

## THE GRASS GENUS DISSANTHELIUM

Jason R. Swallen and Oscar Tovar

The genus Dissanthelium was founded by C. B. Trinius in 1836 (Linnaea 10: 305. 1836) based on a single species, D. supinum, from Peru, "in frigidissimis ad Cerro de Pasco (America calidore, Poeppig)." It is characterized by two awnless florets, mostly exceeded by the equal glumes.

The name Dissanthelium was derived from the Greek word discos, double, and anthelion, a small flower, alluding to the two small florets (Hitchcock, "Manual of the grasses of the United States," p. 173. 1935). The type species of the genus was first described by Presl as Brizopyrum calycinum and soon after was transferred to Poa by Kunth, apparently without having seen the plant.

A. S. Hitchcock examined the type of Presl's species (Brizopyrum calycinum) at the herbarium of the German University in Prague and found that it was the same as the type of Trinius' species (Dissanthelium supinum) which he examined in the herbarium of the Academy of Sciences at Leningrad. Fragments from the types are in the U. S. National Herbarium. On grounds of priority the older name must be adopted. The second Peruvian species was first given a name by Steudel without description and the plant was distributed by Hohenacker in his exsiccatae (Lechler, Plantae Peruvianae, No. 1836) as Vilfa macusaniensis Steud., which was collected "in pascuis prope macusani, Lechler 1836." Macusani is in the Puno in the southern part of Peru. Later Pilger described the same species as Dissanthelium minimum, basing it on Weberbauer No. 5451 from Peru.

Dissanthelium is a genus exclusively American occurring principally in the central Andes of South America at altitudes between 4000 and 4800 meters. The greatest concentration of species is in the Peruvian Andes. One species, D. californicum (Nutt.) Benth., is confined to islands off the southern coast of California, U.S.A.; D. sclerochloides Fourn. is found in Mexico and the central Andes; D. patagonicum Parodi is only known from the Patagonian region of Argentina; and the other 14

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species are from the central Andes of Peru and Bolivia. D. calycinum (Presl) Hitchc. and D. minimum Pilger are widely distributed dwarf species of the high Andes.

The peculiar geographical distribution of the species of Dissanthelium in the central Andes is of interest. They occur only in the "Puna" and are never found in the "Paramo" of Ecuador and Colombia. Neither are they found in the "Jalca" of northern Peru which has a high humidity in comparison with the Puna.

A. S. Hitchcock, in his "Dissanthelium, an American genus of Grasses" recognized only 3 species. The present paper includes 17 species, 10 of which are described as new. All the species considered have been examined in the U. S. National Herbarium (US), Smithsonian Institution. The types and isotypes are deposited there and without these it would have been impossible to solve certain problems satisfactorily.

Most species of Dissanthelium are dwarf; few of them are more than 10 cm. tall. They are mostly perennial with only three annual species. The culms are mostly tufted, erect, glabrous, sometimes decumbent at the base, and in a few cases rhizomatous.

The sheaths are mostly glabrous, only in D. patagonicum, D. longiligulatum, and D. densum are they minutely scabrous. The lower sheaths are shorter than the upper, and sometimes the uppermost is elongate reaching the base of the panicle. The ligule is always membranaceous, usually less than 2.5 mm. long, or rarely as long as 5 or 6 mm. in D. longiligulatum and D. rauhi. The blades are usually narrow, involute, in a few cases folded or flat, soft or subcoriaceous, mostly scabrous or scaberulous above, glabrous beneath, ascending or spreading, the apex acute, subacute, or obtuse.

The panicles are dense or somewhat open. The branches may be appressed, ascending or spreading, floriferous to the base or sometimes naked below for a short distance. The pedicels are scabrous or scaberulous, except in D. semitectum where they are minutely villous.

The small spikelets may be 2-3-flowered, but they are usually 2-flowered, the lower floret always a little longer than the upper. The glumes are equal or nearly so, 3-nerved, usually longer than the florets, only in a few cases as in D. patagonicum, D. aequale, D. brevifolium, and D. rauhi are they as long as the florets. They may be ovate, ovate-lanceolate, oblong-lanceolate or subacuminate, rarely somewhat arcuate, commonly glabrous or scaberulous on the keel toward the summit, the margins sometimes scarious.

The lemmas are usually scabrous or scaberulous, in a few

cases such as D. peruvianum, D. trollii, and D. pygmaeum they are glabrous, and only in D. patagonicum are they densely villous. They are ovate, ovate-lanceolate, or rarely more or less oblong-lanceolate, the apex mostly acute or subacute, sometimes obtuse or subobtuse, 3-nerved, the lateral nerves close to the margin.

The palea is a little shorter than the lemma, narrow, mostly membranaceous, sometimes more or less hyaline, usually minutely scabrous-ciliate on the keels toward the tip. Only in D. patagonicum is it somewhat villous on the keels. The rachilla joint between the florets is glabrous, commonly less than 0.5 mm. long. In the majority of the species, the anthers are less than 1 mm. long, but D. trollii and D. pygmaeum have anthers 2-2.2 mm. long.

The annual or perennial habit, the type of blades, the relative size of glumes and lemmas, the smooth or scabrous lemmas, and the size of the anthers are of especial importance in the taxonomy of Dissanthelium.

These studies have been made during the junior author's tenure as a Fellow of the John Simon Guggenheim Memorial Foundation. The work was done in the Department of Botany, United States National Museum, Smithsonian Institution. To the authorities there, I wish to express sincere thanks for the support and facilities offered. The author is greatly indebted to Dr. Jason R. Swallen for his guidance and criticism, at whose suggestion the project was undertaken, and to C. V. Morton for his generous help in other ways.

#### SYSTEMATIC TREATMENT

DISSANTHELIUM Trin. *Linnaea* 10: 305. 1836.

Phalaridium Nees, *Nov. Act. Acad. Caes. Leop. Carol.* 19: Suppl. 1: 29. 1841; 161. 1843.

Stenochloa Nutt. *Journ. Acad. Phila.* II. 1: 189. 1847.

Spikelets 2-3-flowered (mostly 2-flowered), the lower floret a little longer than the upper; rachilla disarticulating above the glumes and between the florets; glumes firm, equal or nearly so, ovate-lanceolate or subacuminate, usually longer than the florets or somewhat shorter, 3-nerved, the margins sometimes scarious; lemmas ovate, oblong or more or less elliptic, acute, subacute or obtuse, mostly scaberulous, rarely villous or glabrous, membranaceous or subcoriaceous, 3-nerved, the lateral nerves close to the margins; palea somewhat shorter than the lemma, mostly membranaceous, minutely scabrous-ciliate on the keels toward the tip; anthers usually less than 1 mm. long, rarely 2-2.2 mm. long. Annual or perennial tufted grasses, with narrow spikelike or small open panicles.

Type species: Dissanthelium supinum Trinius.

## KEY TO THE SPECIES

## Annual.

Panicles more than 10 cm. long, not spikelike, somewhat loose, the branches ascending..... 1. D. californicum

Panicles less than 4 cm. long, dense, spikelike, the branches appressed.

Lemmas minutely pubescent or scabrous, ovate-oblong, toothed; glumes oblong-lanceolate; blades usually somewhat involute..... 2. D. minimum

Lemmas glabrous, ovate, entire, obtuse or rarely subacuminate; glumes ovate-lanceolate; blades always flat..... 3. D. peruvianum

## Perennial.

Lemmas glabrous, even on the keel; anthers 2-2.2 mm. long.

Tip of blades acute; glumes soft, the nerves inconspicuous; lemmas obtuse..... 4. D. trollii

Tip of blades obtuse; glumes firm, the nerves prominent; lemmas acute or subacuminate... 5. D. pygmaeum

Lemmas scabrous, at least on the keel, minutely hispidulous or villous; anthers less than 1 mm. long.

Lemmas densely villous; palea somewhat villous on the keels..... 6. D. patagonicum

Lemmas scabrous or minutely hispidulous; palea sparsely scaberulous on the keels.

Lower lemma more than 3.8 mm. long; spikelets 5.7-6.5 mm. long.

Panicles lax, few-flowered, not spikelike; glumes as long as the florets or nearly so; blades involute, pubescent above.... 7. D. aequale

Panicles dense, spikelike; glumes 2-2.5 mm. longer than the florets; blades flat or folded, wide, scaberulous above..... 8. D. longiligulatum

Lower lemma less than 2.8 mm. long; spikelets 2.5-5.3 mm. long.

Glumes distinctly longer than the florets.

Glumes narrow, acuminate or subacuminate, somewhat arcuate.

Lemmas oblong-lanceolate, acute.

9. D. semitectum

Lemmas oblong, obtuse or subacute.

Lemmas 1.9-2.1 mm. long; blades involute, pointed at the apex.

10. D. laxifolium

Lemmas 2.5-2.7 mm. long; blades folded or flat, obtuse or rarely subacute at the apex..... 11. D. breve

Glumes ovate-lanceolate, not arcuate.

Blades smooth and shining beneath, the nerves not conspicuous.

Glumes 2.4-3 mm. long; lower lemma 1.8-2.1 mm. long, obtuse or subacute.

12. D. calycinum

Glumes 3.5-4.2 mm. long; lower lemma 2.4-2.8 mm. long, acute.

13. D. sclerochloides

Blades dull, not shining beneath, the nerves conspicuous.

Panicle dense, spikelike, the branches appressed, usually floriferous to the base; anthers 0.5-0.6 mm. long; lemmas minutely hispidulous.

14. D. densum

Panicle loose, not spikelike, the branches spreading or divergent, usually naked at the base for a short distance; anthers 0.9-1 mm. long; lemmas scaberulous.... 15. D. expansum

Glumes as long as the florets or nearly so, somewhat ovate-lanceolate.

Panicle less than 1.5 cm. long; blades coriaceous, rigid, spreading; lemmas obtuse, scabrous; upper ligule mostly 2 mm. long.

16. D. brevifolium

Panicle more than 3 cm. long; blades subcoriaceous, ascending; lemmas subacute, scarcely pubescent; upper ligule mostly 4-5 mm. long..... 17. D. rauhi

1. DISSANTHELIUM CALIFORNICUM (Nutt.) Benth. in Hook. Icon. Pl. III. 4: 56, pl. 1375. 1881.  
Stenochloa californica Nutt. Journ. Acad. Sci. Phila. II. 1: 189. 1848.

Annual; culms somewhat geniculate at the base, 20-35 cm. tall; lower sheaths shorter than the upper, the uppermost elongate; blades 8-13 cm. long, 2-4 mm. wide, flat; panicles 10-15 cm. long, rather loose, the branches in fascicles, ascending, slender, flexuous, some of them floriferous to the base; spikelets 2-3-flowered, the lower floret a little longer than the upper; glumes nearly equal, narrow, acute, glabrous or minutely scabrous on the keel toward the tip, 3-nerved; lower lemma 2.1-2.2 mm. long, more or less lanceolate, scarcely pubescent, 3-nerved; palea a little shorter than the lemma; rachilla joint 0.3 mm. long; anthers 0.4 mm. long.

Type: "Catalina Island, California, Gambel."

Distribution: Open ground, islands off the southern coast of California.

California: San Clemente Island, Trask 324.

2. DISSANTHELIUM MINIMUM Pilger, Bot. Jahrb. Engler 56: Beibl. 123: 28. 1920.  
Vilfa macusaniensis Steud. ex Lechl. Berb. Amer. Austr. 56. 1857, name only. (Lechler 1836).  
Graminastrum macusaniense Krause, Beih. Bot. Centralbl. 32: 348. 1914. Based on Vilfa macusaniensis Steud.

Annual; culms 3-7 cm. tall, slender, erect, more or less filiform, glabrous; sheaths glabrous, membranaceous at the base, the lower shorter than the upper; ligule membranaceous, 0.7-1.7 mm. long; blades 1-4 cm. long, somewhat involute or flat, sub-acute, smooth, ascending, glabrous, the uppermost reaching almost the apex of the panicle; panicles 1-2 cm. long, oblong, dense, the branches appressed, floriferous to the base; glumes equal, 3.3-4.2 mm. long, 0.5 mm. longer than the florets, ovate-lanceolate, glabrous or minutely scaberulous on the keel toward the summit, somewhat scarious toward the margins, 3-nerved; lower lemma 2.5-2.8 mm. long, ovate-oblong, trifid, the middle tooth longer than the others, membranaceous, hyaline toward the tip, minutely pubescent, 3-nerved, the lateral nerves close to the margin; palea a little shorter than the lemma, the narrow tip somewhat bifid, minutely ciliate on the keels; rachilla joint 0.3-0.4 mm. long; anthers 0.3 mm. long.

Type: "Mountains of Peru, between Pisco and Ayacucho, Weberbauer 5451."

Distribution: Open ground in the Andes of Peru and Bolivia, between 3900 and 4500 meters altitude.

Peru: Ancash: Prov. Bolognesi: between Llamac and Jahuacocha, Dist. Pacllón, Cerrate 2323; Conococha, Cerrate 442; Marcará, Velarde 3202. Pasco: Cerro de Pasco, Hitchcock 22240. Junín: between Tarma and Jauja, Killip & Smith 21951. Lima: Prov. Huarochiri: Chicla, between Lima and Oroya, Asplund 11477; Viso, between Lima and Casapalca, Macbride & Featherstone 628; around Tuctucocha lagoon, Cerrate 1856; Prov. Canta: near Antacocha, Cerro Colorado, east of Canta, Pennell 14654. Huancavelica: Prov. Castrovirreina: around Choclococha, between Huancavelica and Castrovirreina, Tovar 2836; Pucapampa, below Chonta Pass, between Huancavelica and Castrovirreina, Tovar 2961; Prov. Huancavelica: Huaytanayocc-Tansiri, Dist. Conaica, Tovar 2572; Laria, about 6 miles from Conaica, Tovar 2493. Puno: near Macusani, Lechler 1836. Salinas, Rauh & Hirsch P-608. La Raya, Rauh & Hirsch P-668.

Bolivia: La Paz: Copacabana, near Lake Titicaca, Asplund 13484; La Paz, Buchtien 6420. Oruro: Challapata, on railroad between Oruro and Uyuni, Asplund 9545. Larecaja: vicinity of Sorata, Ancouma, between Pongo and Anilaya, Mandon 1346.

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.

Annual; culms somewhat geniculate at the base, 2.5-13 cm. tall, glabrous; sheaths glabrous, membranaceous at the base, the uppermost elongate reaching the base of the panicle; ligule 1-4 mm. long, membranaceous; blades 1-4 cm. long, 1.5-3 mm. wide, flat, smooth, soft, glabrous on both surfaces, ascending, the uppermost reaching the apex of the panicle; panicles 1-3.5 cm. long, 0.4-0.8 cm. wide, rather dense, the branches appressed, floriferous to the base, the branchlets ascending; glumes equal,

2.8-3.5 mm. long, 0.8-1.3 mm. longer than the florets, ovate-lanceolate, glabrous or scaberulous on the keel toward the summit, scarious on the margins, 3-nerved; lower lemma 2.2-2.5 mm. long, ovate, obtuse or rarely subacute at the apex, glabrous, obscurely 3-nerved, the lateral nerves close to the margins; palea a little shorter than the lemma, the narrow tip truncate, glabrous; rachilla joint 0.3-0.4 mm. long; anthers 0.3 mm. long.

Type: "Lake Titicaca, Peru, Meyen."

Distribution: Confined to the central Andes of Peru and Bolivia, between 3700 and 4200 meters altitude.

Peru: Ancash: Prov. Bolognesi: vicinity of Lake Condorocha, Cerrate 2257. Lima: Prov. Huarochiri: Chicla between Lima and Oroya, Ball in 1882 (Herb. Kew). Huancavelica: Prov. Tayacaja: Millpu, Puna of Hda. Tocas, between Colcabamba and Paucarbamba, Tovar 1950; Hacienda Alalay, between Mariscal Caceres and Pampas, Tovar 1350; Prov. Castrovirreina: vicinity of Laguna Choclococha, Tovar 2826; Prov. Huancavelica: Sachahuaccta, 6 Km. N.W. from Conaica, Tovar 940.

Bolivia: La Paz: Incachaca, Asplund 9549. Potosí: without locality, D'Orbigny 136, 186, 191; General Campero, on railroad between Viacha and Arica, near Corocoto, Asplund 13490.

4. DISSANTHELIUM TROLLII Pilger, Notizbl. Bot. Gart. Berlin, 11: 778. 1933.

Perennial, somewhat rhizomatous; culms glabrous, 3-5.5 cm. tall; sheaths membranaceous, glabrous, sometimes scaberulous, the lower shorter than the upper; ligule membranaceous, the tip toothed, 0.5-1 mm. long; blades 1.5-3 cm. long, 1-2 mm. wide, spreading, flat or sometimes nearly involute, acute, soft, scaberulous on both surfaces, scabrous on the margins; panicles 1.3-2 cm. long, 0.5 cm. wide, few-flowered, the branches appressed, floriferous to the base, the branchlets appressed; glumes equal, 4.5-5 mm. long, 1.5-1.8 mm. wide from keel to margin, as long as the florets or sometimes 0.3 mm. longer, ovate, obtuse or subacute, smooth, dull, rarely somewhat scaberulous toward the tip, scarious on the margins, 3-nerved; lower lemma 4-4.3 mm. long, 1.2 mm. wide from keel to margin, obtuse, glabrous, soft, 3-nerved; palea a little shorter than the lemma, the narrow tip subacute, glabrous, the nerves prominent; rachilla joint 0.3 mm. long, stout; anthers 2-2.2 mm. long.

Type: "Bolivia, San Eduardo bei La Union, C. Troll 1966."

Distribution: Known only at high altitudes (Puna) of Bolivia, between 4650 and 5000 meters altitude.

Bolivia: La Paz: Chacaltaya, 30 Km. from La Paz, Buchtien 1197. La Cumbre, railroad to Yungas, Parodi 10042; Cumbre, Tate 10.

5. DISSANTHELIUM PYGMAEUM Swallen & Tovar, sp. nov.

Perenne; culmi caespitiosi, erecti, 2-3 cm. alti, glabri; vaginae glabrae, basin membranaceae; ligula 0.7-1 mm. longa,

membranacea; laminae 1-2 cm. longae, conduplicatae vel planae, obtusae, supra sparse pubescentes, subtus glabrae; paniculae 1-1.5 cm. longae, 0.5-0.6 cm. latae, vix pauciflorae, ramis appressis vel adscendentibus, glabris; glumae aequales, 4.5-5 mm. longae, quam flores 0.4 mm. longiores, glabrae, 3-nerves; lemma inferius 4-4.5 mm. longum, vix acuminatum, 3-nerve, glabrum; palea lemmate paulo brevior, glabra; rhachillae internodium 0.3 mm. longum; antherae 2 mm. longae.

Perennial; culms tufted, glabrous, 2-3 cm. tall; sheaths glabrous, membranaceous at the base, the uppermost elongate; ligule membranaceous, 0.7-1 mm. long, truncate or somewhat dentate; blades 1-2 cm. long, folded or somewhat flat, obtuse, scarcely pubescent above, glabrous beneath, spreading; panicles 1-1.5 cm. long, 0.5-0.6 cm. wide, rather few-flowered, the branches appressed or ascending, stiff, glabrous; pedicels glabrous; glumes equal, 4.5-5 mm. long, 1.2-1.4 mm. wide from keel to margin, 0.4 mm. longer than the florets, glabrous, shining, oblong-lanceolate, 3-nerved, the nerves prominent; lower lemma 4-4.5 mm. long, subacuminate, 3-nerved, glabrous; palea a little shorter than the lemma, the narrow tip more or less truncate, membranaceous, glabrous; rachilla joint 0.3 mm. long; anthers 2 mm. long.

Type in the U. S. National Herbarium, No. 2207161, collected in Huaytanayocc-Tansiri, near Manta, District of Conaica, Department and Province Huancavelica, Peru, altitude 4500 meters, May 11, 1956, by Oscar Tovar (No. 2545).

Distribution: Known only from the type locality.

6. DISSANTHELIUM PATAGONICUM Parodi, Physis 8: 80, fig. 7. 1925.

Perennial; culms tufted, erect, 12 cm. tall; sheaths scaberulous, the lower shorter than the upper, membranaceous at the base, the uppermost elongate, somewhat coriaceous; ligule 1.5-4 mm. long, membranaceous; blades 1-2 cm. long, ascending, rigid, pointed, involute or somewhat folded, glabrous or minutely scaberulous; panicles 5.5 cm. long, 0.6 cm. wide, narrow, few-flowered, the branches appressed or sometimes ascending, floriferous to the base, the branchlets appressed or somewhat ascending, stiff, scabrous; glumes equal, 4-4.5 mm. long, nearly as long as the florets or somewhat longer, linear-lanceolate or subacuminate, glabrous or scaberulous, coriaceous, 3-nerved; lower lemma 2.4-2.5 mm. long, ovate-lanceolate, obtuse or subacute, densely villous, 3-nerved; palea a little shorter than the lemma, the narrow tip bifid, villous on the keels; rachilla joint 0.8-1 mm. long.

Type: "Santa Cruz: Río Gallegos, leg. L. Dauber No. 180, verano 1922" (Argentina).

Distribution: Known only from the type locality.

7. DISSANTHELIUM AEQUALE Swallen & Tovar, sp. nov.

Perenne; culmi caespitiosi, erecti, 13-16 cm. alti, minute scaberuli; vaginae glabrae vel scaberulae basin membranaceae; ligula 1-1.5 mm. longa, membranacea; laminae 6-10 cm. longae, involutae, supra pubescentes, subtus glabrae vel minute scabrae,



adscendentes vel appressae; paniculae 3.5-4.5 cm. longae, 0.7 cm. latae, pauciflorae, ramis appressis vel vix adscendentibus, ramulis appressis vel adscendentibus; glumae aequales, carina scabrae, 3-nerves; lemma inferius 5.5-5.8 mm. longum, scabrum, 3-nerve; palea lemmate paulo brevior, in carinis minute ciliata; rhachillae internodium 1 mm. longum.

Perennial, somewhat rhizomatous; culms tufted, erect, sparsely scabrous, 13-16 cm. tall; sheaths glabrous or minutely scabrous, membranaceous at the base; ligule membranaceous, 1-2.5 mm. long; blades 6-10 cm. long, involute, acute or subacute, pubescent above, glabrous or sparsely scabrous beneath, ascending or somewhat appressed; panicles 3.5-4.5 cm. long, 0.7 cm. wide, few-flowered, the branches appressed or ascending, angled, some of them naked below; glumes equal, 5.7-6.3 mm. long, nearly as long as the florets, linear-lanceolate, scaberulous on the keels toward the tip, 3-nerved, the lateral nerves conspicuous only at the base; lower lemma 5.5-5.8 mm. long, linear-lanceolate, scabrous, 3-nerved; palea a little shorter than the lemma, the tip bifid, minutely ciliate on the keels; rachilla joint 1 mm. long.

Type in the U. S. National Herbarium, No. 1818422, collected in Bolivia ("Plantae Andium Bolivienisium") by G. Mandon (No. 1292A). This specimen was mixed with No. 1292.

Distribution: Known only from the type locality.

8. DISSANTHELIUM LONGILIGULATUM Swallen & Tovar, sp. nov.

Perenne; culmi erecti, basi decumbentes, 12-15 cm. alti, glabri; vaginae elongatae, scabridae, compressae, suprema basin paniculae aequans; ligula 2-6 mm. longa, membranacea, vix truncata; laminae 5-7 cm. longae, conduplicatae, rigidae, adscendentes, acutae vel submucronatae, supra scabridae, subtus glabrae, nervis prominentibus ad marginem scabridis; paniculae 5 cm. longae, 1-1.3 cm. latae, densae, ramis appressis, et ramulis adscendentibus rigidis, scabris; glumae aequales, 6-6.5 mm. longae, floribus 2-2.5 mm. longiores, oblongo-lanceolatae vel subacuminatae, glabrae vel in carina scabrae, 3-nerves; lemma inferius 3.8-4 mm. longum, 0.8-1 mm. latum, subacutum, scabrum, 3-nerve; palea 2.6-2.8 mm. longa, membranacea, glabra, truncata; rhachillae internodium 0.4-0.5 mm. longum; antherae 0.6-0.7 mm. longae.

Perennial, rhizomatous; culms erect from a decumbent base, 12-15 cm. tall, glabrous; sheaths elongate, scaberulous, compressed, the lower shorter than the upper, the uppermost reaching the base of the panicle; ligule membranaceous, 2-6 mm. long, truncate; blades 5-7 cm. long, folded, somewhat rigid, ascending, acute or submucronate, sometimes nearly arcuate, scaberulous above, glabrous beneath, the nerves prominent, scabrous toward the margins; panicle 5 cm. long, 1-1.3 cm. wide, dense, spikelike, the branches somewhat appressed, some of them naked at the base for a short distance, the branchlets ascending, stiff, scabrous; glumes equal, 6-6.5 mm. long, 2-2.5 mm. longer than the florets, oblong-lanceolate or subacuminate, glabrous, sometimes scaberulous on the keels, 3-nerved; lower lemma 3.8-4

mm. long, 0.8-1 mm. wide from keel to margin, subacute, scaberulous, 3-nerved, the lateral nerves close to the margin; palea 2.6-2.8 mm. long, somewhat membranaceous, glabrous, the narrow tip truncate; rachilla joint 0.4-0.5 mm. long; anthers 0.6-0.7 mm. long.

Type in the U. S. National Herbarium, No. 1389108, collected in La Paz, Bolivia, altitude 18,000-20,000 feet, January 20, 1926, by A. Guerrero s.n.

Distribution: Known only from the type locality.

9. *DISSANTHELIUM SEMITECTUM* Swallen & Tovar, sp. nov.

Perenne; culmi caespitiosi, basi decumbentes, 9-13 cm. alti, glabri; vaginae glabrae, suprema basin paniculae aequans; ligula 0.5-1 mm. longa, membranacea, subacuta; laminae 4-7 cm. longae, involutae, acutae, supra scabrae, subtus glabrae, adscendentes; paniculae 3.5-4.5 cm. longae, 0.8-1 cm. latae, ramis vix adscendentibus, basin floriferis, ramulis vix divergentibus; spiculae 2-3-florae (plerumque 2-florae), pedicellis villosis; glumae aequales, 4.6-5.3 mm. longae, floribus 1.8-2 mm. longiores, acuminatae, 3-nerves, glabrae vel minute scabrae; lemma inferius 2.5-2.7 mm. longum, subacutum, scabrum, 3-nerve; palea lemmate paulo brevior, truncata, in carinis minute scabra; rhachillae internodium 0.3-0.4 mm. longum; antherae 0.4-0.5 mm. longae.

Perennial; culms tufted, decumbent at the base, glabrous, 9-13 cm. tall; sheaths glabrous, the lower shorter than the upper, the uppermost reaching the base of the panicle; ligule membranaceous, subacute, 0.5-1 mm. long; blades 4-7 cm. long, the uppermost reaching the apex of the panicle, involute, acute, scabrous above, glabrous beneath, ascending; panicles 3.5-4.5 cm. long, 0.8-1 cm. wide, rather loose, the branches spreading or ascending, floriferous to the base or some of them naked below for a short distance; branchlets spreading; spikelets 2-3-flowered (usually 2-flowered), the pedicels villous; glumes equal, 4.6-5.3 mm. long, 0.8 mm. wide from keel to margin, 1.8-2 mm. longer than the florets, narrow, acuminate, rather arcuate, scarious toward the margins, 3-nerved, glabrous or minutely scabrous on the keels; lower lemma 2.5-2.7 mm. long, somewhat oblong-lanceolate, acute or subacute, scabrous, 3-nerved; palea a little shorter than the lemma, the narrow tip truncate, scaberulous on the keels, membranaceous; rachilla joint 0.3-0.4 mm. long; anthers 0.4-0.5 mm. long.

Type in the U. S. National Herbarium, No. 1161061, collected in clumps on northeastern rock ledge to Huaron, Department of Junín, Peru, altitude about 14,000 feet, June 12, 1922, by Macbride & Featherstone (No. 1155).

Distribution: Known only from the type locality.

10. *DISSANTHELIUM LAXIFOLIUM* Swallen & Tovar, sp. nov.

Perenne; culmi caespitiosi, basi decumbentes, erecti, 8-13 cm. alti, glabri; vaginae glabrae, basin membranaceae, suprema basin paniculae aequans; ligula 2-2.5 mm. longa, membranacea; laminae 2.5-8 cm. longae, involutae vel planae, subacutae,

adscendentes, supra minute scabrae, subtus glabrae; paniculae 3-4.5 cm. longae, 1-1.7 cm. latae, ramis adscendentibus vel divergentibus, in parte inferiore nudis, ramulis adscendentibus; glumae aequales, 3.5-4 mm. longae, floribus 1.2-1.6 mm. longiores, vix subacuminatae, glabrae vel in carina scaberulae, 3-nerves; lemma inferius 1.9-2.1 mm. longum, obtusum vel subacutum, minute scabrum, 3-nerve; palea lemmate paulo brevior, in carinis minute ciliata; rhachillae internodium 0.3 mm. longum; antherae 0.4-0.5 mm. longae.

Perennial; culms tufted, somewhat decumbent at the base, erect, glabrous, 8-13 cm. tall; sheaths glabrous, membranaceous at the base, the uppermost elongate reaching the base of the panicle; ligule membranaceous, the uppermost 2-2.5 mm. long; blades 2.5-8 cm. long (the innovations filiform), soft, involute or rarely somewhat flat, pointed, ascending, minutely scabrous above, glabrous beneath, subacute or rather flexuous; panicles 3-4.5 cm. long, 1-1.7 cm. wide, loose, the branches ascending or spreading, some of them naked at the base for a short distance, the branchlets ascending; glumes equal, 3.5-4 mm. long, 1.2-1.6 mm. longer than the florets, linear-lanceolate, or sometimes subacuminate, arcuate, glabrous or scaberulous on the keel toward the summit, scarious on the margins, 3-nerved; lower lemma 1.9-2.1 mm. long, oblong, obtuse or subacute, minutely scabrous in the upper half, 3-nerved, the nerves close to the margin; palea a little shorter than the lemma, the narrow tip truncate, more or less hyaline, glabrous or minutely scabrous-ciliate on the keels; rachilla joint 0.3 mm. long; anthers 0.4-0.5 mm. long.

Type in the U. S. National Herbarium, No. 2207368, collected at Tinya, along Fortaleza valley, Province Bolognesi, Department Ancash, Peru, altitude 4000 meters, May 29, 1956, by Emma Cerrate (No. 2627).

Distribution: Peru at altitudes from 4000-4600 meters.

Peru: Junín: vicinity of Laguna Junín, Aguilar s.n.

Huancavelica: Prov. Castrovirreina, near Lake Choclococha, Tovar 2833.

11. DISSANTHELIUM BREVE Swallen & Tovar, sp. nov.

Perenne; culmi caespitosi, erecti, 5-8 cm. alti, glabri; vaginae glabrae, membranaceae, suprema basin paniculae aequans; ligula 1-2.5 mm. longa, membranacea, vix truncata; laminae 1.5-3.5 cm. longae, adscendentes vel divergentes, conduplicatae vel planae, obtusae vel subacutae, supra scabrae, subtus glabrae; paniculae 2-3 cm. longae, 1-1.3 cm. latae, densae, ramis adscendentibus, in parte inferiore nudis, ramulis adscendentibus; glumae aequales, 4.5-5 mm. longae, floribus 2 mm. longiores, oblongo-lanceolatae, subacuminatae, glabrae vel in carina minute scabrae, 3-nerves; lemma inferius 2.5-2.7 mm. longum, obtusum, minute scabrum, 3-nerve; palea lemmate paulo brevior, truncata, in carinis minute ciliata; rhachillae internodium 0.3 mm. longum; antherae 0.5-0.6 mm. longae.

Perennial; culms tufted, erect, glabrous, 5-8 cm. tall; sheaths glabrous, membranaceous at the base, the uppermost

reaching the base of the panicle; ligule membranaceous, 1-2.5 mm. long, somewhat truncate; blades 1.5-3.5 cm. long, subcoriaceous, spreading or ascending, flat or folded, obtuse or subacute, scabrous above, glabrous beneath, dull, the nerves conspicuous; panicles 2-3 cm. long, 1-1.3 cm. wide, dense, the branches ascending, naked below for a short distance, the branchlets ascending; glumes equal, 4.5-5 mm. long, 2 mm. longer than the florets, oblong-lanceolate or subacuminate, sometimes arcuate toward the tip, glabrous or minutely scabrous on the keel, scarious on the margins, 3-nerved; lower lemma 2.5-2.7 mm. long, oblong, obtuse, scarious toward the tip and margins, minutely scabrous, 3-nerved; palea a little shorter than the lemma, the tip truncate or somewhat bifid, minutely ciliate on the keels; rachilla joint 0.3 mm. long; anthers 0.5-0.6 mm. long.

Type in the U. S. National Herbarium, No. 2181263, collected in Huaytanayocc-Tansiri, near Manta, District of Conaica, Department and Province Huancavelica, Peru, altitude 4400-4500 meters, March 31, 1953, by Oscar Tovar (No. 1161).

Distribution: High Andes of Peru and Bolivia.

Peru: Ancash: Prov. Bolognesi: Chonta Pass, Dist. of Ticllos, Cerrate 2661; Cordillera Blanca, Rauh & Hirsch P-2042. Huánuco: Prov. Dos de Mayo: Cordillera Raura, near glacier, Cardich s.n. Junín: Prov. Yauli: Anticona Pass, between Lima and Oroya, Ferreyra 10959; Ticlio, above Casapalca, Rauh & Hirsch P-252. Huancavelica: Prov. Tayacaja: Hacienda Huari, Salaverry 124; Prov. Castrovirreina: vicinity Laguna Choclococha, between Huancavelica and Castrovirreina, Tovar 2831, 2852, 2878, 2887; Prov. Huancavelica: Huaytanayocc-Tansiri, Dist. of Conaica, Tovar 2525. Cuzco: Ausangate, Rauh & Hirsch P-1183, P-1199.

Bolivia: La Paz: Chacaltaya, 30 Km. from La Paz, Buchtien 1194. La Cumbre, on railroad to Yungas, Parodi 10037. Prov. Larecaja, vicinity of Sorata, near Anilaya, Mandon 1345A.

12. *DISSANTHELIUM CALYGINUM* (Presl) Hitchc. Journ. Washington Acad. Sci. 13: 224. 1923.

*Brizopyrum calycinum* Presl, Rel. Haenk. 1: 281. 1830.

*Poa calycina* Kunth, Rev. Gram. 1: Suppl. XXVIII. 1830; Enum. Pl. 1: 326. 1833.

*Dissanthelium supinum* Trin. Linnaea 10: 305. 1836.  
(Cerro de Pasco, Peru, Poeppig).

Perennial; culms tufted, 2.5-8 cm. tall, glabrous; sheaths glabrous, membranaceous at the base, the lower shorter than the upper, the uppermost elongate; ligule membranaceous, 0.5-1 mm. long, acute; blades 1-3 cm. long, involute, ascending or spreading, scaberulous above, glabrous beneath, the uppermost almost reaching the apex of the panicle; panicles 1-2 cm. long, oblong or ovate, somewhat loose, the branches ascending, floriferous to the base, sometimes naked below for a short distance; glumes equal, 2.4-3 mm. long, 0.5 mm. longer than the florets, ovate-lanceolate or sometimes subacuminate, glabrous, 3-nerved, the

margins scarious; lower lemma 1.8-2.1 mm. long, ovate-oblong, obtuse or subacute, scaberulous on the upper half, subcoriaceous, 3-nerved, the lateral nerves close to the margin; palea a little shorter than the lemma, the narrow tip truncate, minutely ciliate on the keels, membranaceous; rachilla joint slender, 0.2-0.3 mm. long; anthers 0.5-0.7 mm. long.

Type: Original locality not known, but probably Peru where it is widely distributed, Haenke.

Distribution: High altitudes (Puna) of Peru and Bolivia between 4200 and 4900 meters altitude.

Peru: Lima: Prov. Huarochiri: Chicla between Lima and Oroya, Ferreyra & Hutchison 8253. Pasco: Cerro de Pasco, Hitchcock 22246; Casa Cancha, near Cerro de Pasco, Expl. Exped. Wilkes: in frigidissimis ad Cerro de Pasco, Poeppig. Junín: Prov. Junín: Hacienda Atocsaico, near Junín, Hitchcock 22207, 22214, 22203, 22204; Prov. Yauli: Ticlio Pass, Rauh & Hirsch P-90, P-306; Prov. Jauja: Hda. Cachi-cachi, Km. 35 between Jauja and Tarma, Velarde 2868. Huancavelica: Prov. Castrovirreina: near Laguna Choclococha, Tovar 2841; Prov. Huancavelica: Huaytanayocc-Tansiri, Dist. of Conaica, Tovar 1209, 2567. Ayacucho: between Huanta and Hacienda Pargora, Killip & Smith 23305. Puno: Prov. Carabaya: Hacienda Lacka, Macusani, Vargas 7891. Cuzco: Ausangate, Rauh & Hirsch P-1139.

Bolivia: La Paz, Rinconada, railroad between La Paz and Pongo, Hitchcock 22596 1/2. "Bolivian Plateau," Bang 1873.

13. DISSANTHELIUM SCLEROCHLOIDES Fourn. Mex. Pl. 2: 112. 1886.  
Deschampsia mathewsii Ball, Journ. Linn. Soc. Bot. 22:  
 60. 1885. (Casapalta, Peruvian Andes, Mathews).

Perennial; culms tufted, erect or somewhat geniculate at the base, glabrous, 5-9 cm. tall; sheaths glabrous, membranaceous at the base, the lower shorter than the upper, the uppermost elongate; ligule membranaceous, 0.5-1.3 mm. long; blades 1.5-4 cm. long, involute or sometimes somewhat folded, smooth, ascending, subacute, glabrous, the uppermost almost reaching the apex of the panicle; panicles 1.5-3 cm. long, 0.7-1 cm. wide, dense or rather lax, the branches ascending or appressed, floriferous to the base, the branchlets ascending; spikelets 2-flowered, rarely 3-flowered; glumes equal, 3.5-4.2 mm. long, 0.5-1 mm. longer than the florets, more or less ovate-lanceolate, acute, glabrous or scaberulous on the keel toward the summit, 3-nerved, the margins scarious; lower lemma 2.4-2.8 mm. long, ovate-lanceolate, scabrous, 3-nerved, the lateral nerves close to the margin; palea a little shorter than the lemma, truncate, minutely scabrous-ciliate on the keels toward the tip; rachilla joint 0.3 mm. long; anthers 0.6-0.7 mm. long.

Type: Fournier mentions two specimens, "Nevado de Toluca, Hahn, and San Luis de Potosí, Virlet 1434, Mexico."

Distribution: High altitudes of Mexico; central Andes of Peru and Bolivia.

Mexico: Mexico: Nevado de Toluca, Pringle 4222; Beaman 1692; Tlaloc, Beaman 2329; Ixtaccihuatl, Purpus 1633; Matuda

3800. Tlaxcala: Malinche, Beaman 2240.

Peru: Huancavelica: Prov. Huancavelica: Huaytanayoc-Tansiri, Dist. of Conaica, Tovar 2523.

Bolivia: Without locality, Mandon 1345.

14. DISSANTHELIUM DENSUM Swallen & Tovar, sp. nov.

Perenne; culmi caespitiosi, erecti, 6-8 cm. alti, glabri; vaginae minute scabrae, basin membranaceae, suprema basin paniculae aequans; ligula 1-2 mm. longa, membranacea; laminae 2-5 cm. longae, adscendentes, acutae, conduplicatae vel planae, scabrae; paniculae 2-3 cm. longae, 0.7-1 cm. latae, densae, ramis rigidis, appressis, ad basin floriferis, ramulis adscendentibus vel appressis; glumae aequales, 3.5-3.7 mm. longae, floribus 0.6-0.7 mm. longiores vix lanceolatae, glabrae, 3-nerves; lemma inferius 2.5-2.6 mm. longum, obtusum, minute hispidum, 3-nerve; palea lemmate paulo brevior, in carinis minute ciliata; rhachillae internodium 0.3 mm. longum; antherae 0.5-0.6 mm. longae.

Perennial; culms tufted, erect, glabrous, 6-8 cm. tall; sheaths elongate, minutely scabrous, membranaceous at the base, the uppermost reaching the base of the panicle; ligule membranaceous, 1-2 mm. long; blades 2-5 cm. long, ascending, folded or sometimes flat, acute, minutely scabrous on both surfaces, the nerves conspicuous beneath; panicles 2-3 cm. long, dense, spike-like, the branches appressed, stiff, floriferous to the base, the branchlets ascending or nearly appressed; glumes equal, 3.5-3.7 mm. long, 0.6 mm. longer than the florets, somewhat lanceolate, glabrous, shining, scarious on the margins, 3-nerved; lower lemma 2.5-2.6 mm. long, somewhat oblong, obtuse, minutely hispidulous, 3-nerved, membranaceous toward the tip; palea a little shorter than the lemma, truncate, minutely ciliate on the keels toward the summit; rachilla joint 0.3 mm. long; anthers 0.5-0.6 mm. long.

Type in the U. S. National Herbarium, No. 2207162, collected between Huaytanayoc and Manta, District of Conaica, Department and Province Huancavelica, Peru, altitude 4500 meters, May 11, 1956, by Oscar Tovar (No. 2547).

Distribution: Known only from the type locality.

15. DISSANTHELIUM EXPANSUM Swallen & Tovar, sp. nov.

Perenne; culmi caespitiosi, basi decumbentes, 6-10 cm. alti, glabri; vaginae minute scabrae, basin membranaceae; ligula 1-3 mm. longa, membranacea; laminae 1-4 cm. longae, conduplicatae vel planae, adscendentes, glabrae, obtusae vel subacutae; paniculae 2-3.3 cm. longae, 1.5-2 cm. latae, laxae, ramis divergentibus basi nudis, ramulis adscendentibus minute scabris; glumae aequales, 3.5-4 mm. longae, floribus 0.6 mm. longiores, oblongo-lanceolatae, glabrae vel in carina minute scabrae, 3-nerves; lemma inferius 2.4-3 mm. longum, oblongum, obtusum, minute scabrum, 3-nerve; palea lemmate paulo brevior, in carinis minute ciliata; rhachillae internodium 0.3 mm. longum; antherae 0.9-1 mm. longae.

Perennial; culms tufted, stout, somewhat decumbent at the

base, glabrous, 6-10 cm. tall; leaves mostly basal; sheaths short, minutely scabrous, membranaceous at the base, the uppermost elongate; ligule membranaceous, 1-3 mm. long; blades 1-4 cm. long, flat or folded, ascending, soft, glabrous on both surfaces, somewhat waxy, obtuse or subacute, scabrous on the margins; panicles 2-3.3 cm. long, 1.5-2 cm. wide, lax, the branches spreading, naked below for a short distance, the branchlets ascending, sparsely scabrous; glumes equal, 3.5-4 mm. long, about 0.6 mm. longer than the florets, oblong-lanceolate, glabrous or minutely scabrous on the keels, 3-nerved, purple toward the summit; lower lemma 2.4-3 mm. long, more or less oblong, obtuse, minutely scabrous, 3-nerved, the lateral nerves close to the margin; palea a little shorter than the lemma, nearly bifid at the tip, minutely ciliate on the keels toward the tip; rachilla joint 0.3 mm. long; anthers 0.9-1 mm. long.

Type in the U. S. National Herbarium, No. 604490, collected in Pinasniocc, Panticalla Pass, Peru, altitude about 3600 meters, June 18, 1915, by O. F. Cook & G. B. Gilbert (No. 1305).

Distribution: High Andes of Peru.

Peru: Pinasniocc, Panticalla Pass, Cook & Gilbert 1297.

Huánuco: 15 miles N.E. of Huánuco, Macbride & Featherstone 2183.

Lima: Ticlio, canyon of Río Rímac, Prov. Huarochiri, Hutchison 1215.

16. DISSANTHELIUM BREVIFOLIUM Swallen & Tovar, sp. nov.

Perenne; culmi caespitiosi, 2-4 cm. alti, glabri; vaginae glabrae, suprema basin paniculae aequans; ligula 0.6-2 mm. longa, membranacea, truncata; laminae 0.6-1.5 cm. longae, conduplicatae vel vix planae, obtusae, supra scabrae, subtus glabrae; paniculae 0.8-1.5 cm. longae, 0.6-0.8 cm. latae, densae, ramis vix appressis vel adscendentibus, ramulis adscendentibus; glumae aequales, 3-3.4 mm. longae, flores aequantes, glabrae, 3-nerves; lemma inferius 2.2-2.5 mm. longum, scabrum, obtusum vel subacutum; palea lemmate paulo brevior, minute truncata, glabra, vel in carinis minute scabra; rhachillae internodium 0.4-0.5 mm. longum; antherae 0.6-0.8 mm. longae.

Dwarf perennial; culms stout, tufted, glabrous, 2-4 cm. tall, sheaths glabrous, the uppermost elongate, almost reaching the base of the panicle; ligule membranaceous, truncate or rather dentate, 0.6-2 mm. long; blades 0.6-1.5 cm. long, coriaceous, rigid, folded or sometimes flat, spreading, obtuse, scabrous above, glabrous, dull beneath; panicle 0.8-1.5 cm. long, 0.6-0.8 cm. wide, dense, the branches somewhat appressed or ascending, naked below, the branchlets ascending; glumes equal, subacute, 3-3.4 mm. long, more or less ovate, as long as the florets or nearly so, glabrous, rather scarious toward the margins, 3-nerved; lower lemma 2.2-2.5 mm. long, obtuse or subacute, scabrous, 3-nerved; palea a little shorter than the lemma, the narrow tip truncate, glabrous or minutely scaberulous on the keels, the nerves prominent; rachilla joint 0.4-0.5 mm. long; anthers 0.6-0.8 mm. long.

Type in the U. S. National Herbarium, No. 1161062, col-

lected on loose "doby" slope, at Yauli, Department Junín, Peru, altitude about 13,500 feet, May 25, 1922, by Macbride & Featherstone (No. 933).

Distribution: High Andes of Peru.

Peru: Junín: Huarón, northern part, Cerro de Pasco region, Macbride & Featherstone 1153. Pasco: Cerro de Pasco, Hitchcock 22228, 22233, 22242.

17. *DISSANTHELIUM RAUHII* Swallen & Tovar, sp. nov.

Perenne; culmi caespitosi, erecti, 6-9 cm. alti, glabri; vaginae glabrae, membranaceae, suprema basin paniculae aequans; ligula 4-5 mm. longa; laminae 1.5-3.5 cm. longae, adscendentes, conduplicatae vel planae, obtusae, supra minute scabrae, subtus glabrae; paniculae 3-4 cm. longae, 0.8-1.5 cm. latae, densae, ramis adscendentibus vel appressis, in parte inferiore nudis, ramulis adscendentibus; glumae aequales, 2.5-2.6 mm. longae, flores aequantes, ovate-lanceolatae, glabrae, 3-nerves; lemma inferius 2.1-2.2 mm. longum, vix oblongo-lanceolatum, subacutum, sparse pubescens, 3-nerve; palea lemmate paulo brevior, in carinis minute ciliata; rachillae internodium 0.3 mm. longum; antherae 0.5-0.6 mm. longae.

Perennial; culms tufted, erect, glabrous, 6-9 cm. tall; sheaths glabrous, membranaceous at the base, the lower shorter than the upper, the uppermost sometimes reaching the base of the panicle; ligule membranaceous, the uppermost 4-5 mm. long; blades 1.5-3.5 cm. long, folded or somewhat flat, subcoriaceous, ascending, obtuse, minutely scabrous above, glabrous, dull beneath; panicle 3-4 cm. long, 0.8-1.5 cm. wide, rather dense, the branches ascending or nearly appressed, some of them naked at the base, the branchlets ascending; glumes equal, as long as the florets, 2.5-2.6 mm. long, ovate-lanceolate, glabrous, shining, 3-nerved; lower lemma 2.1-2.2 mm. long, more or less oblong-lanceolate, subacute, sparsely pubescent, 3-nerved, the nerves close to the margin; palea a little shorter than the lemma, more or less elliptic, truncate at the tip, minutely ciliate on the keels; rachilla joint 0.3 mm. long; anthers 0.6-0.8 mm. long.

Type in the U. S. National Herbarium, No. 2180752, collected in Salcantay, Peru, May 5, 1957, by Rauh & Hirsch (No. P-1418).

Distribution: Known only from the type locality.