *Hitchcock* 20696. Tupigachi, *André* 3515. Riobamba, *Mille* 293; *Sodi*. Without locality, *Spruce* 5922.

PERU: Obrajillo, *Wilkes Expl. Exped.* Matucana, *Macbride & Featherstone* 219. Huánuco, *Macbride* 3241. Tarma, *Hitchcock* 22167. Ollantaytambo, *Cook & Gilbert* 479. Cuzco, *Hitchcock* 22491. Lake Titicaca, *Meyen*. Azángaro, *Lechler* 1792 (Kew Herb.). Cotahuasi, *Weberbauer* 6868 (Field Mus.). Torata, *Weberbauer* 7413.

²⁸ For a revision of *Bouteloua*, with full synonymy, see Griffiths. The grama grasses (Contr. U. S. Nat. Herb. 14: 343-428. 1912).

²⁹ As synonyms are cited, *Chondrosium humile* Beauv. [Ess. Agrost. 41. 1812, name only.] and *Actinochloa humilis* Willd. "herb."

³⁰ No locality is given with the original description but in a later work (Gen. & Sp. Nov. 5. 1816) the locality is given as Peru.

BOLIVIA: Yungas, *Rusby* 34. La Paz, *Bang* 81; *Buchtien* 161, 161a. Chiguana, *Asplund* 6521. Cochabamba, *Hitchcock* 22819; *Holway* 359. Uyuni, *Asplund* 6522. Puna Patanca, southern Bolivia, *Fiebrig* 2629. Totorá, *Herzog* 2037. Tarija, *Fries* 1058, 1058a. Sorata, *Mandon* 1325 (Kew Herb.).

2. *Bouteloua megapotamica* (Spreng.) Kuntze, Rev. Gen. Pl. 3²: 341. 1893.

Pappophorum megapotamicum Spreng. Syst. Veg. 4: Cur. Post. 34. 1827.

Eutriana multiseta Nees, Agrost. Bras. 413. 1829.

Bouteloua multiseta Griseb. Abh. Ges. Wiss. Göttingen 19: 303. 1879.

A low tufted perennial, with spreading culms 10 to 20 cm. tall, short, flat, mostly basal blades, and 2 to 4 deflexed spikes, with 3 or 4 long-awned sterile lemmas.

Dry plains, southern Bolivia to Uruguay and Argentina. Originally described from Brazil.

BOLIVIA: Padcaya, *Fiebrig* 2552.

3. *Bouteloua aristidoides* (H. B. K.) Griseb. Fl. Brit. W. Ind. 537. 1864.

Dinebra aristidoides H. B. K. Nov. Gen. & Sp. 1: 171. 1816.

Eutriana aristidoides Trin. Gram. Unifl. 242. 1824.

Dinebra hirsuta Presl, Rel. Haenk. 1: 292. 1830. (Peru.)

Eutriana hirsuta Kunth, Rév. Gram. 1: Suppl. XXIII. 1830.

A spreading or erect annual 10 to 20 cm. tall, with numerous narrow spikes about 1 cm. long on an axis as much as 10 cm. long. The sharp-pointed spikes, retrorsely bearded, attach themselves as the fruits in *Aristida*.

Open dry ground, southern United States to Argentina. Originally described from Mexico.

PERU: Without locality, *Haenke*.

BOLIVIA: Gran Chaco, *Fries* 1691.

4. *Bouteloua curtispindula* (Michx.) Torr. in Emory, Mil. Recon. 154. 1848.

Chloris curtispindula Michx. Fl. Bor. Amer. 1: 59. 1803.

Eutriana curtispindula Trin. Fund. Agrost. 161. 1820.

An erect tufted perennial, with culms as much as 1 meter tall, flat blades, and numerous deflexed spikes about 1 cm. long on an axis 10 to 20 cm. long.

Dry plains and hills, Canada to Argentina. Originally described from Illinois.

ECUADOR: Between La Toma and Loja, *Hitchcock* 21399.

PERU: Ambo, *Macbride* 3170. Calacato, *Jelski* 589.

BOLIVIA: Sorata, *Mandon* 1380 (Kew Herb.). Bolivian Plateau, *Bang* 998. Cochabamba, *Hitchcock* 22809; *Holway* 393; *Herzog* 2072. Padcaya, *Fiebrig* 3281 (Kew Herb.), 3282.

5. *Bouteloua disticha* (H. B. K.) Benth. Journ. Linn. Soc. Bot. 19: 105. 1881.

Polyodon distichum H. B. K. Nov. Gen. & Sp. 1: 175. pl. 55. 1816.

Eutriana mucronata Areschoug, Svensk. Freg. Eugenes Resa 118. 1910;

Repert. Nov. Sp. Fedde 10: 300. 1912. (Island of Puna, *Andersson* in 1852.)

Bouteloua plurensis Pilger, Repert. Nov. Sp. Fedde 17: 447. 1921. (*Weberbauer* 5961.)

A spreading annual, with slender decumbent culms 20 to 60 cm. long, flat blades more or less pilose on the margins and upper surface, and 5 to 20 finally spreading or deflexed spikes about 1 cm. long (excluding awns); spikelets mostly 3 to 6, the awns about as long as the spikelets.

Open ground and dry hills, West Indies to northern Peru. Originally described from the mountains of Ecuador, the exact locality not given. (*Bonpland*.)

ECUADOR: Chanduy, *Spruce* 6443.

PERU: Prov. Piura, *Weberbauer* 5961.

6. *Bouteloua pilosa* (Hook. f.) Benth.; S. Wats. Proc. Amer. Acad. 18: 179. 1883.

Eutriana pilosa Hook. f. Trans. Linn. Soc. 20: 173. 1851.

Resembling *B. disticha*; differing in the more numerous and smaller spikes with shorter awns.

Open ground and dry hills, Central America to northern Peru. Originally described from the Galápagos Islands.

ECUADOR: Guayaquil, Hitchcock 19943; Mille 20; Jameson 367 (Kew Herb.). Huigra, Hitchcock 20629.

PERU: Tarapoto, Spruce 4445.

This species is probably a form of *B. disticha*. The Galápagos specimens agree in having smaller, usually nearly awnless spikelets. The continental specimens cited above have small spikelets, but the awns are somewhat more prominent than in those from the Galápagos Islands. The specimens from Panama to Yucatan are intermediate in size of spikelets and length of awns between the form from the Galápagos and the true *B. disticha* as represented by Spruce 6443. The West Indian specimens, having larger spikelets and longer awns, are referred to *B. disticha*.

74. MUNROA Torr.

Spikelets in pairs or threes on a short rachis, the lower one or two larger, 3 or 4-flowered, the upper 2 or 3-flowered, the group (reduced spikes) inclosed in the broad sheaths of short leaves, usually about 3 in a fascicle, forming a cluster or head at the ends of the branches; rachilla disarticulating above the glumes and between the florets; glumes of the lower 1 or 2 spikelets equal, 1-nerved, narrow, acute, a little shorter than the lemmas, those of the upper spikelet unequal, the first much shorter or obsolete; lemmas 3-nerved, those of the lower spikelet coriaceous, acuminate, the points spreading, the mid nerve extended into a mucro, those of the upper spikelet membranaceous; palea narrow, 2-nerved, inclosing the oval, dorsally compressed caryopsis.

Lemmas 3 to 4 mm. long-----1. *M. argentina*.

Lemmas 2 mm. long-----2. *M. decumbens*.

1. *Munroa argentina* Griseb. Abh. Ges. Wiss. Göttingen 24: 300. 1879.

A low spreading branching annual, with fascicled leaves, the blades short, flat, sharp-pointed, the rigid spikelets few-flowered, in little glomerules among these fascicles; lemmas 3 to 4 mm. long; caryopsis 2.5 mm. long.

Dry plains and hills, Bolivia and Argentina. Originally described from Argentina.

BOLIVIA: Atocha, Asplund 6485.

2. *Munroa decumbens* R. A. Phil. Anal. Mus. Nac. Chile Bot. 8: 90. 1891.

Resembling *M. argentina*, spikelets several-flowered, rather soft; lemma 2 mm. long; caryopsis 1.5 mm. long.

Dry plains, Bolivia to Argentina and Chile. Originally described from Tarapacá, Chile.

BOLIVIA: Chiguana, Asplund 6504. Uyuni, Asplund 6487.

75. TORRESIA Ruiz & Pav.

Spikelets with one terminal perfect floret and 2 staminate florets, all about the same length and about as long as the broad equal papery glumes; sterile lemmas usually awned.

1. *Torresia redolens* (Forst.) Roem. & Schult. Syst. Veg. 2: 516. 1817.

Holcus redolens Forst. Fl. Ins. Austr. Prodr. 92. 1786, name only; Vahl, Symb. Bot. 2: 102. 1791.

An erect perennial from a creeping rhizome, with smooth sheaths and blades and a rather compact, nodding, bronze-brown panicle about 10 cm. long. The plant gives off a vanilla scent.

Damp woods and meadows in antarctic regions, extending north to Ecuador. Originally described from Terra del Fuego.

ECUADOR: Wooded hills, 8 kilometers south of Tulcán. *Hitchcock* 21019.

76. ANTHOXANTHUM L.

Glumes very unequal; sterile lemmas awned, exceeding the small awnless perfect floret.

1. *Anthoxanthum odoratum* L. Sp. Pl. 28. 1753. SWEET VERNAL GRASS.

A tufted fragrant perennial, with flat blades and loosely spikelike panicles commonly about 5 cm. long.

A native of Europe, whence originally described, occasionally cultivated in South America and escaped from cultivation.

ECUADOR: Quito, *Harteman* 9, 80; *Mille* 323.

77. PHALARIS L.

Spikelets strongly compressed, the keeled glumes exceeding the subindurate perfect floret and attached sterile lemmas.

Glumes not winged or scarcely so; panicles 8 to 10 cm. long-----1. *P. angusta*.

Glumes broadly winged; panicles mostly less than 5 cm. long.

Sterile lemmas in pairs; fertile lemma 5 to 6 mm. long----2. *P. canariensis*.

Sterile lemmas solitary; fertile lemma 3 mm. long-----3. *P. minor*.

1. *Phalaris angusta* Nees; Trin. Gram. Icon 1: pl. 78. 1827.

A rather stout annual 50 to 100 cm. tall, with flat blades and dense panicles mostly 8 to 10 cm. long.

A weed in fields and waste places, southern United States to Argentina; originally described from Brazil.

BOLIVIA: Sorata, *Mandon* 1246 (Kew Herb.).

2. *Phalaris canariensis* L. Sp. Pl. 54. 1753. CANARY GRASS.

An erect annual, with flat blades and ovoid heads, the papery imbricate spikelets whitish with green stripes.

Widely distributed as a weed of waste places; originally described from Europe.

BOLIVIA: La Paz, *Buchtien* 239. Coroico, *Buchtien* 3641.

3. *Phalaris minor* Retz. Obs. Bot. 3: 8. 1783.

Resembling *P. canariensis*, but the heads oblong, narrower, about 3 to 4 cm. long and 1 cm. thick, the florets 5 mm. long, less prominently crested.

Sparingly found in waste places along the Pacific coast of North and South America, originally described from the Old World, no locality cited.

PERU: Lima, *Hitchcock* 22346.

78. ORYZA L. RICE

Spikelets perfect, paniculate, laterally compressed; glumes minute; lemma and palea subindurate, papillose-roughened, the lemma awned (the awn sometimes obsolete).

1. *Oryza latifolia* Desv. Journ. de Bot. Desv. 1: 77. 1813.

Oryza sativa var. *latifolia* Doell in Mart. Fl. Bras. 2^a: 7. 1871.

A rather robust perennial, the simple culms 2 meters tall or more, with thin flat scabrous blades commonly 50 to 60 cm. long and 4 to 5 cm. wide, and large many-flowered panicles, the short-awned spikelets short-pedicelated along the upper half to two-thirds of the long slender ascending branches.

Swamps and ditches, Central America and West Indies to Ecuador and Brazil. Type locality given as Carolina and Porto Rico, the first clearly an error.

ECUADOR: Puna Island, *Eggers* 14773. Oil Camp between Guayaquil and Salinas, *Hitchcock* 20050.

79. LEERSIA Swartz
(*Homalocenchrus* Mieg.)

Spikelets awnless, the glumes wanting, otherwise as in *Oryza*, the plants and spikelets much smaller. Under the provisions of the Type-basis Code *Homalocenchrus* is not effectively published.

1. *Leersia hexandra* Swartz, Prodr. Veg. Ind. Occ. 21. 1788.

Homalocenchrus hexandrus Kuntze, Rev. Gen. Pl. 2: 777. 1891.

Leersia dubia Areschoug, Svensk. Freg. Eugenies Resa 115. 1910; Repert. Nov. Sp. Fedde 10: 299. 1912. (Guayaquil, *Andersson* in 1852.)

A scabrous subaquatic perennial, the slender culms often 2 meters tall, erect from a creeping base, the flat blades mostly 15 to 20 cm. long and about 8 mm. wide, the many-flowered panicle pale or purplish. Extensively creeping stolons with short blades are sometimes produced in land bordering ponds and ditches.

Swamps and ditches, southern United States to northern Argentina. Originally described from Jamaica.

ECUADOR: Milagro, *Hitchcock* 20252. Guayaquil, *Spruce* 6265 (Kew Herb.).

BOLIVIA: Guanay, *Rusby* 195. Reyes, *Rusby* (*Mulford Biol. Expl.*) 1646. Buena Vista, *Steinbach* 7116.

80. LUZIOLA Juss.

Spikelets unisexual, 1-flowered, disarticulating from the pedicel, the staminate and pistillate flowers in separate panicles on the same plant; first glume and palea wanting; second glume and lemma about equal, thin, several to many-nerved, lanceolate or oblong; stamens several.

1. *Luziola peruviana* Gmel. Syst. Nat. 1: 637. 1791.

A more or less decumbent, spreading, apparently annual grass, with culms 10 to 30 cm. long, flat blades 1 to 2 mm. wide, and spreading panicles 2 to 3 cm. long; pistillate spikelets 2 to 3 mm. long, with striate glume and lemma; fruit globose, smooth, a little more than 1 mm. long; staminate spikelets 5 mm. long.

In water or on mud, Brazil to Peru. Originally described from Peru but no exact locality given, the collector probably Dombey.

PERU: Lima, *Seeman* 866 (Kew Herb.; blades 6 mm. wide).

BOLIVIA: Bermejo, *Fiebrig* 2189.

81. PHARUS L.

Spikelets in pairs, appressed along the slender, spreading, nearly simple panicle branches, one pistillate, sessile, the other much smaller, staminate, pedicellate; fertile lemma subindurate, terete, clothed, at least toward the beaked apex, with thick uncinuate hairs; blades with fine transverse veins between the longitudinal nerves, petioled (the petiole with a single twist reversing the upper and under surfaces of the blade), the nerves running from mid nerve to margin.

Culms creeping at base-----3. *P. parvifolius*.

Culms erect or nearly so.

Fruit pubescent only at tip, slightly exceeding the glumes.....2. *P. latifolius*.

Fruit pubescent all over, two to three times as long as the glumes.

1. *P. glaber*.

1. *Pharus glaber* H. B. K. Nov. Gen. & Sp. 1: 196. 1816.

Pharus glochidiatus Presl, Rel. Haenk. 1: 345. 1830. (Peru.)

An erect glabrous perennial 50 to 75 cm. tall, with flat oblanceolate acuminate blades commonly 15 to 25 cm. long and 3 to 5 cm. wide, and large open fragile panicles, the few branches stiffly ascending or spreading, the appressed oblong brown spikelets about 1 cm. long, the fruit densely clothed with hooked hairs, the panicles readily breaking up, the pieces attaching themselves by the hooked hairs to passing objects.

Rich woods, Mexico and West Indies to Brazil. Originally described from Venezuela.

ECUADOR: Quito Andes, *Jameson* 739 (Kew Herb.).

PERU: San Gaván, *Lechler* 2310 (Kew Herb.). Río Acre,²¹ *Ule* 9144 (Kew Herb.).

BOLIVIA: Tres Cruces, *Herzog* 1578. *Reyes*, *White* 1204.

2. *Pharus latifolius* L. Syst. Nat. ed. 10. 2: 1269. 1759.

Similar to *P. glaber*, the blades on the average broader, the spikelets longer, the summit of the fruit tapering.

Rich woods, West Indies to Brazil and Ecuador. Originally described from Jamaica.

ECUADOR: El Recreo, *Eggers* 15209. Gualaquiza, *Lehmann* 6552 (Kew Herb.). Daule River, *André* 4215 (Kew Herb.).

BOLIVIA: Milluhuaya, *Buchtien* 4173.

3. *Pharus parvifolius* Nash, Bull. Torrey Club 35: 301. 1908.

Creeping at base, the blades on the average smaller and less broadened upward, otherwise like *P. glaber*.

Rich woods, West Indies to Brazil. Originally described from Haiti.

ECUADOR: Without locality, *Eggers* 15188 (Kew Herb.).

BOLIVIA: Covendo, *White* 1043.

MELINIS MINUTIFLORA Beauv. Ess. Agrost. 54 pl. 11. f. 4. 1812. MOLASSES GRASS. This Brazilian species is spreading through the countries of South America and will probably be found within our area. It is a straggling branching perennial, with velvety-pubescent, more or less viscid foliage, and narrow, rather dense, purple panicles 10 to 20 cm. long, the spikelets about 2 mm. long; first glume very short; second glume and sterile lemma about as long as the fertile lemma; sterile lemma bearing a slender flexuous awn about 1 cm. long from a notched apex. The plant has a heavy odor when fresh. Molasses grass is cultivated for forage in Brazil and is being tried for this purpose in other parts of tropical America. It was originally described from Brazil but probably was introduced from Africa at an early date. Kuntze²² describes a variety *inodora* from Bolivia ("Tiefland Velasco") which I have not seen. It is said to be less pilose and to lack the glandular hairs of the ordinary form.

²¹The label is marked Peru but the region is in disputed territory.

²²Rev. Gen. Pl. 3¹: 356. 1898.

82. ARUNDINELLA Raddi

Spikelets short-pedicellate, in large panicles; glumes acuminate, the tips widely spreading, the second longer than the first and the sterile lemma; fertile lemma minute, bearded on the callus, bearing a slender awn from the apex.

Awn tightly twisted below, the part below the bend shorter than the second glume.....1. *A. confinis*.

Awn not tightly twisted below, the part below the bend exceeding the glume.
2. *A. berteroniana*.

1. *Arundinella confinis* (Schult.) Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 290. 1917.

Piptatherum confine Schult. Mant. 2: 184. 1824.

Arundinella martinicensis Trin. Gram. Pan. 62. 1826.

A tufted erect perennial, with strong slender simple culms up to 2.5 meters tall, flat blades, scabrous at least on the upper surface, and rather densely flowered, oblong panicles 20 to 40 cm. long.

Grassy slopes, West Indies and southern Mexico to Paraguay. Originally described from Martinique.

ECUADOR: Between La Chorita and Portovelo, *Hitchcock* 21157. Between Portovelo and El Tambo, *Hitchcock* 21284. Huigra, *Rose* 22208.

2. *Arundinella berteroniana* (Schult.) Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 290. 1917.

Trichochloa berteroniana Schult. Mant. 2: 209. 1824.

Thysanachne peruviana Presl, Rel. Haenk. 1: 253. 1830. (Mountains of Huánuco, Peru, *Haenke*.)

Arundinella crinita Trin. Linnaea 10: 299. 1836. (Peru, *Pöppig*.)

Arundinella peruviana Steud. Syn. Pl. Glum. 1: 115. 1854.

Arundinella convoluta Pilger, Bot. Jahrb. Engler 27: 25. 1899.

Smaller than *A. confinis*, mostly less than 1 meter tall, with narrower, folded or involute blades and more open fewer-flowered panicles with slightly larger spikelets.

Moist places and rocky cliffs, Mexico and West Indies to Brazil and Bolivia. Originally described from Santo Domingo.

ECUADOR: Tocachi, *Sodi* in 1882. Cashurco, *Hitchcock* 21771, 22103. Chota River, *André* 3390 (Kew Herb.). Napo River, *Jameson* 735 (Kew Herb.).

PERU: Colonia Perené, *Hitchcock* 22063. La Merced, *Macbride* 5357. Tarpoto, *Ule* 6513 (Kew Herb.); *Spruce* 4856. Pangoa, *Mathews* 1080 (Kew Herb.). San Gaván, *Lechler* 2427 (Kew Herb.).

BOLIVIA: Bopi River, *Rusby* 328. Mapiri, *Buchtien* 1175. Rurrenabaque, *Cárdenas* (*Mulford Biol. Expl.*) 1166. Covendo, *White* 995. Without locality. *Rusby* (*Mulford Biol. Expl.*) 2142.

83. TRICHOPTERYX Nees

Spikelets 2-flowered, short-pedicelled, in rather dense panicles, the first floret staminate, awnless, glabrous, the second pistillate or perfect, awned, pilose.

1. *Trichopteryx flammida* (Trin.) Benth. Journ. Linn. Soc. Bot. 19: 59. 1882; Ind. Kew. 4: 1109. 1895.

Arundinella flammida Trin. Gram. Icon. 3: pl. 267. 1831.

A robust perennial 1.5 to 2 meters tall, with long flat blades, and a narrow many-flowered bronze-yellow panicle 30 to 60 cm. long.

Grassy plains and rocky slopes, Brazil, whence originally described, to Bolivia and Paraguay.

BOLIVIA: Buena Vista, *Steinbach* 5358, 6958.

84. TRISTACHYA Nees

Spikelets 2-flowered, sessile in clusters of 3 at the ends of the slender flexuous branches of a nearly simple panicle; lower floret staminate, awnless; fertile lemma with a geniculate twisted awn from between 2 slender teeth.

1. *Tristachya chrysothrix* Nees, *Agrost. Bras.* 460. 1829.

A tufted, more or less hispidulous perennial a meter or more tall, with narrow, flat or loosely involute blades, and loose few-flowered panicles of large spikelets, the glumes strongly papillose-hispid with spreading golden hairs, the awns 4 to 6 cm. long.

Open grassy slopes, Brazil to Paraguay and Bolivia. Originally described from Brazil.

BOLIVIA: Tres Cruces, *Herzog* 1558.

TRISTACHYA MICROSTACHYA Nees; *Steud. Syn. Pl. Glum.* 1: 238. 1854. Concerning the origin of the specimen Steudel says, "Lindley hrbr. Lima." The description does not apply to any species known from Peru. Doctor Pilger informs me that the specimen of this at Berlin is a fragment of the inflorescence only and appears to be a species of *Trichopteryx*, probably from Africa and not from South America.

85. LEPTOCORYPHIUM Nees

Spikelets in narrow panicles; first glume wanting; sterile lemma empty, this and the second glume hairy; fertile lemma and palea brown with a white hyaline, somewhat lacerate or ciliate summit, open at maturity.

1. *Leptocoryphium lanatum* (H. B. K.) Nees, *Agrost. Bras.* 84. 1829.

Paspalum lanatum H. B. K. *Nov. Gen. & Sp.* 1: 94. *pl.* 29. 1816.

Anthaenantia lanata Benth. *Journ. Linn. Soc. Bot.* 19: 39. 1881.

A slender erect unbranched tufted perennial up to 1 meter tall, with long, narrow, often involute blades, and loose many-flowered grayish oblong panicles with capillary branchlets and silky-pilose spikelets, the hairs at first appressed, at maturity spreading.

Dry hills and pine barrens, southern Mexico and the West Indies to Argentina. Originally described from Mexico.

PERU: Tarapoto, *Spruce* 4501 (Kew Herb.).

BOLIVIA: Reyes, *Rusby* (*Mulford Biol. Expl.*) 1657. Hacienda Casana, *Buchtien* 7146. Buena Vista, *Steinbach* 6639, 6640.

86. TRICHACHNE Nees (*Valota* Adans.²³)

Spikelets in pairs, short-pedicellate in 2 rows along one side of a narrow rachis, the slender racemes aggregate in a narrow or flabellate panicle; spikelets lanceolate, clothed with long silky hairs; first glume minute; fruit acuminate, brown with broad white hyaline margins.

²³ Under the provisions of the Type-basis Code *Valota* is not effectively published. The earliest effectively published name, *Acicarpa* Raddi, is a homonym.

- Panicle tawny, sheaths hirsute.....1. *T. insularis*.
 Panicle whitish or purplish.
 Spikelets villous but not obscured. Sheaths glabrous.....2. *T. sacchariflora*.
 Spikelets hidden by the dense wool.....3. *T. saccharata*.

1. *Trichachne insularis* (L.) Nees, Agrost. Bras. 86. 1829.

Andropogon insularis L. Syst. Nat. ed. 10. 2: 1304. 1759.

Panicum leucophaeum H. B. K. Nov. Gen. & Sp. 1: 97. 1816.

Valota insularis Chase, Proc. Biol. Soc. Washington 19: 188. 1903.

A rather coarse, tufted, weedy perennial, with sparsely hirsute sheaths, flat, usually scabrous blades, and silky panicles tawny at maturity.

Open ground and waste places in the tropics and subtropics of America at low altitudes. Originally described from Jamaica.

ECUADOR: Between Otavalo and Malchinguí, *Hitchcock* 20831.

2. *Trichachne sacchariflora* (Raddi) Nees, Agrost. Bras. 87. 1829.

Acicarpa sacchariflora Raddi, Agrost. Bras. 31. pl. 1 f. 4. 1823.

Panicum javanianum Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only.

(*Lechler* 2399); Doell in Mart. Fl. Bras. 2²: 137. 1877.

Resembling *T. insularis*; sheaths glabrous, inflorescence looser; greenish or whitish at maturity, not tawny; racemes loosely flowered; spikelets less silky.

Dry open ground, Brazil, whence originally described, to Peru and Argentina.

PERU: Colonia Perené, *Hitchcock* 22079. La Merced, *Macbride* 5451. San Gaván, *Lechler* 2399 (Kew Herb.).

BOLIVIA: Mapiri, *Rusby* 246. Coroico, *Buchtien* 6443. Chulumani, *Hitchcock* 22665. Buena Vista, *Steinbach* 5221, 6638, 6676.

3. *Trichachne saccharata* (Buckl.) Nash in Small, Fl. Southeast. U. S. 83. 1903.

Panicum saccharatum Buckl. Prel. Rep. Geol. Agr. Surv. Tex. App. 2. 1866.

Panicum friesii Hack.; R. E. Fries, Nov. Act. Soc. Sci. Upsal. IV. 1¹: 170. 1905.

Valota saccharata Chase, Proc. Biol. Soc. Washington 19: 188. 1906.

An erect perennial from knotty swollen felty-pubescent bases, with glabrous culms 50 to 100 cm. tall, flat blades usually rather short, sometimes 10 to 20 cm. long, and narrow, white or purplish panicles 10 to 15 cm. long, with very silky spikelets.

Dry open ground, southwestern United States to Argentina. Originally described from Texas.

BOLIVIA: Cochabamba, *Holway* 321, 368; *Herzog* 2069.

87. SYNTHESISMA Walt. CRABGRASS

Spikelets in two's or three's, short-pedicellate in two rows along one side of a narrow rachis, the slender racemes digitate or subdigitate; spikelets lanceolate or elliptic; first glume minute or obsolete; fruit acute, the lemma with narrow hyaline margins.

Plants annual.

Culms erect to spreading, not creeping. Spikelets elliptic, obtusish; fruit brown.....3. *S. violascens*.

Culms widely creeping.

Racemes very slender; rachis with scattered long white hairs; spikelets about 2.5 mm. long.....2. *S. digitata*.

Racemes stouter; rachis without long hairs; spikelets 3 mm. long.

1. *S. sanguinalis*.

Plants perennial.

Spikelets silky-villous.....4. *S. aequatoriensis*.

Spikelets glabrous or inconspicuously pubescent.

Second glume obtuse, shorter than the brown fruit.....5. *S. leiantha*.

Second glume acute, longer than the pale fruit.....6. *S. cuyabensis*.

1. *Syntherisma sanguinalis* (L.) Dulac, Fl. Haut. Pyr. 77. 1867. CRABGRASS.

Panicum sanguinale L. Sp. Pl. 57. 1753.

Digitaria sanguinalis Scop. Fl. Carn. ed. 2. 1: 52. 1772.

Panicum adscendens H. B. K. Nov. Gen. & Sp. 1: 97. 1816.

Digitaria marginata Link, Enum. Pl. 1: 102. 1821.

Digitaria flabriata Link, Hort. Berol. 1: 226. 1827.

A decumbent branching creeping weedy annual, with pilose sheaths and glabrous or pilose, flat blades, and mostly 3 to 8 slender racemes up to 10 cm. long, subdigitate or in fascicles along a short axis, the rachis of the raceme 0.5 mm. broad.

A common weed in cultivated soil and waste places throughout the temperate and tropical regions of both hemispheres. Originally described from America and southern Europe. Probably introduced in the New World.

ECUADOR: Oil Camp between Guayaquil and Salinas, *Hitchcock* 20065. Without locality, *Jameson* 343 (Kew Herb.).

PERU: Colonia Perené, *Hitchcock* 22075, 22082.

BOLIVIA: Bopi River, *Rusby* (*Mulford Biol. Expl.*) 675. Milluhuaya, *Buchtien* 6440. Mapiri, *Rusby* (*Mulford Biol. Expl.*) 245. Coroico, *Buchtien* 443 (Kew Herb.), 3634. Yungas, *Bang* 264 (Kew Herb.). Cochabamba, *Hitchcock* 22839. San Felipe, *Hitchcock* 22606. Hacienda Simaco, *Buchtien* 5318. Hacienda Casana, *Buchtien* 7126. Sirupaya, *Buchtien* 418, Espíritu Santo, *Buchtien* 6439. Buena Vista, *Steinbach* 7057. Río Sirutú, *Steinbach* 6839.

2. *Syntherisma digitata* (Swartz) Hitchc. Contr. U. S. Nat. Herb. 12: 142. 1908.

Milium digitatum Swartz, Prodr. Veg. Ind. Occ. 24. 1788.

Digitaria horizontalis Willd. Enum. Pl. 92. 1809.

Digitaria setigera Roth; Roem. & Schult. Syst. Veg. 2: 474. 1817.

Digitaria setosa Desv.; Hamilt. Prodr. Pl. Ind. Occ. 6. 1825.

Differing from *S. sanguinalis* in the more slender racemes, narrower rachis, more pubescent blades, smaller spikelets, and the presence of scattered long hairs on the rachis.

A common weed in fields, open ground, and waste places, tropical regions of both hemispheres. Originally described from Jamaica.

ECUADOR: Milagro, *Hitchcock* 20272. Balao, *Jameson*, 385 (Kew Herb.).

BOLIVIA: Buena Vista, *Steinbach* 6989.

3. *Syntherisma violascens* (Link) Nash in Brown, Proc. Acad. Phila. 61: 488. 1909.

Digitaria violascens Link, Hort. Berol. 1: 229. 1827.

Panicum violascens Kunth, Rév. Gram. 1: 33. 1829.

A decumbent annual 30 to 80 cm. tall, with glabrous or pubescent sheaths and blades, and few to many slender, ascending and somewhat out-curving racemes 4 to 8 cm. long on an axis 2 to 5 cm. long; rachis with margins much narrower than the center; spikelets 1.3 to 1.5 mm. long, minutely pubescent; first glume obsolete.

Fields and grassy places in the tropics of both hemispheres. Originally described from a garden plant, the seed from Brazil.

PERU: Colonia Perené, *Hitchcock* 22090, 22091, 22092.

BOLIVIA: Coroico, *Buchtien* 644. Coripata, *Hitchcock* 22674. Hacienda Casana, *Buchtien* 7128. Hacienda Simaco, *Buchtien* 5335. Reyes, *White* (*Mulford Biol. Expl.*) 1536 (Kew Herb.).

4. *Syntherisma aequatoriensis* Hitchc., sp. nov.

Perennial, with a knotty felty-pubescent base or crown; culms slender, erect or decumbent and widely spreading, glabrous, 40 to 60 cm. tall, or finally more than 1 meter; sheaths densely papillose-pilose, the hairs whitish, soft, often reflexed, especially above the nodes; ligule membranaceous, about 2 mm. long, truncate, dentate; blades thin, flat, lanceolate, spreading, 5 to 10 cm. long, as much as 15 mm. wide, acuminate, pubescent on both surfaces or glabrate, often pilose with long hairs at base; panicle of several (as many as 25) slender ascending racemes 3 to 20 cm. long on an axis 1 to 10 cm. long, several at the lower 1 or 2 nodes, and 1 or 2 above, the nodes pubescent, often also with a few spreading hairs as much as 3 mm. long, the rachis of the racemes angular, scabrous; spikelets appressed along the rachis, narrow, 3 mm. long; first glume minute, glabrous, triangular, less than 0.5 mm. long; second glume a little shorter and a little narrower than the sterile lemma, acuminate, 3-nerved, appressed-villous; sterile lemma 7-nerved, glabrous along the middle of the back, silky-villous along the margin and the outer internerves, the hairs sometimes purplish, extending beyond the summit as a short tuft or pencil, finally at maturity all the hairs spreading; fertile lemma brownish, acuminate, about as long as the sterile lemma.

Type in the U. S. National Herbarium, no. 1,164,906, collected among brush, at Guayaquil, Ecuador, June 20, 1923, by A. S. Hitchcock (no. 19949).

Besides the type the following specimens have been seen:

ECUADOR: Guayaquil, *Mille* 17, 18. Oil Camp between Guayaquil and Salinas, *Hitchcock* 20056½. Milagro, *Hitchcock* 20271. Huigra, *Hitchcock* 20609; *Holway* 824.

BRAZIL: West of Garanhuns, Pernambuco, *Chase* 7826.

This species approaches *Trichachne* in the felty-pubescent knotty crown and the elongate axis of the racemes, but the shape and pubescence of the spikelets, the shape of the blades, and the spreading habit of the plant are those of *Syntherisma*. An allied species is *Digitaria doellii* Mez.

5. *Syntherisma leiantha* (Hack.) Hitchc.

Panicum adustum var. *leianthum* Hack. Repert. Nov. Sp. Fedde 6: 342. 1909.

Digitaria adusta var. *leiantha* Parodi, Physis 7: 57. 1923.

An erect glabrous perennial about 1 meter tall, with several erect or ascending, rather stiff racemes 10 to 15 cm. long, scattered along an axis 7 cm. long, the glabrous elliptic spikelets about 2.5 cm. long. Differing from *Syntherisma adusta* (Nees) Chase (*Panicum adustum* Nees) in the glabrous spikelets, paler fruit, and the more numerous and longer racemes, these 15 to 20 cm. long.

Meadows and open slopes, southern Brazil and Bolivia to Paraguay and northern Argentina. Originally described from Paraguay.

BOLIVIA: Samaipata, *Herzog* 1763.

6. *Syntherisma cuyabensis* (Trin.) Hitchc. Contr. U. S. Nat. Herb. 22: 468. 1922.

Panicum cuyabense Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 1: 206. 1834.

A spreading perennial, with culms as much as 1 meter long, mostly pubescent, flat blades, several slender ascending racemes about 10 cm. long, and narrowly lanceolate, acuminate spikelets about 2.5 mm. long; first glume obsolete; second glume and sterile lemma somewhat longer than the fertile lemma, somewhat pubescent on the nerves.

Sandy soil, British Guiana to Argentina. Originally described from Brazil.

BOLIVIA: Buena Vista, *Steinbach* 6877.

PASPALUM PUBESCENS Presl, Rel. Haenk. 1: 214. 1830. This is said to come from Peru, but in the errata (p. 351) the locality is changed to Monterey, Calif. It is a species of *Syntherisma* (*S. pubescens* (Presl) Scribn.; *Paspalum preslii* Kunth). The species has not been identified and the locality is uncertain.

88. THRASYA H. B. K.

Inflorescence a single terminal spikelike raceme, the rachis with membranaceous wings, partially embracing the row of spikelets; spikelets apparently sessile and solitary in a single row, but actually in pairs, the spikelets of each pair back to back, the pedicel of the primary spikelet adnate to the mid nerve of the rachis; first glume minute, often hyaline; second glume shorter than the spikelet; sterile lemma subindurate, thinner down the middle, at maturity splitting to the base, the margins of the split rolling inward, the sterile palea nearly as long as its lemma, the margins firm, inclosing a staminate flower or empty; fruit cartilaginous-indurate, commonly with stiff hairs at the summit.

1. *Thrasya campylostachya* (Hack.) Chase, Proc. Biol. Soc. Washington 24: 115. 1911.

Panicum campylostachyum Hack. Oesterr. Bot. Zeitschr. 51: 367. 1901.

An erect caespitose perennial, with flat linear pubescent blades and terminal and axillary racemes 4 to 9 cm. long; spikelets glabrous or nearly so, crowded in a single row, the base partly embraced by the margins of the rachis.

Grassy banks, Guatemala to Bolivia. Originally described from Costa Rica.

BOLIVIA: Coripata, *Hitchcock* 22694. Coroico, *Hitchcock* 22728. San José, *Hitchcock* 22733. Milluhuaya, *Buchtien* 4265.

In the National Herbarium is a fragment (from the Munich Herbarium) of *Thrasya petrosa* (Trin.) Chase, collected in Peru by Haenke. In the absence of other specimens confirming the locality, this species, known only from Brazil and Paraguay, is omitted from the list.

89. PSEUDECHINOLAENA Stapf

Spikelets loosely arranged in several erect or ascending racemes, the back of the fruit of the primary spikelet turned from the axis; first and second glumes about as long as the spikelet, the second uncinately spiny and ventricose at maturity.

1. *Pseudechinolaena polystachya* (H. B. K.) Stapf in Prain, Fl. Trop. Afr. 9: 495. 1919.

Echinolaena polystachya H. B. K. Nov. Gen. & Sp. 1: 119. 1816.

Panicum uncinatum Raddi, Agrost. Bras. 41. 1823.

Plants creeping and rooting at base, the fertile culms erect or ascending, 20 to 40 cm. tall; blades thin, ovate-lanceolate, 3 to 6 cm. long; racemes 2 to 3 cm. long.

Moist shady soil, southern Mexico to Bolivia and Uruguay. Originally described from Colombia.

ECUADOR: Nieblí, *Sodiño* 315. El Recreo, *Eggers* 15147. Cashurco, *Hitchcock* 21853. Cerro Manglar Alto, *Tate* 19. Tandapi, *Holmgren* 859.

PERU: Colonia Perené, *Hitchcock* 22068. La Merced, *Macbride* 5354. Casapi, *Mathews* 2103 (Kew Herb.). Chachapoyas, *Mathews* 3241 (Kew Herb.).

BOLIVIA: Mapiri, *Buchtien* 1166, 1170; *Rusby* 229. Guanay, *Rusby* 218. Yungas, *Bang* 864. Hacienda Simaco, *Buchtien* 5320. Coroico, *Buchtien* 265, 6437. Milluhuaya, *Buchtien* 4273. La Florida, *Hitchcock* 22629. Unduavi, *Rusby* in 1885. Espiritu Santo, *Buchtien* 6468. Tres Cruces, *Herzog* 1594.

90. MESOSETUM Steud.

Inflorescence a single erect terminal spikelike raceme, the spikelets subsessile, solitary, in two rows on one side of a slender rachis, the back of the fruit turned from the rachis, ventricose on the side toward the rachis and fitting into its concavities, the back of the spikelet flat or nearly so; glumes and sterile lemma usually bearing stiff hairs on the strong lateral nerves, the mid nerve of the sterile lemma faint or suppressed; sterile palea wanting; fruit ventricose on the palea side.

1. *Mesosetum rottboellioides* (H. B. K.) Hitchc. Contr. U. S. Nat. Herb. 12: 211. 1909.

Panicum rottboellioides H. B. K. Nov. Gen. & Sp. 1: 96. pl. 32. 1816.

A slender erect perennial 40 to 60 cm. tall, the culms simple, the narrow firm spreading blades mostly 10 to 15 cm. long, the yellowish raceme 5 to 10 cm. long.

Moist places, Colombia to Brazil and Bolivia. Originally described from the Orinoco River.

BOLIVIA: Ixiamas, *White* 2318.

91. ERIOCHLOA H. B. K.

Inflorescence of few to many racemes racemose on a common axis; spikelets subsessile, solitary or paired, the back of the fruit turned from the slender rachis; internode of the rachilla between the first and second glumes thickened, forming a ringlike base to the spikelet, the first glume usually reduced to an obscure sheath adnate to the ring; fruit minutely papillose-rugose, mucronate-pointed or with a delicate, often deciduous awn.

Racemes 2, rarely 3.....1. *E. distachya*.
Racemes several (3 or 4 in *E. pacifica*).

Racemes 1 to 2 cm. long, dense, rather distant; pedicels with erect hairs, nearly as long as the spikelets.....3. *E. weberbaueri*.

Racemes mostly more than 2 cm. long, slender, approximate; pedicels subglabrous or with short hairs.

Spikelets villous, narrowed into a subulate glabrous point; racemes few.....2. *E. pacifica*.

Spikelets more or less pubescent but scarcely villous, acute to acuminate but not subulate-pointed; racemes several.

Spikelets 3 mm. long; plants annual.

Fruit short-awned; pedicels glabrous or nearly so.....4. *E. ramosa*.

Fruit obtuse, awnless; pedicels conspicuously villous...5. *E. peruviana*.

Spikelets 4 to 6 mm. long; plants perennial except in *E. eggersii*.

Nodes villous; first glume evident.....7. *E. polystachya*.

Nodes puberulent; first glume obsolete.

Fruit awned, the awn nearly equaling the sterile lemma.

6. *E. punctata*.

Fruit cuspidate, the point less than 1 mm. long.....8. *E. eggersii*.

1. *Eriochloa distachya* H. B. K. Nov. Gen. & Sp. 1: 95. pl. 30. 1816.

An erect perennial 20 to 40 cm. tall, branched above, the slender exerted peduncles bearing 2 (rarely 3) racemes 1 to 2 cm. long, about 1 cm. apart, the rachis woolly, the short pedicels with a ring of long hairs at the summit.

Growing in moist places, Guatemala to Paraguay. Originally described from Venezuela.

PERU: Tarapoto, *Spruce* 4368 (Kew Herb.).

BOLIVIA: Reyes, *White* 1521. Guanay, *Rusby* 214, 215.

2. *Eriochloa pacifica* Mez, Bot. Jahrb. Engler 56: Beibl. 125: 11. 1921.

Resembling *E. distachya* but stouter, the blades shorter and broader, the racemes mostly 3 or 4, sometimes more, wider, the spikelets long-acuminate and subulate-pointed, silky-villous below, glabrous above.

Dry ground, coast of Ecuador. (Type, *Eggers* 14772.)

ECUADOR: Guayaquil, *Mille* 9. Puna Island, *Eggers* 14772. Chanduy, *Spruce* 6446, 6447. Also in the Galápagos Islands.

3. *Eriochloa weberbaueri* Mez, Bot. Jahrb. Engler 56: Beibl. 125: 11. 1921.

Densely tufted, with long prostrate culms and ascending branches, very leafy below, the short thick racemes mostly spreading, the pedicels bearing stiff hairs nearly as long as the pubescent paired spikelets.

Open dry ground. Known only from the type collection.

PERU: Santa Cruz, *Weberbauer* 4135.

4. *Eriochloa ramosa* (Retz.) Kuntze, Rev. Gen. Pl. 2: 775. 1891.

Milium ramosum Retz. Obs. Bot. 6: 22. 1791.

Eriochloa annulata Kunth, Rév. Gram. 1: 30. 1829.

A slender ascending glabrous annual with sparingly branching culms, linear blades 2 to 5 mm. wide, and pale panicles of few to several erect or ascending racemes; spikelets silky.

Ditches and wet places in the Old World tropics. Originally described from India. Introduced in a few localities in tropical America.

PERU: Lima, *Hitchcock* 22339. Callao, *Wilkes Expl. Exped.* (Kew Herb.).

5. *Eriochloa peruviana* Mez, Bot. Jahrb. Engler 56: Beibl. 125: 12. 1921.

A spreading geniculate annual, differing from *E. ramosa* in the obtuse awnless fruit; spikelets 3 mm. long; pedicels long-villous.

Known only from the type specimen, collected between Plura and the Hacienda Nomala, Peru, *Weberbauer* 5952, in the Berlin Herbarium.

6. *Eriochloa punctata* (L.) Desv.; *Hamilt. Prodr. Pl. Ind. Occ.* 5. 1825.

Milium punctatum L. Syst. Nat. ed. 10. 2: 872. 1759.

Eriochloa montevidensis Griseb. Abh. Ges. Wiss. Göttingen 24: 306. 1879.

A glabrous branching perennial, ascending from a decumbent base, commonly 1 meter or more tall, with flat blades 10 to 15 mm. wide, and several to many narrowly ascending racemes.

Moist places, southern United States to Argentina. Originally described from Jamaica.

ECUADOR: Milagro, *Hitchcock* 20256, 20559.

PERU: Lima, *Didrichsen*. Chosica, *Macbride & Featherstone* 546.

BOLIVIA: Covendo, *White* 914. Coroico, *Buchtien* 6432. Chulumani, *Hitchcock* 22668. Bopi River, *Rusby (Mulford Biol. Expl.)* 674.

7. *Eriochloa polystachya* H. B. K. Nov. Gen. & Sp. 1: 95. pl. 31. 1816.

CARIB GRASS.

Monachne subglabra Nash, Bull. Torrey Club 30: 374. 1903.

Eriochloa subglabra Hitchc. Contr. U. S. Nat. Herb. 12: 208. 1909.

Similar to *E. punctata*, more decumbent or stoloniferous in favorable situations, the nodes densely villous; racemes looser, the spikelets in pairs, the first glume developed as a minute broad loose membrane.

Lowland along the coast, West Indies to Brazil and Ecuador. Originally described from Guayaquil, Ecuador. (*Bonpland.*)

ECUADOR: Guayaquil, *Hitchcock* 19915. Panigón Plantation, *Hitchcock* 20562.

8. *Eriochloa eggersii* Hitchc., sp. nov.

Culms rather stout, erect from a decumbent base, glabrous, about 1 meter tall, the nodes puberulent; sheaths glabrous except the puberulent collar; ligule a short dense fringe of hairs; blades flat, rather lax, glabrous on both surfaces or scaberulous beneath, the margins scabrous, slightly cordate at base, 15 to 25 cm. long, as much as 2 cm. wide; panicle about 10 cm. long, of several ascending or appressed racemes about 2 cm. long, the culm below the panicle and the axis densely pubescent; rachis of the racemes and the pedicels densely short-villous, the pedicels with a tuft of several long hairs at the summit; spikelets 5 to 6 mm. long; second glume sparingly appressed-hispid on the lower half or two-thirds, glabrous above, acuminate; sterile lemma similar to the glume, somewhat shorter; fruit oblong-oval, 2.5 mm. long, abruptly cuspidate, the awn less than 1 mm. long.

Type in the U. S. National Herbarium, no. 822110, collected at El Recreo, Province of Manabí, Ecuador, by Eggers (no. 15423).

This collection is cited by Mez under his original description of *E. pacifica*. I have chosen *Eggers* 14772 as the type of that species, since it is the first specimen cited and the other cited specimens that I have examined are like it rather than like no. 15423. The description is too meager to follow in the selection of the type. The type of *E. eggersii* is the only specimen of this species seen. In this the base of one culm is present but not the base of the entire plant. It appears to be annual.

92. BRACHIARIA (Trin.) Griseb.

Inflorescence of few to several rather thick racemes; spikelets solitary, sessile, the back of the fruit turned from the rachis; first glume well developed.

1. *Brachiaria plantaginea* (Link) Hitchc. Contr. U. S. Nat. Herb. 12: 212. 1909.

Panicum plantagineum Link, Hort. Berol. 1: 206. 1827.

An erect or often widely spreading, glabrous, branching annual, with flat blades as much as 15 mm. wide, and mostly 3 or 4 spreading racemes 3 to 7 cm. long, remote along the axis, the glabrous spikelets 4 to 4.5 mm. long.

Moist places, often a weed in cultivated ground, southern United States to Brazil, whence originally described, and Bolivia.

BOLIVIA: Coripata, *Hitchcock* 22673. Coroico, *Buchtien* 3636. Milluhuaya, *Buchtien* 4197. Without locality, *Bang* 2588.

93. AXONOPUS Beauv.

Inflorescence of 2 to many slender racemes, aggregate at the summit of the culm; spikelets depressed-biconvex, oblong-elliptic, solitary, sessile, the back of the fruit turned from the rachis; first glume wanting; sterile palea obsolete.

Rachis bearing conspicuous stiff spreading golden yellow hairs.

Spikelets partially sunken in the broad rachis.....2. *A. chrysolepharis*.

Spikelets not sunken in the slender rachis.

Spikelets glabrous or nearly so.....1. *A. aureus*.

Spikelets pilose.....3. *A. herzogii*.

Rachis not bearing stiff hairs.

Plants annual, the delicate racemes 2 or 3.....4. *A. capillaris*.

Plants perennial.

Blades flat, mostly more than 5 mm. wide (less in *A. fissifolius*).

Racemes on the main culms few; plants mostly less than 1 m. tall.

Plants stoloniferous or creeping; racemes green.

- Blades of stolons short, broad, obtuse; glume and sterile lemma pointed beyond the fruit.....5. *A. compressus*.
 Blades all alike; glume and sterile lemma not pointed beyond the fruit6. *A. fissifolius*.
 Plants not stoloniferous; racemes purplish-brown....7. *A. mathewsi*.
 Racemes on the main culm numerous; plants robust, usually more than 1 m. tall, sometimes stoloniferous.....8. *A. scoparius*.
 Blades folded or involute not more than 5 mm. wide, usually stiff. Bunch grasses.
 Racemes numerous.
 Spikelets nearly 3 mm. long, strongly nerved.....9. *A. barbigerus*.
 Spikelets 1.5 to 2 mm. long, obscurely nerved.....13. *A. attenuatus*.
 Racemes few to several.
 Spikelets with conspicuous stiff purple hairs.....12. *A. marginatus*.
 Spikelets glabrous or with inconspicuous pubescence.
 Blades involute, fine; pedicels glabrous.....10. *A. siccus*.
 Blades folded, firm; pedicels with a few long, straight hairs below the spikelets.....11. *A. elegantulus*.

1. *Axonopus aureus* Beauv. Ess. Agrost. 12. 1812.

Paspalum aureum H. B. K. Nov. Gen. & Sp. 1: 93. 1816.

A tall slender branching perennial, with wiry compressed culms, rather firm, spreading, flat blades, and a handsome inflorescence of 4 to 15 subdigitate slender golden-brown racemes, the stiff orange-yellow hairs in tufts below the spikelets as well as along the margins.

The name *Paspalum aureum* H. B. K. is based on *Axonopus aureus* Beauv., but the plant described and figured (pl. 27) under the name is *Axonopus chrysoblepharis* (Lag.) Chase.

Wet sandy savannas, Porto Rico and Colombia to Brazil and Bolivia. Type locality not indicated in the original description.

BOLIVIA: Hacienda Casana, *Buchtien* 7142. Ixiamas, *White* 1131. Buena Vista, *Steinbach* 5426, 6948.

2. *Axonopus chrysoblepharis* (Lag.) Chase, Proc. Biol. Soc. Washington 24: 134. 1911.

Cabrera chrysoblepharis Lag. Gen. & Sp. Nov. 5. 1816.

Resembling *A. aureus* but the nodes pubescent, and the racemes stiffer, with a rachis 1 to 1.5 mm. wide, extending beyond the sunken spikelets.

Dry grassy slopes, Venezuela to Bolivia and Paraguay. Originally described from Panama and the port of Arica. We have seen no specimens from Peru or Chile.

BOLIVIA: Reyes, *Rusby* 216. Hacienda Anacuri, *Holway* 708. Chulumani, *Hitchcock* 22703.

3. *Axonopus herzogii* (Hack.) Hitchc.

Paspalum herzogii Hack. in Herzog, Repert. Nov. Sp. Fedde 7: 50. 1909.

An erect perennial 30 to 40 cm. tall, with firm folded blades somewhat flabellately aggregate at the base, papillose-ciliate toward base, and 5 or 6 fascicled racemes 6 to 8 cm. long, the rachis papillose-hispid, the pilose spikelets 2.5 mm. long.

High plains, eastern Bolivia. Originally described from Santiago de Chiquitos. Known only from the type collection.

BOLIVIA: Santiago, *Herzog* in 1905.

4. *Axonopus capillaris* (Lam.) Chase, Proc. Biol. Soc. Washington 24: 133. 1911.

Paspalum capillare Lam. Tabl. Encycl. 1: 176. 1791.

Paspalum minutum Trin. Linnaea 10: 293. 1836. (Cuchero, Peru, Pöppig.)

A slender, ascending, branching, nearly glabrous annual, with thin blades 2.5 to 5 cm. long and about 4 mm. wide, long subcapillary peduncles, and 2 or 3 delicate racemes about 2.5 cm. long.

Moist open ground, Central America to Peru and Brazil. Originally described from tropical America.

ECUADOR: Portovelo, *Hitchcock* 21254.

PERU: Colonia Perené, *Hitchcock* 22111. La Merced, *Macbride* 5609. Without locality, *Pöppig* 829; *Lechler* 2284.

BOLIVIA: Chulumani, *Hitchcock* 22657. Milluhuaya, *Buchtien* 4275. Hacienda Simaco, *Buchtien* 5327. Mapiri, *Buchtien* 1160; *Rusby* 241. Cochabamba, *Bang* 872. Buena Vista, *Steinbach* 6879.

5. *Axonopus compressus* (Swartz) Beauv. Ess. Agrost. 12. 1812. CARPET GRASS.

Milium compressum Swartz, Prodr. Veg. Ind. Occ. 24. 1788.

Paspalum platycaulon Poir. in Lam. Encycl. Suppl. 5: 34. 1804.

Paspalum compressum Raspail, Ann. Sci. Nat. 5: 301. 1825.

Paspalum macropodium Steud. Syn. Pl. Glum. 1: 19. 1854. (*Jameson* 556.)

A nearly glabrous perennial, under favorable conditions producing long leafy stolons with short broad obtuse blades, the flowering culms erect or ascending, compressed, with rather thin blades 8 to 10 mm. wide, and 2 to 5 slender racemes along a short axis, 2 or 3 secondary peduncles often produced from the upper node.

Moist grassland, southern United States to Argentina; also in the warmer parts of the Old World. Originally described from Jamaica.

ECUADOR: Milagro, *Hitchcock* 20174, 20233. Quito, *Harteman* 66. Pomasqui, *Sodi* in 1897. El Recreo, *Eggers* 15836. Baños, *Hitchcock* 21908. Balao, *Eggers* 14658. Between La Chorita and Portovelo, *Hitchcock* 21181. Between La Toma and Loja, *Hitchcock* 21421. Guayaquil, *Jameson* 556 (Kew Herb.). Andes of Ecuador, *Spruce* 5941 (Kew Herb.).

PERU: Colonia Perené, *Hitchcock* 22062, 22088.

BOLIVIA: Chulumani, *Hitchcock* 22671. Buena Vista, *Steinbach* 5159, 6990 (blades pubescent). Espíritu Santo, *Buchtien* 2505. Hacienda Simaco, *Buchtien* 5328.

6. *Axonopus fissifolius* (Raddi) Kuhl. Comm. Linhas Telegr. Matto Grosso 67: 87. 1922.

Paspalum fissifolium Raddi, Agrost. Bras. 26. 1823.

Differing from *A. compressus* in its much more slender and decumbent habit, in the nearly conform foliage of stolons and fertile culms, and in the smaller, less pubescent spikelets, the glume and sterile lemma not pointed beyond the fruit.

Open ground, Colombia to Bolivia. Originally described from Brazil.

BOLIVIA: Coroico, *Hitchcock* 22716; *Buchtien* 267, 6434. Milluhuaya, *Buchtien* 4276. Chulumani, *Hitchcock* 22654. La Florida, *Hitchcock* 22625. Yanacachi, *Buchtien* 419. Hacienda Simaco, *Buchtien* 5326. Buena Vista, *Steinbach* 6724, 6847.

7. *Axonopus mathewsii* (Mez) Hitchc.

Paspalum mathewsii Mez, Repert. Nov. Sp. Fedde 15: 62. 1917.

An erect glabrous perennial 40 to 100 cm. tall, with flat blades as much as 1 cm. wide, and 2 to 8 slender lax spreading racemes 5 to 10 cm. long.

Open slopes, Ecuador and Peru. Originally described from Peru. (Type, *Mathews* 3239.)

ECUADOR: Between Loja and San Lucas, *Hitchcock* 21465, 21483.

PERU: Chachapoyas, *Mathews* 3239 (Kew Herb.).

8. *Axonopus scoparius* (Flügge) Hitchc. Contr. U. S. Nat. Herb. 22: 471. 1922.

Paspalum scoparius Flügge, Monogr. Pasp. 124. 1810.

Paspalum iridifolium Poepp. Reise 2: 324. 1836. (Peru, *Pöppig*.)

Paspalum hackelianum Sodiro, Anal. Univ. Quito 1889: 4. 1889?

Paspalum triptinnatum Mez, Repert. Nov. Sp. Fedde 15: 64. 1917. (*Buchtien* 410 [err. 1410.])

A stout smooth erect perennial as much as 2 meters tall, with long stout stolons, blades as much as 3 cm. wide, and large panicles as much as 30 cm. long. The panicles are terminal and axillary and vary much in size. In vigorous specimens the panicle is compound, the lower branches bearing racemes, the total number of racemes sometimes being as many as 100. On small plants the racemes may be only 10.

Cultivated for forage; called "gamalote," "cachi," and "caricachi."

Moist ground, Colombia to Brazil. Originally described from Venezuela.

ECUADOR: Teresita (cultivated), *Hitchcock* 20470, 20521. Panigón Plantation, *Hitchcock* 20555, 20598. Río Toache, *Sodiro*. Río Pilatón (*Paspalum hackelianum*), *Mille* 302. Río Verde, *Pachano* 236. Baños, *Sodiro*. Cashurco, *Hitchcock* 21752, 21807, 21810, 21826. Portovelo, *Hitchcock* 21267. Between La Chorita and Portovelo, *Hitchcock* 21193. Between El Tambo and La Toma, *Hitchcock* 21336. Napo River, *Jameson* 762 (Kew Herb.). Bucay, *Rose* 22436.

PERU: Colonia Perené, *Hitchcock* 22080, 22086. La Merced, *Hitchcock* 22157. San Miguel, *Cook & Gilbert* 902. Huacachi, *Macbride* 3863. Yanano, *Macbride* 3761. Muña, *Macbride* 4052.

BOLIVIA: Coroico, *Buchtien* 3628. Yanacachi, *Buchtien* 410. La Florida, *Hitchcock* 22608; *Holway* 666. Chulumani, *Hitchcock* 22662, 22700. Hacienda Simaco, *Buchtien* 5324, 5328.

9. *Axonopus barbigerus* (Kunth) Hitchc.

Paspalum barbatum Nees; Trin. Gram. Icon. 1: pl. 98. 1828. Not *P. barbatum* Schult. 1827.

Paspalum barbigerum Kunth, Rév. Gram. 1: 24. 1829.

Axonopus barbatus Chase; Parodi, Rev. Facult. Agron. Vet. 4: 49. 1922.

A robust perennial more than 1 meter tall, with numerous pale slender ascending racemes 10 to 20 cm. long.

Grassy plains, Brazil and Bolivia to Uruguay, whence originally described, and Paraguay.

BOLIVIA: Hacienda Casana, *Buchtien* 7130. Buena Vista, *Steinbach* 5377, 6976.

10. *Axonopus siccus* (Nees) Kuhl. Comm. Linhas Telegr. Matto Grosso 67: 87. 1922.

Paspalum siccum Nees, Agrost. Bras. 28. 1829.

A slender erect perennial 0.5 to 1.5 meters tall, with firm narrow elongate involute blades, and few to several erect racemes 5 to 10 cm. long.

Grassy plains, Brazil, whence originally described, to Bolivia and Paraguay.

BOLIVIA: Samaipata, *Herzog* 1709.

11. *Axonopus elegantulus* (Presl) Hitchc.

Paspalum elegantulum Presl, Rel. Haenk. 1: 211. 1830.

Paspalum gregortense Mez, Bot. Jahrb. Engler 56: Beibl. 125: 10. 1921. (*Weberbauer* 6570.)

An erect or decumbent perennial, with strongly keeled sheaths, hispidulous collar, narrow folded blades, and few to several erect racemes 4 to 6 cm. long. The plants grow in large bunches, the leafless base of the culms often long and slender like a stolon.

Rocky hillsides; known only from Peru. Originally described from the mountains of Huánuco. (*Haenke*.)

PERU: Ollantaytambo, *Hitchcock* 22515. Mito, *Macbride & Featherstone* 1498; *Macbride* 3270, 3324. Yanano, *Macbride* 3760. San Gregorio, *Weberbauer* 6570.

12. *Axonopus marginatus* (Trin.) Chase, Contr. U. S. Nat. Herb. 17: 228. 1913.
Paspalum marginatum Trin. Gram. Pan. 90. 1826.

A slender glabrous closely cespitose perennial 30 to 60 cm. tall from a somewhat swollen base, with erect narrow blades 2 to 3 mm. wide, and few to several ascending racemes 3 to 6 cm. long.

Grassy plains, Brazil, whence originally described, to Bolivia.

BOLIVIA: Hacienda Casana, *Buchtien* 7118.

13. *Axonopus attenuatus* (Presl) Hitchc. Contr. U. S. Nat. Herb. 22: 471. 1922.

Paspalum attenuatum Presl, Rel. Haenk. 1: 212. 1830.

An erect perennial 50 to 100 cm. tall, with compressed shoots, overlapping, strongly keeled sheaths, folded blades, numerous slender racemes 7 to 10 cm. long, and obscurely nerved spikelets 1.5 to 2 mm. long.

Sandy savannas, Guiana to Peru and Brazil. In Peru known only from the type collection.

PERU: Huánuco, *Haenke*.

94. PASPALUM L.³⁴

Inflorescence of 1 to many racemes, these racemes along a common axis; spikelets plano-convex (in a few species unequally biconvex, or concavo-convex), sessile along a slender or winged rachis, the back of the fruit turned toward it; first glume typically wanting, developed in a few species; fertile lemma and palea chartaceous-indurate (thin in *P. saccharoides*).

Rachis winged (wing suppressed in nos. 16 to 19, with silky spikelets). Fruit pale. (Subgenus CERESIA.)

Spikelets glabrous.

Racemes not falling from the main axis. Spikelets more than 3 mm. long.

13. *P. crassum*.

Racemes falling entire from the main axis (tardily in *P. candidum*; spikelets less than 3 mm. long. Rachis green, foliaceous.

Plants perennial, aquatic.....1. *P. repens*.

Plants annual, terrestrial.

Second glume developed.

Rachis extending beyond the uppermost spikelet; second glume and sterile lemma not loose.

Plants in low dense mats. Foliage pilose.....4. *P. pygmaeum*.

Plants not in mats.

Spikelets 2 to 2.2 mm. long, greenish; axis 2 to 2.5 mm. wide.

5. *P. prostratum*.

Spikelets not more than 1.8 mm. long, whitish; axis less than 2 mm. wide.

³⁴ Contributed by Agnes Chase.

- Spikelets distinctly hollowed on the flat side with raised margin; culms decumbent and branching—2. *P. penicillatum*.
 Spikelets not hollowed; culms erect, simple—3. *P. tuberosum*.
 Rachis with a spikelet at its apex; second glume and sterile lemma loose.
 Second glume and sterile lemma not much larger than the fruit; rachis about 2 mm. broad—6. *P. sodiroanum*.
 Second glume and sterile lemma much larger than the fruit; rachis scarcely more than 1 mm. wide, or less.
 Spikelets 2 mm. long, the glume and sterile lemma not fluted.
 7. *P. flavum*.
 Spikelets 2.5 mm. long, the sterile lemma distinctly fluted, the glume slightly so—8. *P. racemosum*.
 Second as well as first glume suppressed.
 Plants very scabrous, elongate and clambering—12. *P. scabrum*.
 Plants not or very slightly scabrous.
 Culms commonly 1 meter or more long; spikelets 2.3 to 2.5 mm. long—9. *P. candidum*.
 Culms commonly not more than 50 cm. long; spikelets not over 2 mm. long.
 Culms vinous-purple or purple-tinged; sheaths glabrous or nearly so—10. *P. depauperatum*.
 Culms pale stramineous; sheaths pilose—11. *P. lineispatha*.
 Spikelets silky. Rachis brightly colored, membranaceous; spikelets clothed with long silky hairs; perennials.
 Rachis more than 5 mm. wide; spikelets solitary.
 Blades 5 to 8 mm. wide—14. *P. ceresia*.
 Blades not more than 3 mm. wide—15. *P. stellatum*.
 Rachis 1 mm. or less wide; spikelets or some of them paired.
 Spikelets pale; glume and sterile lemma 5-nerved, both long-ciliate; blades less than 5 mm. wide—19. *P. polyphyllum*.
 Spikelets purplish to tawny; glume and sterile lemma 3-nerved, only the glume long-ciliate; blades commonly more than 10 mm. wide.
 Racemes spreading or drooping, more than 5 cm. long; spikelets with a conspicuous fringe of long silky hairs.
 Blades stiffly pilose, at least on the margins; racemes mostly 2 to 5, spreading—16. *P. humboldtianum*.
 Blades glabrous or nearly so; racemes mostly 8 to 16, drooping.
 17. *P. buchtienii*.
 Racemes narrowly ascending, less than 5 cm. long; spikelets with a soft inconspicuous fringe—18. *P. soboliferum*.
 Rachis not winged, or if narrowly winged not foliaceous nor broad and membranaceous with silky spikelets.
 Fertile lemma strongly ridged; spikelets concavo-convex. Both glumes suppressed. (Subgenus ANACHYBIS.)
 Blades velvety beneath; rachis sparsely pilose; spikelets 1.7 to 2 mm. long (mostly less than 2 mm.)—53. *P. malacophyllum*.
 Blades glabrous; rachis glabrous; spikelets 2 to 2.2 mm. long.
 54. *P. boliviense*.
 Fertile lemma not ridged, spikelets generally plano-convex; second glume normally developed.
 Fruit scarcely indurate, pointed; spikelets with long silky white hairs on the margin. (Subgenus MOENCHIA)—55. *P. saccharoides*.

Fruit mostly strongly indurate, if relatively thin, spikelets not long-silky
(Subgenus *OPISTHEON*.)

Racemes 2, conjugate, or approximately so, at the summit of the culm,
rarely a third below. Spikelets solitary.

Plants annual, tufted, not stoloniferous.

Spikelets orbicular, bearing globular hairs.....32. *P. multicaule*.

Spikelets obovate, glabrous.....32A. *P. pictum*.

Plants perennial, stoloniferous or creeping.

Spikelets elliptic or narrowly ovate, not silky around the margin.

Second glume and sterile lemma glabrous.....20. *P. vaginatum*.

Second glume pubescent.....21. *P. distichum*.

Spikelets suborbicular or nearly as broad as long.

Spikelets sparsely silky around the margin, about 1.5 mm. long.

38. *P. conjugatum*.

Spikelets glabrous, 2.5 to 3 mm. long.....39. *P. notatum*.

Racemes 1 to many, racemose or fasciculate, not conjugate.

Inflorescence a large flabellate panicle of numerous racemes; spikelets
solitary.....50. *P. fasciculatum*.

Inflorescence not flabellate, or if slightly so, spikelets in pairs.

Racemes solitary (rarely 2 in no. 52); spikelets in pairs.

Spikelets densely white-woolly.....52. *P. ekmanianum*.

Spikelets glabrous. First glume developed on at least one of each
pair of spikelets.

Plants creeping; spikelets 1.5 mm. long.....26. *P. decumbens*.

Plants not creeping; spikelets about 2.5 mm. long.....51. *P. pilosum*.

Racemes 2 to many (or solitary in axillary inflorescences).

Spikelets suborbicular or broadly ovate, not more than 2 mm.
long; fruit pale.

Spikelets pubescent with short crisp hairs, in pairs. Culms
erect or suberect.

Spikelets not more than 1.7 mm. long, brownish.

Sterile lemma pubescent; spikelets rounded at apex, 1.2 to
1.4 mm. long.....29. *P. paniculatum*.

Sterile lemma glabrous; spikelets slightly abruptly acutish,
1.6 to 1.7 mm. long.....30. *P. juergensii*.

Spikelets 2 mm. long, yellowish.....31. *P. tenellum*.

Spikelets glabrous.

Plants creeping; spikelets solitary.

Spikelets about 1 mm. long.....36. *P. orbiculatum*.

Spikelets about 1.8 mm. long.....37. *P. haenkeanum*.

Plants erect, robust; spikelets in pairs.

Rachis scarcely pilose; spikelets 2 to 2.2 mm. long.

45. *P. millegrana*.

Rachis densely pilose; spikelets 1.8 to 2 mm. long.

46. *P. densum*.

Spikelets elliptic to ovate or obovate, if approaching suborbicular
the fruit dark brown.

Fruit pale.

Spikelets 1.2 mm. long.....33. *P. gossipinum*.

Spikelets 2 mm. or more long.

Glume and sterile lemma loose, more or less ruffled,
glabrous; spikelets solitary. Rachis 1 to 2 mm. wide.

Rachis finely pubescent, especially on the inside; blades densely grayish-villous.....23. *P. bonplandianum*.

Rachis glabrous or obscurely puberulent; blades puberulent.

Spikelets 2.1 to 2.3 mm. long; rachis 1.5 mm. wide.

24. *P. pilgerianum*.

Spikelets 2.5 to 3 mm. long; rachis 2.5 to 3 mm. wide.

25. *P. pallidum*.

Glume and sterile lemma not loose and rumped; spikelets paired.

Rachis with very narrow margins, 0.8 to 2 mm. wide.

Plants glabrous; rachis flat; inflorescence terminal only.

Spikelets abruptly and minutely pointed.

22. *P. lividum*.

Plants with more or less puberulent to velvety foliage; rachis with upturned margins; inflorescence terminal and axillary.

Culms 45 to 85 cm. tall; blades puberulent to glabrescent.....27. *P. inconstans*.

Culms 20 to 45 cm. tall; blades densely velvety-pubescent on both surfaces.....28. *P. lepidum*.

Rachis not at all winged.

Spikelets on relatively long pedicels, loosely arranged in slender racemes in open pyramidal panicles.

Plants annual; second glume and sterile lemma equal, covering the fruit.....34. *P. microstachyum*.

Plants perennial; second glume about half as long as the fruit and sterile lemma...35. *P. inaequivalve*.

Spikelets sessile, imbricate.

Spikelets pubescent. Racemes few to several; blades flat.

Blades mostly not more than 1 cm. wide, scarcely wider than the sheath at base; spikelets more than 3 mm. long.....49. *P. remotum*.

Blades 1 to 2.5 cm. wide, broadly rounded and wider than the sheath at base; spikelets not more than 3 mm. long.

Racemes spreading, rather distant; spikelets 2.5 mm. long.....47. *P. macrophyllum*.

Racemes ascending, approximate; spikelets 2.8 to 3 mm. long.....48. *P. barclayi*.

Spikelets glabrous.

Rachis scarcely pilose; spikelets 2 to 2.2 mm. long.

45. *P. millegrana*.

Rachis densely pilose; spikelets 1.8 to 2 mm. long.

46. *P. densum*.

Fruit brown.

Spikelets 3 mm. long; fruit not shining; plants robust, commonly 2 meters tall.....44. *P. virgatum*.

Spikelets 2 to 2.5 mm. long, strongly plano-convex; fruit dark and shining; plants rarely more than 1 meter tall.

Plants annual; spikelets 2 mm. long.

40. *P. melanospermum*.

Plants perennial; spikelets about 2.5 mm. long.

Sterile lemma finely undulate inside the slightly raised margin, glabrous.....41. *P. plicatum*.

Sterile lemma not or very obscurely undulate, appressed pubescent.

Blades densely pubescent beneath, long-pilose above.

42. *P. pubifolium*.

Blades ciliate and with long hairs at the very base, otherwise glabrous.....43. *P. collinum*.

1. *Paspalum repens* Berg. Act. Helv. Phys. Math. 7: 129. pl. 7. 1772.

Ceresia fluitans Ell. Bot. S. C. & Ga. 1: 109. 1816.

Paspalum fluitans Kunth, Rév. Gram. 1: 24. 1829.

An aquatic or subaquatic perennial, with submerged stems and floating branches buoyed up by the inflated sheaths, thin flat blades, and panicles of numerous spreading racemes, the small flat elliptic whitish spikelets in 2 rows on the broad green rachis.

In sluggish streams or standing water, southeastern United States to Ecuador and Paraguay. Originally described from Dutch Guiana.

ECUADOR: Balao, *Eggers* 14632; *Jameson* 540.

2. *Paspalum penicillatum* Hook. f. Trans. Linn. Soc. 20: 171. 1851.

A decumbent branching annual, with ascending flowering culms 15 to 40 cm. long, flat lax blades mostly 3 to 10 cm. long and 6 to 12 mm. wide, and panicles of several to many spreading racemes 10 to 20 mm. long, commonly in pairs, the whitish spikelets about 1.7 mm. long.

Shaded places on moist slopes and in cultivated ground, Ecuador, Peru, and Bolivia. Described from Charles Island, Galápagos.

ECUADOR: Quito, *Holway* 909. Cotocollao, *Mille* 303, 303½. Ambato, *Pachano* 15. Riobamba, *Mille* 58. Huigra, *Rose* 24016. "Andes," *Spruce* 5943.

PERU: Cutervo, *Jelski* 407. Tambillo, *Jelski* 582.

BOLIVIA: Sorata, *Rusby* 240; *Bang* 1310; *Holway* 507½. Sirupaya, *Buchtien* 417. Villa Aspiazu, *Holway* 697. La Florida, *Hitchcock* 22612, 22643.

Part of *Mille's* no. 303 (which we have numbered 303½) has sparsely pilose foliage, and *Holway's* no. 507½ rather copiously pilose foliage.

3. *Paspalum tuberosum* Mez, Repert. Nov. Sp. Fedde 15: 29. 1917.

An erect perennial (?), branching at the base, the slender culms 12 to 28 cm. tall, leafy toward the base, the foliage pilose to glabrescent, the blades 4 to 5 mm. long and about 3 mm. wide, the panicle 3 to 4 cm. long, with 4 to 9 ascending to spreading racemes, the pale spikelets about 1.7 mm. long.

Probably in moist or muddy places.

Known only from *Weberbauer* 3815 from San Pablo, and *Weberbauer* 3932 from San Miguel, Dept. Cajamarca, Peru, both numbers being cited with the original description. Both collections were examined in the herbarium of the Berlin Botanical Museum. The species is described as perennial, but the bases of the plants are matted with dried mud and vegetation, with nothing tuberous evident. All the allied species are annuals and it seems probable that this also is annual.

4. *Paspalum pygmaeum* Hack. Repert. Nov. Sp. Fedde 11: 18. 1912.

Paspalum minimum Meyen, Reis. Erd. 1: 484. 1834, name only. (Maravillas, *Meyen*; dwarf plants.)

Paspalum haenkeanum var. *minimum* Nees, Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 6. 1841; 138. 1843.

Paspalum pygmaeum var. *glabrescens* Hack. Repert. Nov. Sp. Fedde 11: 18. 1912. (*Buchtien* 2490.)

A low annual, branching at the base and forming mats, with spreading culms 2 to 10 cm. long, the ends ascending from strongly geniculate nodes, pilose foliage, the blades rarely more than 3 cm. long, and small panicles of 3 to 6 racemes, mostly less than 12 mm. long, commonly equaled or exceeded by the uppermost blades; spikelets 1.7 to 1.9 mm. long.

Open ground on high plateaus, Peru and Bolivia. (Type, *Buchtien* 859.)

PERU: La Quinhua, *Macbride & Featherstone* 2030. Río Blanco, *Macbride & Featherstone* 804. Pucará, *Weberbauer* 415. Maravillas, *Meyen*. Tambillo, *Jelski* 582. Southern Peru, *Weddell* 4423, 4490.

BOLIVIA: La Paz, *Buchtien* 859, 2490. Pongo, *Hitchcock* 22772. Talca Chuglagullo, *Bang* 808.

In *Macbride & Featherstone's* no. 2030 the spikelets are 2 mm. long.

5. *Paspalum prostratum* Scribn. & Merr. U. S. Dept. Agr. Div. Agrost. Bull. 24: 9. 1900.

Resembles both *P. penicillatum*, than which it is stouter and larger-leaved, and *P. candidum*; from the latter it is distinguished by the greenish spikelets with the second glume developed.

Moist slopes at middle and higher altitudes, southern Mexico to Bolivia. Originally described from Mexico.

BOLIVIA: Sorata, *Holway* 507.

6. *Paspalum sodiroanum* Hack. Oesterr. Bot. Zeitschr. 51: 237. 1901.

Paspalum peruvianum Mez, Repert. Nov. Sp. Fedde 15: 28. 1917. (*Weberbauer* 137.)

A decumbent branching annual, with culms commonly 1 meter or more long, flat lax blades 7 to 18 cm. long and 7 to 12 mm. wide, and oblong panicles of numerous approximate ascending racemes 1 to 4 cm. long, the spikelets 2 mm. long, the sterile lemma loose and rumpled, the terminal spikelet purple.

Moist shaded places, at middle altitudes, Colombia to Peru. Originally described from Ecuador, the type collected by Father Sodiro in 1886 at 2,000 meters, locality not given.

ECUADOR: Nieblí, *Sodiro* in 1882. Without locality, *Sodiro* in 1886.

PERU: Between Tambo de Viso and Chaupichaca, *Weberbauer* 137.

7. *Paspalum flavum* Presl, Rel. Haenk. 1: 220. 1830.

Paspalum cristatum Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 1: 152. 1834.

Paspalum mollendense Mez, Repert. Nov. Sp. Fedde 15: 31. 1917. (*Weberbauer* 1553; an exceptionally robust specimen with panicles 15 to 18 cm. long.)

A glabrous annual, branching at the base, with culms 20 to 55 cm. long, loose sheaths and thin flat blades mostly 5 to 10 cm. long and 5 to 10 mm. wide, and oblong panicles 5 to 18 cm. long and 1.5 to 2 cm. wide, of numerous approximate arching racemes 8 to 20 mm. long, the spikelets about 2 mm. long, stramineous to dark purple, the glumes and sterile lemma larger than the fruit, thin and loose, the rachis scarcely 1 mm. wide, commonly appearing narrower because of the inrolled margins.

Probably in moist places (no habitat is given with any of our specimens), on the Pacific slope, Peru and Chile. Originally described from unknown locality.

PERU: Obrajillo, *Wilkes Expl. Exped.* Lima, *Dombey*. Matucana, *Macbride & Featherstone* 135. Mollendo, *Weberbauer* 1553. Without locality, *Heyne; Pavón*.

8. *Paspalum racemosum* Lam. Tabl. Encycl. 1: 176. 1791.

Paspalum stoloniferum Bosc, Trans. Linn. Soc. 2: 83. pl. 16. 1794. (Peru.)

Milium latifolium Cav. Icon. Pl. 3: 37. pl. 273. 1794. (Peru.)

Paspalum purpureum Ruiz & Pav. Fl. Peruv. Chil. 1: 47. 1798. (Peru.)

Paspallanthum stoloniferum Desv. Opusc. 59. 1831.

Maizilla stolonifera Schlecht. Bot. Zeit. 8: 605. 1850.

Paspalum biglume Steud. Syn. Pl. Glum. 1: 24. 1854.

Paspalum manabiense Mez, Repert. Nov. Sp. Fedde 15: 30. 1917. (Eggers 14965, a small specimen with pale spikelets.)

A glabrous annual, with sparingly branching culms decumbent and rooting at the lower nodes, commonly 60 to 100 cm. long, loose sheaths, thin flat blades usually 3 to 12 cm. long and 1 to 2.5 cm. wide, rounded to subcordate at base, and oblong panicles 5 to 15 cm. long and 1.5 to 3 cm. wide, of numerous approximate, ascending to spreading racemes 1 to 2.5 cm. long, the rachis about 1 mm. wide, the spikelets about 2.5 mm. long, commonly purple to rusty brown, but sometimes pale, the glume and sterile lemma much longer than the fruit, thin, loose and finely fluted.

In recently disturbed soils, fields, waste places, and roadsides, spreading or clambering among brush, Colombia to Peru. Originally described from Peru.

ECUADOR: El Recreo, Eggers 14965. Perucho, Sodiro without number. Huigra, Holway 823; Hitchcock 20341; Rose 22162, 24017, 24022, 24025. Huataxi, Spruce 5959 (Kew Herb.). Guayaquil, Anthony & Tate 79; Hitchcock 19955, 20132, 20134.

PERU: Lima, Hitchcock 22338; Wilkes Expl. Exped.; Cuming 1054; Mathews 425, 426 (last three numbers in Kew Herb.). Santa Clara, Rose 18742. "Callao et Lima," Didrichson 4387.

9. *Paspalum candidum* (Humb. & Bonpl.) Kunth, Mém. Mus. Hist. Nat. 2: 68. 1815.

Reimaria candida Humb. & Bonpl.; Flügge, Monogr. Pasp. 214. 1810.

Paspalum candidum Kunth, Mém. Mus. Hist. Nat. 2: 68. 1815.

Paspalum confertum Willd.; Steud. Nom. Bot. ed. 2. 2: 270. 1841.

Paspalum uniseriatum Steud.; Lechl. Berb. Amer. Austr. 55. 1857, name only. (Lechler 1862.)

A loosely branching annual, with culms commonly more than 1 meter long, decumbent at base, straggling or clambering in brush, smooth to slightly scabrous sheaths, thin, flat, softly pilose blades 5 to 14 cm. long, and 5 to 12 mm. wide, commonly much smaller on the branches, and loose panicles 5 to 12 cm. long, of 8 to 20 ascending or arched-spreading racemes 2 to 4 cm. long, the rachis 2 to 2.5 mm. wide, the white oblong spikelets 2.3 to 2.5 mm. long, commonly so far apart as to appear to be in a single row, not appressed, but more or less spreading from the rachis.

In moist places and recently disturbed soils, roadsides and along hedges, southern Mexico to Bolivia. Originally described from "Puanbo" [Puembo], Ecuador (Bonpland).

ECUADOR: Quito, Heilborn 539. Chillo, Sodiro 300. Nono, Sodiro in 1887. Huigra, Rose 22582. Las Juntas, Rose 23219. Cumbe, Rose 22957.

PERU: Obrajillo, Wilkes Expl. Exped. Mito, Macbride & Featherstone 1366. Machu Picchu, Cook & Gilbert 858. Without locality, Lechler 1862; Heyne.

BOLIVIA: San Felipe, Hitchcock 22597.

10. *Paspalum depauperatum* Presl, Rel. Haenk. 1: 215. 1830.

Paspalum vinosum Mez, Repert. Sp. Nov. Fedde 15: 28. 1917. (Sirupaya, Buchtien. The date and other data of the type specimen agree with those of Buchtien 422.)

Resembling *P. candidum*, but the culms shorter, purplish, decumbent with erect branches; nodes densely pubescent; sheaths smooth; blades velvety

beneath and finely papillose-pubescent above, on the average smaller than in *P. candidum*; panicles shorter, purple-tinged; spikelets about 2 mm. long.

In brushy borders, Venezuela and Colombia to Bolivia. Originally described from Huánuco, Peru, the type specimen collected by Haenke.

ECUADOR: Alausí, *Hitchcock* 20723. Portovelo, *Hitchcock* 21206.

PERU: Huánuco (?), *Ruiz* 4620.

BOLIVIA: Sirupaya, *Buchtien* 422.

Hitchcock's no. 20723 has stouter culms and broader blades than the other specimens and rather dense panicles of few to numerous racemes; some of the panicles are conspicuously vinous-purple.

11. *Paspalum lineispatha* Mez, Repert. Nov. Sp. Fedde 15: 27. 1917.

Resembling *P. candidum*, but much smaller, the weak to delicate, decumbent culms 10 to 30 cm. long; sheaths and blades softly pilose; panicles 1.5 to 3 cm. long, of 2 to 12 spreading racemes 1 to 1.5 cm. long, the rachis about 1.5 mm. wide; spikelets about 1.8 mm. long. Closely related to *P. depauperatum*, differing in the pale weak culms, pilose sheaths, smaller pale panicles, narrower rachis, and smaller spikelets.

Probably in moist shaded places (no habitat given on either specimen seen), at middle and upper altitudes, Peru and Bolivia. Originally described from Peru; type, *Weberbauer* 3142. The locality published is "infra Hacienda Cajabamba, Samanco Inter et Casaz, Dept. Ancachs, alt. 3000-3500 M." Doubtless Caraz, Dept. Ancash, is meant; the altitude indicates a locality well up in the Cordillera.

PERU: Caraz, *Weberbauer* 3142.

BOLIVIA: Hacienda Casano, *Buchtien* 7112.

12. *Paspalum scabrum* Scribn. U. S. Dept. Agr. Div. Agrost. Bull. 4: 36. pl. 3. 1897.

A straggling annual, very scabrous throughout, with elongate, divergently branching, sometimes vinous-purple culms, clambering over shrubs, thin flat scabrous-hispid blades 5 to 10 cm. long and 10 to 18 mm. wide, tapering to both ends, and pale panicles 12 to 20 cm. long of numerous subverticillate spreading racemes 1.5 to 5 cm. long, the rachis acuminate, the white spikelets about 1.8 mm. long.

Brushy slopes, Guatemala to Ecuador. Originally described from Guatemala.

ECUADOR: Guayaquil, *Hitchcock* 19948. Milagro, *Hitchcock* 20274.

13. *Paspalum crassum* Chase in Hitchc. Contr. U. S. Nat. Herb. 17: 239. 1913.

A coarse erect annual 35 to 100 cm. or more tall, branching from the base, with coarsely papillose-hirsute foliage, the flat blades 11 to 25 cm. long and 15 to 25 mm. wide, tapering to a rounded base; panicle of 4 to several pale thick ascending racemes, on a narrowly winged axis, the rachis 3 to 4 mm. wide, tapering to a narrow summit, the margins hispidulous; spikelets solitary (or a few paired about the center of the raceme), crowded, oval, turgid, about 3.5 mm. long, blunt, pale, glabrous, the first glume developed as a minute thick bractlet or obsolete, the second glume and sterile lemma subindurate, equal.

Along ditches and in moist open ground, Mexico and Peru. Originally described from Mexico; the type specimen, from Colima, is much taller than the Peruvian specimen and the blades are as much as 60 cm. long.

PERU: Colonia Perené, *Hitchcock* 22076.

14. *Paspalum cerasia* (Kuntze) Chase in Niles, Contr. U. S. Nat. Herb. 24: 153. 1925.

Paspalum membranaceum Lam. Tabl. Encycl. 1: 177. 1791. Not *P. membranaceum* Walt. 1788.

Ceresia elegans Pers. Syn. Pl. 1: 85. 1805.

Ceresia membranacea Beauv. Ess. Agrost. 9, 171. pl. 5. f. 4. 1812.

Paspalum elegans Roem. & Schult. Syst. Veg. 2: 290. 1817. Not *P. elegans* Flügge 1810.

Panicum ceresia Kuntze, Rev. Gen. Pl. 3²: 360. 1898.

An erect perennial, densely villous at the base, with culms in tufts from a short rhizome, sometimes one or two culms with a decumbent lower joint rooting at the node with a knoblike cluster of villous scales, glaucous foliage, the flat blades mostly 5 to 15 cm. long and 3 to 8 mm. wide, usually stiffly pilose on the upper surface near the margin, and 1 to 4 ascending to arching racemes rather distant on a very slender axis, the ribbonlike rachis purplish or bronze-green with bright yellow-brown margins and crowded silvery-silky spikelets, the hairs exceeding the spikelets and obscuring them.

Open, rather dry, rocky slopes, at middle altitudes, Ecuador, Peru, and Bolivia. Originally described from Peru.

ECUADOR: Between Loja and San Lucas, *Hitchcock* 21491.

PERU: Mito, *Macbride & Featherstone*, 1780. Without locality, *Ruiz* 4621; *Pavón*.

BOLIVIA: Sorata, *Mandon* 1255 (1755?). Cochabamba, *Hitchcock* 22825. Charagua, *Herzog* 1210. Buena Vista, *Steinbach* 5421. Bolivian plateau, *Bang* 1080.

15. *Paspalum stellatum* Humb. & Bonpl. in Flügge, Monogr. Pasp. 62. 1810.

A tufted erect perennial with narrow subinvolute hirsute blades and simple wiry culms 25 to 50 cm. tall, the solitary (or rarely paired) arcuate racemes 5 to 10 cm. long, the ribbonlike rachis golden-brown, the glistening white hairs of the spikelets stellately spreading at maturity.

Open dry slopes in the uplands, southern Mexico to Argentina. Originally described from Colombia.

BOLIVIA: Buena Vista, *Steinbach* 7103.

16. *Paspalum humboldtianum* Flügge, Monogr. Pasp. 67. 1810.

Paspalum ciliatum H. B. K. Nov. Gen. & Sp. 1: 87. pl. 2 $\frac{1}{2}$. 1816. Not *P. ciliatum* Lam. 1791.

Paspalum blepharophorum Roem. & Schult. Syst. Veg. 2: 292. 1817.

Panicum humboldtianum Kuntze, Rev. Gen. Pl. 3²: 361. 1898.

A tufted perennial, with culms commonly 50 to 80 cm. tall, erect from a woody decumbent base, usually branching from the lower nodes, leafy toward the base with overlapping sheaths and spreading blades, the sheaths and blades papillose-pilose, the firm flat sharp-pointed blades 8 to 18 cm. long and 8 to 15 mm. wide; racemes 2 to 5, ascending or spreading, lax, 5 to 10 cm. long, the rachis dull purple, the crowded purplish spikelets glistening with long white silky hairs, but hardly obscured by them.

Stony open or brushy slopes in the highlands from Mexico to Argentina. Originally described from Puenbo, Ecuador (*Bonpland*).

ECUADOR: Quito, *Harteman* 65. Ambato, *Hitchcock* 21710. Huigra, *Rose* 22639. Between Huigra and Naranjapata, *Hitchcock* 20656. Portovelo, *Rose* 24027; *Hitchcock* 21306.

PERU: Chosica, *Holway* 782; *Macbride & Featherstone* 517. Ollantaytambo, *Hitchcock* 22485.

BOLIVIA: Sorata, *Rusby* 205. Cotaña, *Buchtien* 3125. Illimani, *Julio* 44. Cochabamba, *Hitchcock* 22795, 22830. Buena Vista, *Steinbach* 6644. Río Cuchi, *Steinbach* 6618. Without locality, *Bang* 2590.

17. *Paspalum buchtienii* Hack. Repert. Nov. Sp. Fedde 6: 153. 1908.

Resembling *P. humboldtianum*, but on the average taller and somewhat straggling, with larger blades not crowded at base and mostly glabrous on

the upper surface, and commonly with 8 to 16 longer drooping racemes (rarely only 4 or 5), the rachis narrower and the silky hairs on the spikelets less dense.

Open or brushy, stony or gravelly slopes at middle altitudes, in the Yungas region, Bolivia, whence originally described; type, *Buchtien* 420.

BOLIVIA: Unduavi, *Rusby* 24. Coroico, *Buchtien* 444 (Kew Herb.), 3629, 3630. Milluhuaya, *Buchtien* 4274. Hacienda Anacuri, *Holway* 712, 719. La Florida, *Holway* 678. *Hitchcock* 22640, 22648. Sirupaya, *Buchtien* 420. Chulumani, *Hitchcock* 22664. "Yungas," *Bong* 265; *Rusby* 29.

18. *Paspalum soboliferum* Chase, sp. nov.

Plant perennial, about 60 cm. long, somewhat tinged with dull vinous-purple; culm simple below, pushing through vegetation, then freely branching, the branches subfasciculate, stiffly ascending, about equaling the main culm; culms glabrous, leafy, the sheaths overlapping, keeled, the lower sparsely long-pilose, the upper glabrous or pilose along the margin only; ligule 2 to 2.5 mm. long, membranaceous, erose; blades mostly spreading, firm, flat, 5 to 15 cm. long, 6 to 9 mm. wide (the uppermost much reduced), scarcely narrowed at base, long-acuminate, subinvolute at the apex, long-pilose at base on the upper surface and at least the lower sparsely ciliate, glabrous beneath; panicle short-exserted, of 3 to 7 (mostly 5) narrowly ascending racemes, 2 to 4.5 cm. long, the main axis 2 to 5.5 cm. long, slender, glabrous; rachis 1 mm. wide, with a tuft of long hairs at the base, otherwise glabrous; spikelets mostly in pairs on minute slender glabrous pedicels, crowded, elliptic, subacute, 2.8 to 2.9 mm. long, 1.2 to 1.3 mm. wide, excluding the cilia, dull purple to tawny; glume and sterile lemma equal, thin in texture, 3-nerved, the lateral nerves near the margin, the glume finely pubescent, the margin ciliate with soft spreading hairs about 1 mm. long, the sterile lemma glabrous; fruit pale, elliptic, slightly smaller than the spikelet.

Type in the U. S. National Herbarium, no. 1,164,798, collected along an agave hedge, between Loja and San Lucas, altitude 2,100 meters, September 6, 1923, by A. S. Hitchcock (no. 21495). No other collection has been seen.

Related to *P. humboldtianum*; differing in the more numerous flowering branches, the less hairy foliage, and especially in the shorter, more slender, narrowly ascending racemes, with smaller spikelets bearing an inconspicuous fringe of soft hairs.

19. *Paspalum polyphyllum* Nees in Trin. Gram. Pan. 114. 1826.

A slender perennial, with suberect culms 20 to 60 cm. long, after flowering commonly producing short sterile branches with numerous small spreading blades, short-jointed below or throughout; sheaths glabrous except at the mouth, the spreading subinvolute blades 2 to 5 cm. long, mostly not more than 3 mm. wide, densely puberulent on both surfaces and with a few long hairs back of the ligule; racemes 1 to 3, mostly nodding, 2 to 7 cm. long, with crowded pale spikelets with a conspicuous silvery-silky fringe.

Open stony slopes at middle altitudes, eastern Bolivia and Brazil, whence originally described. The collections from Bolivia are depauperate plants.

BOLIVIA: Buena Vista, *Steindach* 5162, 5385, 6808.

20. *Paspalum vaginatum* Swartz, Prodr. Veg. Ind. Occ. 21. 1788.

Paspalum kleineanum Presl, Rel. Haenk. 1: 209. 1830. (Peru.)

An extensively creeping perennial, with loose sheaths and spreading involute-margined blades 2 to 6 mm. wide, tapering from base to apex, the sterile runners often stout, with closely imbricate leaves, the flowering branches

ascending, commonly 20 to 30 cm. tall, with a pair of divergent racemes (rarely 3), the flat acuminate spikelets usually 3 to 4 mm. long.

Seacoasts and brackish sands, Gulf coast and the West Indies to Argentina and Chile; also in the Old World. Originally described from Jamaica.

ECUADOR: Balao, *Eggers* 14602.

PERU: "Callao and Lima," *Didrichsen* 4384.

21. *Paspalum distichum* L. Syst. Nat. ed. 10. 2: 855. 1759.

Panicum paspaliforme Presl, Rel. Haenk. 1: 296. 1830. (Huánuco, Peru, *Haenke*.)

Similar to *P. vaginatum*, the flowering culms commonly taller, the blades slightly wider and softer.

Ditches and wet (sometimes brackish or alkaline) places, southern United States and West Indies to Argentina and Chile; also in the Old World. Original locality not known, probably Jamaica.

ECUADOR: Ibarra, *Sodirol* in 1888. Pomasqui, *Sodirol* in 1897. "Andes," *Spruce* 5921 (Copenhagen Herb.).

PERU: Chosica, *Holway* 781 (sterile).

BOLIVIA: La Paz, *Buchtien* 4518. Cotaña, *Buchtien* 3126. San José, *Hitchcock* 22730. Cochabamba, *Hitchcock* 22793. Arque, *Hitchcock* 22790. Oploca, *Hitchcock* 22882. Tarija, *Fries* 1064. Río Suturú, *Steinbach* 6835.

22. *Paspalum lividum* Trin. in Schlecht. Linnaea 26: 383. 1854.

A tufted glabrous perennial; culms compressed, ascending from a decumbent base; blades flat, lax; racemes 3 to 5, subflexuous, approximate on the very slender axis, the rachis rather broad, the glabrous spikelets commonly lurid purplish, the glume and sterile lemma very thin.

Savannas, moist ground, and along ditches, Gulf coast to Peru and Paraguay. Originally described from Mexico.

ECUADOR: La Magdalena, *Harteman* 16.

PERU: Huánuco, *Ruiz* (?). "Canruru, Andes of Peru," *Savatier* in 1876-79 (Kew Herb.).

23. *Paspalum bonplandianum* Flügge, Monogr. Pasp. 71. 1810.

A tufted perennial, with a thick horizontal rhizome and in favorable situations extensively creeping, stout, leafy stolons, the sheaths and short blades densely grayish-villous; culms simple, ascending to suberect, glabrous, 25 to 60 cm. tall, leafy toward the base, the lower sheaths villous, the upper mostly glabrous, the flat blades 5 to 12 cm. long, 3 to 7 mm. wide, grayish-villous (rarely the foliage nearly glabrous); panicle 6 to 11 cm. long, of 6 to 10 ascending to spreading racemes 1.5 to 5 cm. long, the rachis about 1.5 mm. wide, dark purple, finely pubescent, especially on the inside, the solitary spikelets on minute hairy pedicels, loosely crowded, glabrous, pale to purple-tinged, elliptic, 2.2 to 3 mm. long, the glume and sterile lemma slightly pointed beyond the fruit.

Paramos and high wooded slopes, Ecuador and Peru. In the original description, the specimen collected by Humboldt and Bonpland, is said to be from Peru, but the specimens of this collection in the Berlin and Paris herbaria are labeled "Regnum quitense," (Ecuador). The specimen in the Willdenow Herbarium (which is probably the one described by Flügge) is labeled "Humboldt 3081, Amer. merid." In Hartweg's no. 1447 and Cook & Gilbert's no. 700 the spikelets are only 2 mm. long or slightly longer; the foliage is villous as in typical specimens.

ECUADOR: Tulcán, *Hitchcock* 20989. La Rinconada, *Hitchcock* 20782. Atacatzo, *Holmgren* 597; *Mille* in 1917. Lloa, *Sodiro* 301. Quito, *Hartweg* 1447. Between San Lucas and Oña, *Hitchcock* 21536.

PERU: Ollantaytambo, *Cook & Gilbert* 700.

24. *Paspalum pilgerianum* Chase.

Paspalum bonplandianum var. *glabrescens* Pilger, Bot. Jahrb. Engler 27: 17. 1899.

A tufted perennial with slender rhizomes, not stoloniferous (so far as known); culms simple, ascending or spreading, glabrous, 10 to 35 cm. tall, leafy throughout, the lower sheaths and blades puberulent, the upper sparsely puberulent to nearly glabrous, the flat blades 2 to 12 cm. long, 2 to 5 mm. wide; panicle 2.5 to 7 cm. long, of 3 to 10 approximate ascending to spreading racemes 1 to 3 cm. long, the rachis about 1.5 mm. wide, glabrous, the solitary, pale or purplish glabrous spikelets mostly crowded, 2.1 to 2.3 mm. long, about 1.3 mm. wide, oval, the glume and sterile lemma scarcely exceeding the fruit.

The series of specimens cited below show a difference in habit and a general difference in aspect from *P. bonplandianum*. The plants are not conspicuously villous, as in that species, but they are scarcely glabrescent. Under *Paspalum* the varietal name would be misleading, for which reason the species is renamed in honor of Dr. Robert Pilger.

Wood borders and open slopes at middle altitudes, Ecuador and Peru. The type, *Stübel* 102, was collected "in monte Cusin vel San Pablo Urcu," a locality we are unable to find on the maps.

ECUADOR: San Pablo Urcu, *Stübel* 102. Tulcán, *Hitchcock* 20967. Ambato, *Pachano* 152. Baños, *Hitchcock* 21912. Riobamba, *Mille* 53.

PERU: Goyllarisquisca, *Hitchcock* 22285.

25. *Paspalum pallidum* H. B. K. Nov. Gen. & Sp. 1: 88. 1816.

Paspalum pellitum Willd.; Steud. Nom. Bot. ed. 2. 2: 272. 1841. Not *P. pellitum* Nees 1826. As synonym of *P. pallidum* H. B. K.

Plants perennial, with glabrous, sparingly branching culms 15 to 75 cm. long, decumbent and rooting at the lower nodes; sheaths pilose at the summit or glabrous, the lower much overlapping; blades flat, 4 to 12 cm. long, 5 to 10 mm. wide, puberulent on both surfaces to glabrous, usually ciliate on the margins; panicle 4 to 11 cm. long, of 5 to 20 approximate ascending racemes 2 to 3.5 cm. long, the greenish purple rachis about 2 mm. wide, obscurely puberulent, the solitary, pale or purple spikelets crowded, oblong, glabrous, 2.5 to 3 mm. long, the glume and sterile lemma loose and slightly rumped.

The second glume is occasionally reduced or wanting in some of the spikelets, and the first glume is occasionally developed.

Brushy banks at middle altitudes, Ecuador and Peru. Originally described from Pintac and Chillo, Ecuador. (*Bonpland*.)

ECUADOR: Quito, *Jameson*; *Holway* 954; *Harteman* 33. Ambato, *Tate* 530. Between San Lucas and Oña, *Hitchcock* 21528.

PERU: Callao, *Wilkes Expl. Exped. Matucana, Macbride & Featherstone* 356.

26. *Paspalum decumbens* Swartz, Prodr. Veg. Ind. Occ. 22. 1788.

Paspalum pedunculatum Desv.; Poir. in Lam. Encycl. Suppl. 4: 315. 1816.

Panicum decumbens Roem. & Schult. Syst. Veg. 2: 429. 1817.

A freely branching, decumbent perennial, with slender compressed culms, velvety foliage, the flat blades 5 to 10 cm. long and 5 to 8 mm. wide, and soli-

tary arcuate racemes usually 2 to 3 cm. long, borne on very slender peduncles, these commonly several from the upper sheaths; spikelets obovate, 1.5 mm. long, a small first glume present, the second glume about half the length of the fruit.

Shaded banks and wooded slopes, Central America and the West Indies to Bolivia and Brazil. Originally described from Jamaica.

ECUADOR: Teresita, *Hitchcock* 20413. Between La Chorita and Portovelo, *Hitchcock* 21210.

PERU: Colonia Perené, *Hitchcock* 22061, 22066.

BOLIVIA: Mapiri, *Rusby* 211. Hacienda Simaco, *Buchtien* 5314. Hacienda Casana, *Buchtien* 7105, 7106. Coroico, *Buchtien* 6445; *Hitchcock* 22718.

27. *Paspalum inconstans* Chase, sp. nov.

Plants perennial; culms in small tufts, ascending from a geniculate base, sometimes rooting at the lower nodes, 45 to 85 cm. long, compressed, glabrous, with leafy flowering branches from the second or third nodes or simple, usually with axillary leafless inflorescences from the upper one or two sheaths; nodes dark, glabrous or with a ring of white hairs; sheaths mostly shorter than the internodes, softly pubescent at least toward the summit and finely ciliate; ligule brown, 1 to 2 mm. long; blades flat, commonly 10 to 15 cm. long, 6 to 13 mm. wide (the uppermost reduced), slightly narrowed to the base, acuminate, from puberulent on both surfaces (the hairs longer at the base) to nearly glabrous; inflorescence terminal and axillary, the terminal finally long-exserted, the common axis 2 to 7 cm. long, slender, the upper joint narrowly winged, slightly pubescent above toward the base, the axillary partly included or short-exserted; racemes 1 to 8, usually 2 to 5 in the terminal inflorescence, 1 or 2 in the axillary, ascending to spreading, 4 to 8 cm. long, the rachis glabrous or obscurely pubescent, 1 mm. wide, narrowly winged, the margins slightly upturned; spikelets in pairs on slender pedicels, the longer pedicel 1.5 to 2 mm. long, loosely imbricate, 2.2 to 3 mm. long (mostly about 2.5 mm.), about 1.2 mm. wide, oblong-elliptic, the first glume commonly developed or rudimentary on the lower of the pair of spikelets, wanting on the upper; second glume and sterile lemma 3-nerved or faintly 5-nerved, the glume shorter and exposing the summit of the fruit, the yellowish hyaline margin sparsely pubescent, the lemma glabrous or obscurely pubescent on the margin, a hyaline palea and staminate flower often developed; fruit slightly smaller than the spikelet, pale, very minutely papillose-striate.

Type in the U. S. National Herbarium, no. 1,164,822, collected at Hacienda Casana, on the road to Tipuani, altitude 1,400 meters, November 19, 1922, by Dr. Otto Buchtien (no. 7107).

This species is variable in the amount of pubescence, in the number of racemes, in the size of the spikelets, and in the presence or absence of the first glume on the lower of the pair of spikelets. In Hitchcock's no. 22734 it is wholly wanting and in Buchtien's no. 7109 it is developed on nearly all of the lower spikelets. In the type the racemes are 2, the spikelets 2.5 to 3 mm. It appears to be related to the species described as *Panicum subfalcatum* by Doell, from the upper Amazon in Brazil, which also has a narrowly winged rachis. A specimen of the type collection of that species was examined at the Kew Herbarium. The spikelets are narrower and the second glume and sterile lemma are pointed beyond the fruit.

Open slopes and roadsides at middle altitudes, Ecuador and Bolivia.

ECUADOR: Between La Chorita and Portovelo, *Hitchcock* 21204.

BOLIVIA: Hacienda Casana, *Buchtien* 7107, 7109, 7111. San José, *Hitchcock* 22734. Sirupaya, *Buchtien* 416. La Florida, *Hitchcock* 22609.

28. *Paspalum lepidum* Chase, sp. nov.

Plants perennial, in dense tufts with numerous short leafy sterile shoots at the base; culms ascending or spreading, 20 to 45 cm. tall, compressed, sparsely pilose, at least on the uppermost joint, or sometimes glabrous; nodes short-pubescent or the upper glabrous; leaves mostly 3; sheaths carinate, from softly and densely pubescent to glabrous except on the margin and collar; ligule membranaceous, brown, scarcely 1 mm. long; blades flat, mostly 7 to 11 cm. long and 5 to 10 mm. wide, rounded and scarcely narrowed at the base, short-acuminate, densely velvety-pubescent on both surfaces, the hairs longer at the base; inflorescence terminal and axillary, the terminal short-exserted, the common axis 2.5 to 4 cm. long, slender, plano-convex, sparsely pilose, the racemes 3 or 4, the axillary inflorescence of a single peduncle with 2 racemes entirely inclosed in the upper sheath, at least until the maturity of the terminal inflorescence; racemes (of terminal panicle) ascending to spreading, 2 to 5 cm. long; rachis about 0.8 mm. wide, very narrowly winged, the margins upturned, pubescent toward the base; spikelets in pairs on slender, minutely pubescent pedicels (the longer about 1.5 mm. long), imbricate, 2.3 to 2.4 mm. long (rarely only 2 mm.), about 1.1 mm. wide, elliptic, more or less blotched with purple and golden-brown; first glume rarely developed as a minute pointed rudiment; second glume and sterile lemma 5-nerved, the lateral pair of nerves close together near the margin, the glume slightly shorter than the fruit, obscurely pubescent toward the summit and near the margin, the lemma glabrous; fruit pale, very minutely papillose-striate.

Type in the U. S. National Herbarium, no. 1,164,799 collected in "open ground" at Coroico, Nor-Yungas, Bolivia, altitude 1,560 meters, December 25, 1923, by A. S. Hitchcock (no. 22726).

This species is related to *P. inconstans*. It differs chiefly in being densely tufted and in having shorter simple culms with few nodes, and more densely pubescent foliage crowded at the base of the plant.

Open grassland, uplands, Ecuador to Bolivia.

ECUADOR: Between La Chorita and Portovelo, *Hitchcock* 21189.

BOLIVIA: Coroico, *Hitchcock* 22726. San Felipe, *Hitchcock* 22605. Unduavi, *Rusby* 23.

29. *Paspalum paniculatum* L. Syst. Nat. ed. 10. 2: 855. 1759.

Paspalum hemisphericum Poir. in Lam. Encycl. 5: 31. 1804.

Panicum paniculatum Kuntze, Rev. Gen. Pl. 3⁷: 363. 1898.

A weedy branching perennial, commonly a meter or more tall, the foliage harshly pubescent, the flat blades 20 to 30 cm. long, about 1.5 cm. wide; racemes very numerous, slender, crowded in an oblong panicle, the minute crowded subhemispheric spikelets pubescent. Exceedingly variable in size and in the amount of pubescence.

Savannas and open or partly shaded, mostly moist ground, Mexico and the West Indies to Bolivia and Argentina. Originally described from Jamaica.

ECUADOR: Milagro, *Hitchcock* 20180. "Reg. subtrop.," *Sodi* 299.

PERU: Colonia Perené, *Hitchcock* 22072. La Merced, *Hitchcock* 22132. "Andes," *Pöppig* 957.

BOLIVIA: Mapiri, *Rusby* 198; *Buchtien* 1164. Hacienda Simaco, *Buchtien* 5323. Coroico, *Buchtien* 6435; *Hitchcock* 22722. Hacienda Anacuri, *Holway*

726. Milluhuaya, *Buchtien* 4196, 4269. Sirupaya, *Buchtien* 415. La Florida, *Hobway* 680; *Hitchcock* 22624, 22627. Antahuacana, *Buchtien* 6436.

30. *Paspalum juergensii* Hack. *Repert. Nov. Sp. Fedde* 7: 312. 1909.

Paspalum quitense Mez, *Repert. Nov. Sp. Fedde* 15: 70. 1917. (Ambato, *Spruce*.)²⁵

Resembling *P. paniculatum*, on the average less coarsely pubescent; panicle with fewer laxer racemes, the spikelets slightly larger and not so blunt, the sterile lemma glabrous.

Moist open ground, Ecuador, Bolivia, and southern Brazil. Originally described from Brazil.

ECUADOR: Valley of Pastaza River, between Baños and Cashurco, *Hitchcock* 21749, 21842.

BOLIVIA: "Yungas," *Bong* 308.

31. *Paspalum tenellum* Willd. *Enum. Pl.* 89. 1809.

An erect perennial, with compressed culms in small tufts, velvety or sometimes glabrescent foliage, the flat blades 5 to 20 cm. long and 5 to 15 mm. wide, rounded at base, and 2 to several widely spreading, thick racemes rather distant on a slender axis, the paired crowded obovate spikelets 2 mm. long, densely pubescent with short crinkly hairs, at first stramineous, becoming dull dark purple.

Open dry slopes at middle altitudes, Mexico, Central America, Brazil, and Ecuador. Originally described from a botanical garden specimen, the source unknown, Mexico conjectured. *Hitchcock's* no. 21464 is a depauperate plant, the tallest culm only 21 cm.; the foliage is less pubescent than in North American plants, but the spikelets are identical.

ECUADOR: Near the high pass between Loja and San Lucas, *Hitchcock* 21464.

32. *Paspalum multicaule* Poir. in *Lam. Encycl. Suppl.* 4: 309. 1816.

Paspalum papillosum Spreng. *Nov. Prov. Hal.* 47. 1819.

A low annual, profusely branching from the base and lower nodes, the sheaths and narrowly linear blades pilose; racemes a pair at the summit of the culm (rarely solitary), divergent, slender, about 3 cm. long, the minute pale orbicular spikelets irregularly sprinkled with globular hairs, these often wanting on some of the spikelets but present on some on each plant.

Moist savannas and open ground, West Indies and British Guiana to Brazil and Bolivia. Originally described from Brazil.

PERU: Colonia Perené, *Hitchcock* 22087.

BOLIVIA: Tipuaní, *Bong* 1426a.

32A. *Paspalum pictum* Ekman, *Ark. för Bot.* 10¹¹: 11. *pl. 1. f.* 6. 1911.

Similar to *P. multicaule*, the racemes on the branches frequently solitary; spikelets scarcely 1 mm. long, the glume and sterile lemma narrower than the minutely papillose fruit.

Open moist ground, Costa Rica to Brazil, whence originally described.

BOLIVIA: Buena Vista, *Steinbach* in 1916 (comm. *Osten* while this work was in press).

33. *Paspalum gossipinum* Mez, *Repert. Nov. Sp. Fedde* 15: 68. 1917.

A densely tufted perennial, with slender erect simple culms 35 to 50 cm. tall, leafy toward the base, the foliage densely clothed with long soft spread-

²⁵ *Spruce* journeyed up the valley of Pastaza River on his way to Ambato. It is probable that his specimen was collected in the valley, not at the altitude of Ambato.

ing white hairs, the blades 4 to 10 cm. long and 1.5 to 2 mm. wide; racemes 2 to 5, ascending to spreading, 3 to 5 cm. long, on a slender axis 1 to 2 cm. long; rachis slender, with long white hairs on the margin and upper side; spikelets solitary, about 1.2 mm. long, yellowish, glabrous, the glume and sterile lemma hyaline in the middle, readily tearing.

Mountain slopes. Known only from the type.

PERU: "Montis Morro prope Moyobamba, dept. Loreto, alt. 900-1000 M.," *Weberbauer* 4590.

34. *Paspalum microstachyum* Presl, Rel. Haenk. 1: 215. 1830.

Paspalum effusum Nees, Journ. Bot. Kew Misc. 2: 104. 1850.

Paspalum cognatissimum Steud. Syn. Pl. Glum. 1: 18. 1854. (*Jameson* 552.)

A nearly glabrous annual, with slender erect culms usually 15 to 50 cm. tall, in small tufts, branching from the second or third nodes; blades flat, spreading, 4 to 15 cm. long, 8 to 20 mm. wide; panicle mostly 10 to 20 cm. long, of 7 to 25 or more spreading racemes, the elliptic, yellowish green spikelets about 1.5 mm. long and 0.8 to 0.9 mm. wide, minutely pubescent.

Roadsides, waste places, and cultivated ground, at low altitudes, Guatemala to Ecuador and Brazil. Originally described from a specimen collected by Haenke, the locality unknown.

ECUADOR: Balao, *Jameson* 371 (Kew Herb.). Guayaquil, *Jameson* 552. Milagro, *Hitchcock* 20177. Between Santa Rosa and La Chorita, *Hitchcock* 21138.

35. *Paspalum inaequivalve* Raddi, Agrost. Bras. 28. 1823.

Paspalum inaequivalve var. *glabriflorum* Hack. in Stuck. Anal. Mus. Nac. Buenos Aires 21: 23. 1911.

A slender perennial, with flat, widely trailing culms with stilt roots at the lower nodes, and suberect branches; foliage sparsely papillose-pilose to nearly glabrous, the flat blades mostly 8 to 25 cm. long and 10 to 18 mm. wide, clasping at base; panicles 10 to 25 cm. long, of 5 to 15 laxly spreading racemes, the lower distant, the elliptic spikelets 2 mm. long, the glume and sterile lemma minutely pubescent to nearly glabrous, the glume about half the length of the sterile lemma and the pale shining fruit.

Among shrubs and in shady places, Brazil, whence originally described, and Bolivia to Argentina.

BOLIVIA: Milluhuaya, *Hitchcock* 22672. Coripata, *Hitchcock* 22691. Coroico, *Buchtien* 3614.

In the variety *glabriflorum*, described from Argentina, the spikelets are nearly glabrous, as they are in Bolivian specimens. In the type specimen of *P. inaequivalve* the spikelets are finely pubescent, but plants with nearly glabrous spikelets are the commoner, even in Brazil.

36. *Paspalum orbiculatum* Poir. in Lam. Encycl. 5: 32. 1804.

Paspalum pusillum Vent.; Flügge, Monogr. Pasp. 100. 1810.

A glabrous creeping perennial, with ascending flowering branches 10 to 20 cm. tall, the delicate culms finally branching; blades flat, spreading, mostly 1.5 to 4 cm. long, 4 to 7 mm. wide; racemes 2 or 3, short-exserted, 4 to 5 mm. distant, 1 to 2 cm. long, the minute spikelets pale yellow.

Wet places, southern Mexico and the West Indies to Ecuador and Paraguay. Originally described from Porto Rico.

ECUADOR: Balao, *Eggers* 14668. Teresita, *Hitchcock* 20434. Milagro, *Hitchcock* 20202. Portovelo, *Hitchcock* 21257.

37. *Paspalum haenkeanum* Presl, Rel. Haenk. 1: 210. 1830.

A straggling or creeping perennial, with elongate leafy culms and somewhat glaucous foliage, the sheaths overlapping, the flat spreading blades 4 to 8 cm.

long (rarely longer) and 6 to 9 mm. wide, rounded at base, pubescent at the junction with the sheath and mostly puberulent beneath; racemes 3 to 5, aggregate, ascending, 2 to 4.5 cm. long, rather thick, the flat rachis glabrous; spikelets broadly ovate, the glume and sterile lemma equal, covering the fruit.

Known only from Peru. None of the labels seen give the habitat. Originally described from the mountains of Huánuco. (*Haenke.*)

PERU: Callao, *Wilkes Expl. Exped.* Lima, *Barranca* 537. Santa Clara, *Holway* 786.

38. *Paspalum conjugatum* Bergius, Act. Helv. Phys. Math. 7: 129. 1762.

An extensively creeping perennial, with compressed culms, the suberect flowering branches sometimes 1 meter tall; blades flat, rather thin, up to 20 cm. long, commonly about 8 mm. wide; racemes a pair (rarely a third below), widely divaricate, usually arcuate, slender, commonly 10 to 12 cm. long, the pale yellow, flattened, imbricate spikelets about 1.5 mm. long, with scant long silky hairs around the margin.

Common in moist ground, Gulf States to Bolivia and Argentina; also in the tropics of the Old World. Originally described from Dutch Guiana.

ECUADOR: Balao, *Eggers* 14646. Guayaquil, *Mille* 304. Milagro, *Hitchcock* 20161, 20599. Tenguel, *Holmgren* 58.

PERU: Callao, *Wilkes Expl. Exped.* Chosica, *Macbride & Featherstone* 506. Colonia Perené, *Hitchcock* 22089. Without locality, *Lechler* 2275.

BOLIVIA: Rurrenabaque, *Cárdenas (Mulford Biol. Expl.)* 1175. Buena Vista, *Steinbach* 5160. Río Surutú, *Steinbach* 6836. Mapiri, *Buchtien* 1162. Hacienda Simaco, *Buchtien* 5325. Coroico, *Buchtien* 2504a. La Florida, *Hitchcock* 22633. Antahuacana, *Buchtien* 2504.

39. *Paspalum notatum* Flüge, Monogr. Pasp. 106. 1810.

Culms tufted, ascending from a short hard rhizome, forming tough mats, the leaves crowded at base, the blades flat, 5 to 8 mm. wide, often elongate; racemes 2, approximate, diverging, usually arcuate; spikelets solitary, broadly ovate, 2.5 to 3 mm. long, the glume and sterile lemma papery, shining.

Open slopes and pastures, mostly at low altitudes, Mexico and the West Indies to Argentina. Originally described from St. Thomas, West Indies.

BOLIVIA: Buena Vista, *Steinbach* 5273, 7020.

40. *Paspalum melanospermum* Desv.; Poir. in Lam. Encycl. Suppl. 4: 315. 1816.

Paspalum olivaceum Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 310. 1917.

A nearly smooth, spreading annual, the culms ascending or erect from a decumbent base, 30 to 60 cm. tall, with lax flat blades, and 4 to 6 arcuate ascending racemes 1.5 to 3 cm. long, the axis 3 to 5 cm. long; spikelets 2 mm. long, more or less wrinkled on the flat side.

Open moist sandy soil, Guadeloupe to Brazil and Bolivia. Originally described from French Guiana.

BOLIVIA: Buena Vista, *Steinbach* 5459.

41. *Paspalum plicatulum* Michx. Fl. Bor. Amer. 1: 45. 1803.

Paspalum undulatum Poir. in Lam. Encycl. 5: 29. 1804.

A tufted suberect perennial 0.5 to 1 meter tall, with compressed simple culms, linear blades 5 to 10 mm. wide, sometimes sparsely pilose, and few to several arcuate-spreading racemes 4 to 8 cm. long, the spikelets in pairs, drab-colored, drying brown, oval; fruit dark brown, shining.

Open slopes, banks, along streams, mostly in moist soil, southeastern United States to Bolivia and Argentina. Originally described from Georgia and Florida.

BOLIVIA: Coripata, *Hitchcock* 22675. Río Piray, *Herzog* 1345. Buena Vista, *Steinbach* 6873, 7036. --

42. *Paspalum pubifolium* Presl, Rel. Haenk. 1: 219. 1830.

Resembling *P. plicatulum* and doubtfully distinct, the blades densely pubescent beneath, long pilose above, the sterile lemma not undulate or an occasional one obscurely so.

Wet meadows, Peru. Originally described from the mountains of Huánuco. (*Haenke*.)

PERU: Colonia Perené, *Hitchcock* 22098.

The type was examined in the National Museum at Prague, and a photograph of it is in the United States National Herbarium. This plant agrees with Presl's description in having short blades clustered at the base, and only 3 racemes. The specimen cited above, the only one seen from Peru, has blades as much as 25 cm. long and resembles *P. plicatulum* generally, except that the sterile lemmas are not undulate, the spikelets being exactly like those of *Haenke's* plant.

43. *Paspalum collinum* Chase, sp. nov.

Perennial in small clumps; culms simple, ascending or spreading 30 to 65 cm. tall, flattened, glabrous; nodes dark, glabrous; leaves somewhat crowded toward the base, about four sheaths overlapping and two distant, the sheaths carinate, bearing a few stiff hairs on the margin at the summit, otherwise glabrous; ligule membranaceous, brown, about 1.5 mm. long; blades rather firm, flat, 12 to 20 cm. long, 6 to 9 mm. wide, rounded and scarcely or not at all narrowed at the base, rather short-acuminate, bearing long stiff hairs back of the ligule and sparsely stiff-ciliate, otherwise glabrous; inflorescence rather livid-purplish, long-exserted on a very flat peduncle, the common axis 4.5 to 5.5 cm. long, slender, plano-convex, glabrous; racemes 4 (in the only specimen seen), ascending or spreading, 2 to 6 cm. long; rachis triangular, about 0.7 mm. wide, with a tuft of stiff hairs at the base, otherwise glabrous; spikelets on minute glabrous pedicels, in pairs, closely imbricate, 2.5 mm. long, 1.5 mm. wide, elliptic-obovate, the glume and sterile lemma thin in texture, equal, covering the fruit, 5-nerved, the lateral pair of nerves close together near the margin, appressed-pubescent, the hairs a little longer and spreading toward the margins and summit; fruit almost as large as the spikelet, dark brown, minutely papillose-striate, with a few obscure hairs toward the summit and margin of the lemma.

Type in the U. S. National Herbarium, no. 1,164,831, collected in "moist grassy place," Coroico, Nor-Yungas, Bolivia, altitude 1,560 meters, December 25, 1923, by A. S. Hitchcock (no. 22723).

This species belongs to the *Plicatula* group, but the spikelets are less strongly convex on the back and the glume and sterile lemma are thinner in texture than in the other species, and there is no suggestion of wrinkles within the margin of the sterile lemma. In the lack of wrinkles and in pubescence the spikelets resemble those of *P. pubifolium* Presl, but they are longer, less blunt, and have looser longer pubescence toward the summit and margin.

Known only from the type specimen.

44. *Paspalum virgatum* L. Syst. Nat. ed. 10. 2: 855. 1759.

A robust erect perennial growing in large clumps 1.5 to 2 meters tall, the lower sheaths nodulose in drying; blades commonly 50 cm. long or more, 1 to 2 cm. wide, flat, the margins very scabrous; racemes several to many, 5 to 12 cm. long, forming a panicle 20 to 40 cm. long; spikelets in pairs, crowded,

grayish, becoming rusty brown at maturity, obovate, 3 mm. long, 2 mm. wide, silky-hairy around the margin.

Open, mostly moist or swampy ground, Mexico and the West Indies to Bolivia and Argentina, at rather low altitudes. Originally described from Jamaica.

PERU: Colonia Perené, *Hitchcock* 22073, 22102. Santa Ana, *Cook & Gilbert* 1531.

BOLIVIA: Hacienda Anacuri, *Holway* 703. Coripata, *Hitchcock* 22696.

45. *Paspalum millegrana* Schrad. in Schult. Mant. 2: 175. 1824.

Culms in large strong-rooted clumps, commonly 1.5 meters tall; sheaths nodulose, much overlapping; blades partially conduplicate, narrower, stiffer, and more scabrous than those of *P. virgatum*, often finely pubescent on the upper surface; racemes usually numerous, rather aggregate, ascending, the paired crowded spikelets usually glaucous-purple or lead color, obovate-suborbicular, sometimes almost obovate and apiculate.

Open moist ground, West Indies to Brazil, whence originally described, and eastern Bolivia, mostly at low altitudes.

BOLIVIA: Reyes, *Cárdenas (Mulford Biol. Expl.)* 1656.

Cárdenas's no. 1656 differs from typical *P. millegrana* in having a few obscure hairs at the summit of the spikelets.

46. *Paspalum densum* Poir. in Lam. Encycl. 5: 32. 1804.

Like *P. millegrana* in habit, the culms and sheaths more lush and in drying more strongly nodulose; racemes 4 to 6 cm. long, very numerous, aggregate in an elongate-pyramidal panicle, the light brown, glabrous, densely crowded spikelets 1.8 to 2 mm. long, nearly as broad.

Wet savannas and campos, West Indies and Panama to Brazil and eastern Bolivia. Originally described from Porto Rico.

BOLIVIA: Reyes, *White* 1499. Buena Vista, *Steinbach* 6898.

47. *Paspalum macrophyllum* H. B. K. Nov. Gen. & Sp. 1: 92. 1816.

Paspalum lehmannianum Pilger, Bot. Jahrb. Engler 25: 709. 1898.

A large-leaved perennial, with ascending glabrous culms, 50 to 75 cm. long, solitary or in small tufts, loose sheaths, papillose-pilose toward the summit or glabrous, flat blades commonly 12 to 25 cm. long and 1.2 to 2 cm. wide, rounded at base, long-pilose above the ligule and ciliate at least toward the base, otherwise glabrous or finely pubescent beneath, and 3 to 9 spreading racemes 3.5 to 5 cm. long, on a slender axis, mostly rather distant, with imbricate, dull brown, ovoid-oval spikelets, the glume and sterile lemma equal, covering the pale fruit, the glume finely pubescent, the sterile lemma glabrous or nearly so.

Wood borders, edges of clearings, and moist shady places, at middle altitudes, Colombia and Ecuador. Originally described from Colombia.

ECUADOR: Between Otavalo and Malchinguí, *Hitchcock* 20832. "Subtrop. 1200 m." *Sodiño* 299½.

48. *Paspalum barclayi* Chase, sp. nov.

Plant presumably perennial (the base wanting); culm simple, robust, 70 cm. to probably 1 meter or more tall, leafy toward the summit, compressed and sulcate, glabrous; nodes dark, with a sparse tuft of long stiff white fragile hairs on the edges or glabrate; leaves more than four, the sheaths compressed, carinate, ciliate with long fragile hairs on the margin especially toward the summit, otherwise glabrous; ligule membranaceous, brown, 1.5 to 2 mm. long; blades firm, flat, 10 to 21 cm. long, 1 to 2 cm. wide (the uppermost greatly reduced), rounded at the base, scabrous on the margins and with long hairs at the very

base, otherwise glabrous; inflorescence short-exserted or included at base, purplish brown, the common axis 5 to 8 cm. long, plano-convex to angled and sulcate, glabrous; racemes 6 to 10, rather crowded, ascending, 3.5 to 8 cm. long, thick and dense; rachis about 1 mm. wide at base, tapering to the summit, scabrous on the margins and with a long tuft of stiff hairs at the base; spikelets on minute slender pedicels, in pairs, closely imbricate, 2.8 to 3 mm. long, about 1.5 mm. wide, ovate-elliptic, the glume and sterile lemma thin in texture, equal, forming a short abrupt point beyond the fruit, 5-nerved, the lateral pair of nerves near the margin (those of the lemma close together), the glume sparsely pubescent with long fine appressed hairs, the hairs more copious along the margin toward the summit, accentuating the pointed apex, the lemma glabrous; fruit pale, 2.3 to 2.5 mm. long, about 1.3 mm. wide, elliptic, very minutely papillose-striate.

Type in U. S. National Herbarium, no. 601295, collected in the fields near Callao, Peru, soil light loam, in "1836-41" by George Barclay (no. 311).

The type, the only known specimen, consists of three culms with inflorescences but all lacking the base. It is related to *P. macrophyllum* H. B. K. but has longer, minutely pointed, less turgid spikelets in stiffer racemes in a more crowded panicle.

49. *Paspalum remotum* Remy, Ann. Sci. Nat. III. Bot. 6: 349. 1846.

A glabrous perennial, with decumbent compressed angular culms 25 to 100 cm. long, ascending from a creeping base, smooth sheaths mostly overlapping, flat blades 5 to 20 cm. long and 5 to 10, rarely 12 mm. wide, very scabrous on the margins, and a terminal panicle of 2 to 5 thick nodding racemes 2.5 to 9 cm. long, on a slender axis 2 to 10 cm. long, a single raceme on a leafless peduncle commonly borne in the upper sheath; spikelets in pairs, oval, 3.1 to 3.4 mm. long, about 2 mm. wide, finely pubescent.

Along ditches and in moist places, at middle altitudes, Bolivia. Originally described from Cotagna [Cotaña] below Illimani. (Pentland.)

BOLIVIA: Sorata, *Mandon* 1252; *Bang* 1312. "Yungas" *Rusby* 30. Cochabamba, *Buchtien* 2509; *Holway* 336; *Hitchcock* 22807.

50. *Paspalum fasciculatum* Willd. in Flügge, Monogr. Pasp. 69. 1810.

Paspalum fasciculatum var. *glabratum* Doell in Mart. Fl. Bras. 2: 91. 1877.

A large, extensively creeping perennial, the compressed culms as much as 1 cm. wide and several meters long, the bases forming a tangled mass, the erect flowering culms 1 to 2 meters tall; sheaths densely silky-ciliate, at least toward the summit; blades flat, 30 to 60 cm. long, commonly 2 cm. wide, the margins very scabrous; racemes 10 to 12 cm. long, numerous, aggregate in a fan-shaped panicle; spikelets 4 mm. long, 1.5 mm. wide, acuminate.

Stream banks and swamps, southern Mexico, Colombia, and Dutch Guiana to Argentina. Described from Brazil, with a variety β from Peru, collected by Humboldt and Bonpland. This collection in the Berlin Herbarium is marked, "Habitat in Peruv. Hum. 3813, gamalote." In the Paris Herbarium is a specimen marked "Bonpl. 3813, Guayaquil." In the Humboldt, Bonpland, and Kunth Herbarium, kept apart, in the Paris Herbarium is a specimen labeled "Guayaquil, San Borodon & Estero del Lagarto." These specimens are rather small plants, but are the same species as the type from Brazil. Kunth²⁶ redescribes *P. fasciculatum*, citing the Humboldt and Bonpland collection from "Guayaquil, San Borondon et Estero del Lagarto." He states that he has not seen var. α (the specimen from Brazil).

ECUADOR: Balao, *Eggcrs* 14104.

²⁶ H. B. K. Nov. Gen. & Sp. 1: 89. 1816.

51. *Paspalum pilosum* Lam. Tabl. Encycl. 1: 175. 1791.

Panicum monostachyum H. B. K. Nov. Gen. & Sp. 1: 96. 1816.

An ascending to spreading perennial, in small tufts, the compressed culms 40 to 75 cm. long, the foliage mostly coarsely pubescent, the flat or somewhat revolute blades commonly 8 to 15 cm. long and 5 to 8 mm. wide; racemes solitary, terminal and axillary, 10 to 15 cm. long, erect-arcuate; spikelets in pairs, oblong-elliptic, the first glume usually well developed on the lower of the pair of spikelets, the second glume and sterile lemma firm in texture.

Savannas and brushy slopes, Costa Rica to Brazil and Bolivia. Originally described from tropical America, the particular locality not known.

ECUADOR: Portovelo, *Hitchcock* 21269.

BOLIVIA: Hacienda Casana, *Buchtien* 7108.

Buchtien's no. 7108 differs from the typical form in having glabrous blades 10 to 12 mm. wide, rounded at the base, and sheaths ciliate on the margin, otherwise glabrous.

52. *Paspalum ekmanianum* Henr. Med. Rijks Herb. Leiden 40: 49. 1921.

An erect perennial, with slender simple culms in small tufts, scant foliage, the sheaths ciliate, the narrow erect subinvolute blades 5 to 10 cm. long, papillose-pilose on the upper surface, the long hairs fragile and breaking off, and a single slender pale woolly subfalcate raceme 12 to 13 cm. long, the slender axis glabrous; spikelets in pairs, imbricate, oblong-elliptic, 2 mm. long, excluding the hairs, the equal glume and sterile lemma densely clothed with somewhat crinkled, white hairs twice as long as the spikelet.

Sandy open ground at 450 to 500 meters, eastern Bolivia. (Type, *Herzog* 1654.)

BOLIVIA: Lomas, west of Río Piray, *Herzog* 1654. Buena Vista, *Steinbach* 5320, 6923 (one culm with 2 racemes).

53. *Paspalum malacophyllum* Trin. Gram. Icon. 3: pl. 271. 1831.

A tall, more or less purplish, often robust perennial in large clumps with suberect culms 1 to 2 meters tall, branching after the maturity of the primary panicle; sheaths mostly sparsely papillose-pilose and with long hairs in the throat; blades flat, mostly 15 to 25 cm. long and 10 to 25 mm. wide (smaller on the branches), velvety beneath; panicles 12 to 25 cm. long, of numerous ascending to spreading, subverticillate racemes 3 to 8 cm. long, the rachis sparsely ciliate, the mauve-purple or tawny, imbricate spikelets 1.7 to 2 mm. long.

On open grassy slopes at middle altitudes, Bolivia and Brazil, whence originally described, to Argentina.

BOLIVIA: Samaipata, *Herzog* 1756, 1836. Hacienda Casana, *Buchtien* 7110.

54. *Paspalum bolivense* Chase, sp. nov.

Plants perennial: culms solitary or few in a clump, erect, simple or producing leafy shoots from the second to the fourth nodes, 1 to 1.5 meters tall, terete, mostly dull purple, glabrous; nodes glabrous or sometimes pilose; leaves about 6, the sheaths more or less keeled, glabrous or pilose at the very base only; ligule membranaceous, 1 to 2 mm. long; blades rather firm, flat, mostly 10 to 20 cm. long and 8 to 20 mm. wide (the uppermost greatly reduced and those of the sterile branches commonly longer and narrower), the upper rounded at base, the lower tapering to a base narrower than the summit of the sheath, all pilose at the very base and long-acuminate to a fine point, the margins scabrous and some of them with a few scattered hairs, the blades otherwise glabrous; inflorescence rather long-exserted, at first whitish, turning mauve-purple, mostly 10 to 18 cm. long and 3 to 5 cm. wide, the common axis slender,

sharply angled, glabrous; racemes commonly 8 to 25 (rarely 30 or more), from narrowly ascending to arched-spreading, 1.5 to 6 cm. long; rachis about 1 mm. wide, with a tuft of long hairs in the axil, the margins scabrous and usually with a few scattered long hairs; spikelets on minute slender pedicels, in pairs, imbricate, 2 to 2.2 mm. long, about 1 mm. wide, elliptic, concavo-convex; both glumes wanting, the sterile lemma as long as the fruit, but narrower, thin in texture with 3 strong nerves, glabrous, closely appressed to the concave fertile palea; lemma and palea papillose-striate, the papillae glistening under a lens, the fertile lemma mauve-purple, strongly convex or almost gibbous, with 7 prominent equidistant longitudinal ridges.

Type in U. S. National Herbarium, no. 1,099,153, collected near Sorata, Bolivia, in May, 1892, by Miguel Bang (no. 1306).

This species is allied to *Paspalum malacophyllum* Trin., *P. elongatum* Griseb., and *P. simplex* Morong. It differs from all in having larger spikelets with more strongly papillose fruit. The racemes are shorter than those of any of these except in occasional specimens.

Open rocky slopes, Andes of Bolivia, between 2,500 and 3,000 meters altitude.

BOLIVIA: Sorata, *Bang* 1306; *Holway* 516. Cochabamba, *Hitchcock* 22866; *Holway* 331, 374½. Without locality, *D'Orbigny* 166.

55. *Paspalum saccharoides* Nees in Trin. Gram. Icon. 1: pl. 107. 1828.

Panicum saccharoides Kunth, Rév. Gram. 1: 237. pl. 30. 1830.

Moenchia speciosa Wender.; Steud. Nom. Bot. ed. 2. 2: 153. 1841.

A robust tufted stoloniferous perennial, the branching culms often 2 meters tall, the long flat blades 1 to 1.5 cm. wide, involute toward the apex, pale and appressed-pubescent on the upper surface; racemes numerous, commonly 15 cm. or more long, slender, drooping, forming a feathery panicle, the small narrow spikelets margined with silky white hairs 6 to 8 mm. long, the general appearance unlike that of any other species of *Paspalum*.

Banks and steep slopes, Costa Rica and the Lesser Antilles to Bolivia and Brazil. Originally described from St. Christopher.

ECUADOR: Huigra, *Rose* 22645. Between Huigra and Naranjapata, *Hitchcock* 20652. Between Baños and Cashurco, *Hitchcock* 21761.

PERU: Chicoplaya, *Ruiz*.

BOLIVIA: Coripata, *Hitchcock* 22686. Antahuacana, *Buchtien* 2513.

The following species we have been unable to identify:

PASPALUM ANDERSSONII Mez, Repert. Nov. Sp. Fedde 15: 71. 1917. Collected by Andersson in Peru, the particular locality not known.

PASPALUM CASTANEUM Remy, Ann. Sci. Nat. III. Bot. 6: 348. 1846. Collected by D'Orbigny at "Garulazo, prope Chuquisaca," Bolivia. The description suggests a hirsute specimen of *Paspalum convexum* Flügge, which is not known from Bolivia, but the Department of Chuquisaca is scarcely known botanically.

PASPALUM IBARRENSE Sodiro, Anal. Univ. Quito 1889: 4. [1889?] A name only, "En la provincia Imbabura. Raro." No specimen so named was found in the Sodiro Herbarium at Quito.

PASPALUM MARGINATUM Remy, Ann. Sci. Nat. III. Bot. 6: 348. 1846. Not *P. marginatum* Trin. *Paspalum remyi* Steud. Syn. Pl. Glum. 1: 28. 1854. Based on *P. marginatum* Remy, not Trin. Collected by D'Orbigny "in locis vulgo Pampas Sti Joaquin." We are unable to locate the place cited. The description suggests *Paspalum cujabense* Trin., a narrow-leaved species related to *P. ceresia* (Kuntze) Chase, not known from Bolivia.

95. PANICUM L.

Inflorescence paniculate (rarely racemose); spikelets pedicellate, biconvex; first glume present; sterile lemma usually inclosing a hyaline palea, sometimes a staminate flower; fruit chartaceous-indurate, the margins of the lemma inrolled.

Spikelets short-pedicelated along one side of the panicle branches forming more or less spikelike racemes, these arranged along a simple axis.

Fruit transversely rugose. Spreading or creeping; spikelets glabrous.

Plants perennial. Spikelets not reticulate-veined.

Nodes glabrous.....1. *P. geminatum*.

Nodes bearded.....2. *P. barbinode*.

Plants annual.

Spikelets glabrous, reticulate-veined.

Spikelets turgid, scarcely flattened, reticulate-veined on the upper half.....3. *P. fasciculatum*.

Spikelets plano-convex, reticulate-veined only at tip...4. *P. ramosum*.

Spikelets hispid, not reticulate.....5. *P. echinulatum*.

Fruit not rugose.

Blades lanceolate or ovate-lanceolate.

Spikelets hispid and with 2 crateriform glands on the sterile lemma.

24. *P. pulchellum*.

Spikelets glabrous, glandless. Glumes strongly carinate.

Blades not more than 5 cm., usually 2 to 3 cm., long; second glume rather blunt and shorter than the sterile lemma.

22. *P. stoloniferum*.

Blades 5 to 11 cm. long; second glume acute, nearly equaling the sterile lemma.....23. *P. frondescens*.

Blades linear, often elongate.

Rachis pilose with long hairs.....19. *P. pilosum*.

Rachis without long hairs.

Nodes bearded.....18. *P. polygonatum*.

Nodes glabrous.

Blades narrowed at the base, not cordate.....20. *P. laxum*.

Blades not narrowed at the somewhat cordate base.

21. *P. bolivense*.

Spikelets in open or contracted panicles, if somewhat racemose along the branches not in one-sided racemes.

Fruit finely transversely rugose.

Culms with a cormlike base.....16. *P. bulbosum*.

Culms without a cormlike base.....15. *P. maximum*.

Fruit not transversely rugose.

Sterile lemmas 2.....13. *P. quadriglume*.

Sterile lemma 1.

Plants annual.

Spikelets plano-gibbous, the second glume swollen, bristly and burlike.

First glume nearly as long as the minute spikelet...44. *P. hirtum*.

Spikelets not plano-gibbous nor burlike.

Blades ovate-lanceolate or elliptic, one-fifth to one-fourth as broad as long; spikelets not more than 1.5 mm. long. Plants low.

26. *P. trichoides*.

Blades linear or narrowly lanceolate, many times longer than broad; spikelets 2.5 to 3.5 mm. long.

Panicles terminal and axillary.....9. *P. cayennense*.

Panicles terminal only.

First glume more than half the length of the spikelet, acuminate.

10. *P. hirticaule*.

First glume one-third the length of the spikelet, bluntish.

11. *P. stramineum*.

Plants perennial.

First glume not more than one-fourth as long as the spikelet, usually obtuse or truncate.

Spikelets 2 mm. long, obtuse, clustered toward the ends of the nearly simple panicle branches.....25. *P. schiffneri*.

Spikelets 2 to 5 mm. long, acute, panicle branches compound.

Spikelets 4 to 5 mm. long, acuminate.....8. *P. elephantipes*.

Spikelets 3 mm. long.....6. *P. aquaticum*.

Spikelets 2 mm. long.....7. *P. chloroticum*.

First glume more than one-third as long as the spikelet.

Spikelets viscid, 3 mm. long, obtuse.....28. *P. glutinosum*.

Spikelets not viscid.

Panicle 40 to 60 cm. long, the branches in verticils. Spikelets 3.5 mm. long, turgid.....45. *P. megiston*.

Panicle usually much less than 40 cm. long, the branches not in verticils.

Culms erect or spreading but not much branched or straggling.

(See also 47. *P. procurrens*, with white-margined blades and spikelets 4 mm. long.)

Spikelets 6 to 7 mm. long.

Spikelets glabrous.....46. *P. olyroides*.

Spikelets silky-villous.....34. *P. urvilleanum*.

Spikelets less than 4 mm. long.

Spikelets about 3.5 mm. long, turgid, sparsely hirsute with stiff hairs.....33. *P. rudgei*.

Spikelets not more than 3 mm. long.

Glumes subequal, much shorter than the spikelet.

41. *P. versicolor*.

Glumes unequal, the second as long as the spikelet.

Culms a meter or more tall.

Sheaths hirsute; rhizome wanting...14. *P. hirsutum*.

Sheaths glabrous; rhizome stout.

17. *P. tricholaenoides*.

Culms mostly less than 0.5 meter tall.

Panicle 20 to 30 cm. long.....12. *P. ghiesbreghtii*.

Panicle not more than 10 cm. long.

Plants pubescent.

Spikelets oval 1.5 cm. long...30. *P. obtusiglume*.

Spikelets elliptic, 2 mm. long...36. *P. sclurotis*.

Plants glabrous.....37. *P. stigmatosum*.

Culms much branched, straggling.

Spikelets 5 to 7 mm. long.

Spikelets glabrous, 5.5 to 6 mm. long...42. *P. zizanioides*.

Spikelets velvety, 7 mm. long...43. *P. paucispicatum*.

Spikelets 4 mm. long or less.

Spikelets 1.3 to 1.5 mm. long.

First glume one-fifth as long as spikelet.

27. *P. trichanthum*.

First glume more than half as long as spikelet.

31. *P. parvifolium*.

Spikelets 2 to 4 mm. long.

Spikelets 3 to 4 mm. long.

Spikelets 4 mm. long, pilose. Blades white-margined.

47. *P. procurrens*.

Spikelets 3 mm. long. Blades glabrous.

40. *P. cordovense*.

Spikelets 2 to 2.5 mm. long.

Spikelets short-pediceled toward the ends of the panicle
branches-----29. *P. sellowii*.

Spikelets evenly distributed in the panicle.

Spikelets 2.5 mm. long-----39. *P. polycladum*.

Spikelets 2 mm. long.

Blades pubescent-----38. *P. pantrichum*.

Blades glabrous.

Blades lanceolate, as much as 1.5 cm. wide, some-
what spreading, pubescent on the collar.

35. *P. hebotes*.

Blades linear-lanceolate, mostly less than 6 mm.
wide, appressed, glabrous on the collar.

32. *P. caaguazuense*.

1. *Panicum geminatum* Forsk. Fl. Aegypt. Arab. 18. 1775.

A glabrous perennial 50 to 100 cm. tall, with a narrow panicle of short appressed racemes.

Moist ground or in shallow water, mostly near the coast, southern Florida and Texas to Brazil and Peru; also in the warmer parts of the Old World. Originally described from Egypt.

ECUADOR: Guayaquil, *Hitchcock* 19916.

PERU: Lima, *Wilkes Expl. Exped.* River Chira, *Spruce* 6424 (Kew Herb.).

2. *Panicum barbinode* Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 1: 256. 1834.

PARÁ GRASS.

A tall perennial, with long branching decumbent bases and long stolons, pubescent nodes, glabrous blades, and several racemes on an axis 15 to 20 cm. long, the lower as much as 5 to 10 cm. long and more or less branching, the glabrous spikelets 3 mm. long.

Cultivated and waste grounds at low altitudes, especially in moist places, tropical America, where it appears to be introduced, probably from Africa. Originally described from Brazil.

ECUADOR: Guayaquil, *Hitchcock* 19914. Milagro, *Hitchcock* 20199. Without locality, *Lehmann* 5744 (Kew Herb.).

PERU: Santa Clara, *Rose* 18630; *Holway* 790. Santa Ana, *Cook & Gilbert* 1427, 1530.

3. *Panicum fasciculatum* Swartz, Prodr. Veg. Ind. Occ. 22. 1788.

An erect branching annual up to a meter tall, with panicles of yellow or brown, turgid spikelets about 2.5 mm. long.

A weed in fields and waste places at low altitudes, southern Florida and Texas to Ecuador and Brazil. Originally described from Jamaica.

ECUADOR: Milagro, *Hitchcock* 20215. El Recreo, *Eggers* 15418, 15834. Chanduy, *Spruce* 6422 (Kew Herb.).

4. *Panicum ramosum* L. Mant. 1: 29. 1767.

A spreading annual, with pubescent culms 20 to 30 cm. long, thin, flat, narrowly lanceolate, pubescent blades 3 to 5 mm. wide, and loose racemes 5 to 10 mm. long, somewhat distant on a villous axis 3 to 4 cm. long; spikelets about 2.5 mm. long, glabrous, rather obtuse, the rachis pilose, some of the hairs on the short pedicels as long as the spikelet; first glume rounded or truncate, 1 mm. long; second glume reticulate at apex; sterile lemma somewhat granular in texture; fertile floret transversely rugose.

Open ground, southern Asia. Originally described from a garden specimen from India. In America known only from the following specimen.

PERU: Along the railroad at San Bartolomé, *Weberbauer* 5283 (Field Mus.).

5. *Panicum echinulatum* Mez, Notizbl. Bot. Gart. Berlin 7: 62. 1917.

Panicum echinulatum var. *boliviense* Henr. Med. Rijks Herb. Leiden 40: 50. 1921. (*Herzog* 3004; differs in having wider blades.)

A spreading annual, with firm lanceolate blades and hispidulous spikelets in racemes arranged in a panicle.

Paraguay, whence originally described, and Bolivia; also the Virgin Islands. The specimen from St. Croix, Virgin Islands (*Eggers* in 1876) was cited by Hitchcock and Chase¹¹ under *Panicum adspersum*.

BOLIVIA: Villa Montes, *Pflanz* 607. Santa Cruz, patio of hotel, *Steinbach* 5259; *Herzog* 3004.

6. *Panicum aquaticum* Poir. in Lam. Encycl. Suppl. 4: 281. 1816.

A decumbent spreading glaucous perennial 50 to 100 cm. tall, with glabrous flat blades 5 to 10 mm. wide, and a spreading panicle of spikelets about 3 mm. long.

Wet places or in shallow water, Mexico to Paraguay. Originally described from Porto Rico.

PERU: Lima, *Wilkes Expl. Exped.*; *Didrichsen (Galathea Exped.)* 4394.

7. *Panicum chloroticum* Nees; Trin. Gram. Pan. 236. 1826.

Resembling *P. aquaticum*, but spikelets only about 2 mm. long.

Wet places, Brazil, whence originally described, to Bolivia.

BOLIVIA: Reyes, *Rusby* 1636; *White* 1209 in part.

8. *Panicum elephantipes* Nees, Agrost. Bras. 165. 1829.

Panicum firmum Areschoug, Svensk. Freg. Eugenies Resa 116. 1910; Repert.

Nov. Sp. Fedde 10: 299. 1912. Not *P. firmum* Kunth, 1829. (*N. J. Andersson*, Guayaquil.)

A robust, somewhat succulent perennial the culms as much as 2 cm. thick and 1 to 2 meters tall or more, with long, decumbent or creeping, rooting base, the nodes black in drying; panicle large and open; spikelets narrow, acuminate, 4 to 5 mm. long, the first glume about one-fourth as long.

Ponds and shallow water, West Indies and southern Mexico to Argentina. Originally described from Brazil.

ECUADOR: Guayaquil, *Andersson* in 1852.

This specimen has not been examined and the species is admitted on the description.

9. *Panicum cayennense* Lam. Tabl. Encycl. 1: 173. 1791.

An erect annual 20 to 50 cm. tall, with papillose-pilose sheaths, linear pilose blades 4 to 10 mm. wide, and terminal and axillary panicles 8 to 20 cm. long, the obovoid glabrous spikelets about 2.3 mm. long.

¹¹ Contr. U. S. Nat. Herb. 15: 43. 1910.

Open ground and pine woods, Cuba and Costa Rica to Brazil. Originally described from Cayenne, French Guiana.

BOLIVIA: Buena Vista, *Steinbach* 6935.

10. *Panicum hirticaule* Presl, Rel. Haenk. 1: 308. 1830.

An erect or spreading, usually reddish or brownish annual mostly less than 50 cm. tall, with hispid sheaths, and open panicles of glabrous acute spikelets about 3 mm. long, the first glume half or three-fourths the length of the spikelet.

Dry open ground, southwestern United States to Colombia and Bolivia. Originally described from Mexico.

PERU: Colonia Perené, *Hitchcock* 22115. Huánuco, *Macbride* 3526.

11. *Panicum stramineum* Hitchc. & Chase, Contr. U. S. Nat. Herb. 15: 67. 1910.

Differing from *P. hirticaule* in the pale color, the somewhat larger spikelets, and the shorter, less acute first glume.

Open ground, Mexico to Bolivia. Originally described from Mexico.

ECUADOR: Between La Toma and Loja, *Hitchcock* 21402.

BOLIVIA: Reyes, *Cárdenas* (*Mulford Biol. Expl.*) 1647.

12. *Panicum ghiesbreghtii* Fourn. Mex. Pl. 2: 29. 1886.

A stiff erect hirsute perennial, with elongate flat blades, and narrowly diffuse panicles.

Low moist ground, Mexico, whence originally described, to the West Indies, Ecuador, and Bolivia.

ECUADOR: El Recreo, *Eggers* 15419.

BOLIVIA: Buena Vista, *Steinbach* 6970.

13. *Panicum quadriglume* (Doell) Hitchc.

Panicum cayennense var. *quadriglume* Doell in Mart. Fl. Bras. 2^o: 220. 1877.

An erect cespitose perennial 20 to 40 cm. tall, with hirsute sheaths, narrow erect pilose blades, and open panicles of pointed spikelets 3 mm. long; sterile lemmas 2, much exceeding the dark shining fruit.

Grassy plains, Brazil, whence originally described, to Bolivia and Paraguay.

BOLIVIA: Yungas, *Bang* 493. Mulluhuaya, *Buchtien* 4174. Buena Vista, *Steinbach* 5299.

14. *Panicum hirsutum* Swartz, Fl. Ind. Occ. 1: 173. 1797.

A stout erect perennial as much as 2 meters tall, with hirsute sheaths, flat glabrous blades as much as 2 cm. wide, and large, rather densely flowered panicles, the branches at first ascending, finally spreading; spikelets glabrous, acute, about 2 mm. long.

Open moist soil, West Indies and central Mexico to Ecuador. Originally described from Jamaica.

ECUADOR: Panigón Plantation, *Hitchcock* 20580, 20601.

15. *Panicum maximum* Jacq. Coll. Bot. 1: 76. 1786.

GUINEA GRASS.

A tufted erect perennial as much as 2 meters tall, sometimes taller, with pubescent nodes, elongate flat blades, and a large open panicle of green oblong glabrous spikelets 3 mm. long.

A native of tropical Africa; introduced and spontaneous in the American Tropics at low altitudes; often cultivated. Originally described from Guadeloupe.

ECUADOR: Milagro, *Hitchcock* 20193. Puéllaro, *Mille* 310. Without locality, *Lehmann* 5745.

PERU: Piura, *Spruce* in 1865 (Kew Herb.).

BOLIVIA: Milluhuaya, *Buchtien* 4272. Coroico, *Buchtien* 3640.

16. *Panicum bulbosum* H. B. K. Nov. Gen. & Sp. 1: 99. 1816.

Panicum avenaceum H. B. K. Nov. Gen. & Sp. 1: 99. 1816. (Near Quito, Bonpland.)

Resembling *P. maximum* but the base of the culm enlarged into a hard corm as much as one-half inch in diameter, and the sheaths glabrous.

Moist places in canyons and valleys, southwestern United States to southern Mexico, whence originally described; also in Ecuador.

ECUADOR: Chillo, Sodiro; Mille 309.

17. *Panicum tricholaenoides* Steud. Syn. Pl. Glum. 1: 68. 1854.

Panicum junceum Nees, Agrost. Bras. 159. 1829. Not *P. junceum* Trin. 1826.

A slender, erect, firm or woody perennial a meter or more tall, with stout creeping rhizome, smooth blue-green culm, and narrow panicle of pale turgid spikelets about 2 mm. long.

Moist ground, Brazil, whence originally described, to Bolivia and Argentina.

BOLIVIA: Reyes, White 1209. Dept. Santa Cruz, Steinbach 6900.

18. *Panicum polygonatum* Schrad. in Schult. Mant. 2: 256. 1824.

Panicum ecuadorensis Mez, Bot. Jahrb. Engler 56: Beibl. 125: 3. 1921. (Eggers 15064, Ecuador.)

Similar to *P. laxum*; nodes pubescent; blades more or less cordate at base; panicle more branching, the main branches mostly rebranched, the axis with occasional long hairs.

Swamps and moist ground, Mexico to Brazil and Peru. Originally described from Brazil.

ECUADOR: Bucay, Rose 24020. Teresita, Hitchcock 20424, 20433. Puente de Chimbo, Sodiro 305. Portovelo, Hitchcock 21256. La Chonta, Rose 23475.

PERU: Colonia Perené, Hitchcock 22059, 22124.

BOLIVIA: Milluhuaya, Buchtien 4170. Hacienda Simaco, Buchtien 5334. Hacienda Casana, Buchtien 7129. Chulumani, Hitchcock 22712. Huachi, White 961. Buena Vista, Steinbach 5231. Río Surutú, Steinbach 6840.

19. *Panicum pilosum* Swartz, Prodr. Veg. Ind. Occ. 22. 1788.

Setaria disticha H. B. K. Nov. Gen. & Sp. 1: 112. 1816.

Spreading or ascending; panicles 5 to 15 cm. long, the numerous dense racemes 1 to 3 cm. long, rather closely arranged along the main axis, the rachises stiffly ciliate; spikelets glabrous, 1.5 mm. long.

Moist ground and open woods, Mexico and the West Indies to Brazil and Ecuador. Originally described from Jamaica.

ECUADOR: Teresita, Hitchcock 20467.

BOLIVIA: Mapiri, Rusby 212; Buchtien 1183. Rurrenabaque, Rusby 759. San Buena Ventura, Cárdenas (Mulford Biol. Expt.) 1772.

20. *Panicum laxum* Swartz, Prodr. Veg. Ind. Occ. 23. 1788.

Vilfa gavana Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only. (Lechler 2285).

Plants more or less spreading or decumbent at base, usually 40 to 60 cm. tall, sometimes taller; panicle open, the spikelets along one side of the spreading main branches; spikelets a little more than 1 mm. long.

Ditches and moist open ground, common, Mexico and the West Indies to Bolivia and Paraguay. Originally described from Jamaica.

ECUADOR: Milagro, Hitchcock 20257. Balao, Eggers 14585. Cashurco, Hitchcock 21799, 21867, 21879. Napo River, Jameson 746 (Kew Herb.).

PERU: Colonia Perené, Hitchcock 22064, 22099. San Gaván, Lechler 2285.

BOLIVIA: Reyes, *Rusby* 1658½. Mapiri, *Rusby* 228, 236. Unduavi, *Rusby* 22. Yungas, *Bang* 266, 308a. Corolco, *Buchtien* 6441. Hacienda Simaco, *Buchtien* 5315. Hacienda Casana, *Buchtien* 7122, 7127. La Florida, *Hitchcock* 22626. Chulumani, *Hitchcock* 22667, 22668. Between Río Piray and Río Cuchi, *Herzog* 1444. Buena Vista, *Steinbach* 5161, 5338, 6850.

21. *Panicum boliviense* Hack. Repert. Nov. Sp. Fedde 11: 19. 1912.

Resembling *P. laxum*, but blades broader, lanceolate or oblong-lanceolate, mostly less than 10 cm. long, as much as 1.5 cm. wide, scarcely narrowed at the cordate and slightly petioled base, the panicle more open and loosely flowered.

Moist places, southern Mexico to Bolivia, whence originally described. (Type, *Buchtien* 2501.)

ECUADOR: El Recreo, *Eggers* 15701 in part.

BOLIVIA: Antahuacana, *Buchtien* 2501. Buena Vista, *Steinbach* 6857.

22. *Panicum stoloniferum* Polr. in Lam. Encycl. Suppl. 4: 274. 1816.

A creeping, freely branching perennial, with ascending flowering branches 10 to 30 cm. tall, lanceolate blades 3 to 15 mm. wide, panicles 1 to 5 cm. long, several spreading racemes 5 to 10 mm. long, and glabrous spikelets 2.5 mm. long.

Woods and low ground, Guatemala to Brazil and Bolivia. Originally described from French Guiana.

ECUADOR: Balao, *Eggers* 14149.

PERU: Colonia Perené, *Hitchcock* 22057.

BOLIVIA: Mapiri, *Buchtien* 1167.

23. *Panicum frondescens* Meyer, Prim. Fl. Esseq. 56. 1818.

Culms ascending from a decumbent or creeping base, 30 to 50 cm. tall, the lanceolate blades 12 to 30 mm. wide; racemes numerous and crowded, the lower as much as 25 mm. long; spikelets glabrous, 2.5 to 2.8 mm. long.

Moist ground, Mexico to Brazil and Bolivia. Originally described from British Guiana.

ECUADOR: Guayaquil, *Holmgren* 86. Naranjal, *Lehmann* 5746 (Kew Herb.).

PERU: Colonia Perené, *Hitchcock* 22058. La Merced, *Macbride* 5646. Tarpoto, *Spruce* 4192 (Kew Herb.).

BOLIVIA: Lake Rogagua, *Cárdenas* (*Mulford Biol. Expl.*) 1704. Mapiri, *Rusby* 228, 229; *Buchtien* 1172, 1173. Coroico, *Buchtien* 1173a. Antahuacana, *Buchtien* 2502. Hacienda Casana, *Buchtien* 7120. Buena Vista, *Steinbach* 5130, 6855.

24. *Panicum pulchellum* Raddi, Agrost. Bras. 42. 1823.

A delicate creeping rooting perennial, with ascending flowering branches 20 to 30 cm. tall, thin ovate-lanceolate blades, and oblong panicles of small spikelets, the sterile lemma with a pair of small glands.

Woods and savannas, Mexico to Brazil and Bolivia. Originally described from Brazil.

ECUADOR: Teresita, *Hitchcock* 20536. Between La Chorita and Portovelo, *Hitchcock* 21212. Bucay, *Rose* 22446.

PERU: San Gaván, *Lechler* 2180 (Kew Herb.).

BOLIVIA: Guanay, *Rusby* 217.

25. *Panicum schiffneri* Hack. Ergeb. Bot. Exped. Akad. Wiss. Südbras. 11. 1906.

A slender branching straggling perennial, with culms a meter long, lanceolate blades 1.5 cm. wide, and open panicles 15 cm. long, with a few distant

branches, the spikelets 2 mm. long, clustered along the main branches, the first glume very small.

Copses and brush land, Mexico and the West Indies to Ecuador and Brazil. Originally described from southern Brazil.

ECUADOR: Teresita, *Hitchcock* 20535. Between Huigra and Naranjapata, *Hitchcock* 20672.

26. *Panicum trichoides* Swartz, Prodr. Veg. Ind. Occ. 24. 1788.

A branching annual 20 to 40 cm. tall, with thin lanceolate acuminate blades 1 to 2 cm. wide, delicate open panicles 5 to 20 cm. long, and long-pediceled, sparsely hirsute spikelets a little more than 1 mm. long.

Woods and open ground, often a weed in cultivated soil, Mexico and the West Indies to Brazil and Ecuador. Originally described from Jamaica.

ECUADOR: Guayaquil, *Anthony & Tate* 50; *Hitchcock* 19947, 19969. Balao, *Eggers* 14481. El Recreo, *Eggers* 15417. Milagro, *Hitchcock* 20213. Napo River, *Jameson* 745 (Kew. Herb.). Portovelo, *Rose* 23449.

PERU: Colonia Perené, *Hitchcock* 22101.

27. *Panicum trichanthum* Nees, Agrost. Bras. 210. 1829.

Panicum guayaquilense Steud. Syn. Pl. Glum. 1: 85. 1854. (*Jameson* 560.)

A branching straggling perennial, with slender culms as much as 1 meter long, lanceolate blades as much as 2 cm. wide, and diffuse panicles of minute spikelets about 1.3 mm. long.

Thickets and river banks, Mexico to Peru and Paraguay. Originally described from Brazil.

ECUADOR: Tenguel, *Holmgren* 113. Milagro, *Hitchcock* 20214, 20294. Guayaquil, *Jameson* 560 (Kew Herb.).

PERU: Colonia Perené, *Hitchcock* 22055. La Merced, *Macbride* 5309.

BOLIVIA: Chulumani, *Hitchcock* 22660. Coroico, *Buchtien* 446 (Kew Herb.), 3612.

28. *Panicum glutinosum* Swartz, Prodr. Veg. Ind. Occ. 24. 1788.

Panicum divergens H. B. K. Nov. Gen. & Sp. 1: 102. 1816. (Near Quito. Bonpland.)

Culms 1 to 2 meters tall from a decumbent base; blades elongate, 1.5 to 2.5 cm. wide; panicle 15 to 30 cm. long, open, the spikelets viscid, 3 mm. long, the first glume about as long as the second.

Mountain woods, Mexico and the West Indies to Bolivia and Paraguay. Originally described from Jamaica.

ECUADOR: Between Portovelo and El Tambo, *Hitchcock* 21300.

PERU: Hacienda Pampayacu, *Macbride* 5101. Casapí, *Mathews* 2104 (Kew Herb.).

BOLIVIA: Hacienda Simaco, *Buchtien* 5316. Mapiri, *Rusby* 244.

The type specimen of *Panicum divergens* consists of two species. One is *P. glutinosum*, from which the major part of the description is drawn. The other appears to be *P. stigmatum*, from which the description of the spikelet is drawn.

29. *Panicum sellowii* Nees, Agrost. Bras. 153. 1829.

Plants perennial, spreading; culms as much as 1 meter tall; blades thin, as much as 15 cm. long and 3 cm. wide, pubescent or glabrate; panicle loose and open, rather few-flowered; spikelets a little more than 2 mm. long, glabrous or nearly so, or (in the Ecuador specimens) pubescent, short-pediceled along the outer part of the main branches.

Damp woods, Cuba and Mexico to Brazil. Originally described from Brazil.

ECUADOR: Between Portovelo and El Tambo, *Hitchcock* 21309. Portovelo, *Rose* 23402.

PERU: San Gaván, *Lechler* 2430 (*Kew Herb.*).

BOLIVIA: Chulumani, *Hitchcock* 22697. La Florida, *Hitchcock* 22638. Bella Vista, *Hitchcock* 22752 (spikelets sparsely hispidulous). Yanacachi, *Buchtien* 429. Hacienda Simaco, *Buchtien* 5317. Hacienda Casana, *Buchtien* 7114.

30. *Panicum obtusiglume* Hitchc., sp. nov.

Perennial; culms cespitose, slender, decumbent at base, glabrous, 10 to 15 cm. tall; sheaths pilose with ascending or appressed hairs; ligule a very short glabrous membrane less than 0.5 mm. long; blades mostly appressed, densely pilose on both surfaces with spreading hairs, oblong-lanceolate, scarcely narrowed at the base, 10 to 15 mm. long, about 2 mm. wide; panicles exserted, spreading, few-flowered, 2 to 3 cm. long, about as wide, the branches once or twice divided, somewhat flexuous, the ultimate branchlets or pedicels very slender, 4 to 8 mm. long, glabrous, the axillary pulvini bearing a few slender hairs; spikelets globose or oval, pilose, 1.5 mm. long; first glume about three-fourths as long as the spikelet, obtuse; second glume and sterile lemma slightly exceeding the fruit, obtuse; fertile lemma somewhat apiculate.

Type in the U. S. National Herbarium, no. 1,126,951, collected at Tambillo, Peru, March 18, 1878, by C. de Jelski (no. 403).

The species is allied to *Panicum parvifolium*, from which it differs in the short culms, pubescent foliage, and pilose spikelets. In habit the specimen differs in being densely cespitose, but this may not be constant.

31. *Panicum parvifolium* Lam. Tabl. Encycl. 1: 173. 1791.

Panicum brasiliense Spreng. Syst. Veg. 1: 321. 1825.

A slender straggling branching perennial, with culms 10 to 30 cm. tall, oblong-lanceolate blades mostly 1 to 2 cm. long and 3 to 5 mm. wide, ovoid panicles 2 to 4 cm. long, and elliptic glabrous spikelets about 1.5 mm. long, the first glume more than half as long as the spikelet. Our specimens have pubescent blades like the type of *Panicum brasiliense*.

Savannas and moist places. Central America and the West Indies to Paraguay. Originally described from tropical America.

BOLIVIA: Buena Vista, *Steinbach* 6646, 6865, 7001.

32. *Panicum caaguazuense* Henr. Med. Rijks Herb. Leiden 47: 2. 1922.

A slender branching smooth perennial, with decumbent culms 40 to 60 cm. tall, sessile, erect, rather rigid, acuminate blades, mostly less than 10 cm. long, and a diffuse panicle of smooth oval spikelets about 2 mm. long.

Savannas, Brazil to Paraguay. Originally described from Paraguay.

BOLIVIA: Buena Vista, *Steinbach* 5175. Doubtfully referred, ex description.

33. *Panicum rudgei* Roem. & Schult. Syst. Veg. 2: 444. 1817.

A tufted tawny perennial, with robust, ascending, often zigzag culms as much as 1 meter tall, hirsute sheaths, linear blades, terminal and axillary, open, divaricately spreading panicles, and turgid, abruptly pointed, glabrous or sparsely hispid spikelets 3.5 mm. long.

Savannas and open ground, British Honduras and Jamaica to Brazil. Originally described from British Guiana.

PERU: "In Peruviae Andium," *Ruiz* (fragment from Berlin Herbarium).

BOLIVIA: Mapiri, *Buchtien* 1159.

34. *Panicum urvilleanum* Kunth, Rév. Gram. 2: 403. pl. 115. 1830.

Panicum megastachyum Presl, Rel. Haenk. 1: 305. 1830. (Peru.) Not *P. megastachyum* Nees, 1826.

Panicum prestii Kunth, Enum. Pl. 1: 121. 1833.

A robust perennial from strong creeping rhizomes, with villous sheaths and somewhat open panicles with ascending branches and large silky-villous spikelets 6 to 7 mm. long.

Sandy deserts, southwestern United States; Argentina and Chile. Originally described from Chile.

PERU: Mountains of Huánuco, *Haenke*.

Since no collections from Peru are known except the one made by Haenke, the locality is recorded with doubt. It is known that there are many errors in the records of Haenke's collections, and this specimen may have come from Chile, where Haenke also collected.

A sterile specimen from southern Ecuador may belong to this species (between La Toma and Loja, *Hitchcock* 21397).

35. *Panicum hebotes* Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 1: 301. 1834.

A slender smooth straggling perennial, with lanceolate blades about 1.5 cm. wide and diffuse panicles of glabrous spikelets about 2 mm. long.

Moist thickets, Brazil to Ecuador and Bolivia. Originally described from Brazil.

ECUADOR: Cashurco, *Hitchcock* 21862.

BOLIVIA: Yungas, *Bang* 493.

36. *Panicum sciurotis* Trin. Gram. Pan. 228. 1826.

A slender cespitose perennial, mostly 20 to 40 cm. tall, sometimes 60 cm., finally bearing divaricate branches, the blades softly and finely pubescent, somewhat cordate-clasping, lanceolate, 5 to 15 mm. wide, the panicle open and spreading, mostly 5 to 8 cm. long, the spikelets elliptic, about 2 mm. long.

Shady banks, Brazil, whence originally described, to Ecuador and Bolivia.

ECUADOR: Between La Chorita and Portovelo, *Hitchcock* 21191, 21211, 21211½. Between Portovelo and El Tambo, *Hitchcock* 21302. Cashurco, *Hitchcock* 21809. Baños, *Pachano* 228.

BOLIVIA: Hacienda Simaco, *Buchtien* 5319. Hacienda Casana, *Buchtien* 7115, 7116. Yanacachi, *Buchtien* 414. Chulumani, *Hitchcock* 22669, 22709. San José, *Hitchcock* 22738.

37. *Panicum stigmatum* Trin. Gram. Pan. 194. 1826.

Resembling *P. sciurotis*, but less slender, the blades glabrous, the panicle branches narrowly ascending, and the spikelets about 3 mm. long.

Shady slopes, Brazil, whence originally described, to Ecuador.

ECUADOR: Between La Toma and Loja, *Hitchcock* 21420.

38. *Panicum pantrichum* Hack. Verh. Zool. Bot. Ges. Wien 1915: 72. March, 1915.

Panicum chiriquiense Hitchc. & Chase, Contr. U. S. Nat. Herb. 17: 527. July, 1915.

Panicum protractum Mez, Notizbl. Bot. Gart. Berlin 7: 77. 1917.

A slender branching spreading perennial, rooting at the lower nodes, with pubescent sheaths, narrowly lanceolate, puberulent blades, and open panicles, the glabrous or pubescent, oval spikelets about 2 mm. long, crowded along the upper part of the branchlets.

Shady places, Panama to Brazil and Bolivia. Originally described from Brazil.

ECUADOR: Between La Chorita and Portovelo, *Hitchcock* 21200.

BOLIVIA: Mapiri, *Buchtien* 1171.

39. *Panicum polycladum* Ekman, Ark. för Bot. 11⁴: 24. 1912.

A slender straggling branching perennial, with narrowly lanceolate blades as much as 1 cm. wide on the main culm, reduced on the branches, the panicles open, elliptic, the spikelets glabrous, acute, about 2.5 mm. long.

Thickets, southern Ecuador to northern Argentina. Originally described from Misiones, Argentina.

ECUADOR: Between Portovelo and El Tambo, *Hitchcock* 21316.

40. *Panicum cordovense* Fourn. Mex. Pl. 2: 26. 1886.

A slender branching straggling perennial, with narrowly lanceolate, glabrous blades, mostly less than 10 cm. long, and panicles 10 to 15 cm. long, those on the branches reduced, the spikelets glabrous, about 3 mm. long, somewhat appressed on the branchlets.

Thickets and shady places, Mexico to Bolivia. Originally described from Mexico.

BOLIVIA: Hacienda Simaco, *Buchtien* 5317 in part. La Florida, *Hitchcock* 22614, 22621, 22647. San José, *Hitchcock* 22732.

41. *Panicum versicolor* Doell in Mart. Fl. Bras. 2²: 254. 1877.

Panicum truncatum Nees, Agrost. Bras. 215. 1829. Not *P. truncatum* Trin. 1826.

An erect perennial, with short rhizomes, slender culms 30 to 60 cm. tall, pubescent or nearly glabrous blades 3 to 6 mm. wide, and ovoid or oblong panicles 2 to 8 cm. long, the spikelets asymmetric, about 2.5 mm. long, glabrous; glumes subequal, obtuse, about one-third as long as the spikelet; sterile floret staminate, as long as the fertile one, the gibbous palea as long as the lemma, enlarged and winged in fruit, finally splitting; fertile floret somewhat keeled and compressed laterally, gibbous, at maturity dark brown, shining.

Grassy plains, Brazil, whence originally described, to Colombia and Paraguay.

BOLIVIA: Buena Vista, *Steinbach* 6643, 6656.

42. *Panicum zizanioides* H. B. K. Nov. Gen. & Sp. 1: 100. 1816.

Panicum oryzoides Swartz, Prodr. Veg. Ind. Occ. 23. 1788. Not *P. oryzoides* Ard. 1764.

Acroceras oryzoides Stapf in Prain, Fl. Trop. Afr. 9: 622. 1920.

Plants branched, decumbent and rooting at base, forming a tangle; fertile culms 30 to 60 cm. tall, sometimes taller; blades cordate-clasping, 5 to 15 cm. long, usually 1 to 2 cm. wide; panicle of a few ascending distant branches with short branchlets and appressed glabrous pointed spikelets 5.5 to 6 mm. long, the first glume nearly as long as the spikelet; fertile lemma with a little appendage or crest at the apex.

Moist places, tropical regions of both hemispheres; in South America, Colombia to Brazil and Argentina. Originally described from Colombia.

PERU: Yurimaguas, *Pöppig* 2880 in 1831.

43. *Panicum paucispicatum* Morong, Ann. N. Y. Acad. 7: 262. 1893.

A coarse straggling branching perennial, with velvety oblong-lanceolate blades and narrow panicles with few rather distant, appressed branches, the velvety fusiform acute spikelets about 7 mm. long, short-pediceled and appressed to the branches.

Sandy thickets, Paraguay, whence originally described, and Bolivia.

BOLIVIA: Palmar, *Herzog* 1524.

44. *Panicum hirtum* Lam. Encycl. 4: 741. 1798.

A delicate annual 20 to 30 cm. tall, with ovate-lanceolate clasping blades, and open panicles of pubescent spikelets about 1.5 mm. long, set obliquely on the pedicels.

Shady places, Trinidad to Brazil and Ecuador. Originally described from French Guiana.

ECUADOR: Portovelo, *Hitchcock* 21253. Between Portovelo and El Tambo, *Hitchcock* 21320.

45. *Panicum megiston* Schult. Mant. 2: 248. 1824.

A tall robust perennial, with long creeping base, the flowering culms 1 to 2 meters tall; panicle 40 to 60 cm. long, open, the stiff main branches in distant verticils; spikelets globular-ovoid, abruptly pointed, about 3.5 mm. long, glabrous, the first glume scarcely one-third as long as the spikelet.

Swamps and moist ground, Mexico and Cuba to Ecuador and Paraguay. Originally described from British Guiana.

ECUADOR: Milagro, *Hitchcock* 20283. Panigón Plantation, *Hitchcock* 20571. Balao, *Eggers* 14345; *Jameson* 568 (Kew Herb.). Naranjal, *Mille* 13.

BOLIVIA: Ixiamas, *White* 1135.

46. *Panicum olyroides* H. B. K. Nov. Gen. & Sp. 1: 102. 1816.

Plants perennial, stiffly erect, 50 to 100 cm. tall, the sheaths overlapping, the blades firm; panicle large and open, 20 to 30 cm. long, the numerous stiff slender branches naked below; spikelets rather few, large, on slender pedicels toward the ends of the branches, fusiform, acuminate, 6 to 7 mm. long.

Savannas, Venezuela to Brazil. Originally described from Venezuela.

BOLIVIA: Between Río Piray and Río Cuchí, *Herzog* 1445. Buena Vista, *Steinbach* 5378, 6978.

47. *Panicum procurrens* Nees; Trin. Gram. Pan. 183. 1826.

A decumbent spreading branching perennial, with glabrous or pubescent, narrowly lanceolate, white-margined blades and rather small, pale panicles with ascending branches, the pilose spikelets about 4 mm. long, somewhat appressed along the upper part of the branches.

Plains, Brazil, whence originally described, to Bolivia and Argentina.

BOLIVIA: Ixinmas, *Cárdenas* (*Mulford Biol. Expl.*) 1909. Buena Vista, *Steinbach* 5339, 7012.

The following species of *Panicum* described from our range have not been identified:

PANICUM (Anthaeantia) GIGANTEUM Kuntze, Rev. Gen. Pl. 3²: 360. 1898. Not *P. giganteum* Scheele, 1849. Río Juntas, Bolivia. The description suggests *P. tricholaenoides*.

PANICUM LANUGINOSUM Presl, Rel. Haenk. 1: 306. 1830. (Peru.) Not *P. lanuginosum* Ell. 1816. *Panicum mollicomum* Kunth, Rév. Gram. 1: Suppl. IX. 1830.

PANICUM PAVONI Mez, Bot. Jahrb. Engler 56: Beibl. 125: 5. 1921. "Peru (Pavon)." This may not be a species of *Panicum*.

PANICUM QUETAMEENSE Mez, Notizbl. Bot. Gart. Berlin 7: 75. 1917. This species is described from "Ecuador: ad Quetame in declivitatibus orientallibus Andium Bogotensium (Andrè n. 3210)." Quetame is in Colombia instead of Ecuador, hence not within our range.

98. *ICHNANTHUS* Beauv.

Inflorescence and spikelets as in *Panicum*, the first glume often nearly as long as the spikelet, the fruit acute or subacute, the margins of the lemma usually flat, the rachilla produced below the lemma into a minute stipe, this bearing on either side membranaceous appendages adnate to the base of the lemma and free above, the appendages often wanting and indicated by minute excavations only.

Appendages of fertile lemma developed.

Blades 4 to 7 cm. wide; spikelets 7 mm. long; wings large...1. *I. panicoides*.

Blades 1 to 2 cm. wide; spikelets 3 to 5 mm. wide; wings small.

Spikelets 3 mm. long, obtuse.....2. *I. calvescens*.

Spikelets 4 to 5 mm. long, acute.....3. *I. peruvianus*.

Appendages of fertile lemma reduced to scars.

Culms erect, as much as 5 meters tall.....4. *I. breviscrobis*.

Culms spreading and straggling, much branched, less than 2 meters long.

Blades ovate, rather firm, scabrous on upper surface.....7. *I. axillaris*.

Blades lanceolate or linear-lanceolate, rather thin.

Inflorescence paniculate; spikelets glabrous to sparsely pilose.

Panicles terminal and axillary, mostly less than 10 cm. long.

Spikelets glabrous or occasionally with a few hairs along the margins of the glumes.....5. *I. pallens*.

Spikelets sparsely pilose.....6. *I. candicans*.

Panicles terminal only, 10-20 cm. long, the racemes numerous and close together.....8. *I. ruprechtii*.

Inflorescence of several dense racemes on the main axis; spikelets with long, stiff hairs toward the summit.....9. *I. minarum*.

1. *Ichnanthus panicoides* Beauv. Ess. Agrost. 57. pl. 12 t. 1. 1812.

Culms solitary or few in a cluster, erect or ascending, the lower part naked, the lower sheaths distant, bladeless, the upper overlapping; blades elliptic, rather thick and firm, 4 to 7 cm. wide, 2 to 3 times as long; panicle few-flowered, the spikelets about 7 mm. long.

Floor of virgin forest, Guiana to Peru and Brazil. Originally described from tropical America.

PERU: San Gaván, *Lechler* 2675 (Kew Herb.).

2. *Ichnanthus calvescens* (Nees) Doell in Mart. Fl. Bras. 2³: 285. 1877.

Panicum calvescens Nees; Trin. Gram. Pan. 193. 1826.

A decumbent branching perennial 0.5 to 1 meter tall, with densely villous to glabrate sheaths, lanceolate, falcate, usually velvety blades 1 to 2 cm. wide, and narrow open many-flowered panicles 10 to 20 cm. long, the branches ascending, the glabrous spikelets 3 mm. long.

Rocky cliffs and shrubby slopes, Brazil, whence originally described, to Peru and Bolivia.

PERU: Colonia Perené, *Hitchcock* 22128. La Merced, *Macbridge* 5535.

BOLIVIA: Milluhuaya, *Buchtien* 737, 4264. Chulumani, *Hitchcock* 22653, 22699.

3. *Ichnanthus peruvianus* Mez, Repert. Nov. Sp. Fedde 15: 129. 1918.

A spreading branching perennial, as much as a meter tall, with more or less villous sheaths, narrowly lanceolate blades 1 to 1.5 cm. wide, scaberulous above and velvety beneath, and spreading panicles 10 to 20 cm. long, the spikelets glabrous, about 4 to 5 mm. long, the second glume and sterile lemma blunt.

Shrubby banks, Peru and Bolivia. Originally described from Peru. (Type, *Weberbauer* 1131.)

PERU: Sandía, *Weberbauer* 1131.

BOLIVIA: Hacienda Casana, *Buchtien* 7123. Coroico, *Hitchcock* 22715. San José, *Hitchcock* 22741.

4. *Ichnanthus breviscrobis* Doell in Mart. Fl. Bras. 2²: 294. 1877.

Panicum magnum Hitchc. Contr. U. S. Nat. Herb. 22: 489, 1922.

An erect, glabrous, rather stout, somewhat branched perennial as much as 5 meters tall, with lanceolate blades 2 to 4 cm. wide, and rather open panicles 10 to 30 cm. long, the glabrous spikelets 4 mm. long; wings wanting, the scars short. The sheaths bear a pair of firm auricles.

Open places in forests, Brazil to Bolivia and British Guiana. Originally described from Brazil.

BOLIVIA: Mapiri, *Buchtien* 1156.

Ichnanthus breviscrobis is based on two specimens, Santarem, *Spruce* 385, and Surinam, *Wulfschlaegel* 1148. Since *Panicum magnum* was described, Mrs. Chase has examined the *Wulfschlaegel* collection in the Brussels Herbarium. It proves to be the same as the type of *Panicum magnum* from British Guiana. For the present the species is retained, with some doubt, in *Ichnanthus*, following Doell, thus avoiding a new name until the group as represented in Brazil can be revised.

5. *Ichnanthus pallens* (Swartz) Munro; Benth. Fl. Hongk. 414. 1861.

Panicum pallens Swartz, Prodr. Veg. Ind. Occ. 23. 1788.

Creeping and freely branching, the culms ascending, the flat blades lanceolate, asymmetric, 1 to 2 cm. wide, glabrous; panicles with several ascending branches, terminal and axillary; spikelets 3 to 4 mm. long, glabrous.

Rich woods and shady banks, tropics of the Western Hemisphere. Originally described from Jamaica.

ECUADOR: Milagro, *Hitchcock* 20224. Teresita, *Hitchcock* 20445, 20446. Cashurco, *Hitchcock* 21858, 21871, 21878. Between La Chorita and Portovelo, *Hitchcock* 21213. Cerro Manglar Alto, *Tate* 28. San José, *André* 3259 (Kew Herb.). Balao, *Jameson* 356 (Kew Herb.). La Chonta, *Rose* 23469.

PERU: Colonia Perené, *Hitchcock* 22067. San Gaván, *Lechler* 2187. (Kew Herb.).

BOLIVIA: Hacienda Simaco, *Buchtien* 5322. La Florida, *Hitchcock* 22610, 22620, 22631, 22641. Antahuacana, *Buchtien* 2498.

6. *Ichnanthus candicans* (Nees) Doell in Mart. Fl. Bras. 2²: 291. 1877.

Panicum candicans Nees, Agrost. Bras. 133. 1829.

Panicum maynense Trin. Linnaea 10: 298. 1836. (Tocache, Peru, *Pöppig*.)

A creeping branching perennial with the habit of *I. pallens*, the sheaths and blades villous, the glumes sparsely pilose, acuminate into a terete point (caudate). The blades average smaller and the spikelets narrower than in *I. pallens*.

Rocky cliffs and wet banks, Brazil, whence originally described, to Ecuador and Bolivia.

ECUADOR: Between Santa Rosa and La Chorita, *Hitchcock* 21136. Between La Chorita and Portovelo, *Hitchcock* 21199. Between Portovelo and El Tambo, *Hitchcock* 21303. Andes of Quito, *Jameson* 692 (Kew Herb.).

PERU: Colonia Perené, *Hitchcock* 22069.

BOLIVIA: Hacienda Simaco, *Buchtien* 5321. Chulumani, *Hitchcock* 22670. San José, *Hitchcock* 22739. Antahuacana, *Buchtien* 2497.

7. *Ichnanthus axillaris* (Nees) Hitchc. & Chase, Contr. U. S. Nat Herb. 18: 334. 1917.

Panicum axillare Nees, Agrost. Bras. 141. 1829.

Similar to *I. pallens*, but the blades wider in proportion to the length, usually scabrous on the upper surface, and the spikelets sometimes sparsely hispid.

In open ground the plants may be robust, as much as a meter tall. On the forest floor the plants may be prostrate and matlike with rounded inflorescence.

Moist, more or less shaded slopes, Santo Domingo to Ecuador and Brazil. Originally described from Brazil.

ECUADOR: Balao, *Eggers* 14655. Teresita, *Hitchcock* 20425, 20468. Between La Chorita and Portovelo, *Hitchcock* 21202.

PERU: Hacienda Pampayacu, *Macbride* 5027.

8. *Ichnanthus ruprechtii* Doell in Mart. Fl. Bras. 2¹: 293. 1877.

A spreading, branching, glabrous or sparsely pilose perennial 1 to 2 meters long, with lanceolate blades about 1.5 cm. wide, and rather dense, many-flowered panicles 10 to 20 cm. long, the spikelets glabrous, 3 mm. long.

Shady banks, Brazil, whence originally described, to Bolivia.

BOLIVIA: Hacienda Simaco, *Buchtien* 5236, 5237, 5336, 5337. Hacienda Casana, *Buchtien* 7124.

9. *Ichnanthus minarum* (Nees) Doell in Mart. Fl. Bras. 2¹: 294. 1877.

Oplismenus minarum Nees, Agrost. Bras. 268. 1829.

Oplismenus secundus Presl, Rel. Haenk. 1: 322. 1830. (Peru.)

Panicum secundum Steud. Nom. Bot. ed. 2. 2: 263. 1842.

Panicum sandiense Mez, Bot. Jahrb. Engler 56: Beibl. 125: 5. 1921.

(*Weberbauer* 545.)

A branching straggling glabrous perennial, with lanceolate blades 1 to 2 cm. wide, and a narrow inflorescence 3 to 10 cm. long of 3 to several ascending racemes 1 to 2 cm. long, the spikelets crowded; glumes conspicuously long-hirsute toward the apex, the first the longer, caudate.

Rocky cliffs and shady banks, Brazil, whence originally described, to Peru and Bolivia.

PERU: Between Tarma and La Merced, *Hitchcock* 22153. Piedra Grande, *Macbride* 3670, 3682. Sandía, *Weberbauer* 545.

BOLIVIA: La Florida, *Hitchcock* 22619. Milluhuaya, *Buchtien* 736, 4262, 4263. Coripata, *Hitchcock* 22695. Corolco, *Hitchcock* 22713; *Holway* 736. Valle Grande, *Herzog* 1817. Sorata, *Mandon* 1256; *Holway* 541.

ICHNANTHUS WEBERBAUERI Mez, Repert. Nov. Sp. Fedde 15: 127. 1918. Described from Chunchusmayo (Huirchusmayo), Prov. Sandía, Peru, the type being *Weberbauer* 1236. The fruit is said to have large appendages and the blades are said to be narrowly lanceolate, 40 cm. long and 4 cm. wide; spikelets 5 mm. long. This collection has not been examined.

97. LASIACIS (Griseb.) Hitchc.

(*Panicum* Sect. *Lasiacis* Griseb.)

Inflorescence of open (rarely compact) panicles terminating the culm and leafy branches; spikelets subglobose, placed obliquely on their pedicels; glumes and sterile lemma broad, papery, shining, glabrous, commonly lanate at the apex; fruit white, bony-indurate, obovoid, both lemma and palea bearing at

the apex, in a slight crateriform excavation, a tuft of woolly hairs, the palea concave below, gibbous above, the apex often free at maturity; woody-stemmed clambering (rarely crawling) perennials.

Ligule noticeable, brown, about 2 mm. long.

Blades scabrous on both surfaces, otherwise glabrous, elongate, more than 10 times as long as wide.....1. *L. oaxacensis*.

Blades puberulent beneath, glabrous above, less than 10 times as long as wide.
2. *L. ligulata*.

Ligule inconspicuous, hidden by the mouth of the sheath (sometimes as much as 1 mm. long).

Blades glabrous on both surfaces. Panicles few-flowered, 5 to 10 cm. long.

3. *L. divaricata*.

Blades pubescent on one or both surfaces.

Blades narrowly lanceolate, averaging 8 to 10 times as long as wide; panicle large and open.....4. *L. sorghoidea*.

Blades ovate-lanceolate, usually 3 to 5 times as long as wide; panicle usually compact, rather narrow.....5. *L. ruscifolia*.

1. *Lasiacis oaxacensis* (Steud.) Hitchc. Proc. Biol. Soc. Washington 24: 145. 1911.

Panicum oaxacense Steud. Syn. Pl. Glum. 1: 73. 1854.

Slender, straggling, decumbent and geniculate at base, with numerous prop roots, the long branches ascending and arcuate, with narrow scabrous blades commonly 20 cm. long, and large open few-flowered panicles, the spikelets borne at the ends of the branchlets.

Edges of woods, western Jamaica and Mexico, whence originally described, to Ecuador.

ECUADOR: El Recreo, *Eggers* 15572. Milagro, *Hitchcock* 20299. Panigón Plantation, *Hitchcock* 20568. Teresita, *Hitchcock* 20437. Cashurco, *Hitchcock* 21894. Between Santa Rosa and La Chorita, *Hitchcock* 21131. Venturo, *Rose* 23525.

2. *Lasiacis ligulata* Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 337. 1917.

Panicum megacarpum Steud.; Lechl. Berb. Amer. Austr. 56. 1857. name only. (*Lechler* 2219.)

Plants branched, woody, clambering to the height of 5 to 10 meters; ligule 1 to 2 mm. long; blades narrowly lanceolate, 6 to 12 cm. long, narrowed at base, puberulent beneath; panicles 5 to 10 cm. long, the spikelets obovoid, 4 mm. long, black and hard at maturity.

Copses and open forest, Guatemala to Brazil and Bolivia. Originally described from Trinidad.

ECUADOR: Teresita, *Hitchcock* 20438. Huigra, *Hitchcock* 20523, 20744, 20754. Cashurco, *Hitchcock* 21856, 21863. Gualca, *Sodi* in 1888. Mount Pichincha, *Jameson* 200 (Kew Herb.).

PERU: Colonia Perené, *Hitchcock* 22116. La Merced, *Macbride* 5302. San Gován, *Lechler* 2219. Río Huallaga Canyon, below Río Santo Domingo, *Macbride* 4250. Without locality, *Jelski* 583.

BOLIVIA: La Florida, *Hitchcock* 22616. Yungas, *Bang* 494. Huachi, *White* 1004. Antahuacana, *Buchtien* 2499.

Two specimens (*Hitchcock* 20744, 20754) have larger spikelets, 5 mm. long; two specimens (*Hitchcock* 20438, 20523) have ligules 4 mm. long. More material may show these to represent different species.

3. *Lasiacis divaricata* (L.) Hitchc. Contr. U. S. Nat. Herb. 15: 16. 1910.

Panicum divaricatum L. Syst. Nat. ed. 10. 2: 871. 1759.

Shrubby, with strong canes, clambering to a height of 3 or 4 meters, the main branches often fasciated, the vigorous secondary foliage shoots mostly strongly divaricate or zigzag, usually glabrous throughout except on the margin of the sheaths; blades commonly less than 1 cm. wide, only on vigorous shoots as much as 1.5 cm. wide; panicles usually less than 10 cm. long, the branches deflexed at maturity.

Among shrubs at low altitudes, southern Florida to Brazil and Peru. Originally described from Jamaica.

ECUADOR: Between La Chorita and Portovelo, *Hitchcock* 21180, 21184.

PERU: San Miguel, *Cook & Gilbert* 923.

4. *Lasiacis sorghoidea* (Desv.) Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 338. 1917.

Panicum sorghoideum Desv.; *Hamilt. Prodr. Pl. Ind. Occ.* 10. 1825.

Erect or clambering to a height of 5 to 7 meters, with a strong central cane as much as 1 cm. thick, the main branches 1 meter or more long, arcuate, bearing slender branchlets toward the pendent ends; sheaths and both surfaces of the blades velvety, or the sheaths glabrescent, the blades of the main branches commonly 20 cm. long and 2.5 cm. wide, those of the branchlets much smaller, often less velvety; panicles usually about 10 to 20 cm. long, at maturity as wide or wider, the spikelets more or less clustered on the long distant branches.

Ravines, wood borders, and hedges, Mexico and the West Indies to Paraguay. Originally described from Porto Rico.

ECUADOR: Río Pilatón, *Sodiro* 311. Milagro, *Hitchcock* 20295. Huigra, *Hitchcock* 20362, 20376, 20607; *Rose* 22184, Cashurco, *Hitchcock* 21775, 21806, 21808. Between Santa Rosa and La Chorita, *Hitchcock* 21146. Between La Chorita and Portovelo, *Hitchcock* 21196. Guayaquil, *Hitchcock* 20133; *Jameson* 703 (Kew Herb.). Portovelo, *Rose* 23374, 23401.

PERU: Colonia Perené, *Hitchcock* 22052, 22054, 22118, 22119, 22120, 22122, 22125. Pozuzo, *Macbride* 4571. La Merced, *Macbride* 5298. Without locality, *Mathews* 2111 (Kew Herb.).

BOLIVIA: Chulumani, *Hitchcock* 22652. Milluhuaya, *Buchtien* 4271. Corolco, *Buchtien* 3635. Antahuacana, *Buchtien* 2500. Mapiri, *Buchtien* 6442. Guanay, *Rusby* 191. Cochabamba, *Bang* 1289, 1291. Buena Vista, *Steinbach* 5551, 7111.

Urban²⁸ takes up *Panicum maculatum* Aubl. for this species. Aublet's meager description²⁹ does not identify the plant. The synonym cited refers to a manuscript plate at Berlin which Urban states probably represents *Lasiacis sorghoidea*. The plate was based on a plant from Martinique. Aublet's flora treats of the plants of French Guiana.

5. *Lasiacis ruscifolia* (H. B. K.) Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 339. 1917.

Panicum ruscifolium H. B. K. *Nov. Gen. & Sp.* 1: 101. 1816.

More robust than any other species, freely branching, with numerous leafy dorsiventral shoots; blades as much as 4.5 cm. broad, velvety or glabrous beneath, glabrous or scabrous above; sheaths glabrous or nearly so; panicles scarcely exerted, oblong or club-shaped, usually compactly flowered.

Climbing over bushes, Mexico, whence originally described, and West Indies to Ecuador.

²⁸ *Repert. Nov. Sp. Fedde* 16: 149. 1919.

²⁹ *Aubl. Pl. Gulan.* 1: 51. 1775.

ECUADOR: Guayaquil, *Holway* 801; *Hitchcock* 19963, 20125, 20129, 20135, 20136, 20158; *Anthony & Tate* 63; *Jameson* 587 (Kew Herb.). Oil Camp between Guayaquil and Salinas, *Hitchcock* 20057. Panigón Plantation, *Hitchcock* 20569, 20576, 20584. Milagro, *Hitchcock* 20236. Teresita, *Hitchcock* 20432, 20524. Between Santa Rosa and La Chorita, *Hitchcock* 21130. Without locality, *Eggers* 15553 (Kew Herb.).

PERU: Colonia Perené, *Hitchcock* 22053. Pozuzo, *Macbride* 4563.

98. SACCIOLEPIS Nash

Inflorescence a narrow spikelike panicle; spikelets pointed, the second glume and sterile lemma inflated (the glume more or less saccate), much larger than the minutely stipitate fruit.

1. *Sacciolepis myuros* (Lam.) Chase, Proc. Biol. Soc. Washington 21: 7. 1908.
Panicum myuros Lam. Tabl. Encycl. 1: 172. 1791.

A slender glabrous annual as much as 1 meter tall, with elongate linear blades, the panicles compact, spikelike, about 5 mm. thick; spikelets about 2 mm. long.

Swamps and wet places, Mexico to Brazil. Originally described from tropical America.

BOLIVIA: Buena Vista, *Steinbach* 7030.

99. HYMENACHNE Beauv.

Spikelets short-pedicellate in long, dense, spikelike or interrupted panicles; spikelets acuminate; lemma and palea scarcely indurate, the margins of the lemma flat, the palea not inclosed above.

Inflorescence dense, spikelike.....1. *H. amplexicaulis*.
Inflorescence long and narrow with ascending branches, not spikelike.

2. *H. donacifolia*.

1. *Hymenachne amplexicaulis* (Rudge) Nees, Agrost. Bras. 276. 1829.

Panicum amplexicaule Rudge, Pl. Guian. 21. pl. 27. 1805.

A glabrous perennial, with succulent, sparingly branching culms, often decumbent and rooting below, broad linear cordate-clasping blades, and panicles about 8 mm. thick and 20 to 50 cm. long.

Swamps and shallow water, often forming pure colonies. Tropics and subtropics of both hemispheres. Originally described from British Guiana.

ECUADOR: Oil Camp between Guayaquil and Salinas, *Hitchcock* 20074.

2. *Hymenachne donacifolia* (Raddi) Chase, Journ. Washington Acad. Sci. 13: 177. 1923.

Panicum donacifolium Raddi, Agrost. Bras. 44. 1823.

Panicum auriculatum Willd. in Spreng. Syst. Veg. 1: 322. 1825.

Panicum polystachyum Presl, Rel. Haenk. 1: 312. 1830. (Peru.)

Hymenachne auriculata (Willd.) Chase, Proc. Biol. Soc. Washington 21: 5. 1908.

Similar to *H. amplexicaulis*; olivaceous throughout (at least when dry), the panicles of numerous ascending, densely flowered branches, the lower distant.

River banks and shallow water, Cuba to Brazil. Originally described from Brazil.

ECUADOR: Balao, *Eggers* 14633.

100. HOMOLEPIS Chase

Inflorescence paniculate; spikelets rather large, subfusiform; first and second glumes subequal, 7 to 9-nerved, the pair wholly covering the sterile and fertile florets; sterile lemma nearly as long as the glumes, broad, infolding the fertile

lemma, and inclosing a narrow hyaline palea and sometimes a staminate flower; fruit elliptic, pointed, smooth and shining, the lemma and palea less indurate than in *Panicum*, the margins of the lemma flat.

1. *Homolepis aturensis* (H. B. K.) Chase, Proc. Biol. Soc. Washington 24: 146. 1911.

Panicum aturense H. B. K. Nov. Gen. & Sp. 1: 103. pl. 33. 1816.

A creeping straggling perennial, the ascending culms 30 to 50 cm. tall, with narrowly lanceolate, flat blades 1 to 1.5 cm. wide, and narrow, pale brown panicles 5 to 10 cm. long.

Marshes and wet places, Mexico to Brazil and Bolivia. Originally described from Venezuela.

ECUADOR: Napo River, *Jameson* 764 (Kew Herb.).

BOLIVIA: Buena Vista, *Steinbach* 5120, 7013.

101. ISACHNE R. Br.

Inflorescence paniculate; spikelets small, subglobose; glumes subequal; lower floret perfect or staminate, its lemma and palea indurate and similar in form and texture to those of the upper floret; both fruits plano-convex, nearly equal in size, usually remaining attached by the minute rachilla joint between them.

Blades mostly more than 15 cm. long; panicle branches ascending, the spikelets aggregate toward the ends.....1. *I. arundinacea*.

Blades rarely more than 5 cm. long; panicle branches few-flowered, rigidly spreading.....2. *I. rigens*.

1. *Isachne arundinacea* (Swartz) Griseb. Fl. Brit. W. Ind. 553. 1864.

Panicum arundinaceum Swartz, Prodr. Veg. Ind. Occ. 24. 1788.

Climbing among shrubs or small trees to a height of as much as 6 meters, with strong canes and elongate branches; blades commonly 20 cm. long and 1.5 to 2 cm. wide, scabrous; panicles about 12 cm. long, the long lower branches at first ascending, finally wide-spreading; spikelets crowded toward the ends of the branches.

Wooded hillsides, up to 2,500 meters, Mexico and the West Indies to Bolivia. Originally described from Jamaica.

ECUADOR: Teresita, *Hitchcock* 20534. Between Baños and Mera, *Hitchcock* 21756. Between La Chorita and Portovelo, *Hitchcock* 21205. Between Loja and San Lucas, *Hitchcock* 21454. Mount Chimborazo, alt. 1,000 meters, *Spruce* 6128 (Kew Herb.). Las Juntas, *Rose* 23237.

PERU: Hacienda Pampayacu, *Macbride* 5048.

BOLIVIA: Hacienda Casana, *Buchtien* 7117. Yungas, *Rusby* 6; *Bang* 297.

2. *Isachne rigens* (Swartz) Trin. Gram. Pan. 252. 1826.

Panicum rigens Swartz, Prodr. Veg. Ind. Occ. 23. 1788.

Tufted; culms long, slender, wiry, trailing, the numerous flowering shoots curving upward, the firm divergent scabrous blades 3 to 5 cm. long, 3 to 7 mm. wide, the pyramidal panicles 3 to 5 cm. long, about three-fourths as wide.

Damp shady banks, Jamaica, whence originally described, and Venezuela to Ecuador.

ECUADOR: Andes of Quito, *Jameson* 347 (Kew Herb.)

102. OPLISMENUS Beauv.

Inflorescence of several thick racemes along a common axis; spikelets sessile; glumes and sterile lemma awned or the latter mucronate only; fruit as in *Panicum*, acute.

Awns antrorsely scabrous; plants annual.....1. *O. burmanni*.

Awns smooth or obscurely roughened; plants perennial.

Racemes closely flowered, the lower 1 to 2 cm. long-----2. *O. hirtellus*.

Racemes loosely flowered, the lower 2 to 5 cm. long, the lower pairs of spikelets as much as 1 cm. apart-----3. *O. rariflorus*.

1. *Oplismenus burmanni* (Retz.) Beauv. Ess. Agrost. 54. 1812.

Panicum burmanni Retz. Obs. Bot. 3: 10. 1783.

Oplismenus cristatus Presl, Rel. Haenk. 1: 323. 1830.

A low, creeping, freely branching annual, with pilose sheaths, broadly lanceolate-elliptic blades, and 3 to 5 pale villous ascending racemes approximate along a flexuous axis; awns slender, about 1 cm. long.

Open or somewhat shaded ground and waste places, Mexico to Brazil and Ecuador. Common in the tropics of the Old World, whence probably introduced into America. Originally described from India.

ECUADOR: Puenbo, *Mille* 312. Oil Camp between Guayaquil and Salinas, *Hitchcock* 20080. Milagro, *Hitchcock* 20175. Tandapi, *Holmgren* 860. Baños, *Hitchcock* 21916. Tungurahua Volcano, *Tate* 569. Guayaquil, *Jameson* 385; *Spruce* 6326 (both Kew Herb.). Huilgra, *Rose* 22141.

2. *Oplismenus hirtellus* (L.) Beauv. Ess. Agrost. 54. 168. 1812.

Panicum hirtellum L. Syst. Nat. ed. 10. 2: 870. 1759.

A slender creeping branching perennial, the ascending or erect flower culms 30 to 50 cm. tall, the lanceolate blades undulate-margined; racemes ascending or spreading, as much as 3 cm. long, usually 1 to 2 cm.; sheaths glabrous or hirsute.

Moist woods and shady banks, throughout tropical America. Originally described from Jamaica.

ECUADOR: Perucho, *Mille* 313. Guayaquil, *Hitchcock* 20147; *Jameson* 396 (Kew Herb.). Milagro, *Hitchcock* 20237. Panigón Plantation, *Hitchcock* 20573. Between La Chorita and Portovelo, *Hitchcock* 21177.

PERU: Colonia Perené, *Hitchcock* 22104, 22117. San Miguel, *Cook & Gilbert* 938. Hacienda Pampayacu, *Macbride* 5026. Río Huallaga Canyon, *Macbride* 4251. Without locality, *Mathews* 1079 (Kew Herb.).

BOLIVIA: Coripata, *Bang* 2079. La Florida, *Hitchcock* 22632. Reyes, *White* 1203. Yungas, *Rusby* 41. Hacienda Simaco, *Buchtien* 5301. Sirupaya, *Buchtien* 432. Buena Vista, *Steinbach* 7010.

3. *Oplismenus rariflorus* Presl, Rel. Haenk. 1: 320. 1830.

Resembling *O. hirtellus*, but the racemes longer and more slender, loosely flowered, 2 to 5 cm. long.

Moist shady places, Mexico, whence originally described, to Peru.

ECUADOR: El Recreo, *Eggers* 14897. Teresita, *Hitchcock* 20429. Guayaquil, *Mille* 8.

PERU: Mountains of Huánuco, *Haenke*.

103. ECHINOCHLOA Beauv.

Inflorescence paniculate, the usually compact, densely flowered panicle composed of 1-sided racemes or of subsimple branches; spikelets hispid or spiny; glumes usually mucronate; sterile lemma usually awned; fruit subindurate, acuminate-pointed, the summit of the palea not inclosed.

Spikelets awnless or mucronate only; racemes simple, rather remote.

1. *E. colonum*.

Spikelets more or less awned; racemes subcompound, approximate.

2. *E. crusgalli crus-pavonis*.

1. *Echinochloa colonum* (L.) Link, Hort. Berol. 2: 209. 1833.*Panicum colonum* L. Syst. Nat. ed. 10. 2: 870. 1759.*Panicum colonum* var. *humile* Nees, Act. Acad. Caes. Leop. Carol. 19: Suppl. 1: 7. 1841; 139. 1843. (Peru, *Meyen.*)

A glabrous tufted annual, the culms compressed, branching at the more or less decumbent base; blades flat, linear, about 5 mm. wide, sometimes barred with purplish brown; racemes usually 5 to 10, ascending, distant nearly their own length on the strict axis.

Ditches and moist places in the warmer parts of both hemispheres; introduced in America, whence originally described.

ECUADOR: Oil Camp between Guayaquil and Salinas, *Hitchcock* 20083. Chanduy, *Spruce* 6425 (Kew Herb.). Without locality, *Jameson* 346.

2. *Echinochloa crusgalli crus-pavonis* (H. B. K.) Hitchc. Contr. U. S. Nat. Herb. 22: 148. 1920.*Oplismenus crus-pavonis* H. B. K. Nov. Gen & Sp. 1: 108. 1816.*Panicum sabulicola* Nees, Agrost. Bras. 258. 1829.

An erect, often robust, usually fleshy annual, branching at base, with nearly simple culms often decumbent and rooting at base, and long narrow nodding panicles of usually long-awned spikelets.

Swamps and ditches, throughout tropical America. Originally described from Venezuela.

PERU: Lima, *Hitchcock* 22342, 22428; *Holway* 785.

BOLIVIA: Cochabamba, *Hitchcock* 22805; *Holway* 323, 412. Coripata, *Hitchcock* 22693; *Bang* 2108. Hacienda Simaco, *Buchtien* 5313. Corolco, *Buchtien* 3624. Reyes, *Rusby* (*Mulford Biol. Expl.*) 1635. Sorata, *Mandon* 1258 (Kew Herb.). Quiabaya, *Mandon* 1257 (Kew Herb.).

104. CHAETOCHLOA Scribn.

Inflorescence a dense spikelike (rarely loose) panicle, the spikelets solitary or in small clusters subtended by 1 to several slender scabrous bristles (sterile branchlets), these persistent after the fall of the spikelets; spikelets as in *Panicum*, turgid, the fruit usually transversely rugose.

Bristles below only the terminal spikelets of each branchlet, hence the bristles few and inconspicuous (more numerous in *C. membranifolia*); blades plaited (except in *C. cernua*). Plants perennial (except *C. membranifolia*.) (Subgenus PTYCHOPHYLLUM.)

Panicles open, usually large, the slender branches more or less drooping.

Blades strongly plaited, sometimes as much as 10 cm. wide.

2. *C. sulcata*.

Panicles narrow, compact.

Panicles 30 to 60 cm. long, the branches ascending, approximate, mostly 3 to 5 cm. long; blades strongly plaited. Spikelets secund, 3 mm. long.

1. *C. poiretiana*.

Panicles smaller; blades not strongly plaited.

Plants annual; blades elliptic-lanceolate, thin, somewhat plaited; panicles rather loose, about 10 cm. long; spikelets 2 mm. long

3. *C. membranifolia*.

Plants perennial; blades linear, firm, not plaited; panicles dense and narrow, 10 to 30 cm. long, nodding at the attenuate apex; spikelets 3 mm. long-----

4. *C. cernua*.

Bristles below all the spikelets; blades linear-lanceolate to linear, not plaited: panicles mostly dense and spikelike.

Bristles below each spikelet numerous, at least more than 5. Panicle dense, cylindric, spikelike-----5. *C. geniculata*.

Bristles below each spikelet 1 or, by abortion of the spikelets, 2 or 3.

Bristles more or less retrorsely scabrous.

Plants perennial; spikelets globose or nearly so, 2 mm. long--6. *C. tenax*.

Plants annual; spikelets not globose.

Spikelets 2 mm. long-----7. *C. verticillata*.

Spikelets 1.5 mm. long. Panicles adhesive, at maturity pulling from the sheaths.

Panicles usually green, rarely as much as 8 cm. long, the bristles 2 to 3 mm. long-----8. *C. scandens*.

Panicles usually purple, as much as 15 cm. long, the bristles about 1 cm. long-----9. *C. tenacissima*.

Bristles antorsely scabrous only.

Panicle loose, the branches distant; fruit smooth-----10. *C. oblongata*.

Panicle dense; fruit minutely rugose.

Panicles of main culm 20 to 30 cm. long, 2 to 5 cm. thick.

11. *C. vulpseta*.

Panicles of main culm, mostly not more than 10 cm. long and 1 cm. thick.

Nodes bearded-----13. *C. barbinodis*.

Nodes glabrous.

Blades pubescent-----12. *C. argentina*.

Blades glabrous, somewhat scabrous-----14. *C. trichorhachis*.

1. *Chaetochloa poiretiana* (Schult.) Hitchc. Contr. U. S. Nat. Herb. 22: 159. 1920.

Panicum elongatum Poir. in Lam. Encycl. Suppl. 4: 278. 1816. Not *P. elongatum* Salisb., 1796.

Panicum poiretianum Schult. Mant. 2: 229. 1824.

Setaria poiretiana Kunth, Rev. Gram. 1: 47. 1829.

A tall caespitose perennial with compressed culms and sheaths, the internodes sulcate on the side toward the sheaths, thin, strongly plaited blades commonly 50 cm. long and 5 cm. wide, and elongate narrow panicles with slender bristles several times longer than the spikelets.

Moist woods, Mexico to Brazil and Bolivia. Originally described from Brazil.

ECUADOR: Between Huigra and Naranjapata, *Hitchcock* 20682. Nanegal, *Sodi*ro in 1902. Angamarca, *Sodi*ro 306. Ambato, *Pachano* 245.

PERU: Colonia Perené, *Hitchcock* 22095. Santa Ana, *Cook & Gilbert* 1429, 1528.

BOLIVIA: Coroico, *Hitchcock* 22714, 22719. Antahuacana, *Buchtien* 2508. Rurrenabaque, *White* 1820.

This species was described in the "Grasses of the West Indies"⁴⁰ under *Chaetochloa sulcata*.

2. *Chaetochloa sulcata* (Aubl.) Hitchc. Contr. U. S. Nat. Herb. 17: 260. 1913.

Panicum sulcatum Aubl. Pl. Guian. 1: 50. 1775.

⁴⁰ Contr. U. S. Nat. Herb. 18: 348. 1917.

Setaria sulcata A. Camus, Bull. Mus. Hist. Nat. 30: 108. 1924. Not *S. sulcata* Raddi, 1823.

Setaria effusa Fourn. Mex. Pl. 2: 42. 1886.

On the average taller than the preceding, the sheaths hispid, blades larger, panicle larger, the numerous long slender branches drooping.

Rocky woods and shady banks, West Indies to Ecuador. Originally described from Martinique.

ECUADOR: Bodegas, *Sodi*ro 307. Teresita, *Hitchcock* 20538. Napo River, *Jameson* 725 (Kew Herb.).

3. *Chaetochloa membranifolia* (Herrm.) Hitchc.

Setaria membranifolia Herrm. Beitr. Biol. Pflanz. 10: 61. 1910.

A lax annual, with decumbent culms about 60 to 100 cm. tall, thin flat elliptic-lanceolate blades 15 cm. long and as much as 2 cm. wide, and narrow, rather loose panicles about 10 cm. long, the spikelets about 2 mm. long.

In shady places, western Ecuador. (Type, *Spruce* 6448.)

ECUADOR: Balao, *Eggers* 14584; *Jameson* 372 (Kew Herb.). Chanduy, *Spruce* 6448.

This species has the aspect of *O. barbata* (Lam.) Hitchc. & Chase, a common weed in the West Indies, but the spikelets are smaller.

4. *Chaetochloa cernua* (H. B. K.) Hitchc.

Setaria cernua H. B. K. Nov. Gen. & Sp. 1: 111. 1816.

Panicum stenothyrsus Pilger, Bot. Jahrb. Engler 21: 710. 1898. (*Stübel* 247.)

An erect perennial 50 to 100 cm. tall, with a stout leafy base, numerous approximate keeled sheaths villous at least at the throat, flat blades as much as 40 cm. long and 2 cm. wide narrowed at base, and dense narrow pale panicles 10 to 30 cm. long usually nodding at the apex, the branches short and appressed or in larger specimens as much as 3 cm. long and ascending; spikelets about 3 mm. long, the bristles few and short.

Dry or rocky slopes, Ecuador, the type from Río Guallabamba. (*Bonpland*.)

ECUADOR: Huigra, *Hitchcock* 20361. Ambato, *Hitchcock* 21704; *Pachano* 109. Alausí, *Hitchcock* 20772. Otavalo to Malchinguí, *Hitchcock* 20833. Tumbaco, *Mülle* 308. Riobamba, *Sodi*ro in 1901; *Stübel* 247. Chambo River, *Spruce* 5814. Pomasquí, *Jameson* 253 (Kew Herb.).

5. *Chaetochloa geniculata* (Lam.) Millsp. & Chase, Field Mus. Bot. 3: 37. 1903.

Panicum geniculatum Lam. Encycl. 4: 727 (err. typ. 737). 1798.

Setaria geniculata Beauv. Ess. Agrost. 51, 178. 1812.

Setaria purpurascens H. B. K. Nov. Gen. & Sp. 1: 110. 1816. (Near Quito.)

Tufted, the slender compressed culms erect, geniculate at base, or sometimes spreading, the blades mostly 5 to 8 mm. wide, the long-exserted, dense, spike-like, yellow or purplish panicle 5 to 10 cm. long, 6 to 8 mm. thick excluding the bristles. The bristles vary in length and color. Early in the season they are longer than the spikelets, but on later panicles they may be shorter than the spikelets.

Open ground, waste places, and grassland, throughout the American tropics and northward into southern and eastern United States. Originally described from Guadeloupe.

ECUADOR: Vicinity of Quito, *Harteman* 2, 18, 28, 54; *Hartweg* 1448; *Lehmann* 467; *Mülle* 317; *Jameson* 105, 186. Huigra, *Hitchcock* 20313, 20608. Teresita, *Hitchcock* 20472. Baños, *Hitchcock* 21902; *Lehmann* 5285 (Kew Herb.). Be-

tween Loja and San Lucas, *Hitchcock* 21486. Portovelo, *Hitchcock* 21286. Riobamba, *Spruce* 5809 (Kew Herb.). Chota River, *André* 3560b (Kew Herb.). Zaragura, *Rose* 23159. Tablón de Oña, *Rose* 23076.

PERU: Matucana, *Macbride & Featherstone* 289. Obrajillo, *Wilkes Expl. Exped.* Cuzco, *Hitchcock* 22509. Tarma, *Hitchcock* 22170. Colonia Perené, *Hitchcock* 22109.

BOLIVIA: La Florida, *Hitchcock* 22634, 22646. Yanacachi, *Buchtien* in 1906. Millahuaya, *Buchtien* 4270. Yungas, *Bang* 218, 273. La Paz, *Buchtien* 864. Cotaña, *Buchtien* 3127. Sorata, *Rusby* 222; *Mandon* 1259 (Kew Herb.). Lake Rogagua, *Rusby (Mulford Biol. Expl.)* 1433. Cárdenas (*Mulford Biol. Expl.*) 1708. Cochabamba, *Hitchcock* 22802; *Shepard* 259; *Holway* 348. Antahuacana, *Buchtien* 2506. Between Río Piray and Río Cuchi, *Herzog* 1443. Tarija, *Fries* 1116a.

6. *Chaetochloa tenax* (L. Rich.) Hitchc. Contr. U. S. Nat. Herb. 22: 176. 1920.

Panicum tenax L. Rich. Act. Soc. Hist. Nat. Paris 1: 106. 1792.

Setaria tenax Desv. Opusc. 78. 1831.

Tufted, erect, commonly 1 meter tall, the culms and sheaths compressed, the numerous elongate blades mostly 0.8 to 1.2 cm. wide, usually reaching beyond the base of the rather loose panicle of large globose spikelets and long flexuous bristles.

Savannas, rocky banks, and open woods, West Indies to Uruguay. Originally described from French Guiana.

ECUADOR: Oil Camp between Guayaquil and Salinas, *Hitchcock* 20124. Between Huigra and Naranjapata, *Hitchcock* 20654.

BOLIVIA: Coripata, *Hitchcock* 22685.

The Ecuador specimens are referred here doubtfully. The specimens are past maturity and most of the spikelets have fallen.

7. *Chaetochloa verticillata* (L.) Scribn. U. S. Dept. Agr. Div. Agrost. Bull. 4: 39. 1897.

Panicum verticillatum L. Sp. Pl. ed. 2. 1: 82. 1762.

Setaria verticillata Beauv. Ess. Agrost. 51. 1812.

Culms slender, compressed, geniculate and branching below; blades thin, lanceolate-linear; spikes short, green or purplish, the slender bristles retrorsely barbate.

A weed in fields and waste places, temperate and warmer regions of both hemispheres, introduced in America. Originally described from southern Europe.

PERU: Lima, *Mathews* 429 (Kew Herb.).

8. *Chaetochloa scandens* (Schrad.) Scribn. & Merr. U. S. Dept. Agr. Div. Agrost. Bull. 21: 17. 1900.

Setaria scandens Schrad.; Schult. Mant. 2: 279. 1824.

Repeatedly branching at the geniculate lower nodes, the slender culms usually 20 to 50 cm. tall, the thin blades sparsely pilose, the slender adhesive panicles 2 to 8 cm. long, 4 to 5 mm. thick (excluding bristles), interrupted below, the bristles ascending, exceeding the small turgid spikelets only 2 or 3 mm.

Open ground, Guatemala and West Indies to Peru and Paraguay. Originally described from a garden specimen in Vienna, the native country unknown.

PERU: Between Tarma and La Merced, *Hitchcock* 22158.

BOLIVIA: San José, *Hitchcock* 22740. Coroico, *Buchtien* 449, 3627. Yanacachi, *Buchtien* 425. Hacienda Simaco, *Buchtien* 5330.

9. *Chaetochloa tenacissima* (Schrad.) Hitchc. & Chase. Contr. U. S. Nat. Herb. 18: 352. 1917.

Setaria tenacissima Schrad.; Schult. Mant. 2: 279. 1824.

Culms slender but strong, 1 meter or more tall, leaning or clambering, the long narrow blades very scabrous, the panicles 10 to 15 cm. long, with long slender divaricate bristles and small spikelets nearly black at maturity.

Brushy hillsides, Guatemala to Brazil and Bolivia. Originally described from Brazil.

PERU: Without locality, *Mathews* 2105 (Kew Herb.).

BOLIVIA: Corolco, *Hitchcock* 22717. Sirupaya, *Buchtien* 435. Hacienda Simaco, *Buchtien* 5329.

10. *Chaetochloa oblongata* (Griseb.) Hitchc.

Panicum oblongatum Griseb. Abh. Ges. Wiss. Göttingen 19: 261. 1874.

Setaria leiocarpa Herrm. Beitr. Biol. Pflanz. 10: 62. 1910.

A slender branching perennial 1 to 1.5 meters tall, with flat blades 8 to 12 mm. wide, loose panicles about 20 cm. long, and elliptic spikelets 2 mm. long, the bristles about 5 mm. long.

Among shrubs, Bolivia to Argentina. Originally described from Argentina (*Lorentz* 237).

BOLIVIA: Sorata, *Mandon* 1260 (cited with the original description).

11. *Chaetochloa vulpisetia* (Lam.) Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 350. 1917.

Panicum vulpisetum Lam. Encycl. 4: 735 (err. typ. 745). 1798.

Setaria vulpisetia Roem. & Schult. Syst. Veg. 2: 495. 1817.

In large clumps 1 to 2 meters tall, the culms strongly compressed, the numerous thin blades commonly 50 cm. long and 3 cm. wide, tapering into a long petiolelike base, the bristly spikelike panicle 20 to 30 cm. long and about 2.5 cm. thick, tapering to both ends, the secondary panicles much smaller.

Copses and brushy slopes, West Indies and Central America to Paraguay. Originally described from Santo Domingo.

ECUADOR: Guayaquil, *Hartweg* 704. Panigón Plantation, *Hitchcock* 20581. Otavalo to Malchinguf, *Hitchcock* 20830. Between Santa Rosa and La Chorita, *Hitchcock* 21137. Portovelo, *Hitchcock* 21273.

PERU: Colonia Perené, *Hitchcock* 22094. Santa Ana, *Cook & Gilbert* 1548.

BOLIVIA: San Buena Ventura, *Cárdenas* (*Mulford Biol. Expl.*) 1893. Buena Vista, *Steinbach* 6842.

12. *Chaetochloa argentina* (Herrm.) Hitchc.

Setaria argentina Herrm. Beitr. Biol. Pflanz. 10: 54. 1910.

An erect caespitose perennial 50 to 100 cm. tall, with flat or folded, pubescent blades, and dense spikelike panicles 8 to 12 cm. long, the spikelets acutish, about 2.5 mm. long, the bristles extending beyond the spikelets about 5 mm.

Fields and open ground, Argentina to Bolivia. Originally described from Córdoba, Argentina.

BOLIVIA: Cochabamba, *Hitchcock* 22803; *Buchtien* 2510. Cotaña, *Buchtien* 8128. Sorata, *Mandon* 1262.

13. *Chaetochloa barbinodis* (Herrm.) Hitchc.

Setaria barbinodis Herrm. Beitr. Biol. Pflanz. 10: 60. 1910.

Resembling *C. argentina*, but the blades scabrous, not pubescent, and the spikelets larger and more globose; nodes pubescent.

Known only from the type collection.

BOLIVIA: Sorata, *Mandon* 1261.

14. *Chaetochloa trichorhachis* (Hack.) Hitchc.

Setaria Heilmanni var. *trichorhachis* Hack. Repert. Nov. Sp. Fedde 8: 46. 1910.

A caespitose perennial 40 to 80 cm. tall, with flat scabrous blades as much as 1.5 cm. wide, and dense spike-like panicles 5 to 8 cm. long, the spikelets about 3 mm. long.

Paraguay, whence originally described, to Bolivia.

BOLIVIA: "Bolivian Plateau," Bang 2160.

105. PENNISETUM L. Rich.⁴¹

Spikelets 1, or rarely 2 together, subtended by a whorl of slender bristles (sterile branchlets), subsessile along a common axis forming bristly spikes, the bristles falling attached to the lanceolate spikelet.

Plants annual.....1. *P. annuum*.

Plants perennial.

Plants low, creeping, forming dense mats; introduced....2. *P. clandestinum*.

Plants tall, not creeping; native.

Panicles terminal on the primary culm and leafy branches only, mostly more than 10 cm. long. (See also no. 8 with short panicles, axillary ones sometimes wanting.)

Bristles conspicuously plumose.....3. *P. setosum*.

Bristles not plumose.

Bristles fine and silky, commonly 3 cm. long. Blades 5 to 6 cm. wide.

4. *P. peruvianum*.

Bristles not more than 2 cm. long.

Panicles stiff, grayish to purplish, the persistent stigmas conspicuous.

5. *P. chilense*.

Panicles flexuous, pale yellowish to tawny, the small stigmas not or scarcely visible.

Bristles unequal but none conspicuously longer and stouter than the rest.....6. *P. nervosum*.

Bristles conspicuously unequal, one 3 to 4 times as long as the rest.

7. *P. occidentale*.

Panicles terminal and axillary, the latter on slender naked peduncles 1 to several from a sheath (axillary sometimes wanting in no. 8).

Panicles few, bristly, rather stiff and dense.....8. *P. rupestre*.

Panicles several to numerous, if dense the bristles fine and more or less flexuous.

Bristles of the fascicles few and short, or in some fascicles obsolete.

9. *P. mutilatum*.

Bristles of the fascicles several to numerous.

Bristles several, most of them not much longer than the spikelet, one (except in no. 10) conspicuously longer than the rest.

Blades not more than 1.5 cm. wide; spikelets 6 mm. or more long.

Spikelets 7 to 8 mm. long; one bristle not conspicuously longer than the rest.....10. *P. intectum*.

Spikelets 6 mm. long; one bristle conspicuously longer than the rest.....11. *P. weberbaueri*.

Blades 2.5 to 5 cm. wide; spikelets about 5 mm. long.

12. *P. latifolium*.

⁴¹ Contributed by Agnes Chase.

Bristles numerous, most of them much longer than the spikelet; one longer than the rest but not conspicuously so. Panicle chenille-like.

Sterile floret empty, the spikelet flattish; panicles mostly rather dense.-----13. *P. tristachyum*.

Sterile floret with a well-developed staminate palea and usually a flower; panicles looser, the axis visible between the fascicles.

14. *P. bambusiforme*.

1. *Pennisetum annuum* Mez, Bot. Jahrb. Engler 56: Beibl. 125: 7. 1921.

A weak-stemmed, sparingly branching annual as much as 70 cm. tall, with scabrous flat blades 6 to 20 cm. long and 5 to 10 mm. wide, and pale, terminal and axillary panicles mostly 2.5 to 3 cm. long on slender peduncles, the fascicles with numerous fine bristles shorter than the single spikelet and one purplish falcate bristle 1.5 to 2 cm. long.

On rocky slopes at middle altitudes, Peru. (Type, *Weberbauer* 5354.)

PERU: Matucana, *Macbride & Featherstone* 280. Chosica, *Weberbauer* 5354.

2. *Pennisetum clandestinum* Hochst.; Chiov. Annuar. Ist. Bot. Roma 8: 41. 1903.

Pennisetum longistylum var. *clandestinum* Leeke, Zeitschr. Naturw. 79: 23. 1907.

A stoloniferous perennial forming dense sod, with short, flat, sparsely pilose blades and small terminal few-flowered panicles wholly or partly inclosed in the sheaths.

Open hills at middle altitudes. Introduced for forage from Africa, where it is known as Kikuyu grass. "At Arequipa the Kikuyu grass was growing in a pasture where it formed (being the dry season) a dense short sod. Here and there stamens could be seen arising from flowers hidden in the leaves. The filaments were erect, very slender, 2 to 3 cm. long. In other flowers the long styles arose but were not so conspicuous as the stamens. I was informed that in the rainy season the stems arose to the height of about 1 meter."—A. S. H., field book.

PERU: Chuquibambilla, *Hitchcock* 22449. Arequipa, *Hitchcock* 22439.

3. *Pennisetum setosum* (Swartz) L. Rich. in Pers. Syn. Pl. 1: 72. 1805.

Cenchrus setosus Swartz, Prodr. Veg. Ind. Occ. 26. 1788.

A tall, leafy, branching perennial, erect or ascending from a geniculate base, the long flat blades pubescent or scabrous, the purplish spikes 10 to 15 cm. long, the slender fascicles at maturity spreading horizontally or slightly reflexed.

Open or brushy slopes, Florida and the West Indies to Colombia and Brazil. Originally described from the West Indies.

ECUADOR: Between Huigra and Naranjapata, *Hitchcock* 20659. Between La Chorita and Portovelo, *Hitchcock* 21156. Between Portovelo and El Tambo, *Hitchcock* 21310. Ventura, *Rose* 23513.

BOLIVIA: Coripata, *Bang* 2168. Hacienda Anacuri, *Holway* 714. Chulumani, *Hitchcock* 22661. Villa Asplazu, *Holway* 687.

4. *Pennisetum peruvianum* Trin. Linnaea 10: 295. 1836.

Gymnothrix peruviana Doell in Mart. Fl. Bras. 2^a: 302. 1877.

A robust, branching, erect or leaning perennial 2 to 3 meters tall, with elongate flat blades 4 to 6 cm. wide, tapering to both ends, scabrous on the upper surface, smooth beneath, and nodding pale silky panicles 15 to 25 cm. long and 3 to 5 cm. thick, the involucrel bristles 2 to 3 cm. long.

Brushy or open slopes or banks, at middle altitudes, Ecuador and Peru, whence described. ("And. Peru," *Pöppig*.)

ECUADOR: "Andes Quitenses," *Spruce* in 1865 (Kew Herb.). Río Verde, *Pachano* 239. Between Huigra and Naranjapata, *Hitchcock* 20668. Agoyan, *Spruce* 5937 (Kew Herb.) Between Baños and Cashurco, *Hitchcock* 21822. Pastaza Valley, *Heuborn* 359. Ventura, *Rose* 23509.

PERU: Without locality, *Pöppig*.

5. *Pennisetum chilense* (Desv.) Jacks. Nov. Act. Soc. Sci. Upsal. IV. 1: 172. 1905.

Gymnothrix chilensis Desv. in Gay, Fl. Chile 6: 251. pl. 74. 1853.

Pennisetum chilense var. *planifolia* Hack. Bot. Centralbl. 120: 548. 1912, name only. (*Buchtien* 842.)

A glaucous perennial, with sparingly branching culms 1 to 2 meters tall, suberect from tough hard rhizomes, elongate, scabrous, flat or folded blades 3 to 10 mm. wide, and dense, rather stiff, grayish to pale purplish panicles 8 to 20 cm. long and about 1.5 cm. thick, the bristles mostly less than twice the length of the spikelets, one bristle coarser and longer at least in the upper fascicles, the long brown stigmas persistent, conspicuous.

Open dry slopes, mostly at higher altitudes, Bolivia, Argentina, and Chile, whence originally described.

BOLIVIA: La Paz, *Buchtien* 842; *Bang* 55; *Cárdenas* 72 S; *Holway* 438. Palca, *Hitchcock* 22583. Cochabamba, *Hitchcock* 22827, 22858. Oploca, *Hitchcock* 22898. Tarija, *Fiebrig* 2595.

6. *Pennisetum nervosum* (Nees) Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 1: 177. 1834.

Gymnothrix nervosa Nees, Agrost. Bras. 277. 1829.

A robust perennial 2 to 3 meters tall, usually in clumps and decumbent at base, and with appressed branches above; blades elongate, 8 to 15 mm. wide, scabrous; panicles dense, yellowish to tawny, 12 to 20 cm. long, 12 to 15 mm. thick, flexuous and at maturity commonly with a pronounced S-shaped bend in the middle; bristles stiff, unequal, about one-third of them exceeding the spikelet, rarely none longer.

Brushy or open, mostly moist ground, at low altitudes, Brazil, whence originally described, and Ecuador to Argentina.

ECUADOR: Milagro, *Hitchcock* 20254. Panigón Plantation, *Hitchcock* 20602.

7. *Pennisetum occidentale* Chase, sp. nov.

Plants perennial, robust, in large clumps, glabrous as a whole; culms solid or pithy, obtusely angled, straggling or creeping at base, with prop roots at the lower nodes, as much as 3 meters tall, with numerous ascending, more or less geniculate branches; sheaths keeled, loose, the upper scaberulous toward the truncate or slightly auriculate summit; ligule fimbriate-ciliate, 1 to 1.5 mm. long; blades flat, spreading, 20 to 60 cm. long, 1 to 2 cm. wide, smaller on the ultimate branches, scarcely tapering to a truncate or rounded base (the junction of sheath and blade somewhat constricted), very scabrous on the margin and upper surface, scabrous or nearly smooth beneath, the epidermis rather coarsely cellular (the cells visible under a lens); panicles rather short-exserted from the ends of the numerous leafy branches, often overtopped by the upper blades, mostly 8 to 12 cm. long, 10 to 12 mm. thick excluding the longer bristles, dense, pale, flexuous (with a loose S-shaped bend in the middle at maturity), the rather thick axis densely puberulent, the scars of the fallen fascicles surrounded by white hairs, giving the appearance of stellar pubescence; fascicles spreading, the bristles about 10, fine, scabrous, very unequal, a few exceeding the

spikelet, one 15 to 25 cm. long, fine and straight; spikelets 4.5 to 4.8 mm. long, about 1 mm. wide, lanceolate-acuminate, smooth or scaberulous toward the apex; first glume about one-third the length of the spikelet, 3-nerved, acute; second glume and sterile lemma 7-nerved, sharp-pointed, the glume three-fourths as long as the equal fruit and empty sterile lemma; fruit sharp-pointed, smooth.

Type in U. S. National Herbarium, no. 1,163,831, collected in brushy cut-over land near lagoon, west of Guayaquil, Ecuador, June 20, 1923, by A. S. Hitchcock (no. 19953).

In low ground, coast of Ecuador.

ECUADOR: Chanduy, *Spruce* 6426 (Kew Herb.). Guayaquil, *Hitchcock* 19953; *Mille* 22; *Rose* 22112.

8. *Pennisetum rupestre* Chase, sp. nov.

Plants perennial, in very loose clumps from relatively slender, creeping rhizomes; culms about 75 cm. tall, angled or terete, short-jointed and branching near the base, the ultimate branches compressed and slender; nodes glabrous; sheaths papillose-pilose at least toward the summit, the lower loose and overlapping; ligule fimbriate-ciliate, about 2 mm. long; blades erect, rather stiff, 12 to 18 cm. long, 5 to 10 mm. wide (the uppermost much reduced), flat, round-truncate at base, tapering to a long subinvolute point, scabrous and sparsely papillose-pilose on the upper surface, slightly scaberulous and glabrous or nearly so beneath; inflorescence terminal and axillary, 1 or 2 slender wiry flat peduncles borne in the sheaths; panicles 2.5 to 7 cm. long, about 1 cm. thick, dense, rather stiff; bristles numerous, scabrous, rather stiff, unequal, most of them slightly shorter than the spikelet, a few equaling it or a little longer, one a little stouter than the rest; spikelets one or two to a fascicle (mostly one, or the second rudimentary), 6 mm. long, about 1.5 mm. wide, lanceolate, acute, scabrous toward the apex; first glume minute or obsolete; second glume 1-nerved, acute, about one-third the length of the equal fruit and empty sterile lemma; fertile lemma and palea but little indurate, the lemma 5-nerved.

Type in U. S. National Herbarium, no. 1,161,395, collected "on disintegrated rock slope," at Matucana, Peru, altitude 2,400 meters, between April 12 and May 3, 1922, by Macbride & Featherstone (no. 453).

Known only from the type and a fragmentary immature specimen without axillary panicles collected by Wilkes exploring expedition, at Obrajillo, Peru.

9. *Pennisetum mutilatum* (Kuntze) Hack.; Kuntze, *Rev. Gen. Pl.* 3²: 347. 1898.

Cenchrus mutilatus Kuntze, *Rev. Gen. Pl.* 3²: 347. 1898.

A relatively slender, glaucous perennial, the culms 1 to 2 meters long, ascending from a long, decumbent, sparingly branching base, rooting at the nodes, the upper part of the culm somewhat zigzag and with appressed leafy branches; sheaths sparsely papillose-hirsute to glabrous; blades flat, spreading, 10 to 20 cm. long, 8 to 30 mm. wide, narrowed to a rounded base, at least those of the main culm with a peduncle 5 to 10 mm. (rarely 20 mm.) long; panicles rather few, nodding on slender peduncles, 5 to 9 cm. long, 5 to 8 mm. thick, loosely flowered; bristles few and short.

No habitat is given with any of the specimens seen; probably on brushy slopes; in the Andes of Bolivia and Argentina, evidently rare. Originally described from Argentina.

BOLIVIA: Sorata, *Mandon* 1264; *Holway* 537.

10. *Pennisetum intectum* Chase, sp. nov.

Plants perennial; culms solitary or few together, suberect, about 1.5 meters tall, compressed, glabrous or minutely pubescent just below the nodes, bearing few to several slender branches, appressed below, spreading toward the ends; nodes minutely appressed-hirsute to glabrous; sheaths keeled, appressed papillose-hispid except at the base or the upper scabrous only, the lower ones with erect auricles at the summit joining the ligule on either side; ligule membranaceous, firm, about 2 mm. long; blades spreading, 20 to 35 cm. long, flat and 5 to 10 mm. wide in the middle, tapering into an elongate narrow folded base, acuminate, scaberulous on both surfaces, the folded part more or less hispid within; inflorescence terminal and axillary, 2 to 5 long filiform scaberulous peduncles borne in the upper sheaths; panicles drooping, subflexuous, 4 to 6 cm. long, grayish green, loosely flowered, the slender angled zigzag scabrous axis visible between the fascicles; bristles few to several (4 to 10), scabrous, readily breaking, very unequal, mostly shorter than the spikelet, one or two in occasional fascicles exceeding the spikelet, rarely one bristle noticeably longer than the rest; spikelet 7 to 8 mm. long, about 1.5 mm. wide, lanceolate, acuminate, scabrous; first glume about 1.5 mm. long, subacute; second glume a little more than half the length of the spikelet, 3-nerved (or faintly 5-nerved), acute; sterile lemma empty, equaling the fertile floret, 5-nerved, acuminate, depressed down the center; fruit scabrous toward the pointed apex, the palea obscurely pubescent.

Type in U. S. National Herbarium, no. 1,163,845, collected on a grassy open hillside at about 2,500 meters altitude, between Loja and San Lucas, Province of Loja, Ecuador, by A. S. Hitchcock (no. 21477).

This species appears to be intermediate between *P. mutilatum* and *P. weberbaueri*. The specific name refers to the naked spikelets, the bristles being scant.

11. *Pennisetum weberbaueri* Mez, Notizbl. Bot. Gart. Berlin, 7: 50. 1917.

More slender than *P. tristachyum* and its allies, in dense clumps, 1 to 2 meters tall, rather sparingly branching, the culms and sheaths commonly tinged with vinous purple, the blades 12 to 25 cm. long and 6 to 15 mm. wide, tapering to a narrowly rounded, sometimes short-petiolate base, the panicles 5 to 7 cm. long, mostly purplish-tinged, loosely flowered, the bristles rather scant, flexuous, most of them slightly longer than the spikelets, one two to three times as long.

Moist banks and slopes at middle altitudes, Peru. (Type from Tarma, *Weberbauer* 2393.)

PERU: Obrajillo, *Wilkes Expl. Exped. Matucana, Macbride & Featherstone* 256. Cuzco, *Hitchcock* 22511. Tarma, *Hitchcock* 22160. Huanta, *Pearce* in 1867 (Kew Herb.)

12. *Pennisetum latifolium* Spreng. Syst. Veg. 1: 302. 1825.

Gymnothrix latifolia Schult. Mant. 3: 601. 1827.

Pennisetum lechleri Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only.

(*Lechler* 1925.)

Resembling *P. tristachyum*, less copiously branching, the blades thinner, narrower at the base, more or less scabrous on both surfaces, the panicles 4 to 10 cm. long, greenish, the bristles fewer and stiffer, most of them not exceeding the spikelets, one about twice as long.

Open or brushy, rocky, moist slopes, at middle altitudes, Brazil and Peru to Uruguay, whence described.

PERU: Tabina, *Lechler* 1925.

BOLIVIA: Sorata, *Holway* 503; *Mandon* 1263 (Kew Herb.). Cochabamba, *Hitchcock* 22847. Bermejo, *Fiedrig* 2437.

13. *Pennisetum tristachyum* (H. B. K.) Spreng. Syst. Veg. 1: 302. 1825.

Gymnothrix tristachyum H. B. K. Nov. Gen. & Sp. 1: 113. 1816; 7: pl. 678. 1825.

Cenchrus tristachyus Kuntze, Rev. Gen. Pl. 3²: 347. 1898.

Pennisetum tristachyon var. *jamesoni* Leake, Zeitschr. Naturw. 79: 33. 1907.

A robust perennial 2 to 3 meters or more tall, repeatedly branching above, forming a wide-spreading summit, with flat blades as much as 40 cm. long and 3 cm. wide on the main culm (successively smaller on the branches), scabrous above, glabrous beneath, tapering to a narrowly rounded base, and numerous drooping panicles on slender peduncles, the panicles commonly purple-tinged and 8 to 10 cm. long, flexuous, the fine numerous subflexuous bristles unequal, the longer ones about twice the length of the spikelet.

Open rocky slopes at middle altitudes, Ecuador, the type from Puenbo. (*Bonpland.*)

ECUADOR: Tungurahua, *Lehmann* 5394. Cuenca, *Lehmann* 7687. Cotacallao, *Mille* 316. Quito, *Holway* 945. Nieblí, *André* 3419 (Kew Herb.). Huigra, *Hitchcock* 20353. Between Huigra and Naranjapata, *Hitchcock* 20669. Baños, *Spruce* (Kew Herb.) Between Loja and San Lucas, *Hitchcock* 21482. "Andes, Ecuador," *Spruce* in 1857-1859 (Kew Herb.)

13a. *Pennisetum tristachyum boliviense* Chase, subsp. nov.

Culms as much as 6 meters tall and blades as much as 6 cm. wide; differs from the species in being more leafy at the summit, the blades abruptly attenuate at base, the attenuate part densely silky-ciliate, and in the more silky panicles, the copious fine bristles spreading, pappuslike.

Type in U. S. National Herbarium, nos. 1,163,841 and 1,163,842, collected on a shrubby bank at Coripata, Nor-Yungas, Bolivia, altitude 1,560 meters, December 23, 1923, by A. S. Hitchcock (no. 22687, large leafy sterile shoot, and no. 22729, inflorescence.)

Slopes at middle altitudes in the Yungas region, Bolivia.

BOLIVIA: Coroico, *Bang* 2340; *Buchtien* 451 (Kew Herb.), 3620. Coripata, *Hitchcock* 22687, 22729. La Florida, *Buchtien* 423.

14. *Pennisetum bambusiforme* (Fourn.) Hemsl. Biol. Centr. Amer. Bot. 3: 507. 1885; Ind. Kew. 2: 458. 1894.

Gymnothrix bambusiformis Fourn. Mex. Pl. 2: 48. 1886.

Resembling *P. tristachyum*, the panicles looser and on the average longer, the spikelets smaller, the bristles proportionately longer, one about twice as long as the others.

Open, rocky, mostly moist slopes, at middle altitudes, southern Mexico to Peru. Originally described from Mexico.

ECUADOR: Cotacallao, *Mille* 316. Between Baños and Cashurco, *Hitchcock* 21762. Ambato, *Rose* 22372. Huigra, *Rose* 22530. Las Juntas, *Rose* 23202.

PERU: Tarma, *Hitchcock* 22149. Santa Ana, *Cook & Gilbert* 1632.

Gymnothrix latifolia Presl, Rel. Haenk. 1: 316. 1830 (not *G. latifolia* Schult. 1827), upon which is based *Gymnothrix preslii* Kunth (Rév. Gram. 1: Suppl. XII, 1830; Enum. Pl. 1: 160. 1832) and *Pennisetum preslii* Trin. (in Steud. Nom. Bot. ed. 2. 2: 298. 1841), may be the same as *Pennisetum bambusiforme*. If so, *P. preslii* is the tenable name. The description was drawn from a fragmentary specimen from the mountains of Huánuco, Peru. The species is differentiated from *P. tristachyum* principally by a sterile lemma longer than the fertile floret. In both *P. tristachyum* and *P. bambusiforme*

the sterile lemma is the longer, but in the latter the difference is greater. In this species, however, the lower floret, which Presl refers to as the "neuter floret" is staminate, or at least the palea is well developed. In *P. tristachyum* the lower floret is empty, a true "neuter floret." The type was not found in the Presl Herbarium at Prague when examined by A. S. Hitchcock in 1907.

PENNISETUM TRISTACHYON var. RUIZIANA Leeke, Zeitschr. Naturw. 79: 33. 1907. "Ecuador." This is distinguished from *P. tristachyum* by long-pilose nodes and leaves. Probably an exceptional specimen of *P. tristachyum*.

106. CENCHRUS. L. SANDBUR

Spikelets 1 to 4 together, subtended and surrounded by a spiny bur formed of adnate sterile branches, the burs sessile along a common axis, falling with the spikelets and permanently inclosing them; spikelets acuminate, the first glume sometimes obsolete.

Plants perennial; involucral lobes united at the base only. Spikes dense.

1. *C. myosuroides*.

Plants annual; involucral lobes united above the base.

Involucre with flattened spreading spines, no ring of slender bristles at base.

Burs short-pubescent.....2. *C. pauciflorus*.

Burs densely villous.....3. *C. humilis*.

Involucre with a ring of slender bristles at base.

Bristles antrorsely scabrous.....7. *C. pilosus*.

Bristles retrorsely barbed.

Burs, excluding the bristles, not more than 4 mm. wide, numerous, crowded in a long spike; lobes of involucre interlocking, not spine-like.....6. *C. viridis*.

Burs, excluding the bristles, 5 to 7 mm. wide, not densely crowded; lobes of the involucre erect or nearly so or rarely one or two lobes interlocking, the tips spinelike.

Foliage glabrous.....4. *C. echinatus*.

Foliage pubescent.....5. *C. hillebrandianus*.

1. *Cenchrus myosuroides* H. B. K. Nov. Gen. & Sp. 1: 115. *pl.* 35. 1816.

Glabrous; culms sparingly branching, woody, often 2 meters tall; spikes dense, cylindric, 12 to 20 cm. long, about 8 mm. thick, the erect involucral bristles not exceeding the spikelet.

Sandy soil, southern United States to Ecuador and Argentina. Originally described from Cuba.

ECUADOR: Riobamba, *Mille* 314. Guachalá, *Sodi* 13.

PERU: Callao, *Wilkes Expl. Exped.*; *Cuming* 1063 (Kew Herb.). Chosica, *Macbride & Featherstone* 540.

BOLIVIA: Quiabaya, *Mandon* 1266 (Kew Herb.). Base of Mount Illimani, *Julio* 12. Cochabamba, *Hitchcock* 22806. Cotaña, *Buchtien* 3132. Espña, *White* 604. Tarija, *Fries* 1103.

2. *Cenchrus pauciflorus* Benth. Bot. Voy. Sulph. 56. 1840.

Cenchrus muricatus R. A. Phil. Anal. Univ. Chile 36: 202. 1870. Not *C. muricatus* L. 1771.

Decumbent, freely branching at the base, the flowering culms ascending; sheaths loose; blades firm, commonly folded; spikes short-exserted, of 6 to 12 burs.

Sandy soil, throughout the United States, south to Argentina. Originally described from Lower California.

PERU: La Merced, *Hitchcock* 22134. Colonia Perené, *Hitchcock* 22110.

BOLIVIA: Mapiri, *Buchtien* 1178.

This species has been referred by many authors to *Cenchrus tribuloides* L.

3. *Cenchrus humilis* Hitchc., sp. nov.

Annual; culms branching at base, ascending, mostly 2 to 5 cm. tall, sometimes as much as 10 cm., glabrous or pilose below the inflorescence; sheaths minutely puberulent, keeled, pilose along the margin near the summit; ligule a line of very short hairs; blades flat or folded, about as wide as the sheath at the base, gradually narrowed to an acuminate point, 2 to 5 cm. long, 1 to 2 mm. wide, glabrous, minutely scabrous; inflorescence of 1 to 3 burs, sometimes as many as 6; burs crowded, densely villous, about 3 mm. wide (excluding spines), the base obconic, about 1 mm. long, nearly glabrous; lobes of involucre flat, purplish, densely white-villous, the spreading tip 1 to 2 mm. long, triangular-pointed but not extended into a subulate, retrorsely barbed point as in allied species, the lower spines smaller with a few short slender ones intermixed; spikelets 2 in each bur, 5 mm. long, acuminate; first glume ovate-acuminate, 1-nerved, 3 mm. long; second glume a little shorter than the spikelet, 5-nerved, slightly pubescent with scattered short hairs; sterile lemma about as long as the fertile lemma, scaberulous toward apex, 5-nerved, without stamens, the palea narrow, short or nearly as long as the lemma; fertile lemma faintly 5-nerved toward apex, scaberulous or puberulent on the upper part; palea nearly as large as the lemma; caryopsis free, oblong, compressed, obtuse, 2.5 mm. long.

Type in the U. S. National Herbarium, no. 1,163,875, collected on dry sand, about two kilometers east of Mollendo, Peru, November 17, by A. S. Hitchcock (no. 22349).

The only other specimen seen is *Weberbauer* 1490, also from Mollendo.

4. *Cenchrus echinatus* L. Sp. Pl. 1050. 1753.

Cenchrus pungens H. B. K. Nov. Gen. & Sp. 1: 115. 1816. (Guayaquil, Bonpland).

Cenchrus lechleri Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only. (*Lechler* 1545.)

Culms usually about 50 cm. long, ascending from a decumbent base, branching below; blades flat, thin, usually elongate, 5 to 10 mm. wide; spike commonly 5 to 7 cm. long.

Open ground and waste places. A common weed throughout the warmer parts of America. Originally described from Jamaica and Curaçao.

ECUADOR: Pomasqui, *André* 3789; *Jameson* 245 (Kew Herb.). Riobamba, *Mille* 56; *Spruce* 5818 (Kew Herb.). Baños, *Heilborn* 342. Ambato, *Hitchcock* 21715. Huigra, *Hitchcock* 20360.

PERU: Chosica, *Macbride & Featherstone* 549.

BOLIVIA: Coripata, *Hitchcock* 22688. Milluhuaya, *Buchtien* 4171. Buena Vista, *Steinbach* 5576 (apparently perennial), 6838.

5. *Cenchrus hillebrandianus* Hitchc. Mem. Bishop Mus. 8: 211. f. 106. 1922.

Resembling *C. echinatus* but the foliage pubescent.

Open ground and sandy soil, Peru and islands of the Pacific Ocean. Originally described from the Hawaiian Islands.

PERU: Callao, *Didrichsen* 4393. La Merced, *Hitchcock* 22133. Colonia Perené, *Hitchcock* 22081. Lima, *Ball* in 1882; *Nation* in 1862 (both Kew Herb.)

6. *Cenchrus viridis* Spreng. Syst. Veg. 1: 301. 1825.

Taller than *C. echinatus*, more upright, the spikes commonly 10 cm. long, the burs smaller and closer together.

Open ground and waste places, Florida to Brazil and Bolivia. Originally described from Guadeloupe.

ECUADOR: Panigón Plantation, *Hitchcock* 20596, Milagro, *Hitchcock* 20188.

BOLIVIA: Guanay, *Rusby* 190.

7. *Cenchrus pilosus* H. B. K. Nov. Gen. & Sp. 1: 116. pl. 36. 1816.

Cenchrus pallidus Fourn. Mex. Pl. 2: 50. 1886.

A spreading, rather stout annual similar to *C. echinatus*, but usually decumbent and rooting at the lower nodes; burs larger than those of *C. echinatus*, the bristles antrorsely scabrous, the inner twice as long as the body of the bur.

Open ground and cultivated soil, Mexico to Ecuador. Originally described from Venezuela.

ECUADOR: Chanduy, *Spruce* (Kew Herb.).

The Chanduy specimen is more pilose on the inner spines than most of the specimens from Central America (*C. pallidus*), in which it is similar to the specimens from Venezuela, Colombia, and Curaçao, and one specimen from Mexico (Tomellín, *Hitchcock* 6217). The plate cited above is very poor.

107. OLYRA L.

Plants monoecious; inflorescence paniculate; pistillate spikelets borne on the ends of the branches of loose terminal panicles, the smaller staminate spikelets pedicellate below the pistillate ones, sometimes the upper branches all pistillate and the lower ones all staminate; pistillate spikelets rather large; first glume wanting; second glume and sterile lemma herbaceous, often caudate-acuminate; fruit bony-indurate; staminate spikelets readily deciduous; glumes and sterile lemma wanting, the lemma and palea membranaceous.

Panicles ovoid, few-flowered, less than 3 cm. long; pistillate spikelets less than 3 mm. long.....1. *O. lateralis*.

Panicles, at least the primary, much more than 10 cm. long, many-flowered; pistillate spikelets more than 5 mm. long.

Spikelets short-pediceled along the subdigitate main branches of the inflorescence, the numerous staminate below, a few pistillate toward the end, the branches 10 cm. or more long.

Pistillate spikelets 7 to 8 mm. long, acuminate but not caudate.

2. *O. ecaudata*.

Pistillate spikelets long-caudate, including the point 2 to 4 cm. long.

Staminate spikelets 7 to 10 mm. long; fruit glabrous but delicately pitted.....3. *O. heliconia*.

Staminate spikelets 4 to 5 mm. long; fruit not pitted, glabrous.

Fruit about 1 cm. long; second glume and sterile lemma extending about 1 cm. beyond the fruit.....4. *O. buchtienii*.

Fruit 6 to 7 mm. long; second glume and sterile lemma extending about 3 cm. beyond the fruit.....5. *O. caudata*.

Spikelets in a narrow or open panicle, the branches not subdigitate.

Fruit pubescent.....6. *O. ciliatifolia*.

Fruit glabrous.

Fruit pitted, about 3 mm. long.....7. *O. micrantha*.

Fruit not pitted.....8. *O. latifolia*.

1. *Olyra lateralis* (Presl) Chase, Proc. Biol. Soc. Washington 21: 179. 1908.

Panicum laterale Presl, Rel. Haenk. 1: 305. 1830.

A branching straggling perennial, more delicate than the other species; blades oblong, lanceolate, mostly 3 to 4 cm. long, 5 to 10 mm. wide, glaucous beneath; panicles delicate, about 2 cm. long and about as wide; staminate spikelets linear, 3 to 4 mm. long; pistillate spikelets ovoid, 2 to 3 mm. long, at the periphery of the panicle.

Copses and shady banks, Costa Rica to Bolivia. Originally described from the mountains of Huánuco, Peru. (*Haenke.*)

PERU: Hacienda Villcabamba, *Macbride* 4990. Without locality, *Pöppig* 976.

BOLIVIA: Hacienda Simaco, *Buchtien* 5333.

2. *Olyra ecaudata* Doell in Mart. Fl. Bras. 2^e: 326. 1877.

An erect slender perennial about 60 cm. tall, with oblong blades 10 to 20 cm. long, rough above; branches of the inflorescence fascicled, the staminate spikelets short-pedicel along the main branches, the pistillate toward the end, acuminate but not caudate.

French Guiana, whence originally described, to Bolivia.

BOLIVIA: Cobija, *Ule* 9146.

3. *Olyra heliconia* Lindm. Svensk. Vet. Akad. Handl. 34^e: 11. pl. 6. 1900.

Culms robust but not much branched, 1 to 2 meters tall; blades asymmetrically truncate at base, as much as 30 cm. long and 8 cm. wide; branches of the inflorescence aggregate in about 1 to 2 whorls, slender, as much as 20 cm. long; staminate spikelets often purple, 1 cm. long, pistillate spikelets mostly 3 or 4 toward the end, caudate, the fruit glabrous, delicately pitted.

Shrubby banks, Brazil, whence originally described, to Bolivia and Peru.

PERU: Santa Ana, *Cook & Gilbert* 1653. Colonia Perené, *Hitchcock* 22056, 22070. Pozuzo, *Macbride* 4572. Lamas, *Spruce* 4807 (Kew Herb.).

BOLIVIA: Coroico, *Hitchcock* 22720; *Buchtien* 450 (Kew Herb.), 3622. Yungas, *Bang* 508. Antahuacana, *Buchtien* 6433.

4. *Olyra buchtienii* Hack. Repert. Nov. Sp. Fedde 11: 20. 1912.

Blades oblong-lanceolate, 25 cm. long, 7 cm. wide, glabrous; branches of the inflorescence about 3, digitate, 10 cm. long; staminate spikelets numerous, about 4 mm. long; pistillate spikelets few at the ends of the branches, the glume and sterile lemma acuminate, about 2 cm. long, puberulent within, the fruit smooth.

Known only from the type collection.

BOLIVIA: Mapiri, *Buchtien* 1157.

5. *Olyra caudata* Trin. Linnaea 10: 292. 1836.

Blades oblong, 20 cm. long, 8 cm. wide, glabrous; branches of the inflorescence subdigitate, 10 cm. long, the pistillate spikelets solitary at the ends, the glumes extended into a slender point as much as 3 cm. long, the fruit very white and smooth.

Dense forest, Peru to Guiana. Originally described from northern Peru.

PERU: Tocache, *Pöppig* (a fragment from the type specimen in the Trinius Herbarium).

6. *Olyra ciliatifolia* Raddi, Agrost. Bras. 19. 1823.

Mostly less than 1 meter tall; blades light green, asymmetrically truncate at base, triangular-ovate, 5 to 10 cm. long, 3 to 4 cm. wide; panicle rather delicate, ovoid, about 10 cm. long, the lower branches several in a whorl, again branched once or twice, the upper branches single or in pairs; staminate spikelets about 7 mm. long, acuminate; pistillate spikelets about 1 cm. long, the glume extending about 1 cm. further as a slender point; fruit pubescent.

Rich wood borders, Brazil, whence originally described, to Bolivia and Paraguay.

BOLIVIA: Lake Rogagua, *Rusby* (*Mulford Biol. Expl.*) 1669.

7. *Olyra micrantha* H. B. K. Nov. Gen. & Sp. 1: 199. 1816.

Growing to the height of 3 to 5 meters, the blades as much as 30 cm. long and 10 cm. wide, rounded but scarcely cordate at base, the panicles as much as 30 cm. long; fruits pitted, 3 mm. long.

Rich woods, Colombia, whence originally described, to Paraguay and Peru.

PERU: Colonia Perené, *Hitchcock* 22060. San Gaván, *Lechler* 3235, 3305 (both Kew Herb.).

BOLIVIA: Mapiri, *Buchtien* 1158.

8. *Olyra latifolia* L. Syst. Nat. ed. 10. 2: 1261. 1759.

Olyra arundinacea H. B. K. Nov. Gen. & Sp. 1: 197. 1816.

A glabrous perennial, bamboolike in aspect, commonly 5 meters tall, with flat, firm, asymmetrically lanceolate-oblong, abruptly acuminate blades commonly 20 cm. long and 5 cm. wide, and ovoid panicles 10 to 15 cm. long, the branches stiffly ascending or spreading, each bearing a single large long-acuminate pistillate spikelet at the thickened summit and several small slender-pedicelated staminate spikelets along the branches.

Copses and shady banks, Mexico and West Indies to Brazil and Bolivia. Originally described from Jamaica.

ECUADOR: El Recreo, *Eggers* 15068. Guayaquil, *Hitchcock* 19962. Balao, *Eggers* 14407, 14669. Portovelo, *Holway* 1002. Between Santa Rosa and La Chorita, *Hitchcock* 21126, 21134.

PERU: La Merced, *Macbride* 5521.

BOLIVIA: Mapiri, *Buchtien* 1155; *Rusby* 209. Reyes, *White* 1210.

OLYRA LORETENSIS Mez, Notizbl. Bot. Gart. Berlin 7: 47. 1917. Described from Leticia, in territory in dispute between Peru, Colombia, and Brazil, the type being *Ule* 6224. It is allied to *O. ciliatifolia* but differs in having much smaller staminate spikelets.

108. RADDIA Bertol.

Plants monoecious; staminate and pistillate spikelets in distinct small panicles, the staminate terminal or from the upper nodes, the pistillate axillary; first glume of the pistillate spikelets wanting, the second glume and sterile lemma membranaceous, acuminate; fruit dorsally subcompressed, narrow, bony-indurate.

1. *Raddia capillata* (Trin.) Hitchc.

Olyra capillata Trin. Mém. Acad. St. Pétersb. VI. Sci. Nat. 1: 114. 1834.

Plants rather slender and low; blades thin, glaucescent, 8 to 10 cm. long, 2 cm. wide; fruit slender, smooth, white, 9 mm. long, 1 mm. wide.

Copses and banks, Brazil, whence originally described, to Ecuador.

ECUADOR: Between Portovelo and El Tambo, *Hitchcock* 21280.

109. IMPERATA Cyrillo

Spikelets all perfect, awnless; all pedicellate, articulate below the glumes, the rachis not disjointing, the slender racemes in a narrow spike-like panicle; glumes membranaceous, densely clothed with long silky hairs.

Panicle rarely over 10 cm. long. Spikelets 4 mm. long-----1. *I. brasiliensis*. Panicle and blades elongate.

Blades involute.....2. *I. tenuis*.

Blades flat.

Spikelets 3 mm. long.....3. *I. contracta*.

Spikelets 2 mm. long.....4. *I. minutiflora*.

1. *Imperata brasiliensis* Trin. Mém. Acad. St. Pétersb. VI. Math. Phys. Nat. 2: 331. 1832.

Imperata arundinacea var. *americana* Anderss. Öfv. Svensk. Vet. Akad. Förh. 12: 160. 1855.

An erect tufted perennial with scaly rhizomes, the flat leaves mostly clustered toward the base, the slender, simple, nearly naked culm 0.5 to 1 meter tall.

Open, rather dry ground at low altitudes, Mexico to Argentina and Chile. Originally described from Brazil.

ECUADOR: Between Portovelo and El Tambo, *Hitchcock* 21262, 21288.

BOLIVIA: Reyes, *White* 1535.

2. *Imperata tenuis* Hack. in DC. Monogr. Phan. 6: 689. 1889.

Imperata exaltata var. *angustifolia* Hack. in DC. Monogr. Phan. 6: 99. 1889. (*Spruce* 4224.)

A tall stout erect caespitose perennial, with firm stiff involute blades (some of the upper sometimes flat), and dense silvery spike-like panicles 15 to 20 cm. long.

Grassy savannas, Brazil, whence originally described, to Paraguay and Bolivia.

PERU: Tarapoto, *Spruce* 4224.

BOLIVIA: Buena Vista, *Steinbach* 6885, 6928.

3. *Imperata contracta* (H. B. K.) Hitchc. Rep. Mo. Bot. Gard. 4: 146. 1893.⁴

Saccharum contractum H. B. K. Nov. Gen. & Sp. 1: 182. 1816.

Imperata caudata Trin. Mém. Acad. St. Pétersb. VI. Math. Phys. Nat. 2: 331. 1832.

Imperata exaltata var. *caudata* Hack. in DC. Monogr. Phan. 6: 99. 1889.

Taller than the preceding, the culms leafy, the panicle as much as 40 cm. long.

Swamps and moist open ground, West Indies to Brazil and Peru. Originally described from Colombia.

ECUADOR: Panigón Plantation, *Hitchcock* 20560. Teresita, *Hitchcock* 20499. Naranjito, *Mille* 297.

PERU: Santa Ana, *Cook & Gilbert* 1533.

4. *Imperata minutiflora* Hack. in DC. Monogr. Phan. 6: 100. 1889.

Differing from *I. contracta* in the narrower blades and smaller (2 mm. long) spikelets.

Sandy river banks, Peru and Bolivia. Originally described from Lima.

PERU: Lima, *Wilkes Expl. Exped.*; *Ball* in 1882 (Kew Herb.).

BOLIVIA: Tarija, *Fries* 1229. Covendo, *White* 983. Rfo Guendá, *Steinbach* 6894.

110. SACCHARUM L.

Spikelets all perfect, awnless, a ring of long silky spreading hairs at the base of each, one of the pair sessile; rachis articulate, the slender racemes arranged in a large panicle.

⁴ By error this appears as *I. constricta* in the Index Kewensis (Suppl. 1: 222. 1903).

1. *Saccharum officinarum* L. Sp. Pl. 54. 1753. SUGARCANE.
Saccharum infirmum Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only.
 (Lechler 2148.)

Gigantic perennials with broad leaves, the overlapping sheaths falling from the short-jointed lower part of the culms, the great plummy panicles pinkish silvery; forming seed sparingly.

Cultivated in tropical and subtropical countries of both hemispheres. Originally described from India. The Spanish name is "caña de azúcar."

PERU: San Gaván, *Lechler* 2148, cultivated.

BOLIVIA: Espiritu Santo, *Buchtien* 2514, stated to be growing wild on river banks.

111. ERIOCHRYSIS Beauv.

Spikelets awnless, the sessile spikelets perfect, the pedicellate spikelets pistillate, smaller but fruitful, readily falling, the rachis rather tardily dis-jointing; racemes short, crowded in a narrow interrupted sometimes spikelike panicle; spikelets long-villous at base.

Blades velvety; panicle dense, golden brown.....1. *E. cayennensis*.

Blades not velvety; panicle rather loose (when dry), pale or tawny.

2. *E. warmingiana*.

1. *Eriochrysis cayennensis* Beauv. Ess. Agrost. 8. pl. 4. f. 11. 1812.

An erect unbranched perennial 1 to 2 meters or more tall, the long narrow blades densely velvety, the compact, silky, golden brown panicle 10 to 12 cm. long. The so-called pistillate spikelets are cleistogamous, containing small anthers that remain included.

Moist slopes and savannas, southern Mexico and the West Indies to Uruguay. The type locality is presumably Cayenne, French Guiana, though no locality is mentioned in the original description.

BOLIVIA: Río Piray, *Herzog* 1413. Buena Vista, *Steinbach* 5174, 6915. Reyes, *White* 1533.

2. *Eriochrysis warmingiana* (Hack.) Kuhl. Comm. Linhas Telegraph Estrat. Matto Grosso 67: 29. 1922.

Saccharum warmingianum Hack. in Mart. Fl. Bras. 2^a: 254. pl. 60. 1883.

An erect caespitose perennial about 1 meter tall, with bearded nodes, narrow, loosely involute blades, and a narrow interrupted panicle about 15 cm. long, the racemes 1 to 2 cm. long, overlapping; spikelets 4 mm. long, acutish, the first glume villous toward the tip.

Grassy plains, Brazil, whence originally described, to Paraguay and Bolivia.

BOLIVIA: Buena Vista, *Steinbach* 7032.

112. ERIANTHUS Michx.

Spikelets all perfect, awned, woolly; rachis disarticulating; racemes arranged in a large dense panicle.

Anthers scarcely 1 mm. long (usually remaining in the spikelet after anthesis); panicle pale, mostly more than 30 cm. long, included at base in the somewhat inflated upper sheath; blades mostly more than 1 cm. wide....1. *E. trinitii*.

Anthers 2 to 2.5 mm. long; panicle less than 30 cm. long, finally exerted from the scarcely inflated sheath, the spikelets often purplish; blades mostly less than 1 cm. wide.....2. *E. angustifolius*.

1. *Erianthus trinitii* (Hack.) Hack. in DC. Monogr. Phan. 6: 135. 1889.

Erianthus saccharoides var. *trinitii* Hack. in Mart. Fl. Bras. 2^a: 258. 1883.

A stout perennial 2 to 3 meters tall, with appressed-pubescent sheaths, densely appressed-hispid nodes, and flat pubescent or scabrous blades 1.5

cm. wide; panicle 30 to 40 cm. long, dense, tawny, inclosed in the inflated sheath until maturity, the culm below the panicle densely pubescent; spikelets hidden by the abundant callus hairs, cleistogamous.

Low open ground, Colombia to Brazil and Paraguay. Originally described from Brazil.

BOLIVIA: Coripata, *Hitchcock* 22682.

2. *Erianthus angustifolius* Nees, *Agrost. Bras.* 316. 1829.

Erianthus saccharoides subsp. *angustifolius* Hack. in *Mart. Fl. Bras.* 2^o: 258. 1883.

Erianthus saccharoides subsp. *biaristatus* Hack. in *Mart. Fl. Bras.* 2^o: 258. 1883.

A slender perennial about 1 meter tall, with narrow, elongate, scabrous or pubescent blades 4 to 8 mm. wide, and rather narrow, tawny or purplish panicle mostly 15 to 25 cm. long; spikelets 6 to 7 mm. long, the callus hairs about as long, not so dense as in *E. trinti*; awn straight, 5 to 10 mm. long.

Moist open ground, Brazil to Bolivia and Paraguay. Originally described from southern Brazil.

BOLIVIA: San José, *Hitchcock* 22737. Reyes, *White* 1208.

In *White's* no. 1208 some of the spikelets are 2-awned, the second awn arising from the sterile lemma, the specimen thus being referable to Hackel's subspecies *biaristatus*.

113. ANDROPOGON L.

Sessile spikelet perfect, usually awned; pedicellate spikelet staminate or neuter; rachis articulate; racemes solitary, digitate, or approximate along a continuous main axis.

Racemes solitary at the ends of the culms or branches, from bractlike sheaths; rachis joints clavate, the summit with a cuplike hollow. (Subgenus SCHIZACHYRIUM.)

Plants annual; culms weak, decumbent.....1. *A. brevifolius*.

Plants perennial; culms mostly erect, often stout.

Rachis conspicuously flexuous, very slender, the spikelets spreading.

2. *A. condensatus*.

Rachis straight, the spikelets appressed or narrowly ascending.

Spikelets awnless; racemes 1 to 2 cm. long, partly inclosed in the subtending spathe, numerous, aggregate in a narrow panicle.

3. *A. virgatus*.

Spikelets awned; racemes more than 2 cm. long.

First glume of sessile spikelet villous.....4. *A. hirtiflorus*.

First glume of sessile spikelet glabrous or nearly so.

Rachis joints glabrous.....6. *A. semiberbis*.

Rachis joints ciliate on one side.

Sessile spikelet about 4 mm. long, 1 mm. wide.....7. *A. tener*.

Sessile spikelet 5 to 6 mm. long.....5. *A. cirratus*.

Racemes 2 or more together at the ends of the culms or branches; rachis joints not clavate with hollowed summits.

Racemes numerous or several along an axis, forming an exserted panicle.

Spikelets awnless.....9. *A. hassleri*.

Spikelets awned.

Panicle mostly less than 10 cm. long, silvery white, culms mostly not more than 1 meter tall.....8. *A. saccharoides*.

Panicle 10 to 20 cm. long, greenish rather than silvery white; culms 1.5 to 2 meters tall, mostly solitary.....10. *A. altus*.

Racemes 2 to 4 (rarely 5 or 6), fasciated at the ends of slender branches, subtended by a bladeless sheath (spathe), exerted or partially included, the fascicles usually numerous.

Spikelets awnless.

Plants robust, 1 to 2 meters tall; spathes aggregate in a corymbose, usually dense inflorescence.....11. *A. bicornis*.

Plants slender, usually less than 1 meter tall; spathes not aggregate.

Sessile spikelets about 3 mm. long; blades usually not more than 2 mm. wide, the apex acuminate.....12. *A. leucostachyus*.

Sessile spikelets about 4 mm. long; blades 3 to 5 mm. wide, the apex boat-shaped.....13. *A. selloanus*.

Spikelets awned.

Sessile spikelet 4 to 5 mm. long.

Pedicellate spikelet as large as the sessile one.....14. *A. lateralis*.

Pedicellate spikelet reduced.....15. *A. aequatoriensis*.

Sessile spikelet 6 mm. long.....16. *A. glaucescens*.

1. *Andropogon brevifolius* Swartz, Prodr. Veg. Ind. Occ. 26. 1788.

A slender, trailing or reclining, glabrous, branching annual, with flat obtuse spreading blades and delicate racemes with small spikelets, the awns about 8 mm. long.

Moist banks, tropical regions of both hemispheres. Originally described from Jamaica.

ECUADOR: Panigón Plantation, *Hitchcock* 20566. Huigra, *Hitchcock* 20767.

PERU: Colonia Perené, *Hitchcock* 22113.

2. *Andropogon condensatus* H. B. K. Nov. Gen. & Sp. 1: 188. 1816.

Cymbopogon condensatus Spreng. Syst. Veg. 1: 289. 1825.

Andropogon benthamianus Steud. Syn. Pl. Glum. 1: 382. 1854. (*Hartweg* 1460.)

Andropogon lechleri Steud.; Hack. in Mart. Fl. Bras. 2^e: 297. 1883. (*Lechler* 1860.)

A tall robust tufted perennial with compressed culms, repeatedly branching toward the summit, forming a large corymbose mass of racemes with very flexuous rachises and delicate awns about 12 mm. long. On dry or rocky slopes the plants may be only 30 cm. tall, while under favorable conditions they may be more than 1 meter in height.

Open, rather dry ground, eastern Mexico and the southern West Indies to Argentina. Originally described from Colombia.

ECUADOR: Quito, *Harteman* 64a, 81. Baños, *Hitchcock* 21911 (small form); *Holmgren* 332; *Tate* 601. Portovelo, *Hitchcock* 21278. Perucho, *Hartweg* 1459 (Kew Herb.); 1460 (Kew Herb.), panicles much condensed.

PERU: Huánuco, *Macbride* 3518. Colonia Perené, *Hitchcock* 22077. San Miguel, *Cook & Gilbert* 1132. Tabina, *Lechler* 1860. Quebrada of Parlahuanca, *Mathews* 935 (Kew Herb.). Without locality, *Pöppig* 966.

BOLIVIA: Chulumani, *Hitchcock* 22656, 22707; *Buchtien* 2551. La Florida, *Hitchcock* 22618, 22636, 22637, 22639; *Holway* 679. Yanacachi, *Buchtien* 434. Villa Aspiazu, *Holway* 686½. Coroico, *Buchtien* 6447. Milluhuaya, *Buchtien* 4261. Yungas, *Bang* 276. Mapiri, *Buchtien* 1151. Espiritu Santo, *Buchtien* 6448. Buena Vista, *Steinbach* 6809, 6950, 6951, 6952, 6953. Without locality, *Mulford Biol. Expt.* 298.

3. *Andropogon virgatus* Desv.; Hamilt. Prodr. Pl. Ind. Occ. 9. 1825.

Andropogon spathiflorus Kunth, Enum. Pl. 1: 496. 1833.

A tall glabrous tufted perennial with compressed rigid culms, long linear blades, and elongate panicles of small glabrous racemes partly inclosed in rufous or purplish spathes.

Wet sandy open swamps or savannas, West Indies and Central America to Paraguay. Originally described from the "Antilles."

BOLIVIA: Ixiamas, *White* 1124. Buena Vista, *Steinbach* 5344, 6945.

4. *Andropogon hirtiflorus* (Nees) Kunth, Rév. Gram. 2: 569. 1832.

Schizachyrium hirtiflorus Nees, Agrost. Bras. 334. 1829.

Andropogon tabina Steud.; Lechl. Berb. Amer. Austr. 56. 1857, name only. (*Lechler* 1930.)

Schizachyrium weberbaueri Pilger, Notizbl. Bot. Gart. Berlin 8: 452. 1923. (*Caraz, Weberbauer* 3017.)

Schizachyrium weberbaueri var. *minus* Pilger, Notizbl. Bot. Gart. Berlin 8: 453. 1923. (Prov. Hualgayoc, *Weberbauer* 3949; Tarma, *Weberbauer* 2384.)

A tall slender erect tufted flat-stemmed perennial, with long narrow flat blades and erect short-villous racemes, the twisted awns about 1 cm. long.

Rocky or gravelly hills or flats, Florida, through the West Indies to Paraguay. Originally described from Brazil.

ECUADOR: Quito, *Mille* 296; *Sodiro* in 1887; *Harteman* 63; *Holway* 876. Huigra, *Hitchcock* 20766. Between Loja and San Lucas, *Hitchcock* 21489. Huataxi, *Spruce* 6099 (Kew Herb.).

PERU: Mito, *Macbride* 3325. Río Blanco. *Macbride & Featherstone* 994. Tarma, *Hitchcock* 22147. Tabina, *Lechler* 1930.

BOLIVIA: Sorata, *Mandon* 1384, 1385 (Kew Herb.). Hacienda Anacuri, *Holway* 713. Chulumani, *Hitchcock* 22658. Hacienda Casana, *Buchtien* 7134. Tres Cruces, *Herzog* 1702.

5. *Andropogon cirratus* Hack. Flora 68: 119. 1885.

Resembling *A. hirtiflorus* but the racemes more slender, and the first glume of the sessile spikelet glabrous.

Grassy plains and rocky hills, southwestern United States and Mexico; Ecuador and Peru. Originally described from New Mexico.

ECUADOR: Huigra, *Hitchcock* 20626. Baños, *Hitchcock* 21915. Huataxi, *Spruce* 6099 (Kew Herb.).

PERU: Ollantaytambo, *Hitchcock* 22526. Mito, *Macbride & Featherstone* 1423.

BOLIVIA: Tarija, *Fiebrig* 2787 (Kew Herb.).

6. *Andropogon semiberbis* (Nees) Kunth, Enum. Pl. 1: 496. 1833.

Schizachyrium semiberbe Nees, Agrost. Bras. 336. 1829.

Similar to *A. hirtiflorus*, stouter, taller, often glaucous; blades up to 5 mm. wide; racemes numerous toward the summit of the culm.

Grassy hills and savannas, Florida, through the West Indies to Brazil. Originally described from Brazil.

ECUADOR: Portovelo, *Hitchcock* 21261, 21271. Between Portovelo and El Tambo, *Hitchcock* 21313.

7. *Andropogon tener* (Nees) Kunth, Rév. Gram. 2: 565. 1832.

Schizachyrium tenerum Nees, Agrost. Bras. 336. 1829.

Andropogon gracilis Presl, Rel. Haenk. 1: 336. 1830.

Andropogon preslii Kunth, Enum. Pl. 1: 489. 1833.

Similar to *A. hirtiflorus*, densely tufted, more slender, the blades narrower, more or less involute, the numerous slender racemes rarely 5 cm. long.

Grassy hills and rocky cliffs, southern United States to Argentina. Originally described from Brazil.

BOLIVIA: Sorata, *Mandon* 1383 (Kew Herb.). Camacho, *Fiebrig* 2859. Tarija, *Fiebrig* 3154 (Kew Herb.).

8. *Andropogon saccharoides* Swartz, Prodr. Veg. Ind. Occ. 26. 1788.

SILVER BEARDGRASS

Andropogon kunthii Fourn. Mex. Pl. 2: 58. 1886. (Vicinity of Quito.)

A tall, erect, unbranched perennial with brittle culms, rather firm, long, flat blades, and an oblong pale silky panicle of numerous racemes, the delicate awns 1.5 to 2 cm. long; nodes bearded with stiff white hairs; sessile spikelets about 5 mm. long. The blades may be glabrous or villous.

Rocky hills and grassy slopes, southwestern United States and West Indies to Argentina. Originally described from Jamaica.

BOLIVIA: Cochabamba, *Hitchcock* 22794. La Paz, *Holway* 470.

8a. *Andropogon saccharoides laguroides* Hack. in Mart. Fl. Bras. 2^a: 293. 1883.

Andropogon laguroides DC. Cat. Hort. Monsp. 78. 1813.

Differs from *A. saccharoides* in having glabrous nodes, usually less robust and lower culms, and smaller panicles.

Grassy plains and slopes, southwestern United States to Argentina. Originally described from Mexico.

ECUADOR: Between Huigra and Naranjapata, *Hitchcock* 20660. Portovelo, *Hitchcock* 21251.

PERU: Mayo River, *Spruce* 4854 (Kew Herb.).

BOLIVIA: Cochabamba, *Hitchcock* 22823; *Herzog* 2070.

8b. *Andropogon saccharoides parvispiculus* Hitchc., subsp. nov.

Differing from *A. saccharoides* in having a longer, gray or purplish panicle of smaller (3 to 4 mm. long) spikelets; blades pubescent or glabrous.

Type in the U. S. National Herbarium, no. 1,163,461, collected along an irrigation ditch, near Cochabamba, Bolivia, January 5, 1924, by A. S. Hitchcock (no. 22851).

Open ground, cultivated soil, and grassy slopes, Brazil to Argentina and Ecuador.

ECUADOR: Between Malchinguí and Pomasqui, *Hitchcock* 20903. Quito, *Holway* 903; *Sodi* 298; *Harteman* 24, 60. Ambato, *Hitchcock* 21713. Huigra, *Hitchcock* 20328; *Rose* 22647. Between Huigra and Naranjapata, *Hitchcock* 20653. Quito, *Jameson* 320 (Kew Herb.). Huataxi, *Spruce* 6100 (Kew Herb.).

PERU: Huánuco, *Haenke*. Lima, *Wilkes Expl. Exped.* Tarma, *Hitchcock* 22166. Cuzco, *Hitchcock* 22499.

BOLIVIA: Sorata, *Mandon* 1389. La Florida, *Hitchcock* 22615. La Paz, *Buchtien* 574; *Bang* 102. Cochabamba, *Hitchcock* 22794½, 22851; *Herzog* 2071; *Holway* 392.

This is included by Hackel⁴³ under *A. saccharoides* β *barbinodis*, based on *A. barbinodis* Lag. (type from Mexico), but is not the same as Lagasca's species, the latter being the same as *A. saccharoides* Swartz. It appears also to be included in *A. kunthii* Fourn.,⁴⁴ which is based on *A. argenteus* as described by Kunth,⁴⁵ which Fournier differentiates from the Mexican *A. argenteus*

⁴³ DC. Monogr. Phan. 6: 494. 1889.

⁴⁴ Mex. Pl. 2: 59. 1886.

⁴⁵ H. B. K. Nov. Gen. & Sp. 1: 188. 1816.

DC. (*A. saccharoides* Swartz). Kunth's description, however, based on plants from Ecuador, applies to *A. saccharoides*, while his statement concerning a variety with smaller spikelets probably applies to the subspecies *parvispiculus* described above.

8c. *Andropogon saccharoides perforatus* (Trin.) Hack. in DC. Monogr. Phan. 6: 496. 1889.

Andropogon perforatus Trin.; Fourn. Mex. Pl. 2: 59. 1886.

First glume bearing a small pit or depression on the back above the middle; otherwise resembling *A. saccharoides*.

Plains and hills, Texas to Argentina. Originally described from Mexico.

ECUADOR: Huigra, *Hitchcock* 20616, 20753. Between Huigra and Naranjapata, *Hitchcock* 20655.

PERU: Callao, *Wilkes Expl. Exped.* Chosica, *Holway* 783. Matucana, *Macbride & Featherstone* 255. Tarma, *Hitchcock* 22166½. Tabina, *Lechler* 1952.

BOLIVIA: Cochabamba, *Holway* 325. Comarapa, *Herzog* 1854.

In Mexican Grasses⁴⁰ this form was held to be a distinct species. The typical form has more distinctly flabellate panicles, larger spikelets, and more pronounced pits than the Andean specimens.

9. *Andropogon hassleri* Hack. Bull. Herb. Boiss. II. 4³: 266. 1904.

Andropogon saccharoides var. *hassleri* Ekman, Ark. för Bot. 11⁴: 8. 1912.

Resembling *A. saccharoides laguroides*; culms slender, about 1 meter tall, the nodes glabrous; spikelets awnless; panicle oblong, about 10 cm. long.

Grassy slopes, Paraguay, whence originally described, and Bolivia.

BOLIVIA: Coroico, *Buchtien* 3621. Chulumani, *Hitchcock* 22659.

10. *Andropogon altus* Hitchc. Contr. U. S. Nat. Herb. 17: 208. 1913.

Resembling *A. saccharoides*; culms stout, 1 to 2 meters tall, the nodes bearded; panicle oblong, 10 to 25 cm. long, greenish, less villous than usual in *A. saccharoides*; first glume pitted.

Dry slopes and grassy hills, Mexico and Bolivia. Originally described from Mexico.

BOLIVIA: Hacienda Anacuri, *Holway* 709. Milluhuaya, *Buchtien* 4258. Chulumani, *Hitchcock* 22651, 22705.

11. *Andropogon bicornis* L. Sp. Pl. 1046. 1753.

A tall robust tufted perennial, with long linear blades, scabrous on the margin, and large feathery corymbose inflorescence of delicate racemes, one, sometimes two, of the uppermost pediceled spikelets larger than the fertile ones, the other pediceled spikelets rudimentary.

Grassy hills and banks, southern Mexico to Paraguay. The type is from Jamaica.

ECUADOR: Quito, *Sodiolo* 295. Between Huigra and Naranjapata. *Hitchcock* 20677. Portovelo, *Hitchcock* 21274.

PERU: Colonia Perené, *Hitchcock* 22051.

BOLIVIA: Sorata, *Mandon* 1388 (Kew Herb.). Ixiamas, *White* 1126. Mapiri, *Buchtien* 1152. Hacienda Casana, *Buchtien* 7137. Villa Aspiazu, *Holway* 686. Yanacachi, *Buchtien* 412. La Florida, *Hitchcock* 22617. Coroico, *Buchtien* 6446. Milluhuaya, *Buchtien* 4259. Hacienda Simaco, *Buchtien* 5311, 5312. Buena Vista, *Steinbach* 5274, 6949. Without locality, *Cárdenas (Mulford Biol. Expl.)* 2143.

⁴⁰ Contr. U. S. Nat. Herb. 17: 207. 1913.

12. *Andropogon leucostachyus* H. B. K. Nov. Gen. & Sp. 1: 187. 1816.*Andropogon lanuginosus* H. B. K. Nov. Gen. & Sp. 1: 187. 1816.

A slender, densely tufted, erect perennial, the elongate blades with a deeply impressed mid-vein; racemes 2 or 3 on slender exserted peduncles, the spikelets obscured by the copious long silky hairs.

Cliffs and grassy slopes, West Indies and southern Mexico to Ecuador and Uruguay. Originally described from Venezuela.

ECUADOR: Portovelo, *Hitchcock* 21263.

BOLIVIA: Hacienda Casana, *Buchtien* 7136. Coroico, *Buchtien* 3618. Yanacachi, *Buchtien* 411. Buena Vista, *Steinbach* 6845, 6846. Reyes, *Rusby* (*Mulford Biol. Expl.*) 1321. La Florida, *Hitchcock* 22642. Milluhuaya, *Buchtien* 4260.

13. *Andropogon selloanus* (Hack.) Hack. Bull. Herb. Boiss. II. 4: 266. 1904.*Andropogon leucostachyus* var. *selloanus* Hack. in DC. Monogr. Phan. 6: 420. 1889.

Similar to *A. leucostachyus*, stouter, the blades shorter, broader, and with a boat-shaped tip; racemes often 5 or 6, more copiously villous.

Savannas and open ground, West Indies to Peru and Paraguay. Originally described from Brazil.

PERU: Colonia Perené, *Hitchcock* 22096.

BOLIVIA: Buena Vista, *Steinbach* 5143, 6723, 6874, 6971b.

14. *Andropogon lateralis* Nees, Agrost. Bras. 329. 1829.*Andropogon incanus* var. *lateralis* Hack. in Mart. Fl. Bras. 2^a: 288. 1883.

An erect glabrous usually rich purple perennial 60 to 100 cm. tall, with flat blades 3 to 6 mm. wide, and few to several exserted inflorescences of 2 to 4 racemes 3 to 4 cm. long; joint and sterile pedicel villous; sessile spikelet 4 to 5 mm. long, purplish, the awn about 1 cm. long; sterile spikelet about as long as the fertile.

Rocky slopes, Brazil, whence originally described, to Peru and Uruguay.

PERU: Tarma, *Hitchcock* 22143.

BOLIVIA: Santa Cruz, *Herzog* 1302. Buena Vista, *Steinbach* 5427, 6851.

14a. *Andropogon lateralis incanus* (Hack.) Henr. Med. Rijks Herb. Leiden 40: 42. 1921.*Andropogon incanus* Hack. in DC. Monogr. Phan. 6: 431. 1889.

Differing from *A. lateralis* in having mostly 2, somewhat longer, tawny and more villous racemes.

Grassy hills, Ecuador to Uruguay. Originally described from Brazil.

ECUADOR: Baños, *Hitchcock* 21919. Between El Tambo and La Toma, *Hitchcock* 21335.

PERU: Mito, *Macbride & Featherstone* 1499, 1611; *Macbride* 3323. Tarma, *Hitchcock* 22156.

15. *Andropogon aequatoriensis* Hitchc., sp. nov.

Perennial; culms cespitose, erect, glabrous, about 1 meter tall, branched above; sheaths glabrous; ligule truncate, glabrous, 1 to 2 mm. long, the margin minutely lacerate; blades flat, glabrous, scaberulous on the margin, 15 to 30 cm. long, 3 to 8 mm. wide, gradually narrowed to an involute scabrous tip; fascicles of racemes terminating the numerous slender erect branches, forming a narrow compound inflorescence about one-third as long as the entire plant; peduncles slender, glabrous, 5 to 10 cm. long, finally exserted from the spathes, the spathe tips scarcely inflated; racemes 2 or 3 in a fascicle, somewhat flexuous, 2 to 3 cm. long, mostly unequal in length; joints of rachis about

3 mm. long, slender, long-villous, especially toward the apex, the base, including the callus of the fertile floret, densely short-pilose; sessile floret about 5 mm. long, glabrous; first glume lanceolate-oblong, depressed between the nerves, scabrous on the nerves toward the tip; awn exerted about 5 mm., flexuous; sterile pedicel a little longer than the joint of the rachis and closely resembling it; sterile spikelet reduced to a bract about 1 mm. long.

Type in the U. S. National Herbarium, no. 1,163,457, collected on grassy slopes, between Loja and San Lucas, Ecuador, altitude about 2,500 meters, September 6, 1923, by A. S. Hitchcock (no. 21481).

No other specimen has been seen. The species resembles *A. lateralis*, but in that species the sterile floret is about as large as the fertile one, while in *A. aequatoriensis* it is much reduced.

16. *Andropogon glaucescens* H. B. K. Nov. Gen. & Sp. 1: 186. 1816.

Andropogon amplus Presl, Rel. Haenk. 1: 339. 1830.

Differing from *A. lateralis* in the larger sessile spikelet; first glume 6 mm. long, sulcate on the back, gradually narrowed at the summit.

Grassy slopes, Brazil to Ecuador, whence originally described. (Chillo, Bonpland.)

ECUADOR: Chillo, *Sodi* in 1890. Quito, *Jameson* 316 (Kew Herb.)

ANDROPOGON FLAVESCENS Presl, Rel. Haenk. 1: 339. 1830. In the U. S. National Herbarium there is a fragment of the inflorescence from the type specimen, from Huánuco, Peru, in the National Museum at Prague. It differs from *A. glaucescens* chiefly in the denser fulvous pubescence. No other specimen has been seen.

ANDROPOGON ALTERNANS Presl, Rel. Haenk. 1: 342. 1830. The locality is given as Peru. The type specimen in the herbarium of the German University at Prague is labeled Luzon. It belongs to *Rhaphis parviflora* (R. Br.) Chase (*Andropogon micranthus* Kunth).

114. HYPARRHENIA Anderss.

Racemes in pairs, subtended by spathes, mostly in a compound inflorescence, differing from *Andropogon* in having the lower pair of at least one of the racemes with two similar sterile awnless spikelets, the other pairs consisting of a sessile fertile awned spikelet and a pediceled sterile awnless spikelet, the callus of the fertile spikelet elongate, acute; margins of the first glume of the fertile spikelet involute rather than inflexed and 2-keeled as in *Andropogon*; awn from the sinus of the bifid fertile lemma.

1. *Hyparrhenia bracteata* (Humb. & Bonpl.) Stapf in Prain, Fl. Trop. Afr. 9: 360. 1918.

Andropogon bracteatus Humb. & Bonpl.; Willd. Sp. Pl. 4: 914. 1806.

Anthistiria pilosa Presl, Rel. Haenk. 1: 348. 1830. (Mountains of Huánuco, Peru, *Haenke*).

An erect perennial a meter or more tall, the sheaths more or less hispid, especially near the summit, the blades long and narrow, appressed-hispid beneath, the narrow brown inflorescence commonly 30 cm. or more long; bracts or spathes of the pairs of racemes narrow, 1 to 2 cm. long, the few-flowered racemes mostly less than 1 cm. long, the strongly bent awns about 2 cm. long.

Savannas, southern Mexico to Brazil. Originally described from Venezuela.

ECUADOR: Portovelo, *Hitchcock* 21260, 21314.

PERU: Santa Ana, *Cook & Gilbert* 1638.

BOLIVIA: Chulumani, *Hitchcock* 22704. Ixiamas, *White* 1125. Reyes, *Rusby* 189.

Cymbopogon citratus (DC.) Stapf, the lemon grass, is occasionally cultivated in tropical America. It is a robust aromatic perennial with a large compound inflorescence of small awnless or obscurely awned racemes. The essential oil is used in perfumery. A native of Asia. American specimens are all sterile. Santa Ana, Peru, *Cook & Gilbert* 1529 (called "yerba Luisa").

115. *HOLCUS* L.

Racemes reduced to 1 to 5 joints, borne on slender peduncles on the slender branches of a compound panicle; rachis slender, tardily disjuncting; spikelets arranged as in *Andropogon*, the pedicellate spikelet usually staminate, the sessile spikelets awnless or with a deciduous awn.

Plants perennial, with creeping rhizomes.....1. *H. halepensis*.
Plants annual.....2. *H. sorghum*.

1. *Holcus halepensis* L. Sp. Pl. 1047. 1753. JOHNSON GRASS.

Andropogon halepensis Brot. Fl. Lusit. 1: 89. 1804.

Sorghum halepensis Pers. Syn. Pl. 1: 101. 1805.

A robust perennial with numerous stout rhizomes, flat scabrous-margined blades, and a large open panicle of plump spikelets with deciduous awns, or awnless.

A weed in fields and waste places in the warmer parts of America; introduced from the Old World. Originally described from Syria.

PERU: Santa Ana, *Cook & Gilbert* 1428, 1514. Lima, *Hitchcock* 22347 (awnless), 22348 (awned).

2. *Holcus sorghum* L. Sp. Pl. 1047. 1753. SORGHUM.

Andropogon sorghum Brot. Fl. Lusit. 1: 88. 1804.

Sorghum vulgare Pers. Syn. Pl. 1: 101. 1805.

A large broad-leaved annual, with a compact or open panicle of turgid persistent spikelets.

Widely cultivated in the warmer regions of both hemispheres and sometimes spontaneous. Originally described from India.

BOLIVIA: Coroico, *Buchtien* 3615. Sorata, *Mandon* 1390, cultivated (Kew Herb.).

116. *SORGHASTRUM* Nash

Racemes arranged as in *Holcus*, the pedicellate spikelet wanting, only the pedicel present; rachis flexuous, readily disjuncting.

Awns about 6 cm. long, chestnut brown.....1. *S. minarum*.
Awns less than 2 cm. long.

Awn straight or once geniculate, not strongly spirally twisted at base, shorter than the spikelet or sometimes a little longer (5 to 7 mm.)

2. *S. parviflorum*.

Awn twice geniculate, strongly spirally twisted at base, about three times as long as the spikelet.....3. *S. stipoides*.

1. *Sorghastrum minarum* (Nees) Hitchc.

Trachypogon minarum Nees, Agrost. Bras. 349. 1829.

Andropogon minarum Kunth, Rév. Gram. 1: Suppl. XL. 1830.

A slender erect perennial about 1 meter tall, with flat blades and spike-like panicles 10 to 15 cm. long, the chestnut-brown awns 6 cm. long, twice-geniculate, tightly twisted below, the fruit resembling that of *Stipa*.

Plains and open grassland, Brazil, whence originally described, to Paraguay and Bolivia.

BOLIVIA: Buena Vista, *Steinbach* 5430, 7028.

2. *Sorghastrum parviflorum* (Desv.) Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 287. 1917.

Sorghum parviflorum Desv.; Hamilt. Prodr. Pl. Ind. Occ. 12. 1825.

Andropogon agrostoides Speg. Anal. Soc. Cienc. Argentina 16: 136. 1883.

Andropogon nutans var. *submuticus* Hack. in DC. Monogr. Phan. 6: 529. 1889.

Andropogon nutans var. *agrostoides* Hack. in DC. Monogr. Phan. 6: 529. 1889.

A tall, erect tufted glabrous perennial, with long, flat, or subinvolute blades and long lanceolate panicles with slender or subcapillary branchlets and peduncles and golden-brown spikelets, the ultimate peduncles, the sterile pedicels, and the base of the spikelet clothed with white hairs; awn rather weak, exserted 5 to 7 mm.

Grassy hillsides, southern Mexico and the West Indies to Argentina. Originally described from Hispaniola.

BOLIVIA: Buena Vista, *Steinbach* 5428, 6984, 7050b. Rio Piray, *Herzog* 1656.

3. *Sorghastrum stipoides* (H. B. K.) Nash, N. Amer. Fl. 17: 129. 1912.

Andropogon stipoides H. B. K. Nov. Gen. & Sp. 1: 189. 1816.

Andropogon nutans var. *stipoides* Hack. in DC. Monogr. Phan. 6: 530. 1889.

More slender than the preceding, the narrower blades convolute, the spikelets slightly larger, and the awns well developed, twice geniculate, exserted 10 to 15 mm.

Grassy hillsides, Cuba to Argentina. Originally described from Colombia.

BOLIVIA: Sorata, *Mandon* 1382 (Kew Herb.). Valle Grande, *Herzog* 1789.

117. HETEROPOGON Pers.

Racemes solitary or fascicled, the lower part of the rachis not disjoining, bearing 2 to 5 pairs of staminate awnless spikelets, the upper part of the rachis disarticulating obliquely at the base of each joint, each forming a sharp callus below the long-awned sessile perfect spikelet, the pedicellate spikelet staminate.

Racemes 2 to 7 (sometimes solitary on the branches)-----1. *H. villosus*.
Racemes solitary.

Plants perennial, less than 1 meter tall; outer glume of staminate spikelet more or less hispid-----2. *H. contortus*.

Plants annual, more than 1 meter tall; outer glume of staminate spikelet provided with a row of glands along the back, not pilose.

3. *H. melanocarpus*.

1. *Heteropogon villosus* Nees, Agrost. Bras. 362. 1829.

Andropogon neesii Kunth, Rév. Gram. 1: Suppl. XXXIX. 1830.

Andropogon villosus Ekman, Ark. för Bot. 11⁴: 9. 1912. Not *A. villosus* Thunb. 1794.

An erect or decumbent-spreading perennial as much as 1 meter tall, with villous nodes, flat blades, and exserted panicles of 2 to several villous subdigitate racemes on slender, drooping or S-shaped peduncles about 1 cm. long; first glume of sessile spikelet rounded on the margins, not keeled; awn stipitiform at base, 3 to 5 cm. long.

Dry plains and grassy slopes, Brazil, whence originally described, to Paraguay and Bolivia.

BOLIVIA: Santa Cruz, *Herzog* 1308.

Hackel⁴ places this species in the subgenus *Dichanthium*, but states that it is closely related to the subgenus *Heteropogon* and that if the racemes were always solitary, as they often are on the branches, it would be a true *Heteropo-*

⁴ DC. Monogr. Phan. 6: 581. 1889.

gon. The species resembles *Euclasta condylotricha* (Hochst.) Stapf (*Andropogon piptatherus* Hack.) in the fascicled racemes on nodding peduncles, but in the latter the first glume of the fertile spikelets is compressed dorsally, the edges are sharply inflexed and keeled, and the callus short and obtuse. In *Heteropogon villosus* the first glume of the fertile floret is indurate and little compressed, the edges are rounded and incurved but not keeled, and the callus is long, sharp, and villous, as in the other species of *Heteropogon*.

2. *Heteropogon contortus* (L.) Beauv.; Roem. & Schult. Syst. Veg. 2: 836. 1817.

Andropogon contortus L. Sp. Pl. 1045. 1753.

An erect tufted branching perennial, with compressed culms, keeled sheaths, scabrous blades, and solitary 1-sided racemes about 5 cm. long, the strong brown bent awns as long again.

Rocky slopes, warmer parts of both hemispheres. Originally described from India.

ECUADOR: Huigra, *Hitchcock* 20628. Huataxi, *Spruce* 6094 (Kew Herb.).

PERU: Huánuco, *Macbride* 3239.

BOLIVIA: Camataqui, *Fiebrig* 3074. Sorata, *Mandon* 1387 (Kew Herb.). Tarija, *Fries* 1214.

3. *Heteropogon melanocarpus* (Ell.) Benth. Journ. Linn. Soc. Bot. 19: 71. 1882.

Andropogon melanocarpus Ell. Bot. S. C. & Ga. 1: 146. 1816.

A stout, often glaucous annual 1.5 to 2.5 meters tall, with blades as much as 1 cm. wide, and several racemes crowded in the upper leaves, forming a rather dense inflorescence 20 to 30 cm. long.

Grassy slopes and open ground, southern United States to Bolivia, and in the tropical regions of the Old World. Originally described from Georgia.

ECUADOR: Huigra, *Hitchcock* 20329, 20621.

PERU: Tarapoto, *Spruce* 4180 (Kew Herb.).

BOLIVIA: Coripata, *Hitchcock* 22678. Chulumani, *Hitchcock* 22706.

118. TRACHYPOGON Nees

Perfect spikelet awned, pedicellate, the pedicel disjuncting obliquely, forming a sharp callus below the spikelet; staminate spikelet sessile, persistent on the slender continuous rachis; racemes solitary or few to several digitate.

Blades villous.....3. *T. canescens*.
Blades scabrous.

Racemes solitary, rarely 2, on each culm; awn densely soft pubescent below.

1. *T. montufari*.

Racemes 2 or 3, rarely solitary; awn sparsely plumose with long hairs below.

2. *T. plumosus*.

1. *Trachypogon montufari* (H. B. K.) Nees, Agrost. Bras. 342. 1829.

Andropogon montufari H. B. K. Nov. Gen. & Sp. 1: 184. 1816.

Trachypogon polymorphus var. *montufari* Hack. in Mart. Fl. Bras. 2^a: 264. 1883.

Trachypogon polymorphus var. *bolivianus* Pilger, Bot. Jahrb. Engler 27: 22. 1899. (*Bang* 1079).

Trachypogon plumosus var. *montufari* Hack.; Henr. Med. Rijks Herb. Leiden 40: 40. 1921.

A slender erect perennial 50 to 100 cm. tall, with narrow scabrous blades, a firm ligule as much as 1 cm. long, and a single slender dense long-exserted

raceme; first glume pubescent, obtuse; awn of fertile lemma twice geniculate, 3 to 5 cm. long, pubescent but not plumose.

Dry plains and grassy hills, Arizona through Mexico to Uruguay. Originally described from near Quito. (*Bonpland.*)

ECUADOR: Between Loja and San Lucas, *Hitchcock* 21469. Hulgra, *Hitchcock* 20752. Quito, *Harteman* 64. Portovelo, *Hitchcock* 21270.

PERU: Tarma, *Hitchcock* 22148. Mito, *Macbride & Featherstone* 1447; *Macbride* 3430.

BOLIVIA: Cochabamba, *Hitchcock* 22831. "Bolivian Plateau," *Bang* 1079. Tres Cruces, *Herzog* 1693. Samaipata, *Herzog* 1705. Buena Vista, *Steinbach* 5379. Camacho, *Fiebrig* 2864 (*Kew Herb.*).

2. *Trachypogon plumosus* (Humb. & Bonpl.) Nees, *Agrost. Bras.* 344. 1829. *Andropogon plumosus* Humb. & Bonpl.; Willd. *Sp. Pl.* 4: 918. 1806.

Trachypogon polymorphus var. *plumosus* Hack. in *Mart. Fl. Bras.* 2^o: 265. 1883.

Similar to *T. montufari*, usually taller; racemes 2 or 3, rarely more or only one; awn somewhat plumose.

Dry plains and grassy or rocky slopes, Mexico to Brazil and Bolivia. Originally described from Venezuela.

PERU: Huacachi, *Macbride* 4068.

BOLIVIA: Hacienda Casana, *Buchtien* 7145.

3. *Trachypogon canescens* Nees, *Agrost. Bras.* 343. 1829.

Trachypogon polymorphus var. *canescens* Hack. in *Mart. Fl. Bras.* 2^o: 263. 1883.

Resembling *T. montufari*; blades mostly involute, villous; racemes mostly solitary; awn plumose below.

Grassy plains and rocky slopes, Brazil, whence originally described, to Paraguay and Bolivia.

BOLIVIA: Buena Vista, *Steinbach* 6947.

119. ELYONURUS Humb. & Bonpl.

Spikelets in pairs, one sessile and perfect, the other pedicellate and staminate, both awnless, arranged in a solitary spike-like raceme.

First glume of sessile spikelet entire.....1. *E. adustus*.
First glume of sessile spikelet 2-toothed.....2. *E. tripsacoides*.

1. *Elyonurus adustus* (Trin.) Ekman, *Ark. för Bot.* 13¹⁰: 6. 1913.

Andropogon adustus Trin. *Mém. Acad.-St. Pétersb.* VI. *Math. Phys. Nat.* 2: 259. 1832.

Andropogon latiflorus Nees; *Steud. Syn. Pl. Glum.* 1: 364. 1854.

Elyonurus latiflorus Nees; Hack. in *Mart. Fl. Bras.* 2^o: 307. 1883.

An erect slender perennial 50 to 100 cm. tall, closely cespitose and somewhat bulbous at base, with slender, erect, elongate blades, and a raceme 5 to 10 cm. long, the spikelets villous, about 6 mm. long.

Dry plains and grassy slopes, British Guiana to Argentina. Originally described from Chile and Brazil.

PERU: Tarapoto, *Spruce* 4500 (*Kew Herb.*).

BOLIVIA: Reyes, *Cárdenas (Mulford Biol. Expl.)* 1665. Corico, *Buchtien* 3619. Hacienda Casana, *Buchtien* 7138. Buena Vista, *Steinbach* 5244, 5404, 6641, 6642, 6875.

2. *Elyonurus tripsacoides* Humb. & Bonpl.; Willd. *Sp. Pl.* 4: 941. 1806.

Elionurus ciliaris H. B. K. *Nov. Gen. & Sp.* 1: 193. *pl.* 63. 1816.

Elionurus tripsacoides var. *ciliaris* Hack. *DC. Monogr. Phan.* 6: 333. 1889.

Elionurus tripsacoides var. *brevidentatus* Hack. in DC. Monogr. Phan. 6: 334. 1889.

Resembling *E. adustus*, but the first glume 2-toothed. The spikelets may be villous (subsp. *ciliaris*) or only pubescent (subsp. *brevidentatus*). The typical form with glumes glabrous on the back has not been seen from this region.

Dry plains and slopes, Mexico to Argentina. Originally described from Venezuela.

BOLIVIA: Cochabamba, *Herzog* 2126 (*ciliaris*). Camacho, *Fiebrig* 2577. Río Guendá, *Steinbach* 6896.

120. MANISURIS L.

Sessile spikelets perfect, awnless, sunken in hollows in the thickened articulate joints of the rachis, the flat, often rugose, indurate first glume covering the hollow; pedicellate spikelet sterile, the pedicel thickened, appressed, or adnate to the rachis joint; racemes solitary.

Culms creeping and ascending, flattened; racemes compressed.

1. *M. fasciculata*.

Culms erect, terete; racemes terete-----2. *M. aurita*.

1. *Manisuris fasciculata* (Lam.) Hitchc. Amer. Journ. Bot. 2: 299. 1915.

Rottboellia fasciculata Lam. Tabl. Encycl. 1: 204. 1791.

Culms ascending from a long creeping base, compressed and 2-edged, the blades 10 to 15 cm. long, 3 to 8 mm. wide; racemes axillary, compressed, 3 to 5 or as much as 10 cm. long.

Ponds and ditches, in water or mud, Texas to Argentina; also in the warmer parts of the Old World. Originally described from North Africa; probably introduced in the Western Hemisphere.

ECUADOR: Milagro, *Hitchcock* 20279.

PERU: Chosica, *Macbride & Featherstone* 553.

BOLIVIA: Espía, *White* 627.

2. *Manisuris aurita* (Steud.) Hitchc. & Chase, Contr. U. S. Nat. Herb. 18: 276. 1917.

Rottboellia aurita Steud. Syn. Pl. Glum. 1: 361. 1854.

A stout perennial 1 to 1.5 meters tall, the erect branches with numerous slender racemes 6 to 10 cm. long, the first glume marginate and winged above, foveolate or pitted on the back.

Grassy hillsides, Brazil, whence originally described, to Trinidad and Bolivia.

BOLIVIA: Reyes, *White* 1221. Buena Vista, *Steinbach* 6973b.

121. ISCHAEMUM L.

Sessile spikelets perfect, awned; pedicellate spikelets perfect but not always fruitful; rachis disjointing; racemes 2 to several, digitate or fascicled.

1. *Ischaemum latifolium* (Spreng.) Kunth, Rév. Gram. 1: 168. 1829.

Andropogon latifolius Spreng. Syst. Veg. 1: 286. 1825.

A large stout branching annual, geniculate below, with flat glabrous blades up to 20 cm. long and 3 cm. wide, and several rather flexuous racemes in a fan-shaped cluster.

Moist shady places, southern Mexico and the Lesser Antilles to Brazil and Ecuador. Originally described from the West Indies, Guadeloupe and Martinique being mentioned.

ECUADOR: Near Cashurco, *Hitchcock* 21751.

1a. *Ischaemum latifolium hirtivaginum* Hitchc., subsp. nov.

Differs from *I. latifolium* in having pilose sheaths, the hairs 5 mm. long, yellowish, densely arranged about the nodes and along the back of the sheath, sparsely so along the margins and toward the summit.

Type in the U. S. National Herbarium, no. 1,163,404, collected along trail in tropical forest, near Cashurco, 13 kilometers east of Baños, Ecuador, altitude 1,300 meters, September 25, 1923, by A. S. Hitchcock (no. 21757).

The only other specimen seen is Hitchcock's no. 21755 from the same region as the type. In this the pubescence is less dense.

122. *HACKELOCHLOA* Kuntze

(*Rytilix* Raf.⁴⁵)

Sessile spikelets perfect, the first glume globose, indurate, alveolate, the adnate rachis joint and pedicel fitting into the opening of the glume; pedicellate spikelet relatively large, sterile.

1. *Hackelochloa granularis* (L.) Kuntze, Rev. Gen. Pl. 2: 776. 1891.

Cenchrus granularis L. Mant. Pl. 575. 1771.

Manisuris granularis Swartz, Prodr. Veg. Ind. Occ. 25. 1788.

Rytilix granularis Skeels, U. S. Dept. Agr. Bur. Pl. Ind. Bull. 282: 20. 1913.

A coarsely hispid, freely branching annual, with flat blades and numerous terminal and axillary racemes 1 to 2.5 cm. long.

A common weed throughout tropical America, introduced from the Old World. Originally described from the East Indies.

ECUADOR: Milagro, *Hitchcock* 20266. Panigón Plantation, *Hitchcock* 20565.

PERU: Colonia Perené, *Hitchcock* 22083. La Merced, *Macbride* 5452.

BOLIVIA: Milluhuaya, *Buchtien* 4189. Reyes, *White* 1215. Sorata, *Bang* 1310. Buena Vista, *Steinbach* 5301. Chulumani, *Hitchcock* 22655.

123. *TRIPSACUM* L.

Spikelets unisexual; pistillate spikelets solitary, embedded in the joints of a thickened cartilaginous articulate rachis, the indurate first glume covering the recess in the rachis, the joints readily separating at maturity; staminate spikelets in pairs at the joints of the continuous upper segment of the same rachis, this falling as a whole after anthesis. Stout perennials.

1. *Tripsacum dactyloides* (L.) L. Syst. Nat. ed. 10. 2: 1261. 1759.

Coix dactyloides L. Sp. Pl. 972. 1753.

Culms sparingly branching, about 2 meters tall, in large clumps; blades flat, up to 3 cm. wide; inflorescence of 1 to 3 erect spikes; staminate spikelets both nearly sessile, firm, obtuse.

Shady ravines and moist ground at low altitudes, central and southeastern United States, through the West Indies to Paraguay. Originally described from America, no definite locality given.

ECUADOR: Between Huigra and Naranjapata, *Hitchcock* 20643.

BOLIVIA: Coroico, *Hitchcock* 22721. Ixiamas, *White* 2324.

In *White*'s no. 2324 the culms are covered with a white felty deciduous pubescence and the nodes are appressed-hispid.

⁴⁵Bull. Bot. Seringe 1: 219. 1830. Under the provisions of the Type-basis Code *Rytilix* is not effectively published.

124. COIX L.

Spikelets unisexual; pistillate spikelets 2 or 3 together, 1 fertile and 1 or 2 rudimentary, inclosed in a bony beadlike involucre (morphologically a subtending leaf sheath); staminate spikelets approximate in threes (the third sometimes obsolete) on a slender rachis, forming a short raceme, the rachis protruding from the orifice of the involucre, these ultimate inflorescences borne on the ends of numerous branches. Broad-leaved perennials.

1. *Coix lachryma-jobi* L. Sp. Pl. 972. 1753.

JOBS-TEARS.

Freely branching, 1 meter or more tall, the cordate clasping blades 2 to 3 cm. broad, the "beads" 8 to 10 mm. long.

Moist ground and waste places at low altitudes, especially near dwellings, introduced throughout tropical America, cultivated as an ornamental and for the ivory or grayish beads; often escaped. Originally described from the East Indies.

ECUADOR: Milagro, *Hitchcock* 20194. Mount Chimborazo, *Spruce* 6127 (Kew Herb.).

PERU: Santa Ana, *Cook & Gilbert* 1424.

BOLIVIA: Espiritu Santo, *Buchtien* 2521. Yungas, *Bang* 527.

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LOCALITIES CITED

Nearly all the localities given on the labels of the specimens cited in the preceding work have been located on the maps of the region. These are listed below. A few localities have not been identified and are given in the distribution of specimens on the authority of the label only. The altitudes, especially in Bolivia, are taken from labels, and may represent points considerably above or below the city or town cited. The altitudes in Ecuador have been corrected by Wolf's *Geografía y Geología del Ecuador*, and in Peru by Weberbauer's *Pflanzenwelt der Peruanischen Anden*.

ECUADOR

- AGOYÁN. River and falls near Ambato.
ALAUÍ. On railroad between Guayaquil and Riobamba, Prov. Chimborazo, alt. 2500 meters.
ALTAR. See El Altar.
AMBATO. Capital, Prov. Tungurahua, alt. 2,600 meters.
ANGAMARCA. Prov. León, northwest of Ambato.
ANTISANA. Volcano southeast of Quito, alt. 5,756 meters.
ANTISANILLA. Hacienda, near Mount Antisana.
ATACATZO. Volcano, south of Quito, alt. 4,539 meters.
AZOGUES. Capital, Prov. Cañar.
AZUAY. Mountain, southern part Prov. Cañar.
BAHÍA DE CARAQUEZ. Prov. Manabí, mouth of Chave River.
BALAO. Seaport, southern part Prov. Guayas.
BAÑOS. Southeast of Ambato, near Volcano Tungurahua, valley of Pastasa River, alt. 1,800 meters.
BODEGAS (Babahoyo). Capital, Prov. Los Ríos.
BUCAY. On railroad east of Guayaquil at base of mountains, alt. 300 meters.
CAÑAR. Prov. Cañar, alt. 3,100 meters.
CASHURCO. East of Baños, near Mera. "Casha Urco" (Spruce).
CERRO MANGLAR ALTO. Northwestern part Prov. Guayas, east of Manglar Alto.
CHAMBO RIVER. Large river near Riobamba.
CHANCHÁN RIVER. Southern part Prov. Chimborazo.
CHANDUY. Coast, southeast of Salinas.
CHILLO. Valley, near Quito.
CHILLOGALLO. Southwest of Quito.
CHIMBORAZO. Volcano, northwest of Riobamba, alt. 6,310 meters.
CHIRA (La Chira). River, Dept. Piura.
CHOLLOGALLO. South of Quito.
CROTA RIVER. North of Ibarra.
COLTA. Lake, west of Riobamba.
CORAZÓN. Mountain, south of Quito.
COTOCALLAO. Near Quito.
COTOPAXI. Station on railroad near Volcano Cotopaxi.
COTOPAXI. Volcano, northeast of Latacunga, alt. 5,943 meters.

- CUENCA. Capital, Prov. Azuay, alt. 2,580 meters.
 CUMBE. Prov. Azuay, south of Cuenca.
 DAULE RIVER. Coastal plain.
 EL ALTAR. Mountains, east of Riobamba.
 EL RECREO. Prov. Manabí, near Cabo Pasado.
 EL TAMBO. Prov. Loja, between Zaruma and Loja.
 GUACHALÁ. Prov. Pichincha, northeast of Quito.
 GUALAQUIZA. Northeast of Loja, on Gualaquiza River.
 GUALEA. Prov. Pichincha, northwest of Quito.
 GUAMANÍ. Mountain, north of Antisana, alt. 4,447 meters.
 GUÁPULO. Nine kilometers from Quito, alt. 2,400 meters.
 GUARANDA. Capital, Prov. Bolívar.
 GUAYAQUIL. Capital, sea level.
 GUAYBAPATA. Prov. Chimborazo.
 HUANO (Guano). River, near Mount Chimborazo.
 HUATAXI (Guataxi). Ranch, near Huigra.
 HUIGRA. On railroad between Bucay and Alausí, alt. 1,200 meters.
 IBARRA. Capital, Prov. Imbabura, alt. 2,225 meters.
 IGUALATA. Mountain, between Ambato and Riobamba.
 JUNTAS, LAS. Prov. Loja, north of Loja.
 LA CHONTA. Between La Chorita and Portovelo.
 LA CHORITA. Prov. Oro, near Santa Rosa.
 LAKE COLTA. Prov. Chimborazo, west of Riobamba.
 LA MAGDALENA. Near Quito.
 LA RINCONADA RANCH. Prov. Carchi, southwest of Tulcán, alt. 3,000 meters.
 LATACUNGA. Capital, Prov. León, alt. 2,800 meters.
 LA TOMA. Prov. Loja, northwest of Loja, alt. 1,457 meters.
 LLOA. Prov. Pichincha, west of Quito.
 LOJA. Capital, Prov. Loja, alt. 2,220 meters.
 LUISA. On railroad west of Riobamba.
 MACHALA. Capital, Prov. Oro.
 MALCHINGUÍ. Prov. Pichincha, north of Quito, alt. 2,878 meters.
 MERA. East of Baños, on Pastasa River.
 MILAGRO. On railroad between Guayaquil and Bucay, alt. 50 meters.
 NABÓN. Prov. Azuay, south of Cuenca, alt. 2,765 meters.
 NANEGAL. Prov. Pichincha, northwest of Quito.
 NAPO RIVER. Flowing east from the Cotopaxi region.
 NARANJAL. On Daule River.
 NARANJAPATA. On railroad between Bucay and Huigra.
 NARANJITO. On railroad east of Milagro.
 NIEBLÍ. Prov. Pichincha, north of Quito.
 NONO. Prov. Pichincha, northwest of Quito.
 OÑA. Prov. Azuay, alt. 2,552 meters.
 OTAVALO. Prov. Imbabura, alt. 2,580 meters.
 PANACILLO. Hill, near Quito.
 PANIGÓN PLANTATION. Twelve kilometers south of Milagro.
 PEBIPA. Prov. Pichincha, on upper Palenque River.
 PERUCHO. Prov. Pichincha, north of Quito.
 PICHINCHA. Mountain, near Quito, alt. 4,500 meters.
 PIFO. Prov. Pichincha, east of Quito.
 PINTAC. Southeast of Quito.
 POMASQUI. Prov. Pichincha, north of Quito.
 PORTOVELO. Gold mine, near Zaruma, Prov. Oro, alt. 1,200 meters.

- PUCARÁ DE CHISALO.** Pucará is a town in Prov. Azuay, east of Malchala, also (Alto de Pucará) a place near Ibarra, but Pucará de Chisalo may not be the same as either of these.
- PUÉLLARO.** Prov. Pichincha, near Malchinguí.
- PUEMBO.** Prov. Pichincha, east of Quito.
- PUNTE DE CHIMBO.** Upper valley of Chimbo River near Bucay, Prov. Bolívar.
- PUERTO BOLÍVAR.** Prov. Oro, seaport near Machala.
- PUNA ISLAND.** Gulf of Guayaquil.
- PUNÍN.** South of Riobamba.
- PUNTAS.** Mountain east of Quito.
- QUEBRADA CHELÁN.** Near Punín.
- QUERO.** South of Ambato.
- QUITO.** Prov. Pichincha, alt. 2,800 meters.
- RIOBAMBA.** Capital, Prov. Chimborazo, alt. 2,800 meters.
- RÍO PILATÓN.** Southwest of Quito.
- RÍO TOACHE.** Western León and Pichincha.
- RÍO VERDE.** Prov. Esmeraldas.
- SALINAS.** Coast, west of Guayaquil.
- SANGUAY.** Mountain, southeast of Riobamba.
- SAN JOSÉ.** Prov. Bolívar, south of Guaranda.
- SAN LUCAS.** Prov. Loja, north of Loja, alt. 2,650 meters.
- SAN NICOLÁS.** Unidentified locality of Sodiro, alt. 1,200 meters. There is an hacienda by this name near Mira in Prov. Carchi.
- SAN PABLO URCU.** Not identified. Probably San Pablo, east of Otavalo.
- SANTA BÁRBARA.** Unidentified locality of André. There is a Río Santa Bárbara in Prov. Azuay.
- SANTA ROSA.** Seaport, Prov. Oro.
- SANTA ROSA DE CAÑAR.** Southwest of Azogues.
- SARAGURO (ZARAGURO).** Seventy kilometers northwest of Loja, alt. 2,700 meters.
- TABLÓN DE OÑA.** Between Oña and Saraguro.
- TANDAPÍ.** Unidentified locality of Holmgren, "western slope of Andes, 1,500 to 2,000 meters."
- TENGUEL.** Lowland, south of Guayaquil.
- TERESITA.** Three kilometers west of Bucay.
- TIGUA.** River in western part of Prov. Esmeraldas, tributary of the Cojimico.
- TIXAN (TIGSÁN).** On railroad between Alausí and Palmira.
- TOCACHI.** Prov. Pichincha, northeast of Quito.
- TULCÁN.** Capital, Prov. Carchi, alt. 3,000 meters.
- TUMBACO.** East of Quito.
- TUNGURAHUA.** Volcano, southeast of Ambato, alt. 5,087 meters.
- TUPIGACHI.** Prov. Pichincha, northeast of Quito.
- URBINA.** On railroad near Mt. Chimborazo, alt. 3,600 meters.
- VENTURA.** On railroad above Bucay.

PERU

- ABANCAY.** Capital, Dept. Apurímac.
- AGUAS CALIENTES.** Near Cuzco.
- AMBO.** Dept. Huánuco south of Huánuco.
- ARARANCA.** Dept. Puno, on railroad south of La Raya, alt. 4,000 meters.
- AREQUIPA.** Capital, Prov. Arequipa, alt. 2,300 meters.
- AYAPATA.** Dept. Puno, near Macusani.

- AYACUCHO.** Capital, Dept. Ayacucho.
AZÁNGARO. Dept. Puno, north of Puno.
BAÑOS. West of Cerro de Pasco, on way from Casa Cancha, alt. 4,000 meters.
CAJATAMBO. Dept. Ancash.
CALLACATE. Hacienda near Cutervo.
CALLAO. Seaport of Lima.
CANDAMO. Dept. Puno, northern part.
CANI. Dept. Huánuco, near Mito.
CANRUBU. Unidentified locality of Savatier.
CABAZ (CARÁS). Dept. Ancash, alt. 2,237 meters.
CABUMAS. Dept. Moquegua.
CASA CANCHA. Between Culnai and Cerro de Pasco, alt. 4,400 meters.
CASAPALCA (CASAPALTA). On railroad between Lima and Oroya, alt. 4,100 meters.
CASAPÍ. Dept. Huánuco, on the Huallaga River.
CERRO DE PASCO. Capital Dept. Junín, alt. 4,300 meters.
CHACHAPOYAS. Capital, Dept. Amazonas.
CHASQUI. Dept. Huánuco, near Mito.
CHAUPICHACA. Near Viso.
CHAVINILLO. Dept. Huánuco, west of Huánuco on Marañón River.
CHICLA. Dept. Lima, northeast of Lima, on railroad between Lima and Oroya, alt. 3,723 meters.
CHICOPLAYA. Dept. Huánuco, Dist. Monzón.
CHIVAY. Dept. Arequipa.
CHORRILLOS. East of Lima.
CHOSICA. On railroad between Lima and Oroya, alt. 1,000 meters.
CHUQUIBAMBILLA. Dept. Puno, on railroad north of Juliaca, alt. 3,900 meters.
COLONIA PERENÉ. Dept. Junín, plantation east of La Merced, alt. 600 meters.
COTAHUASI. Prov. La Unión, Dept. Arequipa.
CULNAI. Between Obrajillo and Cerro de Pasco, alt. 3,000 meters.
CUTERVO. Dept. Cajamarca, west of Chota.
CUYO-CUYO. Dept. Puno, south of Sandía, alt. 3,443 meters.
CUZCO. Capital, Dept. Cuzco, alt. 3,500 meters.
GOYLLARISQUISCA. Dept. Junín, end of railroad north of Cerro de Pasco, alt. 4,100 meters.
HACIENDA ATOCSAICO. Dept. Junín, west of Junín, alt. 4,000 meters.
HACIENDA CHINCHE. Dept. Junín, near Yanahuanca, alt. 3,500 meters.
HACIENDA PAMPAYACU. Dept. Huánuco, mouth of Chinchao River.
HACIENDA VILLCABAMBA. Dept. Huánuco, east of Huánuco, alt. 1,800 meters.
HUACACHI. Near Muña, alt. 2,000 meters.
HUALGAYOC. Dept. Cajamarca, north of Cajamarca, alt. 3,700 meters.
HUANTA. Dept. Ayacucho.
HUÁNUCO. Capital, Dept. Huánuco, alt. 1,860 meters.
HUARÓN. Dept. Junín, northern part, Cerro de Pasco region.
HUARAZ. Capital, Dept. Ancash.
JULIACA. Dept. Puno, on railroad between Arequipa and Cuzco, alt. 3,800 meters.
LAGUNILLAS. Dept. Puno, on railroad west of Juliaca, alt. 4,300 meters.
LAMAS. Dept. San Martín, west of Tarapoto.
LA MERCED. Dept. Junín, northeast of Tarma.
LA QUINHUA (QUINUA). Dept. Junín, gold mine near Goyllarisquisca, alt. 3,500 meters.
LA RAYA. On rail road between Juliaca and Cuzco, alt. 4,313 meters.
LIMA. Near sea level.

- LLATA.** Dept. Huánuco, western part.
LUBIN. Southeast of Lima.
MACHU PICCHU. Urubamba Valley between Cuzco and Santa Ana.
MACUSANI. Dept. Puno.
MARAVILLAS. Dept. Puno, west of Lake Titicaca.
MATUCANA. On railroad between Lima and Oroya, alt. 2,374 meters.
MAYO RIVER. Prov. San Martín, northern part.
MIRAFLORES. Suburb of Lima.
MITO. Dept. Huánuco, 25 kilometers west of Huánuco, alt. 2,800 meters.
MOLLENDO. Seaport, Dept. Arequipa.
MONZÓN. Dept. Huánuco, north of Huánuco on Monzón River.
MOQUEGUA. Dept. Moquegua.
MOYOBAMBA. Capital, San Martín.
MUÑA. Dept. Huánuco, east of Huánuco, alt. 1,800 meters.
OBRAJILLO. Northeast part of Dept. Lima, near Canta, on way to Cerro de Pasco.
OCCA PAMPA. Dept. Puno, alt. 3,100 meters.
OCROS. Dept. Ancash, north of Supe, alt. 3,200 meters.
OLLANTAYTAMBO. North of Cuzco, alt. 3,000 meters.
OROYA (LA OROYA). Dept. Junín, on railroad between Lima and Cerro de Pasco, alt. 3,712 meters.
PACASMAYO. Seaport, north of Lima.
PAITA. Seaport, Dept. Piura.
PALCA. Dept. Junín, alt. 2,735 meters.
PANAO. Dept. Huánuco, east of Huánuco.
PANGO RIVER. Dept. Junín, east of Tarma.
PANTICALLA PASS. Urubamba Valley, between Cuzco and Santa Ana, alt. 3,600 meters.
PARIAHUANCA. Not located; probably in the region of Huánuco.
PAUCARTAMBO. North of Cuzco.
PATAZ. Dept. Libertad, eastern part.
PIEDRA GRANDE. Dept. Huánuco, between Huánuco and Pozuzo.
PISCO. Seaport, Dept. Ica.
PIURA. Capital, Dept. Piura.
PLAYAPAMPA. Dept. Huánuco, near Tambo de Vaca.
POTO. Dept. Puno, south of Sandía, alt. 4,400 meters.
POZUZO. Dept. Huánuco, east of Huánuco.
PUCARÁ. Dept. Puno, on railroad north of Juliaca, alt. 3,882 meters.
PURUCHUCA. Prov. Lima, Dist. Ate.
RIMAC VALLEY. Vicinity of Lima.
RÍO BLANCO. On railroad between Lima and Oroya, alt. 3,600 meters.
RÍO HUALLAGO CANYON. Huánuco region.
RÍO DE LAS TRANCAS and RÍO LLAXWA. South of Nazca, Dept. Ica.
SACHAPATA. Dept. Puno, Prov. Carabaya.
SALAVERRY. Seaport, Dept. Libertad.
SAMANCO. Seaport, Prov. Ancash.
SAN ANTONIO. Dept. Puno, north of Azángaro.
SAN BARTOLOMÉ. On railroad east of Lima, alt. 1,511 meters.
SANDÍA. Dept. Puno, alt. 2,103 meters.
SAN GAVÁN (GABÁN). Dept. Puno, Prov. Carabaya.
SAN GALLÁN ISLAND. Near Pisco, Dept. Ica.
SAN GREGORIO. Dept. Huancavelica.
SAN JOSÉ. Dept. Junín, northern part.

- SAN MIGUEL.** Dept. Cuzco, Urubamba Valley, alt. 1,800 meters.
SANTA ANA. Dept. Cuzco, Urubamba Valley, alt. 900 meters.
SANTA CLARA. On railroad east of Lima.
SANTA CRUZ. Dept. Cajamarca, northwest of Cajamarca.
SANTA ROSA. Dept. Cuzco, south of Santa Ana.
SUMBAY. Dept. Arequipa, on railroad between Arequipa and Juliaca, alt. 4,000 meters.
TABINA. Dept. Puno.
TAMBILLO. Eleven kilometers southwest of Panao, alt. 2,400 meters. This is the locality visited by Macbride. The name is a common one and the Tambillo of other collectors (e. g. Jelski) may be different.
TAMBO DE VACA. Dept. Huánuco between Huánuco and Pozuzo, alt. 4,000 meters.
TARAPOTO. Dept. San Martín, southeast of Moyobamba, alt. 374 meters.
TARMA. Dept. Junín, northeast of Oroyo, alt. 3,080 meters.
TINTA. Dept. Cuzco, on railroad between Juliaca and Cuzco, alt. 3,500 meters.
TOCACHE. Dept. San Martín, southern part.
TORATA. Dept. Moquegua.
TORONTOY. Urubamba Valley, north of Cuzco, alt. 2,400 meters.
VALLE DE ANTA. Prov. Cuzco, alt. 3,280 meters.
VISO (TAMBO DE VISO). Dept. Lima, 8 kilometers above Matucana.
YANAHUANCA. Dept. Junín, northwest of Cerro de Pasco, alt. 3,000 meters
YANANO. Dept. Huánuco, 24 kilometers northeast of Panao.
YAULI. Dept. Junín, southwest of Oroya, alt. 4,090 meters.
YUNGAY. Dept. Ancash, south of Caraz, alt. 2,400 meters.
YURIMAGUAS. Dept. Loreto, east of Moyobamba, alt. 170 meters.

BOLIVIA

- ACHACACHE.** Dept. La Paz, near Lake Titicaca, alt. 4,000 meters.
AIQUILE. Cordillera Real, north of Sucre.
ANTAHUACANA. One hundred and fifty kilometers northeast of Cochabamba, alt. 750 meters.
ARQUE. South of Cochabamba.
ATOCHA. Dept. Potosí, on railroad between Uyuni and Tupiza.
BELLA VISTA. Dept. La Paz, Prov. Nor-Yungas, west of Coroico.
BERMEJO. Dept. Tarija, south of Tarija. There is another Bermejo southwest of Santa Cruz.
BOPI RIVER. Sur-Yungas, tributary of Beni.
BUENA VISTA. Dept. Santa Cruz, northwest of Santa Cruz, alt. 500 meters.
CALACOTO. Dept. La Paz, on railroad southwest of Corocoro, alt. 4,000 meters.
CALDERILLO. Vicinity of Tarija.
CAMACHO. Dept. Tarija, south of Tarija.
CAMATAQUI. Dept. Chuquisaca, northeast of Tupiza, alt. 2,500 meters.
CAÑAMINA. Dept. La Paz, Prov. Inquisivi, south of Espña.
CAPAL. One hundred kilometers southeast of La Paz.
CABABUCO. Dept. La Paz, near Lake Titicaca, alt. 4,200 meters.
CABANGAS. Dept. Oruro, western part.
CHACALTAYA. Dept. La Paz, north of La Paz, alt. 4,800 meters.
CHACO. Dept. Tarija.
CHALLAPATA. Dept. Oruro, on railroad between Oruro and Uyuni, alt. 3,900 meters.
CHARAGUA. Dept. Santa Cruz, southwestern part.
CHIGUANA. Dept. Potosí, on railroad near Chilean border.
CHOQUETANGA. Southeast of La Paz., alt. 3,600 meters.

- CHUGLAGUILLO (TALCA CHUGUIAQUILLO). Southeast of La Paz.
- CHULUMANI. Dept. La Paz, capital, Prov. Sur-Yungas, alt. 1,600 meters.
- CHUQUISACA. Department north of Dept. Tarija, extending to Río Paraguay.
- COBIJA. Territorio de Colonias, on Aquiry River.
- COCHABAMBA. Capital, Dept. Cochabamba, alt. 2,500 meters.
- COMANCHE. Dept. La Paz, on railroad south of Viacha, alt. 4,200 meters.
- COMARAPA. Dept. Santa Cruz, west of Santa Cruz, alt. 1,900 meters.
- COPACABANA. Dept. La Paz, near Lake Titicaca.
- CORDILLERA SAN BONITO. Dept. Cochabamba.
- CORIPATA. Dept. La Paz, Prov. Nor-Yungas, alt. 2,000 meters.
- COBOICO. Dept. La Paz, capital, Prov. Nor-Yungas, alt. 1,500 meters.
- COTAÑA. Near Volcano Illimani, alt. 2,450 meters.
- COVENDO. Dept. La Paz, Prov. Sur-Yungas, on Beni River, alt. 600 meters.
- CREVAUX. Dept. Tarija, southeast of Villa Montes.
- CUESTA SAN ANATON. Vicinity of Tarija.
- ESPÍA. Dept. La Paz, Prov. Inquisivi, on Bopl River, alt. 600 meters.
- ESPÍRITU SANTO. Dept. Cochabamba.
- EUCALIPTUS. On railroad north of Oruro.
- GABULAZO. "Prope Chuquisaca."
- GENERAL CAMPERO. On railroad between Viacha and Arica, near Corocoto.
- GRAN CHACO. Dept. Tarija.
- GUANAY. Territorio de Colonias.
- GUAQUI. Shore of Lake Titicaca.
- GUCACHACA. Unidentified locality of Cárdenas, 4,000 meters, probably near La Paz.
- HACIENDA ANACURI. Dept. La Paz, Prov. Nor-Yungas.
- HACIENDA CASANA. Near Tipuani, alt. 1,400 meters.
- HACIENDA SIMACO. Near Tipuani, alt. 1,400 meters.
- HUACHI. Dept. La Paz, Sur-Yungas, on Beni River, alt. 1,800 meters.
- HUANAY. Dept. La Paz, north of Covendo.
- ILLIMANI. Volcano, east of La Paz.
- INGENIO DEL ORO. Dept. La Paz, between Sorata and Mapiri.
- ISLA DEL SOL. Island in Lake Titicaca.
- IXIAMAS (ISIAMAS). Northern part Dept. La Paz, alt. 250 meters.
- LA CUMBRE. Dept. La Paz, on railroad between La Paz and Pongo, alt. 4,600 meters.
- LA FLORIDA. Dept. La Paz, Prov. Sur-Yungas, near Yanacachi, alt. 1,840 meters.
- LA PAZ. Alt. 3,700 meters.
- LLAVETAL. Tunari region, alt. 4,100 meters.
- MAPIRI. Dept. La Paz, northern part Prov. Larecaja, alt. 570 meters.
- MATARAL. Dept. Santa Cruz, southwest of Santa Cruz.
- MILLUHUAYA. Dept. La Paz, Prov. Nor-Yungas, south of Coripata, alt. 1,300 meters.
- OPLOCA. Dept. Potosí, north of Tupiza.
- ORO INGENIO. Dept. Potosí, between Atocha and Tupiza.
- ORURO. Capital, Dept. Oruro, alt. 3,730 meters.
- PADCAYA. Dept. Tarija, south of Tarija.
- PALCA. Between La Paz and Illimani.
- PALMAR. Dept. Santa Cruz, near Santa Cruz, alt. 450 meters.
- PASÑA. Dept. Oruro, on railroad south of Oruro, alt. 4,200 meters.
- PEÑA BLANCA. Between Atocha and Tupiza.
- PILAYA. Near Mount Illimani.
- POLO-POLO. Near Coroico, Nor-Yungas, alt. 1,100 meters.
- POTOSÍ. Capital, Dept. Potosí.

- PONGO.** Dept. La Paz, on railroad between La Paz and Yungas, alt. 3,600 meters.
- QUIABAYA.** Dept. La Paz, north of Sorata.
- REYES.** Western part Dept. Beni, alt. 300 meters.
- RINCONADA.** Dept. La Paz, on railroad between La Paz and Pongo.
- RÍO PIRAY.** Dept. Santa Cruz.
- RÍO CUCHÍ.** Dept. Santa Cruz.
- RÍO GUENDÁ.** Dept. Santa Cruz.
- RÍO PERDIZ.** Dept. Santa Cruz.
- RÍO SANJANA.** Southeast of La Paz, alt. 3,000 meters.
- RÍO SAN JUAN.** North of Valle Grande, Dept. Santa Cruz.
- RÍO SUBUTÚ.** Dept. Santa Cruz.
- ROGAGUA.** Lake in Dept. Beni (Yacuma), alt. 450 meters.
- RURRENABAQUE.** Dept. Beni, on Beni River. Alt. 450 meters.
- SAMAIPATA.** Dept. Santa Cruz, southwest of Santa Cruz, alt. 1,650 meters.
- SAN BUENA VENTURA.** Dept. La Paz, opposite Rurrenabaque, alt. 750 meters.
- SAN FELIPE.** Dept. La Paz, Prov. Sur-Yungas, alt. 3,220 meters.
- SAN JOSÉ.** Dept. La Paz, Prov. Nor-Yungas, alt. 1,500 meters.
- SANTA CRUZ.** Capital, Dept. Santa Cruz, 450 meters.
- SANTIAGO.** Dept. Santa Cruz, Prov. Chiquitos, north of San José.
- SIPASCOLLO.** Dept. Cochabamba, northeast of Totora.
- SIBUPAYA.** Dept. La Paz, Prov. Sur-Yungas, near Yanacachi, alt. 1,900 meters.
- SORATA.** East of Lake Titicaca, near Volcano Sorata.
- SUCHES.** Dept. La Paz.
- TABLAS.** Dept. Cochabamba, north of Cochabamba.
- TALCA CHUGIAGUILLO.** See Chugiaguillo.
- TARIJA.** Capital, Dept. Tarija.
- TIPUANI.** Dept. La Paz, Prov. Larecaja, alt. 1,400 meters.
- TITICACA.** Lake between Peru and Bolivia, alt. 3,600 meters.
- TORTORA.** Dept. Potosí, northwest of Potosí.
- TOTORA.** Vicinity of Santa Cruz, alt. 3,000 meters.
- TRES CRUCES.** Dept. Santa Cruz, east of Santa Cruz, alt. 1,450 meters.
- TUNARI.** Mountains north of Cochabamba. Cerro Tunari, alt. 5,200 meters.
- TUPIZA.** Southern Bolivia, Prov. Sur-Chichas.
- UNDUAVI.** Dept. La Paz, Prov. Murillo, east of Pongo, alt. 3,246 meters.
- UYUNI.** Dept. Potosí, on railroad south of Oruro, alt. 3,700 meters.
- VALLE GRANDE.** Dept. Santa Cruz, southwest of Santa Cruz, alt. 2,100 meters.
- VIACHA.** Southwest of La Paz.
- VILLA ASPIAZU.** Dept. La Paz, Prov. Sur-Yungas.
- VILLA MONTES.** Dept. Tarija (Gran Chaco).
- YANACACHI.** Dept. La Paz, Prov. Sur-Yungas, west of Chulumani, alt. 2,300 meters.
- YUNGAS.** The region of Nor-Yungas and Sur-Yungas.
- ZONGO.** Dept. La Paz, north of Pongo.

INDEX TO NUMBERED SPECIMENS

The following list includes the numbered specimens of the more important collectors cited in the distribution of the species. Two or more species when here listed under one number were distributed under this number by the collector.

ANDRÉ, EDUARD

- 3259. *Ichnanthus pallens*.
- 3390. *Arundinella berteroniana*.
- 3419. *Pennisetum tristachyum*.
- 3483. *Calamagrostis beyrichiana*.
- 3515. *Bouteloua simplex*.
- 3560b. *Chaetochloa geniculata*.
- 3789. *Cenchrus echinatus*.
- 3907. *Trisetum andinum*.
- 4215. *Pharus latifolius*.
- 4499. *Neurolepis aristata*.

ANTHONY, H. E., AND TATE, G. H. H.

- 50. *Panicum trichoides*.
- 63. *Lasiacis ruscifolia*.
- 79. *Paspalum racemosum*.
- 279. *Poa subspicata*.
- 281. *Calamagrostis recta*.
- 284. *Agrostis nigritella*.
- 328. *Cortaderia rudiuscula*.
- 329. *Polypogon lutosus*.
- 366. *Agrostis breviculmis*.
- 370. *Agrostis toluensis*.
- 372. *Polypogon lutosus*.
- 435. *Bromus unioloides*.
- 441. *Eragrostis nigricans*.
- 442. *Stipa ichu*.
- 447. *Polypogon lutosus*.

ARCADE, BROTHER

- 1. *Festuca bromoides*.
- 3. *Briza minor*.
- 4. *Festuca bromoides*.
- 5. *Eragrostis nigricans*.
- 6. *Eragrostis pilosa*.
- 10. *Avena sativa*.
- 14. *Poa annua*.
- 15. *Festuca megalura*.
- 19. *Trisetum spicatum*.
- 20. *Trisetum scabriflorum*.

ASPLUND, E.

- 6416. *Festuca megalura*.
- 6458. *Bromus lanatus*.
- 6459. *Bromus lanatus*.
- 6460. *Agropyron attenuatum*.
- 6461. *Agropyron breviaristatum*.
- 6462. *Lolium multiflorum*.
- 6463. *Calamagrostis violacea*.
- 6464. *Dissanthellium calycinum*.
- 6465. *Poa gymnantha*.
- 6466. *Poa scaberula*.
- 6467. *Agrostis haenkeana*.
- 6473. *Poa horridula*.
- 6474. *Puccinellia oresigena*.
- 6475. *Calamagrostis orbignyana*.
- 6476. *Trisetum spicatum*.
- 6477. *Dissanthellium minimum*.
- 6478. *Poa scaberula*.
- 6479. *Poa buchtienii*.
- 6480. *Calamagrostis heterophylla*.
- 6481. *Dissanthellium calycinum*.
- 6482. *Poa candamoana*.
- 6484. *Calamagrostis orbignyana*.
- 6485. *Munroa argentina*.
- 6487. *Munroa decumbens*.
- 6488. *Poa gymnantha*.
- 6489. *Agrostis toluensis*.
- 6490. *Agrostis haenkeana*.
- 6491. *Calamagrostis heterophylla*.
- 6492. *Koeleria cristata*.
- 6493. *Calamagrostis violacea*.
- 6494. *Aclachne pulvinata*.
- 6495. *Poa gymnantha*.
- 6496. *Agrostis haenkeana*.
- 6497. *Trisetum spicatum*.
- 6498. *Muhlenbergia ligularis*.
- 6499. *Dissanthellium minimum*.
- 6500. *Triodia avenacea*.
- 6501. *Poa annua*.
- 6503. *Calamagrostis rigescens*.
- 6504. *Munroa decumbens*.

ASPLUND, E.—Continued

6505. *Dissanthelium calycinum*.
 6506. *Calamagrostis violacea*.
 6507. *Trisetum floribundum*.
 6508. *Poa horridula*.
 6509. *Calamagrostis amoena*.
 6510. *Muhlenbergia ligularis*.
 6511. *Calamagrostis vicunarum*.
 6512. *Calamagrostis vicunarum*.
 6513. *Stipa hans-meyeri*.
 6514. *Calamagrostis antoniana*.
 6515. *Stipa hans-meyeri*.
 6516. *Calamagrostis curta*.
 6517. *Calamagrostis violacea*.
 6518. *Calamagrostis vicunarum*.
 6519. *Calamagrostis brevifolia*.
 6520. *Calamagrostis violacea*.
 6521. *Bouteloua simplex*.
 6522. *Bouteloua simplex*.
 6524. *Eragrostis nigricans*.
 6524. *Eragrostis lugens*.
 6525. *Distichlis humilis*.
 6526. *Anthochloa lepidula*.
 6527. *Distichlis spicata*.
 6529. *Poa asperiflora*.
 6530. *Festuca dolichophylla*.
 6531. *Festuca orthophylla*.
 6532. *Calamagrostis orbignyana*.
 6533. *Festuca dolichophylla*.
 6534. *Festuca sublimis*.
 6535. *Calamagrostis amoena*.
 6536. *Festuca rigescens*.
 6537. *Festuca rigescens*.
 6538. *Festuca rigescens*.
 6539. *Stipa nardoides*.
 6540. *Aristida adscensionis*.
 6541. *Aristida enodis*.
 6542. *Aristida enodis*.
 6543. *Nassella pubiflora*.
 6545. *Stipa obtusa*.
 6546. *Stipa holwayi*.
 6547. *Stipa curviseta*.
 6548. *Nassella asplundii*.
 6549. *Nassella asplundii*.
 6550. *Stipa curviseta*.
 6551. *Stipa curviseta*.
 6552. *Stipa speciosa*.
 6553. *Stipa inconspicua*.
 6554. *Stipa curviseta*.
 6555. *Stipa inconspicua*.
 6556. *Stipa polyclada*.
 6557. *Stipa brachyphylla*.
 6558. *Stipa inconspicua*.

ASPLUND, E.—Continued

6560. *Stipa mucronata*.
 6562. *Stipa dasycarpa*.
 6563. *Stipa polyclada*.
 6564. *Stipa hans-meyeri*.
 6565. *Stipa depauperata*.
 6566. *Stipa capilliseta*.
 6567. *Alopecurus aequalis*.
 6578. *Festuca rigescens*.
 8466. *Triodia avenacea*.

BANG, MIGUEL

20. *Agrostis toluensis*.
 21. *Eragrostis nigricans*.
 26. *Cortaderia rudiusscula*.
 30. *Melica adhaerens*.
 33. *Festuca dolichophylla*.
 40. *Polypogon lutosus*.
 47. *Polypogon lutosus*.
 55. *Pennisetum chilense*.
 79. *Sporobolus argutus*.
 80. *Eragrostis nigricans*.
 81. *Bouteloua simplex*.
 82. *Chloris beyrichiana*.
 102. *Andropogon saccharoides parviflorus*.
 104. *Calamagrostis rigescens*.
 108. *Distichlis spicata*.
 109. *Muhlenbergia ligularis*.
 155. *Notholcus lanatus*.
 173. *Festuca rigescens*.
 201. *Eragrostis montufari*.
 218. *Chaetochloa geniculata*.
 264. *Syntherisma sanguinalis*.
 265. *Paspalum buchtienii*.
 266. *Panicum laxum*.
 267. *Chloris distichophylla*.
 273. *Chaetochloa geniculata*.
 276. *Andropogon condensatus*.
 297. *Isachne arundinacea*.
 307. *Eragrostis lugens*.
 308. *Paspalum jurgensii*.
 308a. *Panicum laxum*.
 364. *Pseudechinolaena polystachya*.
 487. *Muhlenbergia quitensis*.
 493. *Panicum quadriglume*.
 493. *Panicum hebotes*.
 494. *Lasiacis ligulata*.
 508. *Olyra heliconia*.
 527. *Coix lacryma-jobi*.
 680. *Muhlenbergia tenuissima*.
 762. *Lycurus phleoides*.
 773. *Muhlenbergia peruviana*.

BANG, MIGUEL—Continued

805. *Calamagrostis amoena*.
 806. *Muhlenbergia peruviana*.
 807. *Festuca magalura*.
 808. *Paspalum pygmaeum*.
 847a. *Pariana zingiberina*.
 872. *Axonopus capillaris*.
 998. *Bouteloua curtispindula*.
 1078. *Eragrostis cilianensis*.
 1079. *Trachypogon montufari*.
 1080. *Paspalum ceresia*.
 1105. *Festuca megalura*.
 1289. *Lasiacis sorghoidea*.
 1291. *Lasiacis sorghoidea*.
 1306. *Paspalum boliviensis*.
 1307. *Aegopogon bryophilus*.
 1310. *Hackelochloa granularis*.
 1310. *Paspalum penicillatum*.
 1312. *Paspalum remotum*.
 1426a. *Paspalum multicaule*.
 1826. *Chusquea scandens*.
 1843. *Aciachne pulvinata*.
 1873. *Dissanthelium calycinum*.
 2079. *Oplismenus hirtellus*.
 2108. *Echinochloa crusgalli crus-*
pavonis.
 2131. *Zeugites mexicana*.
 2160. *Chaetochloa trichorhachis*.
 2168. *Pennisetum setosum*.
 2173. *Chloris radiata*.
 2340. *Pennisetum tristachyum*
boliviense.
 2348. *Chusquea serrulata*.
 2588. *Brachiaria plantaginea*.
 2589. *Agrostis haenkeana*.
 2589½. *Koeleria cristata*.
 2590. *Paspalum humboldtianum*.
 2591. *Sporobolus berterioanus*.

BUCHTIEN, OTTO

2. *Eragrostis nigricans*.
 26. *Calamagrostis vicuniarum*.
 123. *Calamagrostis humboldtiana*.
 157. *Nassella pubiflora*.
 157. *Stipa inconspicua*.
 159. *Calamagrostis vicuniarum*.
 160. *Muhlenbergia peruviana*.
 161. *Bouteloua simplex*.
 161a. *Bouteloua simplex*.
 184. *Stipa obtusa*.
 208. *Aristida adscensionis*.
 236. *Poa pratensis*.
 237. *Lolium temulentum*.

BUCHTIEN, OTTO—Continued

239. *Phalaris canariensis*.
 265. *Pseudechinolaena polystachya*.
 267. *Axonopus fissifolius*.
 410. *Axonopus scoparius*.
 411. *Andropogon leucostachyus*.
 412. *Andropogon bicornis*.
 414. *Panicum sciurotis*.
 415. *Paspalum paniculatum*.
 416. *Paspalum inconstans*.
 417. *Paspalum penicillatum*.
 418. *Syntherisma sanguinalis*.
 419. *Axonopus fissifolius*.
 420. *Paspalum buchtienii*.
 421. *Eleusine indica*.
 422. *Paspalum depauperatum*.
 423. *Pennisetum tristachyum bol-*
iviense.
 425. *Chaetochloa scandens*.
 428. *Eragrostis mexicana*.
 428. *Eragrostis pilosa*.
 429. *Panicum sellowii*.
 430. *Calamagrostis beyrichiana*.
 430. *Stipa mucronata*.
 431. *Calamagrostis montevidensis*.
 431. *Alopecurus bracteatus*.
 432. *Oplismenus hirtellus*.
 433. *Zeugites mexicana*.
 434. *Andropogon condensatus*.
 435. *Chaetochloa tenacissima*.
 443. *Syntherisma sanguinalis*.
 444. *Paspalum buchtienii*.
 446. *Panicum trichanthum*.
 449. *Chaetochloa scandens*.
 450. *Olyra heliconia*.
 451. *Pennisetum tristachyum bol-*
iviense.
 501. *Calamagrostis orbignyana*.
 503. *Sporobolus berterioanus*.
 505. *Melica adhaerens*.
 506. *Hordeum halophilum*.
 518. *Bromus pitensis*.
 551. *Aristida adscensionis*.
 562. *Eragrostis nigricans*.
 562a. *Eragrostis nigricans*.
 573. *Chloris beyrichiana*.
 574. *Andropogon saccharoides par-*
vispiculus.
 736. *Ichnanthus minarum*.
 737. *Ichnanthus calvescens*.
 819. *Muhlenbergia rigida*.
 820. *Eragrostis pilosa*.
 820. *Eragrostis nigricans*.

BUCHTIEN, OTTO—Continued

839. *Chusquea dombeyana*.
 839. *Chusquea scandens*.
 841. *Agrostis gelida*.
 842. *Pennisetum chilense*.
 843. *Bromus unioloides*.
 844. *Bromus unioloides*.
 845. *Bromus unioloides*.
 846. *Poa horridula*.
 847. *Eragrostis lurida*.
 848. *Eragrostis montufari*.
 849. *Eragrostis lugens*.
 850. *Cortaderia rudiucula*.
 851. *Melica adhaerens*.
 854. *Festuca megalura*.
 855. *Stipa depauperata*.
 856. *Stipa mucronata*.
 857. *Aristida enodis*.
 858. *Stipa brachyphylla*.
 859. *Paspalum pygmaeum*.
 860. *Distichlis humilis*.
 861. *Alopecurus bracteatus*.
 862. *Hordeum murinum*.
 864. *Chaetochloa geniculata*.
 865. *Muhlenbergia peruviana*.
 866. *Calamagrostis heterophylla*.
 867. *Polypogon lutosus*.
 869. *Poa buchtienii*.
 870. *Festuca dolichophylla*.
 871. *Agropyron attenuatum*.
 1151. *Andropogon condensatus*.
 1152. *Andropogon bicornis*.
 1154. *Chusquea delicatula*.
 1155. *Olyra latifolia*.
 1156. *Ichnanthus breviscrobis*.
 1157. *Olyra buchtienii*.
 1158. *Olyra micrantha*.
 1159. *Panicum rudgei*.
 1160. *Axonopus capillaris*.
 1162. *Paspalum conjugatum*.
 1163. *Eleusine indica*.
 1164. *Paspalum paniculatum*.
 1166. *Pseudechinolaena polystachya*.
 1167. *Panicum stoloniferum*.
 1170. *Pseudechinolaena polystachya*.
 1171. *Panicum pantrichum*.
 1172. *Panicum frondescens*.
 1173. *Panicum frondescens*.
 1173a. *Panicum frondescens*.
 1175. *Arundinella berteroniana*.
 1177. *Gynerium sagittatum*.
 1178. *Cenchrus pauciflorus*.
 1183. *Panicum pilosum*.

BUCHTIEN, OTTO—Continued

1184. *Stipa speciosa*.
 1185. *Stipa ichu*.
 1186. *Festuca orthophylla*.
 1188. *Stipa inconspicua*.
 1189. *Stipa inconspicua*.
 1190. *Nassella pubiflora*.
 1191. *Festuca rigescens*.
 1192. *Calamagrostis ovata*.
 1193. *Calamagrostis jamesoni*.
 1194. *Dissanthellium peruvianum*.
 1195. *Calamagrostis cephalantha*.
 1196. *Anthochloa lepidula*.
 1197. *Dissanthellium calycinum*.
 1199. *Calamagrostis violacea*.
 1200. *Calamagrostis vicunarum*.
 1201. *Poa humillima*.
 1202. *Calamagrostis vicunarum*.
 1203. *Poa gymnantha*.
 1204. *Agrostis haenkeana*.
 1205. *Calamagrostis cephalantha*.
 1206. *Aclachne pulvinata*.
 1207. *Muhlenbergia fastigiata*.
 2464. *Poa annua*.
 2465. *Poa annua*.
 2466. *Poa buchtienii*.
 2467. *Poa buchtienii*.
 2468. *Poa buchtienii*.
 2469. *Poa buchtienii*.
 2470. *Poa buchtienii*.
 2472. *Poa candamoana*.
 2476. *Bromus unioloides*.
 2478. *Bromus unioloides*.
 2480. *Bromus unioloides*.
 2481. *Bromus unioloides*.
 2482. *Poa horridula*.
 2484. *Nassella pubiflora*.
 2485. *Nassella pubiflora*.
 2486. *Nassella pubiflora*.
 2487. *Nassella pubiflora*.
 2488. *Nassella pubiflora*.
 2489. *Stipa obtusa*.
 2490. *Paspalum pygmaeum*.
 2491. *Polypogon lutosus*.
 2492. *Stipa ichu*.
 2493. *Aristida adscensionis*.
 2495. *Calamagrostis humboldtiana*.
 2496. *Poa scaberula*.
 2497. *Ichnanthus candicans*.
 2498. *Ichnanthus pallens*.
 2499. *Lasiacis ligulata*.
 2500. *Lasiacis sorghoidea*.
 2501. *Panicum boliviense*.

BUCHTIEN, OTTO—Continued

2502. *Panicum frondescens*.
 2504. *Paspalum conjugatum*.
 2504a. *Paspalum conjugatum*.
 2505. *Axonopus compressus*.
 2506. *Chaetochloa geniculata*.
 2508. *Chaetochloa poiretiana*.
 2509. *Paspalum remotum*.
 2510. *Chaetochloa argentina*.
 2512. *Chloris virgata*.
 2513. *Paspalum saccharoides*.
 2514. *Saccharum officinarum*.
 2515. *Eragrostis pilosa*.
 2516. *Eragrostis pilosa*.
 2518. *Polypogon lutosus*.
 2519. *Agrostis verticillata*.
 2520. *Polypogon elongatus*.
 2520. *Polypogon lutosus*.
 2521. *Coix lacryma-jobi*.
 2522. *Nassella pubiflora*.
 2523. *Poa buchtienii*.
 2524. *Koeleria cristata*.
 2525. *Calamagrostis humboldtiana*.
 2527. *Sporobolus berterioanus*.
 2528. *Poa candamoana*.
 2529. *Calamagrostis violacea*.
 2530. *Calamagrostis humboldtiana*.
 2531. *Agrostis exasperata*.
 2532. *Bromus unioloides*.
 2533. *Nassella pubiflora*.
 2534. *Poa annua*.
 2535. *Eragrostis nigricans*.
 2536. *Poa pratensis*.
 2537. *Agrostis attenuata*.
 2538. *Bromus pitensis*.
 2539. *Stipa obtusa*.
 2540. *Aristida enodis*.
 2542. *Poa candamoana*.
 2543. *Bromus unioloides*.
 2544. *Stipa ichu*.
 2545. *Stipa ichu*.
 2546. *Festuca dolichophylla*.
 2548. *Polypogon lutosus*.
 2549. *Poa asperiflora*.
 2550. *Stipa inconspicua*.
 2551. *Andropogon condensatus*.
 2576. *Cortaderia bifida*.
 2578. *Aegopogon cenchroides*.
 2579. *Alopecurus bracteatus*.
 2581. *Agrostis araucana*.
 2582. *Poa horridula*.
 2583. *Poa horridula*.
 2584. *Poa denticulata*.

BUCHTIEN, OTTO—Continued

2585. *Agrostis perennans*.
 2586. *Agrostis araucana*.
 2587. *Trisetum spicatum*.
 3124. *Sporobolus argutus*.
 3125. *Paspalum humboldtianum*.
 3126. *Paspalum distichum*.
 3127. *Chaetochloa geniculata*.
 3128. *Chaetochloa argentina*.
 3129. *Aristida adscensionis*.
 3130. *Bromus unioloides*.
 3131. *Festuca dolichophylla*.
 3132. *Cenchrus myosuroides*.
 3133. *Polypogon elongatus*.
 3134. *Stipa illimanica*.
 3135. *Eragrostis pilosa*.
 3136. *Leptochloa dubia*.
 3137. *Leptochloa dubia*.
 3138. *Eragrostis montufarii*.
 3139. *Polypogon lutosus*.
 3612. *Panicum trichanthum*.
 3614. *Paspalum inaequivalve*.
 3615. *Holcus sorghum*.
 3618. *Andropogon leucostachyus*.
 3619. *Elyonurus adustus*.
 3620. *Pennisetum tristachyum boliv-
 iense*.
 3621. *Andropogon hassleri*.
 3622. *Olyra heliconia*.
 3624. *Echinochloa crusgalli crus-
 pavonis*.
 3627. *Chaetochloa scandens*.
 3628. *Axonopus scoparius*.
 3629. *Paspalum buchtienii*.
 3630. *Paspalum buchtienii*.
 3631. *Chloris radiata*.
 3633. *Chloris distichophylla*.
 3634. *Syntherisma sanguinalis*.
 3635. *Lasiacis sorghoidea*.
 3636. *Brachiaria plantaginea*.
 3637. *Sporobolus berterioanus*.
 3638. *Eragrostis montufarii*.
 3640. *Panicum maximum*.
 3641. *Phalaris canariensis*.
 3950. *Calamagrostis heterophylla*.
 3962. *Stipa mucronata*.
 3966. *Festuca dolichophylla*.
 3967. *Festuca dolichophylla*.
 4170. *Panicum polygonatum*.
 4171. *Cenchrus echinatus*.
 4172. *Triniochloa stipoides*.
 4173. *Phalaris latifolius*.
 4174. *Panicum quadriglume*.

BUCHTIEN, OTTO—Continued

4176. *Nazia aliena*.
 4185. *Chusquea scandens*.
 4189. *Hackelochloa granularis*.
 4194. *Eleusine indica*.
 4195. *Chloris distichophylla*.
 4196. *Paspalum paniculatum*.
 4197. *Brachiaria plantaginea*.
 4257. *Leptochloa uninervia*.
 4257. *Stipa inconspicua*.
 4258. *Andropogon altus*.
 4259. *Andropogon bicornis*.
 4260. *Andropogon leucostachyus*.
 4261. *Andropogon condensatus*.
 4262. *Ichnanthus minarum*.
 4263. *Ichnanthus minarum*.
 4264. *Ichnanthus calvescens*.
 4265. *Thrasya campylostachya*.
 4266. *Leptochloa domingensis*.
 4268. *Aphanelytrum procumbens*.
 4269. *Paspalum paniculatum*.
 4270. *Chaetochloa geniculata*.
 4271. *Lasiacis sorghoidea*.
 4272. *Panicum maximum*.
 4273. *Pseudechinolaena polystachya*.
 4274. *Paspalum buchtienii*.
 4275. *Axonopus capillaris*.
 4276. *Axonopus fissifolius*.
 4277. *Eragrostis lugens*.
 4278. *Agrostis haenkeana*.
 4279. *Chloris polydactyla*.
 4280. *Briza mandoniana*.
 4485. *Lycurus phleoides*.
 4486. *Festuca dolichophylla*.
 4487. *Lolium perenne*.
 4488. *Festuca dolichophylla*.
 4518. *Paspalum distichum*.
 5236. *Ichnanthus ruprechtii*.
 5237. *Ichnanthus ruprechtii*.
 5301. *Oplismenus hirtellus*.
 5311. *Andropogon bicornis*.
 5312. *Andropogon bicornis*.
 5313. *Echinochloa crusgalli crus-pavenis*.
 5314. *Paspalum decumbens*.
 5315. *Panicum laxum*.
 5316. *Panicum glutinosum*.
 5317. *Panicum cordovense*.
 5317. *Panicum sellowii*.
 5318. *Syntherisma sanguinalis*.
 5319. *Panicum sclurotis*.
 5320. *Pseudechinolaena polystachya*.
 5321. *Ichnanthus candicans*.

BUCHTIEN, OTTO—Continued

5322. *Ichnanthus pallens*.
 5323. *Paspalum paniculatum*.
 5324. *Axonopus scoparius*.
 5325. *Paspalum conjugatum*.
 5326. *Axonopus fissifolius*.
 5327. *Axonopus capillaris*.
 5328. *Axonopus compressus*.
 5328. *Axonopus scoparius*.
 5329. *Chaetochloa tenacissima*.
 5330. *Chaetochloa scandens*.
 5332. *Eleusine indica*.
 5333. *Olyra latifolia*.
 5334. *Panicum polygonatum*.
 5335. *Syntherisma violascens*.
 5336. *Ichnanthus ruprechtii*.
 5337. *Ichnanthus ruprechtii*.
 6414. *Bromus unioloides*.
 6415. *Festuca ulochaeta*.
 6417. *Distichlis spicata*.
 6418. *Koeleria cristata*.
 6419. *Eleusine indica*.
 6420. *Dissanthelium minimum*.
 6421. *Eragrostis nigricans*.
 6422. *Avena scabrivalvis*.
 6423. *Chloris polydactyla*.
 6424. *Chloris distichophylla*.
 6426. *Agrostis perennans*.
 6427. *Agrostis perennans*.
 6428. *Calamagrostis violacea*.
 6429. *Calamagrostis heterophylla*.
 6430. *Calamagrostis montevidensis*.
 6431. *Piptochaetium tuberculatum*.
 6432. *Eriochloa punctata*.
 6433. *Olyra heliconia*.
 6434. *Axonopus fissifolius*.
 6435. *Paspalum paniculatum*.
 6436. *Paspalum paniculatum*.
 6437. *Pseudechinolaena polystachya*.
 6439. *Syntherisma sanguinalis*.
 6440. *Syntherisma sanguinalis*.
 6441. *Panicum laxum*.
 6442. *Lasiacis sorghoidea*.
 6443. *Trichachne sacchariflora*.
 6444. *Syntherisma violascens*.
 6445. *Paspalum decumbens*.
 6446. *Andropogon bicornis*.
 6447. *Andropogon condensatus*.
 6448. *Andropogon condensatus*.
 6468. *Pseudechinolaena polystachya*.
 6468. *Trisetum spicatum*.
 6469. *Koeleria cristata*.
 6470. *Koeleria cristata*.

BUCHTIEN, OTTO—Continued

6471. *Poa gymnantha*.
 6472. *Calamagrostis orbignyana*.
 6528. *Poa annua*.
 7105. *Paspalum decumbens*.
 7106. *Paspalum decumbens*.
 7107. *Paspalum inconstans*.
 7108. *Paspalum pilosum*.
 7109. *Paspalum inconstans*.
 7110. *Paspalum malacophyllum*.
 7111. *Paspalum inconstans*.
 7112. *Paspalum lineispatha*.
 7114. *Panicum sellowii*.
 7115. *Panicum sciurotis*.
 7116. *Panicum sciurotis*.
 7117. *Isachne arundinacea*.
 7118. *Axonopus marginatus*.
 7120. *Panicum frondescens*.
 7121. *Eragrostis lugens*.
 7122. *Panicum laxum*.
 7123. *Ichnanthus peruvianus*.
 7124. *Ichnanthus ruprechtii*.
 7126. *Syntherisma sanguinalis*.
 7127. *Panicum laxum*.
 7128. *Syntherisma violascens*.
 7129. *Panicum polygonatum*.
 7130. *Axonopus barbigerus*.
 7134. *Andropogon hirtiflorus*.
 7136. *Andropogon leucostachyus*.
 7137. *Andropogon bicornis*.
 7138. *Elyonurus adustus*.
 7139. *Poa annua*.
 7140. *Eragrostis montufari*.
 7142. *Axonopus aureus*.
 7144. *Aegopogon bryophilus*.
 7145. *Trachypogon plumosus*.
 7146. *Leptocoryphium lanatum*.
 7147. *Sporobolus aeneus*.

CÁRDENAS, MARTÍN (MULFORD BIOL. EXPL.)

- 36 S. *Agrostis gelida*.
 69 S. *Sporobolus berterioanus*.
 70 S. *Stipa mucronata*.
 299. *Chloris polydactyla*.
 695. *Sporobolus berterioanus*.
 1166. *Arundinella berterioana*.
 1175. *Paspalum conjugatum*.
 1647. *Panicum stramineum*.
 1656. *Paspalum millegrana*.
 1665. *Elyonurus adustus*.
 1704. *Panicum frondescens*.

CÁRDENAS, MARTÍN (MULFORD BIOL. EXPL.)—Continued

1708. *Chaetochloa geniculata*.
 1772. *Panicum pilosum*.
 1889. *Pariana zingiberina*.
 1893. *Chaetochloa vulpiseta*.
 1909. *Panicum procurrens*.
 2143. *Andropogon bicornis*.
 2144. *Eragrostis montufari*.

COOK, O. F., AND GILBERT, G. B.

56. *Eragrostis peruviana*.
 168. *Muhlenbergia fastigiata*.
 173. *Aciachne pulvinata*.
 174. *Calamagrostis vicunorum*.
 183. *Calamagrostis vicunorum*.
 189. *Hordeum vulgare*.
 211. *Muhlenbergia peruviana*.
 222. *Hordeum vulgare*.
 447. *Sporobolus berterioanus*.
 478. *Festuca megalura*.
 479. *Bouteloua simplex*.
 510. *Festuca dichoclada*.
 514. *Muhlenbergia rigida*.
 516. *Sporobolus berterioanus*.
 518. *Sporobolus berterioanus*.
 520. *Aristida adscensionis*.
 676. *Stipa ichu*.
 684. *Stipa plumosa*.
 699. *Aegopogon cenchroides*.
 700. *Paspalum bonplandianum*.
 858. *Paspalum candidum*.
 902. *Axonopus scoparius*.
 923. *Lasiacis divaricata*.
 938. *Oplismenus hirtellus*.
 958. *Muhlenbergia diversiglumis*.
 965. *Chusquea huantensis*.
 1132. *Andropogon condensatus*.
 1189. *Lamprothyrus peruvianus*.
 1297. *Dissanthelium calycinum*.
 1305. *Dissanthelium calycinum*.
 1424. *Coix lacryma-jobi*.
 1427. *Panicum barbinode*.
 1428. *Holcus halepensis*.
 1429. *Chaetochloa polretiana*.
 1514. *Holcus halepensis*.
 1523. *Chaetochloa polretiana*.
 1530. *Panicum barbinode*.
 1531. *Paspalum virgatum*.
 1532. *Chloris distichophylla*.
 1533. *Imperata contracta*.
 1548. *Chaetochloa vulpiseta*.

COOK, O. F., AND GILBERT, G. B.—Contd.

1576. *Chloris distichophylla*.
 1632. *Pennisetum bambusiforme*.
 1638. *Hyparrhenia bracteata*.
 1653. *Olyra heliconia*.
 1828. *Aciachne pulvinata*.
 1910. *Cortaderia rudiusscula*.

CUMING, HUGH

1063. *Cenchrus myosuroides*.
 1054. *Paspalum racemosum*.

DIDRICHSEN, F.

4383. *Sporobolus virginicus*.
 4384. *Paspalum vaginatum*.
 4387. *Paspalum racemosum*.
 4393. *Cenchrus hillebrandianus*.
 4394. *Panicum aquaticum*.

D'ORBIGNY, A.

136. *Dissanthellium minimum*.
 166. *Paspalum boliviense*.
 185. *Calamagrostis vicunarum*.
 186. *Dissanthellium calycinum*.
 187. *Calamagrostis vicunarum*.
 191. *Dissanthellium calycinum*.
 194. *Poa humillima*.
 201. *Muhlenbergia peruviana*.
 202. *Calamagrostis heterophylla*.
 217. *Calamagrostis orbignyana*.
 219. *Calamagrostis curvula*.
 222. *Calamagrostis vicunarum*.

EGGERS, H. F. A.

14104. *Paspalum fasciculatum*.
 14149. *Panicum stoloniferum*.
 14345. *Panicum megiston*.
 14407. *Olyra latifolia*.
 14481. *Panicum trichoides*.
 14558. *Eragrostis hypnoides*.
 14584. *Chaetochloa membranifolia*.
 14585. *Panicum laxum*.
 14602. *Paspalum vaginatum*.
 14630. *Chloris radiata*.
 14632. *Paspalum repens*.
 14633. *Hymenachne donacifolia*.
 14646. *Paspalum conjugatum*.
 14655. *Ichnanthus axillaris*.
 14658. *Axonopus compressus*.
 14668. *Paspalum orbiculatum*.
 14669. *Olyra latifolia*.
 14724. *Orthocladia laxa*.

EGGERS, H. P. A.—Continued

14772. *Eriochloa pacifica*.
 14773. *Oryza latifolia*.
 14863. *Streptochaeta spicata*.
 14897. *Oplismenus rariflorus*.
 14965. *Paspalum racemosum*.
 15068. *Olyra latifolia*.
 15147. *Pseudechinolaena polystachya*.
 15188. *Pharus parvifolius*.
 15209. *Pharus latifolius*.
 15417. *Panicum trichoides*.
 15418. *Panicum fasciculatum*.
 15419. *Panicum ghiesbreghtii*.
 15423. *Eriochloa eggertii*.
 15553. *Lasiacis ruscifolia*.
 15572. *Lasiacis oaxacensis*.
 15701. *Sporobolus argutus*.
 15701. *Panicum boliviense*.
 15813. *Phragmites communis*.
 15834. *Panicum fasciculatum*.
 15836. *Axonopus compressus*.

FIERBIG, K.

2099. *Lamprothyrsus hieronymi*.
 2189. *Luziola peruviana*.
 2384. *Sporobolus eximius*.
 2437. *Pennisetum latifolium*.
 2528. *Eragrostis pilosa*.
 2552. *Bouteloua megapotamica*.
 2577. *Elyonurus tripsacoides*.
 2595. *Pennisetum chilense*.
 2629. *Bouteloua simplex*.
 2633. *Muhlenbergia fastigiata*.
 2656. *Cortaderia rudiusscula*.
 2787. *Andropogon cirratus*.
 2821. *Agrostis boliviana*.
 2859. *Andropogon tener*.
 2864. *Trachypogon montufari*.
 2865. *Aegopogon bryophilus*.
 2904. *Bromus unioloides*.
 2905. *Agrostis boliviana*.
 2907. *Agrostis montevdensis*.
 2936. *Poa scaberula*.
 2954. *Phragmites communis*.
 2955. *Festuca dolichophylla*.
 3043. *Cortaderia rudiusscula*.
 3074. *Heteropogon contortus*.
 3117. *Festuca procera*.
 3118. *Festuca procera*.
 3119. *Calamagrostis tarmensis*.
 3120. *Calamagrostis tarmensis*.
 3154. *Andropogon tener*.
 3159. *Festuca megalura*.

FIEBRIG, K.—Continued

3172. *Calamagrostis calderillensis*.
 3173. *Muhlenbergia angustata*.
 3191. *Calamagrostis fiebrigii*.
 3192. *Festuca orthophylla*.
 3277. *Muhlenbergia peruviana*.
 3281. *Bouteloua curtispindula*.
 3282. *Bouteloua curtispindula*.
 3571. *Aciachne pulvinata*.

FRIES, R. E.

1058. *Bouteloua simplex*.
 1058a. *Bouteloua simplex*.
 1059. *Chloris virgata*.
 1060. *Chloris beyrichiana*.
 1061. *Eragrostis cilianensis*.
 1064. *Paspalum distichum*.
 1065. *Aristida adscensionis*.
 1091. *Dactyloctenium aegyptium*.
 1093. *Sporobolus argutus*.
 1094. *Leptochloa dubia*.
 1099. *Pappophorum mucronulatum*.
 1100. *Eragrostis pilosa*.
 1103. *Cenchrus myosuroides*.
 1105. *Sporobolus berterianus*.
 1116a. *Chaetochloa geniculata*.
 1214. *Heteropogon contortus*.
 1221. *Pappophorum wrightii*.
 1229. *Imperata minutiflora*.
 1301. *Calamagrostis tarmensis*.
 1308. *Stipa pampagrandensis*.
 1463. *Eragrostis articulata*.
 1470. *Gouinia virgata*.
 1472. *Aristida adscensionis*.
 1589. *Aristida mendocina*.
 1622. *Arundo donax*.
 1691. *Bouteloua aristidoides*.

HARTEMAN, BROTHER

1. *Eragrostis nigricans*.
 2. *Chaetochloa geniculata*.
 3. *Bromus unioloides*.
 4. *Bromus pitensis*.
 5. *Eragrostis patula*.
 6. *Agrostis stolonifera*.
 7. *Trisetum spicatum*.
 7a. *Festuca sublimis*.
 8. *Bromus unioloides*.
 9. *Anthoxanthum odoratum*.
 11. *Trisetum spicatum*.
 12. *Agrostis toluensis*.
 13. *Poa trivialis*.

HARTEMAN, BROTHER—Continued

13. *Agrostis toluensis*.
 15. *Bromus pitensis*.
 16. *Paspalum lividum*.
 17. *Bromus unioloides*.
 17. *Agrostis toluensis*.
 18. *Agropyron attenuatum*.
 18. *Chaetochloa geniculata*.
 19. *Cortaderia rudiuscula*.
 22. *Stipa mucronata*.
 24. *Andropogon saccharoides parvispiculus*.
 25. *Briza mandoniana*.
 26. *Aegopogon cenchroides*.
 28. *Chaetochloa geniculata*.
 29. *Eragrostis patula*.
 30. *Agrostis toluensis*.
 32. *Polypogon elongatus*.
 33. *Paspalum pallidum*.
 36. *Polypogon elongatus*.
 37. *Polypogon elongatus*.
 38. *Agrostis toluensis*.
 39. *Festuca procera*.
 40. *Triniochloa stipoides*.
 41. *Brachypodium mexicanum*.
 42. *Briza mandoniana*.
 44. *Eragrostis nigricans*.
 45. *Poa annua*.
 47. *Bromus unioloides*.
 48. *Notholcus lanatus*.
 49. *Dactylis glomerata*.
 50. *Festuca bromoides*.
 51. *Polypogon lutosus*.
 52. *Briza minor*.
 53. *Agrostis toluensis*.
 54. *Chaetochloa geniculata*.
 55. *Eragrostis patula*.
 56. *Aegopogon cenchroides*.
 58. *Stipa mucronata*.
 59. *Polypogon elongatus*.
 60. *Andropogon saccharoides parvispiculus*.
 61. *Agrostis attenuata*.
 62. *Calamagrostis heterophylla*.
 63. *Andropogon hirtiflorus*.
 64. *Trachypogon montufari*.
 64a. *Andropogon condensatus*.
 65. *Paspalum humboldtianum*.
 66. *Axonopus compressus*.
 67. *Festuca dolichophylla*.
 69. *Calamagrostis jamesoni*.
 70. *Agrostis perennans*.
 71. *Festuca bromoides*.

HARTEMAN, BROTHER—Continued

73. *Dactylis glomerata*.
 76. *Poa pardoana*.
 78. *Bromus lanatus*.
 80. *Anthoxanthum odoratum*.
 81. *Andropogon condensatus*.
 82. *Agrostis nigrifolia*.
 83. *Poa cucullata*.
 84. *Calamagrostis ligulata*.
 85. *Poa pardoana*.

HARTWEG, C. T.

704. *Chaetochloa vulpiseta*.
 1447. *Paspalum bonplandianum*.
 1448. *Chaetochloa geniculata*.
 1449. *Trisetum andinum*.
 1450. *Poa vaginalis*.
 1452. *Eragrostis pastoensis*.
 1454. *Festuca australis*.
 1456. *Calamagrostis recta*.
 1459. *Andropogon condensatus*.
 1460. *Andropogon condensatus*.

HERZOG, TH.

1210. *Paspalum ceresia*.
 1211. *Cynodon dactylon*.
 1236. *Eragrostis articulata*.
 1302. *Andropogon lateralis*.
 1308. *Heteropogon villosus*.
 1309a. *Eragrostis articulata glabrescens*.
 1345. *Paspalum plicatulum*.
 1413. *Eriochrysis cayennensis*.
 1434. *Eleusine indica*.
 1442. *Aristida complanata*.
 1443. *Chaetochloa geniculata*.
 1444. *Panicum laxum*.
 1445. *Panicum olyroides*.
 1446. *Sporobolus tenuissimus*.
 1448. *Microchloa indica*.
 1449. *Tripogon spicatus*.
 1464. *Leptochloa domingensis*.
 1524. *Panicum paucispicatum*.
 1558. *Tristachya chrysothrix*.
 1578. *Pharus glaber*.
 1594. *Pseudechinolaena polystachya*.
 1654. *Paspalum ekmanianum*.
 1656. *Sorghastrum parviflorum*.
 1669. *Chloris beyrichiana*.
 1693. *Trachypogon montufari*.
 1702. *Andropogon hirtiflorus*.
 1705. *Trachypogon montufari*.

HERZOG, TH.—Continued

1705. *Eragrostis bahiensis*.
 1709. *Axonopus siccus*.
 1756. *Paspalum malacophyllum*.
 1763. *Syntherisma leiantha*.
 1789. *Sorghastrum stipoides*.
 1790. *Lycurus phleoides*.
 1804. *Trichloris mendocina*.
 1817. *Ichnanthus minarum*.
 1836. *Paspalum malacophyllum*.
 1854. *Andropogon saccharoides perforatus*.
 1855. *Stipa plumosa*.
 1925. *Leptochloa dubia*.
 1928. *Trichloris pluriflora*.
 2037. *Bouteloua simplex*.
 2038. *Muhlenbergia peruviana*.
 2052. *Festuca dolichophylla*.
 2054. *Calamagrostis amoena*.
 2057. *Muhlenbergia peruviana*.
 2069. *Trichachne saccharata*.
 2070. *Andropogon saccharoides laguroides*.
 2071. *Andropogon saccharoides parvispiculus*.
 2072. *Bouteloua curtipendula*.
 2079. *Calamagrostis humboldtiana*.
 2080. *Calamagrostis eminens*.
 2100. *Anthochloa lepidula*.
 2107. *Calamagrostis ovata*.
 2126. *Elyonurus tripsacoides*.
 2182. *Poa myriantha*.
 2194. *Cortaderia bifida*.
 2226. *Muhlenbergia peruviana*.
 2383. *Chusquea scandens*.
 2396. *Arundinaria herzogiana*.
 2515. *Distichlis humilis*.
 3004. *Panicum echinulatum*.
 3011. *Nassella pubiflora*.
 3017. *Briza mandoniana*.

HITCHCOCK, A. S.

19914. *Panicum barbinode*.
 19915. *Eriochloa polystachya*.
 19916. *Panicum geminatum*.
 19917. *Chloris radiata*.
 19943. *Bouteloua pilosa*.
 19947. *Panicum trichoides*.
 19948. *Paspalum scabrum*.
 19949. *Syntherisma aequatoriensis*.
 19953. *Pennisetum occidentale*.
 19955. *Paspalum racemosum*.
 19962. *Olyra latifolia*.

HITCHCOCK, A. S.—Continued

19963. *Lasiacis ruscifolia*.
 19969. *Panicum trichoides*.
 19977. *Sporobolus argutus*.
 19990. *Chloris radiata*.
 20000. *Sporobolus argutus*.
 20006. *Dactyloctenium aegyptium*.
 20015. *Eragrostis ciliaris*.
 20032. *Anthephora hermaphrodita*.
 20050. *Oryza latifolia*.
 20056. *Chloris angustiflora*.
 20056½. *Syntherisma aequatoriensis*.
 20057. *Lasiacis ruscifolia*.
 20064. *Chloris angustiflora*.
 20065. *Syntherisma sanguinalis*.
 20074. *Hymenachne amplexicaulis*.
 20080. *Oplismenus burmanni*.
 20083. *Echinochloa colonum*.
 20092. *Eragrostis viscosa*.
 20107. *Leptochloa filiformis*.
 20124. *Chaetochloa tenax*.
 20125. *Lasiacis ruscifolia*.
 20129. *Lasiacis ruscifolia*.
 20132. *Paspalum racemosum*.
 20133. *Lasiacis sorghoidea*.
 20134. *Paspalum racemosum*.
 20135. *Lasiacis ruscifolia*.
 20136. *Lasiacis ruscifolia*.
 20147. *Oplismenus hirtellus*.
 20158. *Lasiacis ruscifolia*.
 20161. *Paspalum conjugatum*.
 20163. *Leptochloa filiformis*.
 20168. *Eragrostis hypnoides*.
 20171. *Eleusine indica*.
 20172. *Leptochloa scabra*.
 20174. *Axonopus compressus*.
 20175. *Oplismenus burmanni*.
 20176. *Eragrostis ciliaris*.
 20177. *Paspalum microstachyum*.
 20178. *Chloris radiata*.
 20179. *Eragrostis amabilis*.
 20180. *Paspalum paniculatum*.
 20188. *Cenchrus viridis*.
 20193. *Panicum maximum*.
 20194. *Coix lachryma-jobi*.
 20199. *Panicum barbinode*.
 20202. *Paspalum orbiculatum*.
 20213. *Panicum trichoides*.
 20214. *Panicum trichanthum*.
 20215. *Panicum fasciculatum*.
 20224. *Ichnanthus pallens*.
 20233. *Axonopus compressus*.
 20236. *Lasiacis ruscifolia*.

HITCHCOCK, A. S.—Continued

20237. *Oplismenus hirtellus*.
 20252. *Leersia hexandra*.
 20254. *Pennisetum nervosum*.
 20256. *Eriochloa punctata*.
 20257. *Panicum laxum*.
 20266. *Hackelochloa granularis*.
 20271. *Syntherisma aequatoriensis*.
 20272. *Syntherisma digitata*.
 20274. *Paspalum scabrum*.
 20279. *Manisuris fasciculata*.
 20283. *Panicum megiston*.
 20285. *Leptochloa virgata*.
 20294. *Panicum trichanthum*.
 20295. *Lasiacis sorghoidea*.
 20299. *Lasiacis oaxacensis*.
 20313. *Chaetochloa geniculata*.
 20322. *Muhlenbergia diversiglumis*.
 20326. *Pereilema beyrichianum*.
 20328. *Andropogon saccharoides parvispiculus*.
 20329. *Heteropogon melanocarpus*.
 20333. *Uniola condensata*.
 20341. *Paspalum racemosum*.
 20344. *Melica scabra*.
 20349. *Polypogon lutosus*.
 20350. *Polypogon elongatus*.
 20353. *Pennisetum tristachyum*.
 20360. *Cenchrus echinatus*.
 20361. *Chaetochloa cernua*.
 20362. *Lasiacis sorghoidea*.
 20376. *Lasiacis sorghoidea*.
 20382. *Sporobolus berterioanus*.
 20399. *Muhlenbergia microsperma*.
 20413. *Paspalum decumbens*.
 20424. *Panicum polygonatum*.
 20425. *Ichnanthus axillaris*.
 20429. *Oplismenus rariflorus*.
 20432. *Lasiacis ruscifolia*.
 20433. *Panicum polygonatum*.
 20434. *Paspalum orbiculatum*.
 20437. *Lasiacis oaxacensis*.
 20438. *Lasiacis ligulata*.
 20445. *Ichnanthus pallens*.
 20446. *Ichnanthus pallens*.
 20467. *Panicum pilosum*.
 20468. *Ichnanthus axillaris*.
 20470. *Axonopus scoparius*.
 20472. *Chaetochloa geniculata*.
 20499. *Imperata contracta*.
 20517. *Gynerium sagittatum*.
 20521. *Axonopus scoparius*.
 20523. *Lasiacis ligulata*.

HITCHCOCK, A. S.—Continued

20524. *Lasiacis ruscifolia*.
 20534. *Isachne arundinacea*.
 20535. *Panicum schiffneri*.
 20536. *Panicum pulchellum*.
 20538. *Chaetochloa sulcata*.
 20555. *Axonopus scoparius*.
 20556. *Gynerium sagittatum*.
 20559. *Eriochloa punctata*.
 20560. *Imperata contracta*.
 20562. *Eriochloa polystachya*.
 20565. *Hackelochloa granularis*.
 20566. *Andropogon brevifolius*.
 20568. *Lasiacis oaxacensis*.
 20569. *Lasiacis ruscifolia*.
 20570. *Eragrostis glomerata*.
 20571. *Panicum megiston*.
 20573. *Oplismenus hirtellus*.
 20576. *Lasiacis ruscifolia*.
 20577. *Arundo donax*.
 20580. *Panicum hirsutum*.
 20581. *Chaetochloa vulpiseta*.
 20584. *Lasiacis ruscifolia*.
 20596. *Cenchrus viridis*.
 20598. *Axonopus scoparius*.
 20599. *Paspalum conjugatum*.
 20601. *Panicum hirsutum*.
 20602. *Pennisetum nervosum*.
 20607. *Lasiacis sorghoidea*.
 20608. *Chaetochloa geniculata*.
 20609. *Syntherisma aequatoriensis*.
 20610. *Stipa mucronata*.
 20613. *Eragrostis pilosa*.
 20616. *Andropogon saccharoides perforatus*.
 20621. *Heteropogon melanocarpus*.
 20626. *Andropogon cirratus*.
 20627. *Trinichloa stipoides*.
 20628. *Heteropogon contortus*.
 20629. *Bouteloua pilosa*.
 20635. *Pereilema beyrichianum*.
 20643. *Tripsacum dactylodes*.
 20652. *Paspalum saccharoides*.
 20653. *Andropogon saccharoides parvispiculus*.
 20654. *Chaetochloa tenax*.
 20655. *Andropogon saccharoides perforatus*.
 20656. *Paspalum humboldtianum*.
 20659. *Pennisetum setosum*.
 20660. *Andropogon saccharoides lagroides*.
 20661. *Aristida adscensionis*.

HITCHCOCK, A. S.—Continued

20668. *Pennisetum peruvianum*.
 20669. *Pennisetum tristachyum*.
 20672. *Panicum schiffneri*.
 20677. *Andropogon bicornis*.
 20680. *Pereilema beyrichianum*.
 20682. *Chaetochloa poiretiana*.
 20686. *Nassella pubiflora*.
 20687. *Aristida adscensionis*.
 20689. *Bromus unioloides*.
 20690. *Eragrostis pilosa*.
 20691. *Eragrostis lurida*.
 20695. *Chloris radiata*.
 20696. *Bouteloua simplex*.
 20698. *Stipa milleana*.
 20700. *Cortaderia rudiucula*.
 20701. *Stipa ichu*.
 20707. *Festuca australis*.
 20708. *Stipa depauperata*.
 20709. *Sporobolus berterioanus*.
 20712. *Stipa depauperata*.
 20713. *Eragrostis lurida*.
 20716. *Aristida spadicea*.
 20717. *Aegopogon cenchroides*.
 20718. *Eragrostis montufari*.
 20721. *Stipa mucronata*.
 20723. *Paspalum depauperatum*.
 20722. *Agropyron attenuatum*.
 20727. *Stipa milleana*.
 20738. *Melica scabra*.
 20741. *Chusquea peruviana*.
 20743. *Stipa mucronata*.
 20744. *Lasiacis ligulata*.
 20746. *Festuca eminens*.
 20752. *Trachypogon montufari*.
 20753. *Andropogon saccharoides perforatus*.
 20754. *Lasiacis ligulata*.
 20757. *Stipa mucronata*.
 20758. *Eragrostis montufari*.
 20759. *Trisetum deyeuxioides*.
 20760. *Bromus pitensis*.
 20761. *Aristida marginalis*.
 20762. *Festuca megalura*.
 20765. *Aristida schiedeana*.
 20766. *Andropogon hirtiflorus*.
 20767. *Andropogon brevifolius*.
 20768. *Muhlenbergia diversiglumis*.
 20771. *Stipa mucronata*.
 20772. *Chaetochloa cernua*.
 20773. *Eragrostis patula*.
 20774. *Stipa depauperata*.
 20782. *Paspalum bonplandianum*.

HITCHCOCK, A. S.—Continued

20797. *Calamagrostis planifolia*.
 20798. *Festuca procera*.
 20799. *Bromus pitensis*.
 20800. *Agrostis perennans*.
 20809. *Stipa neesiana*.
 20818. *Agropyron attenuatum*.
 20819. *Aegopogon cenchroides*.
 20825. *Chusquea scandens*.
 20827. *Calamagrostis heterophylla*.
 20828. *Agrostis toluensis*.
 20829. *Bromus pitensis*.
 20830. *Chaetochloa vulpiseta*.
 20831. *Trichachne insularis*.
 20832. *Paspalum macrophyllum*.
 20833. *Chaetochloa cernua*.
 20834. *Sporobolus argutus*.
 20855. *Cortaderia nitida*.
 20856. *Agropyron attenuatum*.
 20857. *Agrostis breviculmis*.
 20862. *Cortaderia nitida*.
 20863. *Neurolepis aristata*.
 20864. *Bromus pitensis*.
 20865. *Festuca australis*.
 20875. *Calamagrostis planifolia*.
 20886. *Trinichloa stipoides*.
 20897. *Eragrostis pastoensis*.
 20898. *Stipa ibarrensii*.
 20899. *Polypogon lutosus*.
 20900. *Polypogon elongatus*.
 20901. *Stipa mucronata*.
 20902. *Eragrostis pastoensis*.
 20903. *Andropogon saccharoides parvispiculus*.
 20904. *Eragrostis patula*.
 20905. *Notholeus lanatus*.
 20914. *Calamagrostis podophora*.
 20916. *Calamagrostis effusa*.
 20918. *Calamagrostis humboldtiana*.
 20919. *Poa pardoana*.
 20920. *Calamagrostis bogotensis*.
 20921. *Calamagrostis heterophylla*.
 20922. *Bromus lanatus*.
 20938. *Festuca australis*.
 20958. *Trisetum scabriflorum*.
 20967. *Paspalum pilgerianum*.
 20972. *Calamagrostis planifolia*.
 20974. *Bromus unioloides*.
 20975. *Stipa mucronata*.
 20989. *Paspalum bonplandianum*.
 20994. *Stipa mucronata*.
 21008. *Polypogon elongatus*.
 21009. *Brachypodium mexicanum*.

HITCHCOCK, A. S.—Continued

21011. *Calamagrostis heterophylla*.
 21018. *Bromus pitensis*.
 21019. *Torresia redolens*.
 21021. *Agrostis toluensis*.
 21026. *Aegopogon cenchroides*.
 21027. *Bromus unioloides*.
 21028. *Bromus pitensis*.
 21031. *Calamagrostis planifolia*.
 21036. *Poa annua*.
 21037. *Stipa mucronata*.
 21039. *Bromus lanatus*.
 21040. *Trisetum scabriflorum*.
 21041. *Briza mandoniana*.
 21042. *Festuca ulochaeta*.
 21045. *Agrostis toluensis*.
 21048. *Poa cucullata*.
 21053. *Agrostis nigritella*.
 21058. *Festuca breviaristata*.
 21059. *Trisetum andinum*.
 21063. *Calamagrostis coarctata*.
 21082. *Agrostis haenkeana*.
 21083. *Poa pardoana*.
 21085. *Calamagrostis recta*.
 21092. *Stipa mucronata*.
 21093. *Agropyron attenuatum*.
 21094. *Festuca procera*.
 21099½. *Phragmites communis*.
 21101. *Sporobolus virginicus*.
 21103. *Sporobolus argutus*.
 21126. *Olyra latifolia*.
 21130. *Lasiacis ruscifolia*.
 21131. *Lasiacis oaxacensis*.
 21134. *Olyra latifolia*.
 21136. *Ichnanthus candicans*.
 21137. *Chaetochloa vulpiseta*.
 21138. *Paspalum microstachyum*.
 21146. *Lasiacis sorghoidea*.
 21156. *Pennisetum setosum*.
 21157. *Arundinella confinis*.
 21177. *Oplismenus hirtellus*.
 21180. *Lasiacis divaricata*.
 21181. *Axonopus compressus*.
 21184. *Lasiacis divaricata*.
 21189. *Paspalum lepidum*.
 21191. *Panicum sciurotis*.
 21192. *Calamagrostis beyrichiana*.
 21193. *Axonopus scoparius*.
 21196. *Lasiacis sorghoidea*.
 21199. *Ichnanthus candicans*.
 21200. *Panicum pantrichum*.
 21202. *Ichnanthus axillaris*.
 21204. *Paspalum inconstans*.

HITCHCOCK, A. S.—Continued

21205. *Isachne arundinacea*.
 21206. *Paspalum depauperatum*.
 21210. *Paspalum decumbens*.
 21211. *Panicum sciurotis*.
 21211½. *Panicum sciurotis*.
 21212. *Panicum pulchellum*.
 21213. *Ichnanthus pallens*.
 21251. *Andropogon saccharoides* la-
 guroides.
 21252. *Leptochloa virgata*.
 21253. *Panicum hirtum*.
 21254. *Axonopus capillaris*.
 21256. *Panicum polygonatum*.
 21257. *Paspalum orbiculatum*.
 21260. *Hyparrhenia bracteata*.
 21261. *Andropogon semiberbis*.
 21262. *Imperata brasiliensis*.
 21263. *Andropogon leucostachys*.
 21266. *Chaetochloa geniculata*.
 21267. *Axonopus scoparius*.
 21268. *Eragrostis viscosa*.
 21269. *Paspalum pilosum*.
 21270. *Trachypogon montufari*.
 21271. *Andropogon semiberbis*.
 21273. *Chaetochloa vulpiseta*.
 21274. *Andropogon bicornis*.
 21278. *Andropogon condensatus*.
 21280. *Raddia capillata*.
 21284. *Arundinella confinis*.
 21288. *Imperata brasiliensis*.
 21293. *Aristida adscensionis*.
 21294. *Aristida capillacea*.
 21300. *Panicum glutinosum*.
 21302. *Panicum sciurotis*.
 21303. *Ichnanthus candicans*.
 21305. *Aristida marginalis*.
 21306. *Paspalum humboldtianum*.
 21309. *Panicum sellowii*.
 21310. *Pennisetum setosum*.
 21313. *Andropogon semiberbis*.
 21314. *Hyparrhenia bracteata*.
 21316. *Panicum polycladum*.
 21320. *Panicum hirtum*.
 21335. *Andropogon lateralis incanus*.
 21336. *Axonopus scoparius*.
 21353. *Aristida marginalis*.
 21369. *Poa aequatoriensis*.
 21380. *Agrostis perennans*.
 21381. *Stipa inconspicua*.
 21384. *Briza mandoniana*.
 21385. *Calamagrostis beyrichiana*.
 21388. *Chusquea serrulata*.

HITCHCOCK, A. S.—Continued

21397. *Panicum urvilleanum*.
 21398. *Aristida adscensionis*.
 21399. *Bouteloua curtipendula*.
 21400. *Trichloris pluriflora*.
 21401. *Eragrostis cilianensis*.
 21402. *Panicum stramineum*.
 21403. *Chloris virgata*.
 21404. *Aristida adscensionis*.
 21407. *Eragrostis pastoensis*.
 21408. *Aristida schiedeana*.
 21409. *Chloris beyrichiana*.
 21410. *Eragrostis montufari*.
 21418. *Sporobolus purpurascens*.
 21419. *Aegopogon cenchroides*.
 21420. *Panicum stigmatum*.
 21421. *Axonopus compressus*.
 21430. *Briza mandoniana*.
 21439. *Cortaderia nitida*.
 21444. *Triniochloa stipoides*.
 21454. *Isachne arundinacea*.
 21455. *Stipa inconspicua*.
 21457. *Agrostis breviculmis*.
 21461. *Muhlenbergia angustata*.
 21462. *Briza mandoniana*.
 21463. *Sporobolus purpurascens*.
 21464. *Paspalum tenellum*.
 21465. *Axonopus mathewii*.
 21466. *Agrostis perennans*.
 21468. *Bromus pitensis*.
 21469. *Trachypogon montufari*.
 21477. *Pennisetum intectum*.
 21478. *Lamprothyrsus peruvianus*.
 21481. *Andropogon aequatoriensis*.
 21482. *Pennisetum tristachyum*.
 21483. *Axonopus mathewii*.
 21484. *Eragrostis pastoensis*.
 21486. *Chaetochloa geniculata*.
 21487. *Briza mandoniana*.
 21488. *Bromus unioloides*.
 21489. *Andropogon hirtiflorus*.
 21491. *Paspalum cerasia*.
 21495. *Paspalum soboliferum*.
 21506. *Cortaderia nitida*.
 21512. *Festuca procera*.
 21523. *Stipa rosea*.
 21524. *Danthonia secundiflora*.
 21528. *Paspalum pallidum*.
 21530. *Danthonia secundiflora*.
 21531. *Briza mandoniana*.
 21532. *Calamagrostis planifolia*.
 21533. *Calamagrostis humboldtiana*.
 21534. *Agrostis perennans*.

HITCHCOCK, A. S.—Continued

21535. *Calamagrostis humboldtiana*.
 21536. *Paspalum bonplandianum*.
 21557. *Poa aequatoriensis*.
 21590. *Stipa brachyphylla*.
 21591. *Eragrostis pastoensis*.
 21593. *Agrostis toluensis*.
 21602. *Lolium temulentum arvense*.
 21605. *Stipa inconspicua*.
 21619. *Cortaderia nitida*.
 21628. *Briza mandoniana*.
 21630. *Poa pardoana*.
 21631. *Agrostis perennans*.
 21632. *Trinichloa stipoides*.
 21639. *Briza mandoniana*.
 21642. *Agrostis nigrifolia*.
 21643. *Agrostis toluensis*.
 21647. *Agrostis perennans*.
 21652. *Calamagrostis bogotensis*.
 21654. *Calamagrostis tarmensis*.
 21682. *Festuca sublimis*.
 21689. *Calamagrostis humboldtiana*.
 21690. *Cortaderia nitida*.
 21691. *Agrostis toluensis*.
 21704. *Chaetochloa cernua*.
 21709. *Stipa ibarrensensis*.
 21710. *Paspalum humboldtianum*.
 21711. *Bromus pitensis*.
 21712. *Polypogon elongatus*.
 21713. *Andropogon saccharoides parvispiculus*.
 21714. *Agropyron attenuatum*.
 21715. *Cenchrus echinatus*.
 21716. *Stipa ibarrensensis*.
 21718. *Bromus pitensis*.
 21719. *Stipa ibarrensensis*.
 21724. *Eragrostis lurida*.
 21728. *Eragrostis lurida*.
 21741. *Sporobolus berterianus*.
 21742. *Eragrostis nigricans*.
 21745. *Stipa ibarrensensis*.
 21749. *Paspalum juergensii*.
 21751. *Ischaemum latifolium*.
 21752. *Axonopus scoparius*.
 21755. *Ischaemum latifolium hirtivaginum*.
 21756. *Isachne arundinacea*.
 21757. *Ischaemum latifolium hirtivaginum*.
 21761. *Paspalum saccharoides*.
 21762. *Pennisetum bambusifolium*.
 21771. *Arundinella berterianiana*.
 21775. *Lasiacis sorghoidea*.

HITCHCOCK, A. S.—Continued

21799. *Panicum laxum*.
 21806. *Lasiacis sorghoidea*.
 21807. *Axonopus scoparius*.
 21808. *Lasiacis sorghoidea*.
 21809. *Panicum sciurotis*.
 21810. *Axonopus scoparius*.
 21822. *Pennisetum peruvianum*.
 21826. *Axonopus scoparius*.
 21842. *Paspalum juergensii*.
 21853. *Pseudechinolaena polystachya*.
 21856. *Lasiacis ligulata*.
 21858. *Ichnanthus pallens*.
 21862. *Panicum hebotes*.
 21863. *Lasiacis ligulata*.
 21867. *Panicum laxum*.
 21871. *Ichnanthus pallens*.
 21878. *Ichnanthus pallens*.
 21879. *Panicum laxum*.
 21894. *Lasiacis oaxacensis*.
 21895. *Chloris radiata*.
 21900. *Stipa mucronata*.
 21901. *Eragrostis pastoensis*.
 21902. *Chaetochloa geniculata*.
 21903. *Eragrostis pilosa*.
 21908. *Axonopus compressus*.
 21909. *Briza mandoniana*.
 21911. *Andropogon condensatus*.
 21912. *Paspalum pilgerianum*.
 21913. *Stipa ibarrensensis*.
 21914. *Eragrostis lugens*.
 21915. *Andropogon cirratus*.
 21916. *Oplismenus burmanni*.
 21919. *Andropogon lateralis incanus*.
 21920. *Stipa mucronata*.
 21921. *Muhlenbergia ciliata*.
 21922. *Aegopogon cenchroides*.
 21923. *Festuca megalura*.
 21926. *Festuca procera*.
 21931. *Eragrostis patula*.
 21932. *Eragrostis nigricans*.
 21944. *Festuca dolichophylla*.
 21948. *Poa pardoana*.
 21948½. *Briza mandoniana*.
 21949. *Calamagrostis humboldtiana*.
 21950. *Agrostis nigrifolia*.
 21951. *Festuca dolichophylla*.
 21955. *Calamagrostis coarctata*.
 21956. *Poa cucullata*.
 21958. *Bromus lanatus*.
 21967. *Poa cucullata*.
 21968. *Calamagrostis ligulata*.
 21978. *Festuca dolichophylla*.

HITCHCOCK, A. S.—Continued

21979. *Bromus lanatus*.
 21980. *Calamagrostis recta*.
 21981. *Festuca andicola*.
 21982. *Agrostis breviculmis*.
 21983. *Cortaderia sericantha*.
 21984. *Poa cucullata*.
 21985. *Calamagrostis jamesoni*.
 21986. *Poa pardoana*.
 21993. *Agrostis breviculmis*.
 21994. *Festuca dolichophylla*.
 21999. *Agrostis araucana*.
 21999½. *Poa subspicata*.
 21999¾. *Calamagrostis coarctata*.
 22002. *Agrostis breviculmis*.
 22003. *Bromus lanatus*.
 22004. *Poa pardoana*.
 22007. *Agrostis breviculmis*.
 22011. *Poa annua*.
 22014. *Agrostis breviculmis*.
 22015. *Agrostis toluensis*.
 22016. *Agrostis toluensis*.
 22017. *Poa cucullata*.
 22018. *Nassella pubiflora*.
 22019. *Festuca breviaristata*.
 22020. *Calamagrostis coarctata*.
 22026. *Poa subspicata*.
 22628. *Festuca australis*.
 22629. *Trisetum spicatum*.
 22030. *Festuca dolichophylla*.
 22045. *Agrostis breviculmis*.
 22051. *Andropogon bicornis*.
 22052. *Lasiacis sorghoidea*.
 22053. *Lasiacis ruscifolia*.
 22054. *Lasiacis sorghoidea*.
 22055. *Panicum trichanthum*.
 22056. *Olyra heliconia*.
 22057. *Panicum stoloniferum*.
 22058. *Panicum frondescens*.
 22059. *Panicum polygonatum*.
 22060. *Olyra micrantha*.
 22061. *Paspalum decumbens*.
 22062. *Axonopus compressus*.
 22063. *Arundinella berteroniana*.
 22064. *Panicum laxum*.
 22065. *Eleusine indica*.
 22066. *Paspalum decumbens*.
 22067. *Ichnanthus pallens*.
 22068. *Pseudechinolaena polystachya*.
 22069. *Ichnanthus candicans*.
 22070. *Olyra heliconia*.
 22072. *Paspalum paniculatum*.
 22073. *Paspalum virgatum*.

HITCHCOCK, A. S.—Continued

22074. *Eragrostis ciliaris*.
 22075. *Syntherisma sanguinalis*.
 22076. *Paspalum crassum*.
 22077. *Andropogon condensatus*.
 22078. *Leptochloa domingensis*.
 22079. *Trichachne sacchariflora*.
 22080. *Axonopus scoparius*.
 22081. *Cenchrus hillebrandianus*.
 22082. *Syntherisma sanguinalis*.
 22083. *Hackelochloa granularis*.
 22086. *Axonopus scoparius*.
 22087. *Paspalum multicaule*.
 22088. *Axonopus compressus*.
 22089. *Paspalum conjugatum*.
 22090. *Syntherisma violascens*.
 22091. *Syntherisma violascens*.
 22092. *Syntherisma violascens*.
 22094. *Chaetochloa vulpisetia*.
 22095. *Chaetochloa poiretiana*.
 22096. *Andropogon selloanus*.
 22097. *Chloris radiata*.
 22098. *Paspalum pubifolium*.
 22099. *Panicum laxum*.
 22100. *Leptochloa domingensis*.
 22101. *Panicum trichoides*.
 22102. *Paspalum virgatum*.
 22103. *Arundinella berteroniana*.
 22104. *Oplismenus hirtellus*.
 22108. *Sporobolus berteronius*.
 22109. *Chaetochloa geniculata*.
 22110. *Cenchrus pauciflorus*.
 22111. *Axonopus capillaris*.
 22113. *Andropogon brevifolius*.
 22115. *Panicum hirticaule*.
 22116. *Lasiacis ligulata*.
 22117. *Oplismenus hirtellus*.
 22118. *Lasiacis sorghoidea*.
 22119. *Lasiacis sorghoidea*.
 22120. *Lasiacis sorghoidea*.
 22121. *Guadua weberbaueri*.
 22122. *Lasiacis sorghoidea*.
 22123. *Gynerium sagittatum*.
 22124. *Panicum polygonatum*.
 22125. *Lasiacis sorghoidea*.
 22128. *Ichnanthus calvescens*.
 22130. *Eragrostis nigricans*.
 22131. *Eragrostis montufarii*.
 22132. *Paspalum paniculatum*.
 22133. *Cenchrus hillebrandianus*.
 22134. *Cenchrus pauciflorus*.
 22135. *Muhlenbergia fastigiata*.
 22136. *Calamagrostis densiflora*.

HITCHCOCK, A. S.—Continued

22137. *Calamagrostis densiflora*.
 22138. *Calamagrostis vicunarum*.
 22139. *Calamagrostis vicunarum*.
 22140. *Calamagrostis rigescens*.
 22141. *Lamprothyrsus peruvianus*.
 22143. *Andropogon lateralis*.
 22144. *Festuca megalura*.
 22145. *Agrostis toluensis*.
 22146. *Lamprothyrsus peruvianus*.
 22147. *Andropogon hirtiflorus*.
 22148. *Trachypogon montufari*.
 22149. *Pennisetum bambusiforme*.
 22150. *Eragrostis montufari*.
 22151. *Sporobolus berterianus*.
 22152. *Calamagrostis beyrichiana*.
 22152½. *Polypogon elongatus*.
 22153. *Ichnanthus minarum*.
 22154. *Muhlenbergia tenuissima*.
 22155. *Aegopogon cenchroides*.
 22156. *Andropogon lateralis incanus*.
 22157. *Axonopus scoparius*.
 22158. *Chaetochloa scandens*.
 22159. *Bromus unioloides*.
 22160. *Pennisetum weberbaueri*.
 22161. *Stipa brachyphylla*.
 22162. *Eragrostis lurida*.
 22163. *Eragrostis lurida*.
 22164. *Nassella pubiflora*.
 22165. *Muhlenbergia rigida*.
 22166. *Andropogon saccharoides parvispiculus*.
 22166½. *Andropogon saccharoides perforatus*.
 22167. *Bouteloua simplex*.
 22168. *Aristida adscensionis*.
 22169. *Lycurus phleoides*.
 22170. *Chaetochloa geniculata*.
 22171. *Poa pratensis*.
 22172. *Polypogon lutosus*.
 22173. *Festuca compressifolia*.
 22174. *Stipa ichu*.
 22175. *Poa asperiflora*.
 22176. *Poa fibrifera*.
 22177. *Polypogon lutosus*.
 22178. *Nassella pubiflora*.
 22179. *Festuca rigescens*.
 22180. *Elymus angulatus*.
 22181. *Stipa mucronata*.
 22182. *Muhlenbergia angustata*.
 22183. *Stipa brachyphylla*.
 22184. *Koeleria cristata*.
 22184½. *Trisetum spicatum*.

HITCHCOCK, A. S.—Continued

22185. *Agropyron attenuatum*.
 22186. *Poa scaberula*.
 22187. *Calamagrostis heterophylla*.
 22188. *Poa candamoana*.
 22190. *Poa annua*.
 22191. *Festuca rigescens*.
 22192. *Calamagrostis brevifolia*.
 22193. *Festuca parvipaniculata*.
 22194. *Festuca rigescens*.
 22195. *Poa subspicata*.
 22196. *Poa candamoana*.
 22197. *Festuca rigescens*.
 22198. *Calamagrostis preslii*.
 22199. *Trisetum spicatum*.
 22200. *Calamagrostis preslii*.
 22201. *Poa subspicata*.
 22202. *Agrostis haenkeana*.
 22203. *Dissanthelium calycinum*.
 22204. *Dissanthelium calycinum*.
 22205. *Agrostis breviculmis*.
 22206. *Calamagrostis vicunarum*.
 22207. *Dissanthelium calycinum*.
 22209. *Calamagrostis brevifolia*.
 22210. *Bromus unioloides*.
 22211. *Stipa mucronata*.
 22212. *Poa candamoana*.
 22213. *Poa candamoana*.
 22214. *Dissanthelium calycinum*.
 22216. *Poa candamoana*.
 22218. *Aciachne pulvinata*.
 22219. *Calamagrostis vicunarum*.
 22220. *Calamagrostis vicunarum*.
 22221. *Calamagrostis eminens*.
 22222. *Calamagrostis rigescens*.
 22223. *Calamagrostis densiflora*.
 22224. *Hordeum murinum*.
 22225. *Calamagrostis vicunarum*.
 22226. *Stipa brachyphylla*.
 22227. *Festuca casapaltensis*.
 22228. *Dissanthelium calycinum*.
 22229. *Calamagrostis vicunarum*.
 22230. *Bromus unioloides*.
 22231. *Bromus pitensis*.
 22232. *Festuca rigescens*.
 22233. *Dissanthelium calycinum*.
 22234. *Festuca rigescens*.
 22235. *Festuca rigescens*.
 22236. *Calamagrostis preslii*.
 22237. *Agrostis breviculmis*.
 22238. *Calamagrostis rigescens*.
 22239. *Festuca rigescens*.
 22240. *Dissanthelium minimum*.

HITCHCOCK, A. S.—Continued

22241. *Stipa hans-meyeri*
 22242. *Dissanthellium calycinum*.
 22243. *Stipa brachyphylla*.
 22244. *Festuca parvipaniculata*.
 22245. *Festuca parvipaniculata*.
 22246. *Dissanthellium calycinum*.
 22247. *Agrostis breviculmis*.
 22248. *Poa annua*.
 22249. *Aclachne pulvinata*.
 22250. *Calamagrostis podophora*.
 22251. *Poa horridula*.
 22252. *Festuca rigescens*.
 22253. *Calamagrostis brevifolia*.
 22254. *Trisetum spicatum*.
 22255. *Calamagrostis rigescens*.
 22256. *Aclachne pulvinata*.
 22258. *Stipa inconspicua*.
 22259. *Brachypodium mexicanum*.
 22260. *Poa horridula*.
 22261. *Hordeum murinum*.
 22262. *Polypogon lutosus*.
 22263. *Agropyron attenuatum*.
 22264. *Agrostis toluensis*.
 22265. *Poa horridula*.
 22266. *Poa trivialis*.
 22267. *Elymus angulatus*.
 22268. *Bromus pitensis*.
 22269. *Trisetum spicatum*.
 22270. *Festuca dolichophylla*.
 22271. *Trisetum spicatum*.
 22272. *Bromus pitensis*.
 22273. *Calamagrostis tarmensis*.
 22274. *Calamagrostis heterophylla*.
 22275. *Calamagrostis brevifolia*.
 22276. *Festuca dolichophylla*.
 22277. *Poa trivialis*.
 22278. *Elymus angulatus*.
 22279. *Poa trivialis*.
 22280. *Poa horridula*.
 22281. *Festuca dolichophylla*.
 22282. *Festuca rigescens*.
 22283. *Calamagrostis recta*.
 22284. *Calamagrostis heterophylla*.
 22285. *Paspalum pilgerianum*.
 22286. *Polypogon lutosus*.
 22287. *Festuca australis*.
 22288. *Poa candamoana*.
 22289. *Poa candamoana*.
 22290. *Bromus unioloides*.
 22291. *Agrostis araucana*.
 22292. *Stipa inconspicua*.
 22293. *Stipa inconspicua*.

HITCHCOCK, A. S.—Continued

22294. *Trisetum spicatum*.
 22295. *Stipa inconspicua*.
 22296. *Agrostis verticillata*.
 22297. *Agropyron attenuatum*.
 22298. *Brachypodium mexicanum*.
 22299. *Stipa mucronata*.
 22300. *Festuca rigescens*.
 22301. *Calamagrostis rigescens*.
 22302. *Poa horridula*.
 22302. *Lamprothyrsus peruvianus*.
 22303. *Lamprothyrsus peruvianus*.
 22304. *Lamprothyrsus peruvianus*.
 22305. *Calamagrostis fuscata*.
 22306. *Cortaderia rudiuscula*.
 22307. *Stipa mucronata*.
 22308. *Muhlenbergia angustata*.
 22309. *Festuca australis*.
 22310. *Agrostis toluensis*.
 22311. *Stipa inconspicua*.
 22312. *Bromus pitensis*.
 22313. *Festuca compressifolia*.
 22314. *Calamagrostis recta*.
 22315. *Calamagrostis recta*.
 22316. *Poa horridula*.
 22318. *Calamagrostis recta*.
 22319. *Elymus angulatus*.
 22320. *Agrostis breviculmis*.
 22321. *Agrostis toluensis*.
 22322. *Poa horridula*.
 22323. *Trisetum spicatum*.
 22324. *Bromus unioloides*.
 22325. *Bromus pitensis*.
 22326. *Bromus pitensis*.
 22327. *Calamagrostis humboldtiana*.
 22328. *Festuca dolichophylla*.
 22329. *Agropyron breviaristatum*.
 22330. *Agrostis perennans*.
 22331. *Agrostis gelida*.
 22332. *Calamagrostis emnens*.
 22333. *Polypogon lutosus*.
 22334. *Alopecurus bracteatus*.
 22335. *Poa candamoana*.
 22336. *Cortaderia rudiuscula*.
 22337. *Polypogon lutosus*.
 22337½. *Agrostis verticillata*.
 22338. *Paspalum racemosum*.
 22339. *Eriochloa ramosa*.
 22340. *Polypogon elongatus*.
 22341. *Bromus unioloides*.
 22342. *Echinochloa crusgalli crus-pavonis*.
 22343. *Cynodon dactylon*.

HITCHCOCK, A. S.—Continued

22344. *Poa annua*.
 22345. *Chloris radiata*.
 22346. *Phalaris minor*.
 22347. *Holcus halepensis*.
 22348. *Holcus halepensis*.
 22349. *Cenchrus humilis*.
 22350. *Stipa nardoides*.
 22351. *Eragrostis peruviana*.
 22352. *Nazia aliena*.
 22353. *Sporobolus virginicus*.
 22386. *Bromus striatus*.
 22387. *Festuca megalura*.
 22423. *Koeleria trachycantha*.
 22424. *Eragrostis attenuata*.
 22426. *Lolium temulentum*.
 22427. *Briza minor*.
 22428. *Echinochloa crusgalli crus-pavonis*.
 22429. *Distichlis spicata*.
 22430. *Bromus unioloides*.
 22431. *Polypogon elongatus*.
 22432. *Polypogon elongatus*.
 22433. *Polypogon lutosus*.
 22434. *Sporobolus berterioanus*.
 22436. *Poa annua*.
 22437. *Agrostis verticillata*.
 22438. *Nassella pubiflora*.
 22439. *Pennisetum clandestinum*.
 22442. *Poa candamoana*.
 22443. *Poa horridula*.
 22444. *Stipa brachyphylla*.
 22445. *Calamagrostis vicunarum*.
 22446. *Nassella pubiflora*.
 22447. *Stipa ichu*.
 22448. *Muhlenbergia fastigiata*.
 22449. *Pennisetum clandestinum*.
 22450. *Distichlis humilis*.
 22451. *Poa annua*.
 22452. *Stipa inconspicua*.
 22453. *Festuca rigescens*.
 22454. *Avena sterilis*.
 22455. *Festuca orthophylla*.
 22457. *Hordeum vulgare*.
 22458. *Poa horridula*.
 22459. *Poa horridula*.
 22460. *Stipa ichu*.
 22461. *Melica scabra*.
 22462. *Agropyron brevilaristatum*.
 22463. *Eragrostis lurida*.
 22465. *Aegopogon cenchroides*.
 22467. *Bromus unioloides*.
 22469. *Poa candamoana*.

HITCHCOCK, A. S.—Continued

22471. *Trisetum spicatum*.
 22472. *Lolium temulentum arvense*.
 22474. *Festuca megalura*.
 22475. *Cortaderia rudiusecula*.
 22476. *Polypogon lutosus*.
 22477. *Poa horridula*.
 22478. *Bromus unioloides*.
 22479. *Poa horridula*.
 22480. *Trisetum spicatum*.
 22481. *Nassella pubiflora*.
 22482. *Brachypodium mexicanum*.
 22483. *Stipa mucronata*.
 22484. *Agrostis araucana*.
 22485. *Paspalum humboldtianum*.
 22486. *Eragrostis lurida*.
 22487. *Polypogon elongatus*.
 22488. *Brachypodium mexicanum*.
 22489. *Bromus unioloides*.
 22490. *Eragrostis montufari*.
 22491. *Bouteloua simplex*.
 22492. *Chloris beyrichiana*.
 22495. *Bromus trinitii*.
 22495½. *Poa annua*.
 22496. *Avena sterilis*.
 22497. *Eragrostis nigricans*.
 22498. *Eragrostis nigricans*.
 22499. *Andropogon saccharoides parvispiculus*.
 22500. *Eragrostis lurida*.
 22501. *Poa candamoana*.
 22502. *Stipa neesiana*.
 22503. *Nassella pubiflora*.
 22505. *Stipa mucronata*.
 22506. *Festuca megalura*.
 22507. *Sporobolus berterioanus*.
 22508. *Polypogon lutosus*.
 22509. *Chaetochloa geniculata*.
 22510. *Stipa neesiana*.
 22511. *Pennisetum weberbaueri*.
 22513. *Poa horridula*.
 22514. *Stipa inconspicua*.
 22515. *Axonopus elegantulus*.
 22517. *Eragrostis lugens*.
 22518. *Eragrostis lurida*.
 22519. *Eragrostis lurida*.
 22520. *Sporobolus berterioanus*.
 22521. *Cortaderia rudiusecula*.
 22522. *Eragrostis pastoensis*.
 22523. *Nassella pubiflora*.
 22526. *Andropogon cirratus*.
 22527. *Stipa ichu*.
 22530. *Bromus pitensis*.

HITCHCOCK, A. S.—Continued

22531. *Bromus pitensis*.
 22532. *Festuca ulochaeta*.
 22533. *Agrostis gelida*.
 22534. *Agrostis toluensis*.
 22535. *Trisetum spicatum*.
 22538. *Agropyron breviaristatum*.
 22539. *Agrostis toluensis*.
 22540. *Poa scaberula*.
 22551. *Eragrostis nigricans*.
 22552. *Chloris beyrichiana*.
 22553. *Aristida adscensionis*.
 22554. *Eragrostis lurida*.
 22556. *Stipa mucronata*.
 22557. *Stipa plumosa*.
 22558. *Stipa ichu*.
 22559. *Poa buchtienii*.
 22560. *Festuca rigescens*.
 22561. *Bromus unioloides*.
 22562. *Bromus unioloides*.
 22563. *Trisetum spleatum*.
 22564. *Koeleria cristata*.
 22565. *Melica adhaerans*.
 22566. *Hordeum murinum*.
 22567. *Poa buchtienii*.
 22568. *Festuca dolichophylla*.
 22569. *Polypogon elongatus*.
 22570. *Poa buchtienii*.
 22571. *Poa buchtienii*.
 22572. *Poa pratensis*.
 22573. *Cortaderia rudijscula*.
 22574. *Poa annua*.
 22575. *Lolium perenne*.
 22576. *Polypogon lutosus*.
 22577. *Stipa mucronata*.
 22578. *Nassella pubiflora*.
 22579. *Nassella pubiflora*.
 22580. *Stipa mucronata*.
 22581. *Stipa ichu*.
 22582. *Bromus unioloides*.
 22583. *Pennisetum chilense*.
 22584. *Chloris beyrichiana*.
 22585. *Alopecurus bracteatus*.
 22586. *Muhlenbergia ligularis*.
 22587. *Poa asperiflora*.
 22589. *Poa asperiflora*.
 22590. *Calamagrostis glacialis*.
 22591. *Calamagrostis ovata*.
 22592. *Aciachne pulvinata*.
 22593. *Nassella pubiflora*.
 22594. *Sporobolus argutus*.
 22595. *Nassella pubiflora*.
 22596. *Muhlenbergia ligularis*.

HITCHCOCK, A. S.—Continued

- 22596½. *Dissanthellium calycinum*.
 22597. *Paspalum candidum*.
 22598. *Poa scaberula*.
 22599. *Polypogon elongatus*.
 22600. *Agrostis toluensis*.
 22601. *Calamagrostis montevidensis*.
 22602. *Trinichloa stipoides*.
 22603. *Aegopogon bryophilus*.
 22604. *Sporobolus berteroi*.
 22605. *Paspalum lepidum*.
 22606. *Syntherisma sanguinalis*.
 22607. *Cortaderia rudijscula*.
 22608. *Axonopus scoparius*.
 22609. *Paspalum inconstans*.
 22610. *Ichnanthus pallens*.
 22611. *Bromus unioloides*.
 22612. *Paspalum penicillatum*.
 22613. *Eragrostis montufari*.
 22614. *Panicum cordovense*.
 22615. *Andropogon saccharoides parvispiculus*.
 22616. *Lasiacis ligulata*.
 22617. *Andropogon bicornis*.
 22618. *Andropogon condensatus*.
 22619. *Ichnanthus minarum*.
 22620. *Ichnanthus pallens*.
 22621. *Panicum cordovense*.
 22622. *Muhlenbergia tenuissima*.
 22623. *Eragrostis montufari*.
 22624. *Paspalum paniculatum*.
 22625. *Axonopus fissifolius*.
 22626. *Panicum laxum*.
 22627. *Paspalum paniculatum*.
 22628. *Sporobolus berteroi*.
 22629. *Pseudechinolaena polystachya*.
 22631. *Ichnanthus pallens*.
 22632. *Oplismenus hirtellus*.
 22633. *Paspalum conjugatum*.
 22634. *Chaetochloa geniculata*.
 22635. *Chloris distichophylla*.
 22636. *Andropogon condensatus*.
 22637. *Andropogon condensatus*.
 22638. *Panicum sellowii*.
 22639. *Andropogon condensatus*.
 22640. *Paspalum buchtienii*.
 22641. *Ichnanthus pallens*.
 22642. *Andropogon leucostachyus*.
 22643. *Paspalum penicillatum*.
 22644. *Eragrostis pilosa*.
 22646. *Chaetochloa geniculata*.
 22647. *Panicum cordovense*.
 22648. *Paspalum buchtienii*.

HITCHCOCK, A. S.—Continued

22649. *Nazia aliena*.
 22650. *Gouinia latifolia*.
 22651. *Andropogon altus*.
 22652. *Lasiacis sorghoidea*.
 22653. *Ichnanthus calvescens*.
 22654. *Axonopus fissifolius*.
 22655. *Hackelochloa granularis*.
 22656. *Andropogon condensatus*.
 22657. *Axonopus capillaris*.
 22658. *Andropogon hirtiflorus*.
 22659. *Andropogon hassleri*.
 22660. *Panicum trichanthum*.
 22661. *Pennisetum setosum*.
 22662. *Axonopus scoparius*.
 22663. *Chloris distichophylla*.
 22664. *Paspalum buchtienii*.
 22665. *Trichachne sacchariflora*.
 22666. *Eriochloa punctata*.
 22667. *Panicum laxum*.
 22668. *Panicum laxum*.
 22669. *Panicum sciurotis*.
 22670. *Ichnanthus candicans*.
 22671. *Axonopus compressus*.
 22672. *Paspalum inaequivalve*.
 22673. *Brachiaria plantaginea*.
 22674. *Syntherisma violascens*.
 22675. *Paspalum plicatulum*.
 22676. *Aristida circinalis*.
 22677. *Chloris distichophylla*.
 22678. *Heteropogon melanocarpus*.
 22679. *Chloris radiata*.
 22680. *Eragrostis lugens*.
 22681. *Eragrostis bahiensis*.
 22682. *Erianthus trinii*.
 22683. *Gynerium sagittatum*.
 22684. *Eragrostis montufari*.
 22685. *Chaetochloa tenax*.
 22686. *Paspalum saccharoides*.
 22687. *Pennisetum tristachyum boliv-
 iense*.
 22688. *Cenchrus echinatus*.
 22689. *Chloris polydactyla*.
 22690. *Chloris polydactyla*.
 22691. *Paspalum inaequivalve*.
 22692. *Leptochloa domingensis*.
 22693. *Echinochloa crusgalli cruspa-
 vonis*.
 22694. *Thrasya campylostachya*.
 22695. *Ichnanthus minarum*.
 22696. *Paspalum virgatum*.
 22697. *Panicum sellowii*.
 22698. *Chloris polydactyla*.

HITCHCOCK, A. S.—Continued

22699. *Ichnanthus calvescens*.
 22700. *Axonopus scoparius*.
 22701. *Cortaderia rudiusecula*.
 22702. *Aristida riparia*.
 22703. *Axonopus chrysoblepharis*.
 22704. *Hyparrhenia bracteata*.
 22705. *Andropogon altus*.
 22706. *Heteropogon melanocarpus*.
 22707. *Andropogon condensatus*.
 22708. *Eragrostis lugens*.
 22709. *Panicum sciurotis*.
 22710. *Eragrostis lugens*.
 22711. *Aristida circinalis*.
 22712. *Panicum polygonatum*.
 22713. *Ichnanthus minarum*.
 22714. *Chaetochloa poiretiana*.
 22715. *Ichnanthus peruvianus*.
 22716. *Axonopus fissifolius*.
 22717. *Chaetochloa tenacissima*.
 22718. *Paspalum decumbens*.
 22719. *Chaetochloa poiretiana*.
 22720. *Olyra heliconia*.
 22721. *Tripsacum dactylodes*.
 22722. *Paspalum paniculatum*.
 22723. *Paspalum collinum*.
 22724. *Arundo donax*.
 22725. *Chusquea scandens*.
 22726. *Paspalum lepidum*.
 22727. *Eragrostis lugens*.
 22728. *Thrasya campylostachya*.
 22729. *Pennisetum tristachyum boliv-
 iense*.
 22730. *Paspalum distichum*.
 22732. *Paspalum cordovense*.
 22733. *Thrasya campylostachya*.
 22734. *Paspalum inconstans*.
 22735. *Polypogon elongatus*.
 22736. *Chloris distichophylla*.
 22737. *Erianthus angustifolius*.
 22738. *Panicum sciurotis*.
 22739. *Ichnanthus candicans*.
 22740. *Chaetochloa scandens*.
 22741. *Ichnanthus peruvianus*.
 22742. *Chusquea scandens*.
 22744. *Chusquea peruviana*.
 22745. *Chusquea peruviana*.
 22746. *Chusquea peruviana*.
 22747. *Chusquea scandens*.
 22748. *Chusquea delicatula*.
 22749. *Chusquea delicatula*.
 22750. *Chusquea serrulata*.
 22751. *Zeugites mexicana*.

HITCHCOCK, A. S.—Continued

22752. *Panicum sellowii*.
 22753. *Chusquea uniflora*.
 22754. *Poa horridula*.
 22755. *Agrostis toluensis*.
 22756. *Aphanelytrum procumbens*.
 22757. *Agrostis perennans*.
 22758. *Pariana lunata*.
 22759. *Poa myriantha*.
 22760. *Festuca megalura*.
 22761. *Poa scaberula*.
 22762. *Bromus pitensis*.
 22763. *Muhlenbergia ligularis*.
 22764. *Agrostis haenkeana*.
 22765. *Poa candamoana*.
 22766. *Agropyron attenuatum*.
 22767. *Koeleria cristata*.
 22768. *Alopecurus bracteatus*.
 22769. *Poa candamoana*.
 22770. *Agrostis toluensis*.
 22771. *Stipa inconspicua*.
 22772. *Paspalum pygmaeum*.
 22773. *Briza mandoniana*.
 22774. *Poa asperiflora*.
 22775. *Festuca sublimis*.
 22776. *Bromus pitensis*.
 22777. *Stipa hans-meyeri*.
 22778. *Festuca dolichophylla*.
 22779. *Agrostis araucana*.
 22780. *Cortaderia bifida*.
 22781. *Agrostis gelida*.
 22782. *Poa horridula*.
 22783. *Aciachne pulvinata*.
 22784. *Agrostis stolonifera*.
 22785. *Stipa ichu*.
 22786. *Festuca orthophylla*.
 22787. *Sporobolus argutus*.
 22788. *Chloris virgata*.
 22789. *Chloris beyrichiana*.
 22790. *Paspalum distichum*.
 22791. *Distichlis spicata*.
 22792. *Polypogon lutosus*.
 22793. *Paspalum distichum*.
 22794. *Andropogon saccharoides*.
 22794½. *Andropogon saccharoides parvispicula*.
 22795. *Paspalum humboldtianum*.
 22796. *Chloris polydactyla*.
 22797. *Chloris polydactyla*.
 22798. *Eragrostis montufari*.
 22799. *Stipa mucronata*.

HITCHCOCK, A. S.—Continued

22800. *Stipa inconspicua*.
 22801. *Sporobolus berterioanus*.
 22802. *Chaetochloa geniculata*.
 22803. *Chaetochloa argentina*.
 22804. *Eragrostis pilosa*.
 22805. *Echinochloa crusgalli crus-pavonis*.
 22806. *Cenchrus myosuroides*.
 22807. *Paspalum remotum*.
 22808. *Agrostis verticillata*.
 22809. *Bouteloua curtipendula*.
 22810. *Bromus unioloides*.
 22811. *Chloris beyrichiana*.
 22812. *Stipa ichu*.
 22813. *Polypogon elongatus*.
 22814. *Aira conferta*.
 22814½. *Calamagrostis montevidensis*.
 22815. *Lycurus phleoides*.
 22816. *Chloris beyrichiana*.
 22817. *Aristida adscensionis*.
 22818. *Muhlenbergia ligularis*.
 22819. *Bouteloua simplex*.
 22820. *Aegopogon cenchroides*.
 22821. *Eragrostis lugens*.
 22822. *Lycurus phleoides*.
 22823. *Andropogon saccharoides laguroides*.
 22824. *Microchloa indica*.
 22825. *Paspalum ceresia*.
 22826. *Lamprothyrsus hieronymi*.
 22827. *Pennisetum chilense*.
 22828. *Cortaderia rudiusscula*.
 22829. *Festuca megalura*.
 22830. *Paspalum humboldtianum*.
 22831. *Trachypogon montufari*.
 22833. *Stipa inconspicua*.
 22834. *Sporobolus argutus*.
 22835. *Eragrostis montufari*.
 22836. *Avena fatua*.
 22837. *Lolium temulentum arvense*.
 22838. *Calamagrostis lilloi*.
 22839. *Syntherisma sanguinalis*.
 22840. *Distichlis spicata*.
 22841. *Distichlis spicata*.
 22842. *Chloris virgata*.
 22843. *Aegopogon cenchroides*.
 22844. *Eragrostis cilianensis*.
 22845. *Chloris beyrichiana*.
 22846. *Eragrostis pilosa*.
 22847. *Pennisetum latifolium*.

HITCHCOCK, A. S.—Continued

22848. *Agrostis verticillata*.
 22849. *Polypogon lutosus*.
 22850. *Stipa neesiana*.
 22851. *Andropogon saccharoides parvispiculus*.
 22852. *Cortaderia rudiusecula*.
 22853. *Eragrostis lugens*.
 22854. *Stipa inconspicua*.
 22855. *Brachypodium mexicanum*.
 22856. *Lamprothyrsus hieronymi*.
 22858. *Pennisetum chilense*.
 22859. *Poa scaberula*.
 22860. *Poa scaberula*.
 22861. *Eragrostis montufari*.
 22862. *Muhlenbergia rigida*.
 22863. *Lycurus phleoides*.
 22864. *Poa annua*.
 22865. *Poa scaberula*.
 22866. *Paspalum bolivianum*.
 22867. *Eragrostis pilosa*.
 22869. *Eragrostis lurida*.
 22870. *Stipa plumosa*.
 22871. *Festuca orthophylla*.
 22872. *Stipa ichu*.
 22873. *Calamagrostis curvula*.
 22874. *Distichlis humilis*.
 22876. *Distichlis humilis*.
 22877. *Bromus unioloides*.
 22878. *Puccinellia parvula*.
 22879. *Puccinellia oresigena*.
 22880. *Stipa inconspicua*.
 22882. *Paspalum distichum*.
 22883. *Distichlis spicata*.
 22884. *Distichlis spicata*.
 22885. *Distichlis spicata*.
 22886. *Distichlis spicata*.
 22887. *Hordeum murinum*.
 22888. *Distichlis spicata*.
 22889. *Eragrostis nigricans*.
 22890. *Cortaderia rudiusecula*.
 22891. *Sporobolus asperifolius*.
 22892. *Elymus angulatus*.
 22893. *Polypogon lutosus*.
 22894. *Bromus unioloides*.
 22895. *Cortaderia rudiusecula*.
 22896. *Cortaderia rudiusecula*.
 22897. *Distichlis spicata*.
 22898. *Pennisetum chilense*.
 22899. *Bromus unioloides*.

HITCHCOCK, A. S.—Continued

22900. *Eragrostis pilosa*.
 22921. *Distichlis spicata*.
 22922. *Eragrostis pilosa*.
 22923. *Elymus angulatus*.
 22924. *Hordeum murinum*.
 22926. *Stipa inconspicua*.
 22928. *Eragrostis nigricans*.
 22930. *Festuca rigescens*.
 22931. *Poa pardoana*.

HOLMGREN, T.

58. *Paspalum conjugatum*.
 86. *Panicum frondescens*.
 113. *Panicum trichanthum*.
 166. *Bromus lanatus*.
 298. *Bromus lanatus*.
 332. *Andropogon condensatus*.
 527. *Stipa neesiana*.
 553. *Trisetum andinum*.
 570. *Alopecurus aequalis*.
 575. *Polypogon elongatus*.
 597. *Paspalum bonplandianum*.
 598. *Poa pardoana*.
 649. *Aphanelytrum procumbens*.
 859. *Pseudechinolaena polystachya*.
 860. *Oplismenus burmanni*.

HOLWAY, E. D. W., AND MARY M.

321. *Trichachne saccharata*.
 322. *Chloris beyrichiana*.
 323. *Echinochloa crusgalli crus-pavonis*.
 325. *Andropogon saccharoides perforatus*.
 328. *Stipa neesiana*.
 330. *Stipa ichu*.
 331. *Paspalum bolivianum*.
 336. *Paspalum remotum*.
 342. *Stipa ichu*.
 345. *Stipa ichu*.
 346. *Festuca dolichophylla*.
 346½. *Bromus lanatus*.
 348. *Chaetochloa geniculata*.
 350. *Distichlis spicata*.
 351. *Sporobolus berterioanus*.
 356. *Eragrostis pilosa*.
 359. *Bouteloua simplex*.
 361. *Microchloa indica*.
 362. *Stipa ichu*.

HOLWAY, E. D. W., AND MARY M.—CON.

367. *Pappophorum mucronulatum*.
 368. *Trichachne saccharata*.
 372. *Eragrostis pilosa*.
 374½. *Paspalum bolivianum*.
 377. *Eragrostis montufarii*.
 379. *Calamagrostis lelophylla*.
 380. *Stipa holwayi*.
 382. *Bromus lanatus*.
 383. *Briza stricta*.
 384. *Melica adhaerans*.
 387. *Stipa ichu*.
 389. *Stipa ichu*.
 392. *Andropogon saccharoides parvispiculus*.
 393. *Bouteloua curtipendula*.
 398. *Stipa inconspicua*.
 399. *Stipa ichu*.
 409. *Brachypodium mexicanum*.
 412. *Echinochloa crusgalli crus-pavonis*.
 415. *Bromus unioloides*.
 418. *Nassella pubiflora*.
 419. *Nassella pubiflora*.
 421. *Poa annua*.
 423. *Stipa mucronata*.
 427. *Agropyron attenuatum*.
 429. *Bromus unioloides*.
 430. *Nassella pubiflora*.
 433. *Stipa brachyphylla*.
 438. *Pennisetum chilense*.
 449. *Nassella pubiflora*.
 451. *Stipa ichu*.
 456. *Bromus unioloides*.
 457. *Melica adhaerans*.
 460. *Festuca dolichophylla*.
 461. *Stipa inconspicua*.
 463. *Eragrostis lugens*.
 464. *Nassella pubiflora*.
 470. *Andropogon saccharoides*.
 471. *Bromus unioloides*.
 473. *Festuca dolichophylla*.
 474. *Hordeum murinum*.
 476. *Nassella pubiflora*.
 477. *Festuca dolichophylla*.
 478. *Trisetum spicatum*.
 478½. *Calamagrostis heterophylla*.
 479. *Nassella pubiflora*.
 481. *Sporobolus berteroi*.
 483. *Festuca rigescens*.
 484. *Calamagrostis rigescens*.
 489. *Aristida adscensionis*.

HOLWAY, E. D. W., AND MARY M.—CON.

490. *Microchloa indica*.
 491. *Festuca rigescens*.
 492. *Stipa depauperata*.
 495. *Hordeum murinum*.
 496. *Poa horridula*.
 497. *Nassella pubiflora*.
 503. *Pennisetum latifolium*.
 507. *Paspalum prostratum*.
 507½. *Paspalum penicillatum*.
 508. *Stipa inconspicua*.
 511. *Stipa mucronata*.
 514. *Muhlenbergia rigida*.
 516. *Paspalum bolivianum*.
 519. *Festuca dolichophylla*.
 529. *Stipa ichu*.
 530. *Muhlenbergia holwayorum*.
 535. *Aegopogon cenchroides*.
 537. *Pennisetum mutilatum*.
 539. *Eragrostis nigricans*.
 541. *Ichnanthus minarum*.
 544. *Brachypodium mexicanum*.
 547. *Piptochaetium tuberculatum*.
 552. *Bromus pitensis*.
 583. *Calamagrostis heterophylla*.
 597. *Stipa ichu*.
 600. *Stipa inconspicua*.
 604. *Festuca rigescens*.
 666. *Axonopus scoparius*.
 677. *Chloris distichophylla*.
 678. *Paspalum buchtienii*.
 679. *Andropogon condensatus*.
 680. *Paspalum paniculatum*.
 686. *Andropogon bicornis*.
 686½. *Andropogon condensatus*.
 687. *Pennisetum setosum*.
 697. *Paspalum penicillatum*.
 703. *Paspalum virgatum*.
 708. *Axonopus chrysoblepharis*.
 709. *Andropogon altus*.
 712. *Paspalum buchtienii*.
 713. *Andropogon hirtiflorus*.
 714. *Pennisetum setosum*.
 719. *Paspalum buchtienii*.
 721. *Chloris polydactyla*.
 726. *Paspalum paniculatum*.
 736. *Ichnanthus minarum*.
 744. *Nassella pubiflora*.
 746. *Melica scabra*.
 747. *Bromus unioloides*.
 763. *Stipa mucronata*.
 770. *Aristida adscensionis*.

HOLWAY, E. D. W., AND MARY M.—Con.

771. *Aristida adscensionis*.
 781. *Paspalum distichum*.
 782. *Paspalum humboldtianum*.
 783. *Andropogon saccharoides perforatus*.
 785. *Echinochloa crusgalli crus-pavonis*.
 786. *Paspalum haenkeanum*.
 790. *Panicum barbinode*.
 801. *Lasiacis ruscifolia*.
 823. *Paspalum racemosum*.
 824. *Syntherisma aequatoriensis*.
 862. *Sporobolus berteronanus*.
 864. *Bromus unioloides*.
 867. *Arundo donax*.
 869. *Agropyron attenuatum*.
 876. *Andropogon hirtiflorus*.
 886. *Brachypodium mexicanum*.
 901. *Bromus unioloides*.
 903. *Andropogon saccharoides parvispiculus*.
 907. *Stipa ibarrensis*.
 909. *Paspalum penicillatum*.
 914. *Aegopogon cenchroides*.
 928. *Polypogon elongatus*.
 945. *Pennisetum tristachyum*.
 952. *Muhlenbergia angustata*.
 953. *Briza mandoniana*.
 954. *Paspalum pallidum*.
 958. *Polypogon elongatus*.
 1002. *Olyra latifolia*.

JAMESON, W.

21. *Calamagrostis jamesoni*.
 58. *Pereilema crinitum*.
 92. *Neurolepis aristata*.
 93. *Cortaderia sericantha*.
 95. *Calamagrostis ligulata*.
 97. *Calamagrostis ligulata*.
 105. *Chaetochloa geniculata*.
 107. *Aristida spadicea*.
 159. *Calamagrostis rigescens*.
 162. *Eragrostis mexicana*.
 163. *Poa horridula*.
 168. *Aphanelytrum procumbens*.
 186. *Chaetochloa geniculata*.
 190. *Calamagrostis recta*.
 191. *Festuca sublimis*.
 200. *Lasiacis ligulata*.
 229. *Agrostis araucana*.
 245. *Cenchrus echinatus*.

JAMESON, W.—Continued

248. *Muhlenbergia microsperma*.
 249. *Eragrostis nigricans*.
 251. *Stipa milleana*.
 253. *Chaetochloa cernua*.
 257. *Festuca australis*.
 269. *Aphanelytrum procumbens*.
 302. *Agrostis toluensis*.
 304. *Festuca australis*.
 305. *Agropyron attenuatum*.
 306. *Agropyron attenuatum*.
 316. *Andropogon glaucescens*.
 320. *Andropogon saccharoides parvispicula*.
 343. *Syntherisma sanguinalis*.
 346. *Echinochloa colonum*.
 347. *Isachne rigens*.
 349. *Chloris radiata*.
 350. *Antheophora hermaphrodita*.
 356. *Ichnanthus pallens*.
 365. *Oplismenus burmanni*.
 367. *Bouteloua pilosa*.
 371. *Paspalum microstachyum*.
 372. *Chaetochloa membranifolia*.
 385. *Syntherisma digitata*.
 393. *Chloris angustiflora*.
 396. *Oplismenus hirtellus*.
 417. *Polypogon elongatus*.
 431. *Calamagrostis rigescens*.
 540. *Paspalum repens*.
 541. *Eragrostis glomerata*.
 552. *Paspalum microstachyum*.
 556. *Axonopus compressus*.
 560. *Panicum trichanthum*.
 568. *Panicum megiston*.
 578. *Sporobolus argutus*.
 587. *Lasiacis ruscifolia*.
 630. *Chusquea scandens*.
 630. *Aegopogon cenchroides*.
 692. *Ichnanthus candicans*.
 694. *Poa horridula*.
 703. *Lasiacis sorgholdea*.
 725. *Chaetochloa sulcata*.
 735. *Arundinella berteroniana*.
 739. *Pharus glaber*.
 745. *Panicum trichoides*.
 746. *Panicum laxum*.
 762. *Axonopus scoparius*.
 764. *Homolepis aturensis*.
 779. *Briza mandoniana*.
 798. *Calamagrostis rigescens*.
 836. *Calamagrostis ligulata*.

JELSKI, C. DE

392. *Poa subspicata*.
 403. *Panicum obtusiglume*.
 487. *Paspalum penicillatum*.
 582. *Paspalum penicillatum*.
 582. *Paspalum pygmaeum*.
 583. *Lasiacis ligulata*.
 589. *Bouteloua curtipendula*.
 590. *Melica scabra*.

LECHLER, W.

1728. *Sporobolus berterianus*.
 1734. *Poa horridula*.
 1735. *Stipa peruviana*.
 1736. *Nassella pubiflora*.
 1756. *Calamagrostis heterophylla*.
 1774. *Aristida enodis*.
 1792. *Bouteloua simplex*.
 1800. *Calamagrostis antoniana*.
 1800. *Calamagrostis heterophylla*.
 1813. *Aciachne pulvinata*.
 1813b. *Muhlenbergia peruviana*.
 1827. *Calamagrostis ovata*.
 1829. *Festuca rigescens*.
 1832. *Dissanthellum calycinum*.
 1836. *Dissanthellum minimum*.
 1843. *Calamagrostis humboldtiana*.
 1960. *Andropogon condensatus*.
 1862. *Paspalum candidum*.
 1925. *Pennisetum latifolium*.
 1930. *Andropogon hirtiflorus*.
 1952. *Andropogon saccharoides perforatus*.
 1965. *Calamagrostis chrysantha*.
 1978. *Stipa hans-meyeri*.
 1981. *Calamagrostis rigescens*.
 2057. *Calamagrostis ovata*.
 2058. *Poa horridula*.
 2142. *Calamagrostis fuscata*.
 2148. *Saccharum officinarum*.
 2154. *Chusquea spicata*.
 2180. *Panicum pulchellum*.
 2187. *Ichnanthus pallens*.
 2219. *Lasiacis ligulata*.
 2275. *Paspalum conjugatum*.
 2284. *Axonopus capillaris*.
 2285. *Panicum laxum*.
 2310. *Pharus glaber*.
 2399. *Trichachne sacchariflora*.
 2427. *Arundinella berteroniana*.
 2430. *Panicum sellowii*.
 2432. *Orthoclada laxa*.

LECHLER, W.—Continued

2478. *Chloris radiata*.
 2604. *Agrostis haenkeana*.
 2640. *Chusquea spicata*.
 2640a. *Agrostis perennans*.
 2675. *Ichnanthus panicoides*.
 2682. *Poa horridula*.
 2694. *Chusquea spicata*.
 2695. *Calamagrostis recta*.
 3234. *Aciachne pulvinata*.
 3235. *Olyra micrantha*.
 3304. *Calamagrostis recta*.
 3305. *Olyra micrantha*.

LEHMANN, F. C.

- 442a. *Eragrostis tenax*.
 467. *Chaetochloa geniculata*.
 473. *Chusquea scandens*.
 491a. *Poa cucullata*.
 493. *Festuca breviaristata*.
 4400. *Streptochaeta sodiroana*.
 5284. *Polypogon lutosus*.
 5285. *Chaetochloa geniculata*.
 5286. *Stipa ibarrensii*.
 5286a. *Festuca megalura*.
 5392. *Stipa ichu*.
 5394. *Pennisetum tristachyum*.
 5744. *Panicum barbinode*.
 5745. *Panicum maximum*.
 5746. *Panicum frondescens*.
 6552. *Pharus latifolius*.
 7687. *Pennisetum tristachyum*.
 8025. *Poa cucullata*.

MACBRIDE, J. F.

2876. *Cottea pappophoroides*.
 2926. *Eragrostis patula*.
 2936. *Cortaderia rudiusecula*.
 2969. *Poa candamoana*.
 3001. *Poa asperiflora*.
 3045. *Festuca dichoclada*.
 3078. *Alopecurus aequalis*.
 3170. *Bouteloua curtipendula*.
 3176. *Stipa macbridei*.
 3177. *Aristida adscensionis*.
 3217. *Muhlenbergia microsperma*.
 3238. *Pappophorum alopecuroideum*.
 3239. *Heteropogon contortus*.
 3240. *Cottea pappophoroides*.
 3241. *Bouteloua simplex*.
 3258. *Festuca compressifolia*.
 3270. *Axonopus elegantulus*.

MACBRIDE, J. F.—Continued

3315. *Sporobolus lasiophyllus*.
 3316. *Briza mandoniana*.
 3317. *Festuca compressifolia*.
 3320. *Muhlenbergia rigida*.
 3322. *Calamagrostis fuscata*.
 3323. *Andropogon lateralis incanus*.
 3324. *Axonopus elegantulus*.
 3325. *Andropogon hirtiflorus*.
 3331. *Chloris beyrichiana*.
 3350. *Triniochloa stipoides*.
 3362. *Festuca dolichophylla*.
 3363. *Poa fibrifera*.
 3364. *Calamagrostis fuscata*.
 3365. *Cinna poaeformis*.
 3376. *Muhlenbergia ciliata*.
 3401. *Muhlenbergia peruviana*.
 3428. *Avena sterilis*.
 3429. *Hordeum vulgare*.
 3430. *Trachypogon montufari*.
 3511. *Aristida adscensionis*.
 3513. *Aristida adscensionis*.
 3514. *Muhlenbergia microsperma*.
 3516. *Eragrostis patula*.
 3518. *Andropogon condensatus*.
 3526. *Panicum hirticaule*.
 3584. *Agrostis gelida*.
 3621. *Zeugites mexicana*.
 3670. *Ichnanthus minarum*.
 3682. *Ichnanthus minarum*.
 3684. *Muhlenbergia ciliata*.
 3760. *Axonopus elegantulus*.
 3761. *Axonopus scoparius*.
 3778. *Chusquea scandens*.
 3779. *Pariana lunata*.
 3863. *Axonopus scoparius*.
 3874. *Muhlenbergia flexuosa*.
 4052. *Axonopus scoparius*.
 4068. *Trachypogon plumosus*.
 4069. *Eragrostis magna*.
 4073. *Sporobolus lasiophyllus*.
 4205. *Muhlenbergia flexuosa*.
 4250. *Lasiacis ligulata*.
 4251. *Oplismenus hirtellus*.
 4354. *Poa fibrifera*.
 4356. *Poa subspicata*.
 4357. *Agrostis toluensis*.
 4365. *Lasiacis ruscifolia*.
 4396. *Agrostis perennans*.
 4512. *Arundinaria patula*.
 4563. *Lasiacis ruscifolia*.
 4571. *Lasiacis sorghoidea*.

MACBRIDE, J. F.—Continued

4572. *Olyra heliconia*.
 4904. *Festuca dolichophylla*.
 4990. *Olyra lateralis*.
 5026. *Oplismenus hirtellus*.
 5027. *Ichnanthus axillaris*.
 5048. *Isachne arundinacea*.
 5101. *Panicum glutinosum*.
 5152. *Calamagrostis montevidensis*.
 5230. *Eleusine indica*.
 5251. *Gynerium sagittatum*.
 5298. *Lasiacis sorghoidea*.
 5302. *Lasiacis ligulata*.
 5309. *Panicum trichanthum*.
 5354. *Pseudechinolaena polystachya*.
 5357. *Arundinella berteroniana*.
 5451. *Trichachne sacchariflora*.
 5452. *Hackelochloa granularis*.
 5475. *Pariana zingiberina*.
 5521. *Olyra latifolia*.
 5535. *Ichnanthus calvescens*.
 5609. *Axonopus capillaris*.
 5646. *Panicum frondescens*.
 5871. *Koeleria trachycantha*.
 5874. *Eragrostis peruviana*.
 5906. *Poa annua*.
 5925. *Eragrostis peruviana*.
 5954. *Eragrostis mexicana*.

MACBRIDE, J. F., AND FEATHERSTONE,
WILLIAM

47. *Distichlis spicata*.
 47a. *Sporobolus virginicus*.
 135. *Paspalum flavum*.
 136. *Avena barbata*.
 137. *Stipa plumosa*.
 164. *Eragrostis pilosa*.
 186. *Aegopogon bryophilus*.
 219. *Bouteloua simplex*.
 220. *Aristida adscensionis*.
 221. *Hordeum murinum*.
 222. *Chloris virgata*.
 223. *Eragrostis nigricans*.
 224. *Eragrostis mexicana*.
 225. *Eragrostis pilosa*.
 226. *Festuca megalura*.
 227. *Bromus trinii*.
 228. *Nassella pubiflora*.
 231. *Bromus trinii*.
 251. *Eragrostis lurida*.
 252. *Eragrostis lurida*.
 253. *Bromus unioloides*.

MACBRIDE, J. F., AND FEATHERSTONE,
WILLIAM—Continued

254. *Stipa ichu*.
 255. *Andropogon saccharoides perforatus*.
 256. *Pennisetum weberbaueri*.
 280. *Pennisetum annuum*.
 281. *Melica scabra*.
 289. *Chaetochloa geniculata*.
 303. *Eragrostis weberbaueri*.
 329. *Tripogon spicatus*.
 334. *Festuca compressifolia*.
 335. *Stipa ichu*.
 342. *Aristida adscensionis*.
 343. *Nazia aliena*.
 356. *Paspalum pallidum*.
 358. *Muhlenbergia rigida*.
 359. *Calamagrostis heterophylla*.
 365. *Melica scabra*.
 367. *Poa fibrifera*.
 377. *Polypogon lutosus*.
 378. *Stipa mucronata*.
 378a. *Bromus trinit*.
 392. *Muhlenbergia microsperma*.
 393. *Eragrostis pilosa*.
 439. *Calamagrostis heterophylla*.
 440. *Poa fibrifera*.
 448. *Microchloa indica*.
 450. *Muhlenbergia peruviana*.
 451. *Eragrostis pilosa*.
 452. *Stipa macbridei*.
 453. *Pennisetum rupestre*.
 454. *Melica scabra*.
 506. *Paspalum conjugatum*.
 517. *Paspalum humboldtianum*.
 524. *Cynodon dactylon*.
 540. *Cenchrus myosuroides*.
 543. *Aristida adscensionis*.
 546. *Eriochloa punctata*.
 549. *Cenchrus echinatus*.
 551. *Eragrostis pilosa*.
 552. *Chloris radiata*.
 553. *Manisuris fasciculata*.
 628. *Dissanthelium minimum*.
 629. *Poa asperiflora*.
 643. *Bromus pitensis*.
 644. *Stipa ichu*.
 645. *Stipa ichu*.
 646. *Poa horridula*.
 647. *Bromus unioloides*.
 648. *Stipa inconspicua*.
 649. *Festuca dolichophylla*.
 650. *Elymus angulatus*.

MACBRIDE, J. F., AND FEATHERSTONE,
WILLIAM—Continued

651. *Bromus unioloides*.
 652. *Calamagrostis heterophylla*.
 653. *Festuca megalura*.
 669. *Stipa brachyphylla*.
 707. *Poa horridula*.
 731. *Nassella pubiflora*.
 751. *Hordeum halophilum*.
 765. *Muhlenbergia rigida*.
 785. *Calamagrostis brevifolia*.
 786. *Calamagrostis rigescens*.
 787. *Calamagrostis vicunarum*.
 800. *Muhlenbergia peruviana*.
 801. *Bromus lanatus*.
 802. *Calamagrostis heterophylla*.
 803. *Stipa hans-meyeri*.
 803a. *Stipa featherstonei*.
 804. *Paspalum pygmaeum*.
 825. *Anthochloa lepidula*.
 851. *Trisetum floribundum*.
 854. *Bromus villosissimus*.
 864. *Calamagrostis chrysantha*.
 903. *Calamagrostis humboldtiana*.
 916. *Muhlenbergia peruviana*.
 933. *Dissanthelium calycinum*.
 948. *Calamagrostis vicunarum*.
 949. *Festuca compressifolia*.
 950. *Festuca dolichophylla*.
 951. *Calamagrostis humboldtiana*.
 952. *Stipa ichu*.
 956. *Nassella pubiflora*.
 957. *Agropyron attenuatum*.
 981. *Festuca rigescens*.
 983. *Aristida enodis*.
 984. *Muhlenbergia peruviana*.
 987. *Eragrostis lurida*.
 994. *Andropogon hirtiflorus*.
 998. *Calamagrostis heterophylla*.
 1031. *Sporobolus berterioanus*.
 1065. *Nassella pubiflora*.
 1066. *Festuca compressifolia*.
 1067. *Calamagrostis humboldtiana*.
 1105. *Calamagrostis humboldtiana*.
 1112. *Festuca rigescens*.
 1130. *Trisetum floribundum*.
 1131. *Trisetum macbridei*.
 1133. *Alopecurus bracteatus*.
 1134. *Calamagrostis eminens*.
 1135. *Poa nigriflora*.
 1150. *Bromus lanatus*.
 1153. *Dissanthelium calycinum*.
 1154. *Briza mandoniana*.

MACBRIDE, J. F., AND FEATHERSTONE,
WILLIAM—Continued

1155. *Dissanthelium peruvianum*.
 1156. *Calamagrostis vicunarum*.
 1157. *Aciachne pulvinata*.
 1204. *Muhlenbergia angustata*.
 1205. *Lamprothyrus peruvianus*.
 1223. *Melica scabra*.
 1253. *Bromus unioloides*.
 1254. *Aristida enodis*.
 1280a. *Koeleria cristata*.
 1281. *Agropyron attenuatum*.
 1282. *Festuca compressifolia*.
 1283. *Stipa mucronata*.
 1284. *Calamagrostis macrophylla*.
 1366. *Paspalum candidum*.
 1421. *Sporobolus berterioanus*.
 1423. *Andropogon hirtiflorus*.
 1425. *Eragrostis montufari*.
 1427. *Aegopogon cenchroides*.
 1433. *Briza mandoniana*.
 1447. *Trachypogon montufari*.
 1498. *Axonopus elegantulus*.
 1499. *Andropogon lateralis incanus*.
 1611. *Andropogon lateralis incanus*.
 1687. *Chusquea serrulata*.
 1695. *Festuca compressifolia*.
 1696. *Trinichloa stipoides*.
 1697. *Calamagrostis humboldtiana*.
 1712. *Poa annua*.
 1721. *Muhlenbergia angustata*.
 1728. *Briza mandoniana*.
 1729. *Festuca megalura*.
 1780. *Paspalum ceresia*.
 1800. *Agrostis araucana*.
 1822. *Cortaderia bifida*.
 1847. *Agrostis gelida*.
 1875. *Calamagrostis humboldtiana*.
 1876. *Stipa mexicana*.
 1890. *Cortaderia sericantha*.
 1929. *Muhlenbergia angustata*.
 1970. *Poa horridula*.
 2030. *Paspalum pygmaeum*.
 2032. *Festuca megalura*.
 2033. *Stipa inconspicua*.
 2114. *Muhlenbergia peruviana*.
 2118. *Aegopogon cenchroides*.
 2172. *Festuca dolichophylla*.
 2180. *Agrostis gelida*.
 2183. *Dissanthelium calycinum*.
 2212. *Chusquea scandens*.
 2232. *Melica scabra*.
 2307. *Cortaderia rudiucula*.

MACBRIDE, J. F., AND FEATHERSTONE,
WILLIAM—Continued

2443. *Leptochloa uninervia*.
 2461. *Festuca rigescens*.
 2500. *Calamagrostis eminens*.

MANDON, GILBERT

1243. *Alopecurus aequalis*.
 1244. *Alopecurus bracteatus*.
 1246. *Phalaris angusta*.
 1252. *Paspalum remotum*.
 1255. *Paspalum ceresia*.
 1256. *Ichnanthus minarum*.
 1257. *Echinochloa crusgalli crus-pa-*
vonis.
 1258. *Echinochloa crusgalli crus-pa-*
vonis.
 1259. *Chaetochloa geniculata*.
 1260. *Chaetochloa oblongata*.
 1261. *Chaetochloa barbinodis*.
 1262. *Chaetochloa argentina*.
 1263. *Pennisetum latifolium*.
 1264. *Pennisetum mutilatum*.
 1266. *Cenchrus myosuroides*.
 1268. *Nazia aliena*.
 1270. *Nassella pubiflora*.
 1270. *Oryzopsis florulenta*.
 1272. *Stipa hans-meyeri*.
 1272. *Anthochloa lepidula*.
 1273. *Stipa ichu*.
 1274. *Piptochaetium tuberculatum*.
 1276. *Stipa mucronata*.
 1276. *Stipa neesiana*.
 1277. *Aristida enodis*.
 1277. *Aristida adscensionis*.
 1279. *Muhlenbergia angustata*.
 1280. *Muhlenbergia rigida*.
 1281. *Muhlenbergia peruviana*.
 1283. *Muhlenbergia peruviana*.
 1284. *Lycurus phleoides*.
 1285. *Sporobolus berterioanus*.
 1286. *Muhlenbergia ligularis*.
 1287. *Aciachne pulvinata*.
 1291. *Agrostis haenkeana*.
 1292. *Agrostis haenkeana*.
 1292. *Dissanthelium calycinum*.
 1292b. *Calamagrostis rigescens*.
 1294. *Polypogon elongatus*.
 1295. *Polypogon lutosus*.
 1296. *Aegopogon cenchroides*.
 1299. *Calamagrostis lelophylla*.
 1301. *Calamagrostis amoena*.
 1303. *Calamagrostis amoena*.

MANDON, GILBERT—Continued

1304. *Calamagrostis montevidensis*.
 1306. *Calamagrostis amoena*.
 1307. *Calamagrostis violacea*.
 1308. *Calamagrostis humboldtiana*.
 1309. *Calamagrostis eminens*.
 1310. *Calamagrostis eminens*.
 1312. *Calamagrostis glacialis*.
 1313. *Calamagrostis cryptolopha*.
 1314. *Agrostis haenkeana*.
 1316. *Calamagrostis curta*.
 1317. *Calamagrostis rigescens*.
 1317. *Calamagrostis vicunarum*.
 1318. *Calamagrostis ovata*.
 1319. *Calamagrostis chrysantha*.
 1320. *Calamagrostis ovata*.
 1323. *Chloris beyrichiana*.
 1325. *Bouteloua simplex*.
 1327. *Calamagrostis heterophylla*.
 1328. *Eragrostis montufari*.
 1329. *Eragrostis montufari*.
 1329. *Eragrostis pilosa*.
 1330. *Eragrostis montufari*.
 1331. *Eragrostis lugens*.
 1332. *Eragrostis lurida*.
 1336. *Poa scaberula*.
 1338. *Poa buchtienii*.
 1339. *Poa horridula*.
 1341. *Poa asperiflora*.
 1342. *Poa myriantha*.
 1343. *Melica scabra*.
 1345. *Dissanthelium peruvianum*.
 1346. *Dissanthelium minimum*.
 1347. *Poa gymnantha*.
 1350. *Poa gymnantha*.
 1351. *Poa gymnantha*.
 1353. *Poa humillima*.
 1354. *Distichlis humilis*.
 1355. *Briza mandoniana*.
 1356. *Briza mandoniana*.
 1357. *Melica adhaerens*.
 1359. *Koeleria cristata*.
 1360. *Lamprothyrus hieronymi*.
 1361. *Festuca dolichophylla*.
 1362. *Festuca sublimis*.
 1363. *Festuca megalura*.
 1365. *Bromus pitensis*.
 1366. *Bromus pitensis*.
 1367. *Bromus unioloides*.
 1368. *Bromus pitensis*.
 1369. *Bromus unioloides*.
 1370. *Bromus trinitii*.
 1371. *Trisetum floribundum*.

MANDON, GILBERT—Continued

1375. *Agropyron attenuatum*.
 1377. *Lolium temulentum arvense*.
 1379. *Hordeum murinum*.
 1380. *Bouteloua curtipendula*.
 1382. *Sorghastrum stipoides*.
 1383. *Andropogon tener*.
 1384. *Andropogon hirtiflorus*.
 1385. *Andropogon hirtiflorus*.
 1387. *Heteropogon contortus*.
 1388. *Andropogon bicornis*.
 1389. *Andropogon saccharoides parvispiculus*.
 1390. *Holcus sorghum*.

MATHEWS, ANDREW

425. *Paspalum racemosum*.
 426. *Paspalum racemosum*.
 429. *Chaetochloa verticillata*.
 545. *Polypogon elongatus*.
 770. *Eragrostis weberbaueri*.
 935. *Andropogon condensatus*.
 1079. *Oplismenus hirtellus*.
 1080. *Arundinella berteroniana*.
 2103. *Pseudechinolaena polystachya*.
 2104. *Panicum glutinosum*.
 2105. *Chaetochloa tenacissima*.
 2111. *Lasiacis sorghoidea*.
 3237. *Briza mandoniana*.
 3239. *Axonopus mathewii*.
 3240. *Agrostis toluensis*.
 3241. *Pseudechinolaena polystachya*.
 3242. *Eragrostis nigricans*.

MEYER, HANS

139. *Stipa hans-meyeri*.
 144. *Calamagrostis ligulata*.
 145. *Agrostis haenkeana*.
 146. *Agrostis haenkeana*.
 148. *Calamagrostis mollis*.
 437. *Poa cucullata*.

MILLE, FATHER A.

8. *Oplismenus rariflorus*.
 9. *Eriochloa pacifica*.
 13. *Panicum megiston*.
 17. *Syntherisma aequatoriensis*.
 18. *Syntherisma aequatoriensis*.
 19. *Eragrostis mexicana*.
 20. *Bouteloua pilosa*.
 22. *Pennisetum occidentale*.
 23. *Leptochloa filiformis*.

MILLE, FATHER A.—Continued

25. *Agropyron attenuatum*.
 50. *Cynodon dactylon*.
 51. *Bromus unioloides*.
 52. *Eragrostis lurida*.
 53. *Paspalum pilgerianum*.
 54. *Eragrostis nigricans*.
 55. *Bromus pitensis*.
 56. *Cenchrus echinatus*.
 57. *Stipa mucronata*.
 58. *Paspalum penicillatum*.
 65. *Polypogon lutosus*.
 200. *Hordeum nodosum*.
 237. *Bromus lanatus*.
 238. *Bromus pitensis*.
 240. *Bromus pitensis*.
 240½. *Bromus pitensis*.
 242. *Aegopogon cenchroides*.
 243. *Muhlenbergia ligularis*.
 245. *Trinichloa stipoides*.
 246. *Bromus pitensis*.
 246. *Muhlenbergia microsperma*.
 247. *Aristida adscensionis*.
 248. *Agrostis toluensis*.
 249. *Muhlenbergia peruviana*.
 250. *Agrostis perennans*.
 251. *Agrostis perennans*.
 253. *Agrostis perennans*.
 254. *Stipa ibarrensis*.
 255. *Stipa ichu*.
 256. *Stipa milleana*.
 257. *Stipa mucronata*.
 258. *Stipa inconspicua*.
 259. *Stipa milleana*.
 260. *Hordeum comosum*.
 261. *Polypogon lutosus*.
 262. *Polypogon lutosus*.
 263. *Agropyron attenuatum*.
 264. *Agropyron attenuatum*.
 267. *Muhlenbergia angustata*.
 268. *Trisetum spicatum*.
 269. *Weingartneria canescens*.
 270. *Aspris capillaris*.
 271. *Eragrostis tenax*.
 272. *Eragrostis pastoensis*.
 273. *Eragrostis lurida*.
 274. *Briza minor*.
 276. *Briza mandoniana*.
 277. *Poa cucullata*.
 279. *Festuca megalura*.
 281. *Festuca procera*.
 283. *Festuca sublimis*.
 284. *Festuca dolichophylla*.

MILLE, FATHER A.—Continued

285. *Festuca sublimis*.
 286. *Festuca procera*.
 287. *Festuca dichoclada*.
 288. *Cortaderia sericantha*.
 289. *Melica scabra*.
 291. *Cynodon dactylon*.
 292. *Eleusine indica*.
 293. *Bouteloua simplex*.
 294. *Brachypodium mexicanum*.
 296. *Andropogon hirtiflorus*.
 297. *Imperata contracta*.
 302. *Axonopus scoparius*.
 303. *Paspalum penicillatum*.
 303½. *Paspalum penicillatum*.
 304. *Paspalum conjugatum*.
 308. *Chaetochloa cernua*.
 309. *Panicum bulbosum*.
 310. *Panicum maximum*.
 312. *Oplismenus burmanni*.
 313. *Oplismenus hirtellus*.
 314. *Cenchrus myosuroides*.
 316. *Pennisetum bambusifforme*.
 316. *Pennisetum tristachyum*.
 317. *Chaetochloa geniculata*.
 318. *Neurolepis stuebelii*.
 319. *Chusquea scandens*.
 320. *Chusquea serrulata*.
 321. *Arundinaria patula*.
 322. *Cortaderia nitida*.
 323. *Anthoxanthum odoratum*.
 371. *Eragrostis patula*.
 392. *Stipa milleana*.

MULFORD BIOL. EXPED.⁴⁰

298. *Andropogon condensatus*.

PACHANO, A.

15. *Paspalum penicillatum*.
 64. *Eragrostis nigricans*.
 93. *Stipa ichu*.
 96. *Bromus pitensis*.
 109. *Chaetochloa cernua*.
 152. *Paspalum pilgerianum*.
 228. *Panicum sciurotis*.
 236. *Axonopus scoparius*.
 239. *Pennisetum peruvianum*.
 245. *Chaetochloa poiretiana*.

⁴⁰ See also Cárdenas, Rusby, and White.

PFLANZ, CARLOS

305. *Calamagrostis ovata*.
 360. *Poa asperiflora*.
 607. *Panicum echinulatum*.
 2526. *Chloris beyrichiana*.
 2541. *Avena barbata*.

PÖPPIG, E. F.

829. *Axonopus capillaris*.
 957. *Paspalum paniculatum*.
 966. *Andropogon condensatus*.
 976. *Olyra latifolia*.
 2280. *Panicum zizanioides*.

ROSE, J. N.

18518. *Distichlis spicata*.
 18520. *Cynodon dactylon*.
 18617. *Chloris radiata*.
 18630. *Panicum barbinode*.
 18644. *Hordeum murinum*.
 18683. *Poa candamoana*.
 18694. *Stipa ichu*.
 18742. *Paspalum racemosum*.
 18790. *Polypogon lutosus*.
 18802. *Aristida adscensionis*.
 18865. *Poa annua*.
 18866. *Polypogon lutosus*.
 18867. *Poa annua*.
 18868. *Bromus unioloides*.
 18925. *Stipa inconspicua*.
 18980. *Eragrostis peruviana*.
 18981. *Eragrostis peruviana*.
 19009. *Polypogon lutosus*.
 19535. *Stipa nardoides*.
 22112. *Pennisetum occidentale*.
 22141. *Oplismenus burmanni*.
 22162. *Paspalum racemosum*.
 22184. *Lasiacis sorghoidea*.
 22208. *Arundinella confinis*.
 22221. *Hordeum vulgare*.
 22292. *Chusquea peruviana*.
 22334. *Eragrostis lurida*.
 22372. *Pennisetum bambusiforme*.
 22381. *Cortaderia rudiusscula*.
 22385. *Arundo donax*.
 22402. *Poa annua*.
 22404. *Bromus unioloides*.
 22419. *Aristida adscensionis*.
 22435. *Gynerium sagittatum*.
 22436. *Axonopus scoparius*.
 22446. *Panicum pulchellum*.
 22472. *Polypogon elongatus*.
 22473. *Bromus pitensis*.

ROSE, J. N.—Continued

22496. *Polypogon lutosus*.
 22530. *Pennisetum bambusiforme*.
 22539. *Polypogon elongatus*.
 22540. *Melica scabra*.
 22550. *Muhlenbergia microsperma*.
 22582. *Paspalum candidum*.
 22639. *Paspalum humboldtianum*.
 22645. *Paspalum saccharoides*.
 22647. *Andropogon saccharoides parvispiculus*.
 22662. *Agrostis trichodes*.
 22745. *Poa annua*.
 22798. *Eragrostis mexicana*.
 22799. *Stipa ichu*.
 22886. *Polypogon lutosus*.
 22887. *Aegopogon cenchroides*.
 22890. *Polypogon lutosus*.
 22915. *Bromus unioloides*.
 22957. *Paspalum candidum*.
 22958. *Bromus unioloides*.
 22994. *Calamagrostis recta*.
 22997. *Cortaderia rudiusscula*.
 23075. *Polypogon elongatus*.
 23076. *Chaetochloa geniculata*.
 23102. *Cortaderia bifida*.
 23149. *Chusquea scandens*.
 23159. *Chaetochloa geniculata*.
 23201. *Chusquea scandens*.
 23202. *Pennisetum bambusiforme*.
 23219. *Paspalum candidum*.
 23237. *Isachne arundinacea*.
 23318. *Aegopogon cenchroides*.
 23374. *Lasiacis sorghoidea*.
 23399. *Eragrostis hypnoides*.
 23401. *Lasiacis sorghoidea*.
 23402. *Panicum sellowii*.
 23441. *Leptochloa virgata*.
 23449. *Panicum trichoides*.
 23469. *Ichnanthus pallens*.
 23475. *Panicum polygonatum*.
 23509. *Pennisetum peruvianum*.
 23510. *Gynerium sagittatum*.
 23513. *Pennisetum setosum*.
 23525. *Lasiacis oaxacensis*.
 23534. *Agrostis toluensis*.
 23535. *Agrostis breviculmis*.
 23536. *Stipa ibarrensensis*.
 23573. *Bromus unioloides*.
 23574. *Stipa ibarrensensis*.
 23575. *Stipa ichu*.
 23577. *Poa annua*.
 23909. *Poa annua*.

ROSE, J. N.—Continued

23938. *Stipa inconspicua*.
 24016. *Paspalum penicillatum*.
 24017. *Paspalum racemosum*.
 24018. *Muhlenbergia microsperma*.
 24019. *Polypogon lutosus*.
 24020. *Panicum polygonatum*.
 24021. *Lolium temulentum*.
 24022. *Paspalum racemosum*.
 24023. *Polypogon lutosus*.
 24024. *Aristida adscensionis*.
 24025. *Paspalum racemosum*.
 24026. *Polypogon lutosus*.
 24027. *Paspalum humboldtianum*.
 24028. *Agrostis breviculmis*.
 24029. *Stipa mucronata*.
 24031. *Agrostis toluensis*.
 24032. *Melica scabra*.
 24066. *Stipa ibarrensis*.

RUSBY, H. H.

6. *Isachne arundinacea*.
 8. *Hordeum murinum*.
 9. *Calamagrostis heterophylla*.
 10. *Chusquea serrulata*.
 13. *Poa horridula*.
 14. *Chloris beyrichiana*.
 16. *Muhlenbergia tenuissima*.
 18. *Zeugites mexicana*.
 22. *Panicum laxum*.
 23. *Paspalum lepidum*.
 24. *Paspalum buchtienii*.
 27. *Poa candamoana*.
 29. *Paspalum buchtienii*.
 30. *Paspalum remotum*.
 34. *Bouteloua simplex*.
 39. *Agrostis exasperata*.
 40. *Agrostis verticillata*.
 41. *Oplismenus hirtellus*.
 44. *Festuca sublimis*.
 45. *Eragrostis lugens*.
 49. *Eragrostis lurida*.
 50. *Festuca dolichophylla*.
 51. *Muhlenbergia ligularis*.
 52. *Melica adhaerens*.
 54. *Hordeum murinum*.
 55. *Sporobolus berterioanus*.
 179. *Hordeum murinum*.
 189. *Hyparrhenia bracteata*.
 190. *Cenchrus viridis*.
 191. *Lasiacis sorghoidea*.
 192. *Eragrostis maypurensis*.
 194. *Chloris polydactyla*.

RUSBY, H. H.—Continued

195. *Leersia hexandra*.
 196. *Chusquea spicata*.
 198. *Paspalum paniculatum*.
 200. *Aegopogon cenchroides*.
 201. *Muhlenbergia holwayorum*.
 201½. *Calamagrostis heterophylla*.
 202. *Sporobolus berterioanus*.
 204. *Festuca sublimis*.
 205. *Paspalum humboldtianum*.
 206. *Muhlenbergia holwayorum*.
 207. *Eleusine indica*.
 208. *Aristida capillacea*.
 209. *Olyra latifolia*.
 211. *Paspalum decumbens*.
 212. *Panicum pilosum*.
 214. *Eriochloa distachya*.
 215. *Eriochloa distachya*.
 215. *Gymnopogon jubiflorus*.
 216. *Axonopus chrysoblepharis*.
 217. *Panicum pulchellum*.
 218. *Pseudechinolaena polystachya*.
 221. *Eleusine indica*.
 222. *Chaetochloa geniculata*.
 223. *Poa buchtienii*.
 224. *Festuca dolichophylla*.
 225. *Bromus unioloides*.
 226. *Nassella pubiflora*.
 227. *Eragrostis hypnoides*.
 228. *Panicum laxum*.
 228. *Panicum frondescens*.
 229. *Panicum frondescens*.
 229. *Pseudechinolaena polystachya*.
 230. *Eragrostis hypnoides*.
 232. *Pariaria zingiberina*.
 234. *Eragrostis lugens*.
 236. *Panicum laxum*.
 237. *Stipa neesiana*.
 238. *Briza mandoniana*.
 239. *Eragrostis lugens*.
 240. *Paspalum penicillatum*.
 241. *Axonopus capillaris*.
 243. *Eragrostis hypnoides*.
 244. *Panicum glutinosum*.
 245. *Syntherisma sanguinalis*.
 246. *Trichachne sacchariflora*.
 247. *Stipa inconspicua*.
 328. *Arundinella berteroniana*.
 674. *Eriochloa punctata*.
 675. *Syntherisma sanguinalis*.
 759. *Panicum pilosum*.
 818. *Eleusine indica*.
 1319. *Chloris distichophylla*.

RUSBY, H. H.—Continued

1321. *Andropogon leucostachyus*.
 1433. *Chaetochloa geniculata*.
 1635. *Echinochloa crusgalli crus-pa-
 vonis*.
 1636. *Panicum chloroticum*.
 1646. *Leersia hexandra*.
 1657. *Leptocoryphium lanatum*.
 1658½. *Panicum laxum*.
 1669. *Olyra ciliatifolia*.
 2142. *Arundinella berteroniana*.

SHEPARD, MRS. R. S.

57. *Avena scabrivalvis*.
 58. *Hordeum murinum*.
 59. *Poa gymnantha*.
 60. *Calamagrostis heterophylla*.
 61. *Alopecurus bracteatus*.
 63. *Stipa ichu*.
 90. *Poa annua*.
 128. *Distichlis humilis*.
 160. *Polypogon lutosus*.
 167. *Cortaderia rudiusecula*.
 259. *Chaetochloa geniculata*.

SODIRO, FATHER LUIS

13. *Cenchrus myosuroides*.
 241. *Cynodon dactylon*.
 244. *Sporobolus bertereanus*.
 252. *Agrostis araucana*.
 265. *Calamagrostis humboldtiana*.
 266. *Calamagrostis humboldtiana*.
 278. *Festuca bromoides*.
 280. *Festuca dasyantha*.
 282. *Festuca procera*.
 290. *Chloris radiata*.
 295. *Andropogon bicornis*.
 298. *Andropogon saccharoides par-
 vispiculus*.
 299. *Paspalum paniculatum*.
 299½. *Paspalum macrophyllum*.
 300. *Paspalum candidum*.
 301. *Paspalum bonplandianum*.
 305. *Panicum polygonatum*.
 306. *Chaetochloa poiretiana*.
 307. *Chaetochloa sulcata*.
 311. *Lasiacis sorghoidea*.
 315. *Pseudechinolaena polystachya*.

SPRUCE, RICHARD

4180. *Heteropogon melanocarpus*.
 4192. *Panicum frondescens*.

SPRUCE, RICHARD—Continued

4224. *Imperata tenuis*.
 4368. *Eriochloa distachya*.
 4402. *Antheophora hermaphrodita*.
 4445. *Bouteloua pilosa*.
 4500. *Elyonurus adustus*.
 4501. *Leptocoryphium lanatum*.
 4526. *Aristida setifolia*.
 4807. *Olyra heliconia*.
 4854. *Andropogon saccharoides la-
 guroides*.
 4855. *Sporobolus bertereanus*.
 4856. *Arundinella berteroniana*.
 4911. *Chloris distichophylla*.
 5406. *Stipa mucronata*.
 5407. *Eragrostis pastoensis*.
 5408. *Aegopogon cenchroides*.
 5509. *Festuca dolichophylla*.
 5609. *Eragrostis lugens*.
 5802. *Nazia aliena*.
 5803. *Polypogon lutosus*.
 5803. *Polypogon elongatus*.
 5808. *Eragrostis lurida*.
 5809. *Chaetochloa geniculata*.
 5813. *Eragrostis nigricans*.
 5814. *Chaetochloa cernua*.
 5815. *Bromus unioloides*.
 5816. *Bromus unioloides*.
 5817. *Stipa ibarrensensis*.
 5818. *Cenchrus echinatus*.
 5917. *Brachypodium mexicanum*.
 5918. *Aristida adscensionis*.
 5919. *Distichlis spicata*.
 5921. *Paspalum distichum*.
 5922. *Bouteloua simplex*.
 5923. *Stipa ichu*.
 5925. *Agropyron attenuatum*.
 5926. *Agrostis perennans*.
 5927. *Agrostis toluensis*.
 5927. *Calamagrostis recta*.
 5929. *Poa aequatoriensis*.
 5930. *Agrostis toluensis*.
 5933. *Sporobolus bertereanus*.
 5934. *Trisetum spicatum*.
 5935. *Trisetum spicatum*.
 5936. *Agrostis breviculmis*.
 5937. *Pennisetum peruvianum*.
 5938. *Festuca procera*.
 5940. *Chusquea uniflora*.
 5941. *Axonopus compressus*.
 5943. *Paspalum penicillatum*.
 5957. *Agrostis toluensis*.
 5958. *Stipa milleana*.

SPRUCE, RICHARD—Continued

5958. *Festuca megalura*.
 5959. *Paspalum racemosum*.
 6092. *Eragrostis mexicana*.
 6093. *Chusquea peruviana*.
 6094. *Heteropogon contortus*.
 6095. *Poa aequatoriensis*.
 6096. *Poa annua*.
 6097. *Agrostis haenkeana*.
 6098. *Poa pardoana*.
 6099. *Andropogon cirratus*.
 6099. *Andropogon hirtiflorus*.
 6100. *Andropogon saccharoides parvispiculus*.
 6127. *Coix lachryma*.
 6128. *Isachne arundinacea*.
 6265. *Leersia hexandra*.
 6326. *Oplismenus burmanni*.
 6422. *Panicum fasciculatum*.
 6424. *Panicum geminatum*.
 6425. *Echinochloa colonum*.
 6426. *Pennisetum occidentale*.
 6427. *Eragrostis cilianensis*.
 6428. *Eragrostis pilosa*.
 6429. *Eragrostis glomerata*.
 6430. *Eragrostis hypnoides*.
 6431a. *Eragrostis ciliaris*.
 6431b. *Eragrostis ciliaris*.
 6432. *Eragrostis viscosa*.
 6433. *Eragrostis ciliaris*.
 6434. *Phragmites communis*.
 6435. *Aristida adscensionis*.
 6436. *Chloris angustiflora*.
 6437. *Chloris virgata*.
 6438. *Chloris radiata*.
 6439. *Chloris virgata*.
 6440. *Antheophora hermaphrodita*.
 6441. *Nazia aliena*.
 6442. *Leptochloa filiformis*.
 6443. *Bouteloua disticha*.
 6444. *Cottea pappophoroides*.
 6446. *Eriochloa pacifica*.
 6447. *Eriochloa pacifica*.
 6449. *Sporobolus virginicus*.
 6450. *Sporobolus argutus*.
 6451. *Cortaderia rudiuscula*.

STEINBACH, JOSÉ

5120. *Homolepis aturensis*.
 5130. *Panicum frondescens*.
 5143. *Andropogon selleanus*.
 5148. *Sporobolus berterianus*.

STEINBACH, JOSÉ—Continued

5149. *Eleusine indica*.
 5159. *Axonopus compressus*.
 5160. *Paspalum conjugatum*.
 5161. *Panicum laxum*.
 5162. *Paspalum polyphyllum*.
 5174. *Eriochrysis cayennensis*.
 5175. *Panicum caaguazuense*.
 5182. *Eragrostis articulata*.
 5184. *Eragrostis bahiensis*.
 5221. *Trichachne sacchariflora*.
 5222. *Leptochloa domingensis*.
 5231. *Panicum polygonatum*.
 5244. *Elyonurus adustus*.
 5259. *Panicum echinulatum*.
 5273. *Paspalum notatum*.
 5274. *Andropogon bicornis*.
 5299. *Panicum quadriglume*.
 5301. *Hackelochloa granularis*.
 5320. *Paspalum ekmanianum*.
 5338. *Panicum laxum*.
 5339. *Panicum procurrens*.
 5344. *Andropogon virgatus*.
 5352. *Aristida implexa*.
 5355. *Aristida complanata*.
 5358. *Trichopteryx flammida*.
 5359. *Chloris distichophylla*.
 5377. *Axonopus barbigerus*.
 5378. *Panicum olyroides*.
 5379. *Trachypogon montufari*.
 5385. *Paspalum polyphyllum*.
 5386. *Gymnopogon spicatus*.
 5404. *Elyonurus adustus*.
 5421. *Paspalum cerealia*.
 5426. *Axonopus aureus*.
 5427. *Andropogon lateralis*.
 5428. *Sorghastrum parviflorum*.
 5430. *Sorghastrum minarum*.
 5459. *Paspalum melanospermum*.
 5551. *Lasiacis sorghoidea*.
 5576. *Cenchrus echinatus*.
 6610. *Paspalum humboldtianum*.
 6638. *Trichachne sacchariflora*.
 6639. *Leptocoryphium lanatum*.
 6640. *Leptocoryphium lanatum*.
 6641. *Elyonurus adustus*.
 6642. *Elyonurus adustus*.
 6643. *Panicum versicolor*.
 6644. *Paspalum humboldtianum*.
 6646. *Panicum parvifolium*.
 6656. *Panicum versicolor*.
 6676. *Trichachne sacchariflora*.
 6701. *Sporobolus indicus*.

STEINBACH, JOSÉ—Continued

6707. *Sporobolus indicus*.
 6723. *Andropogon selloanus*.
 6724. *Axonopus fissifolius*.
 6807. *Aristida enodis*.
 6808. *Paspalum polyphyllum*.
 6809. *Andropogon condensatus*.
 6818. *Paspalum humboldtianum*.
 6834. *Leptochloa virgata*.
 6835. *Paspalum distichum*.
 6836. *Paspalum conjugatum*.
 6837. *Eleusine indica*.
 6838. *Cenchrus echinatus*.
 6839. *Syntherisma sanguinalis*.
 6840. *Panicum polygonatum*.
 6842. *Chaetochloa vulpiseta*.
 6843. *Sporobolus indicus*.
 6844. *Sporobolus indicus*.
 6845. *Andropogon leucostachyus*.
 6846. *Andropogon leucostachyus*.
 6847. *Axonopus fissifolius*.
 6850. *Panicum laxum*.
 6851. *Andropogon lateralis*.
 6852. *Sporobolus indicus*.
 6854. *Sporobolus indicus*.
 6855. *Panicum frondescens*.
 6857. *Panicum bolivense*.
 6865. *Panicum parviflorum*.
 6867. *Chloris distichophylla*.
 6868. *Leptochloa domingensis*.
 6873. *Paspalum plicatulum*.
 6874. *Andropogon selloanus*.
 6875. *Elyonurus adustus*.
 6877. *Syntherisma cuyabensis*.
 6879. *Axonopus capillaris*.
 6881. *Eragrostis bahiensis*.
 6885. *Imperata tenuis*.
 6889. *Eragrostis bahiensis*.
 6894. *Imperata minutiflora*.
 6896. *Elyonurus tripsacoides*.
 6898. *Paspalum densum*.
 6899. *Eragrostis expansa*.
 6900. *Panicum tricholaenoides*.
 6915. *Eriochrysis cayennensis*.
 6923. *Paspalum ekmanianum*.
 6928. *Imperata tenuis*.
 6935. *Panicum cayennense*.
 6945. *Andropogon virgatus*.
 6947. *Trachypogon canescens*.
 6948. *Axonopus aureus*.
 6949. *Andropogon bicornis*.

STEINBACH, JOSÉ—Continued

6950. *Andropogon condensatus*.
 6951. *Andropogon condensatus*.
 6952. *Andropogon condensatus*.
 6953. *Andropogon condensatus*.
 6958. *Trichopteryx flammida*.
 6871. *Andropogon selloanus*.
 6873. *Manisuris aurita*.
 6976. *Axonopus barbigerus*.
 6977. *Gymnopogon spicatus*.
 6978. *Panicum olyroides*.
 6979. *Panicum ghiesbreghtii*.
 6980. *Eragrostis polytricha*.
 6984. *Sorghastrum parviflorum*.
 6989. *Syntherisma digitata*.
 6990. *Axonopus compressus*.
 6991. *Eragrostis articulata*.
 7001. *Panicum parvifolium*.
 7010. *Oplismenus hirtellus*.
 7012. *Panicum procurrens*.
 7013. *Homolepis aturensis*.
 7020. *Paspalum notatum*.
 7028. *Sorghastrum minarum*.
 7029. *Aristida implexa*.
 7030. *Sacciolepis myuros*.
 7032. *Eriochrysis warmingianum*.
 7036. *Paspalum plicatulum*.
 7050. *Sorghastrum parviflorum*.
 7057. *Syntherisma sanguinalis*.
 7103. *Paspalum stellatum*.
 7111. *Lasiacis sorghoidea*.
 7116. *Leersia hexandra*.

STÜBEL

34. *Calamagrostis macrophylla*.
 60. *Festuca rigescens*.
 60e. *Bromus unioloides*.
 60f. *Poa scaberula*.
 61b. *Bromus lanatus*.
 87. *Festuca orthophylla*.
 102. *Paspalum pilgerianum*.
 152. *Aira conferta*.
 153. *Aristida spadicea*.
 207. *Festuca breviaristata*.
 230. *Poa cucullata*.
 231. *Agrostis nigrifolia*.
 231b. *Calamagrostis jamesoni*.
 247. *Chaetochloa cernua*.
 257. *Calamagrostis humboldtiana*.
 292. *Cortaderia sericantha*.
 297. *Festuca sublimis*.

TATE, G. H. H.

19. *Pseudechinolaena polystachya*.
 28. *Ichnanthus pallens*.
 530. *Paspalum pallidum*.
 546. *Notholcus lanatus*.
 569. *Oplismenus burmanni*.
 599. *Notholcus lanatus*.
 600. *Aegopogon cenchroides*.
 601. *Andropogon condensatus*.

ULE, ERNST

6513. *Arundinella berteroniana*.
 6598. *Arundinaria humillima*.
 9144. *Pharus glaber*.
 9146. *Olyra ecaudata*.

WEBERBAUER, A.

137. *Paspalum sodiroanum*.
 415. *Paspalum pygmaeum*.
 415. *Muhlenbergia peruviana*.
 472. *Poa candamoana*.
 474. *Calamagrostis heterophylla*.
 475. *Stipa rigidiseta*.
 477. *Poa fibrifera*.
 545. *Ichnanthus minarum*.
 688. *Chusquea dombeyana*.
 694. *Chusquea peruviana*.
 905. *Calamagrostis heterophylla*.
 906. *Calamagrostis antoniana*.
 907. *Festuca dolichophylla*.
 940. *Stipa hans-meyeri*.
 960. *Calamagrostis rigida*.
 1003. *Calamagrostis cephalantha*.
 1014. *Calamagrostis rigida*.
 1025. *Stipa hans-meyeri*.
 1028. *Trisetum floribundum*.
 1041. *Calamagrostis rigida*.
 1131. *Ichnanthus peruvianus*.
 1328. *Cortaderia bifida*.
 1487. *Stipa nardoides*.
 1490. *Cenchrus humilis*.
 1553. *Paspalum flavum*.
 2129. *Chusquea tarmensis*.
 2217. *Chusquea spicata*.
 2231. *Calamagrostis podophora*.
 2233. *Festuca dolichophylla*.
 2295. *Chusquea inamoena*.
 2381. *Sporobolus lasiophyllus*.
 2393. *Pennisetum weberbaueri*.
 2460. *Calamagrostis tarmensis*.
 2462. *Festuca compressifolia*.

WEBERBAUER, A.—Continued

2467. *Sporobolus lasiophyllus*.
 2586. *Festuca dolichophylla*.
 2602. *Poa humillima*.
 2615. *Stipa depauperata*.
 2662. *Poa fibrifera*.
 2663. *Eragrostis pastoensis*.
 2686. *Calamagrostis rigescens*.
 2811. *Trisetum floribundum*.
 2814. *Festuca casapaltensis*.
 2842. *Calamagrostis heterophylla*.
 2999. *Eragrostis carazensis*.
 3073. *Poa carazensis*.
 3076. *Stipa depauperata*.
 3078. *Trisetum floribundum*.
 3105. *Calamagrostis heterophylla*.
 3106. *Festuca dolichophylla*.
 3113. *Poa horridula*.
 3114. *Eragrostis pilgeriana*.
 3142. *Paspalum lineispatha*.
 3189. *Eragrostis weberbaueri*.
 3218. *Festuca dolichophylla*.
 3230. *Festuca dichoclada*.
 3275. *Festuca glyceriantha*.
 3317. *Festuca dolichophylla*.
 3349. *Cortaderia bifida*.
 3387. *Arundinaria haenkei*.
 3709. *Chusquea depauperata*.
 3719. *Agrostis perennans*.
 3815. *Paspalum tuberosum*.
 3932. *Paspalum tuberosum*.
 3974. *Festuca dolichophylla*.
 3975. *Poa pardoana*.
 4021. *Chusquea polyclados*.
 4135. *Eriochloa weberbaueri*.
 4408. *Chusquea straminea*.
 4415. *Chusquea weberbaueri*.
 4562. *Guadua weberbaueri*.
 4590. *Paspalum gossipinum*.
 4842. *Festuca orthophylla*.
 4873. *Calamagrostis trichophylla*.
 5113. *Poa humillima*.
 5118. *Poa chamaeclinos*.
 5283. *Panicum ramosum*.
 5311. *Tripogon spicatus*.
 5353. *Stipa annua*.
 5354. *Pennisetum annuum*.
 5380. *Aristida adscensionis*.
 5440. *Poa gymnantha*.
 5451. *Dissanthelium minimum*.
 5581. *Chusquea huantensis*.
 5938. *Aristida adscensionis*.

WEBERBAUER, A.—Continued

5950. *Antheophora hermaphrodita*.
 5952. *Eriochloa peruviana*.
 5961. *Bouteloua disticha*.
 5963. *Aristida adscensionis*.
 5964. *Chloris virgata*.
 6186. *Sporobolus mirabilis*.
 6570. *Axonopus elegantulus*.
 6836. *Eragrostis weberbaueri*.
 6867. *Aristida adscensionis*.
 6868. *Bouteloua simplex*.
 6869. *Pappophorum wrightii*.
 6870. *Eragrostis weberbaueri*.
 6892. *Festuca orthophylla*.
 6893. *Stipa ichu*.
 6897. *Festuca orthophylla*.
 6898. *Calamagrostis violacea*.
 6900. *Calamagrostis violacea*.
 6901. *Calamagrostis heterophylla*.
 6902. *Bromus lanatus*.
 6903. *Stipa depauperata*.
 6904. *Calamagrostis violacea*.
 6905. *Poa gymnantha*.
 6906. *Stipa depauperata*.
 6915. *Calamagrostis heterophylla*.
 6922. *Festuca sublimis*.
 6923. *Agrostis araucana*.
 6924. *Cortaderia nitida*.
 6966. *Stipa hans-meyeri*.
 7030. *Neurolepis weberbaueri*.
 7031. *Arundinaria hirtula*.
 7295. *Muhlenbergia peruviana*.
 7310. *Poa candamoana*.
 7317. *Calamagrostis violacea*.
 7339. *Nassella pubiflora*.
 7346. *Festuca dolichophylla*.
 7405. *Eragrostis nigricans*.
 7410. *Aristida adscensionis*.
 7413. *Bouteloua simplex*.
 7438. *Eragrostis cilianensis*.
 7439. *Pappophorum wrightii*.
 7442. *Stipa annua*.
 7447. *Eragrostis limbata*.
 7447a. *Eragrostis nigricans*.

WHITE, O. E. (MULFORD BIOL. EXPL.)

173. *Calamagrostis vicunarum*.
 190. *Cortaderia bifida*.
 238. *Calamagrostis humboldtiana*.
 297. *Gynerium sagittatum*.
 604. *Cenchrus myosuroides*.
 613. *Eragrostis glomerata*.
 627. *Manisuris fasciculata*.
 901. *Gynerium sagittatum*.
 914. *Eriochloa punctata*.
 915. *Eragrostis glomerata*.
 915. *Eragrostis ciliaris*.
 961. *Panicum polygonatum*.
 983. *Imperata minutiflora*.
 984. *Gynerium sagittatum*.
 995. *Arundinella berteroniana*.
 1000. *Eragrostis glomerata*.
 1004. *Lasiacis ligulata*.
 1043. *Pharus parvifolius*.
 1124. *Andropogon virgatus*.
 1125. *Hyparrhenia bracteata*.
 1126. *Andropogon bicornis*.
 1131. *Axonopus aureus*.
 1135. *Panicum megiston*.
 1203. *Oplismenus hirtellus*.
 1204. *Pharus glaber*.
 1208. *Erianthus angustifolius*.
 1209. *Panicum tricholaenoides*.
 1209. *Panicum chloroticum*.
 1210. *Olyra latifolia*.
 1215. *Hackelochloa granularis*.
 1221. *Manisuris aurita*.
 1232. *Eragrostis hypnoides*.
 1499. *Paspalum densum*.
 1521. *Eriochloa distachya*.
 1533. *Eriobrysis cayennensis*.
 1535. *Imperata brasiliensis*.
 1536. *Sporobolus indicus*.
 1536. *Syntherisma violascens*.
 1545. *Sporobolus argutus*.
 1658. *Sporobolus indicus*.
 1820. *Chaetochloa poiretiana*.
 2318. *Mesosetum rottboellioides*.
 2324. *Tripsacum dactyloides*.