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FESTUCA FLORIBUNDA, A NEW COMBINATION FOR *DIELSIOCHLOA* (POACEAE: POOIDEAE: POEAE: LOLIODINAE: LOLIINAE)

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ABSTRACT

Based on morphological and molecular evidence, *Trisetum floribundum* [syn. *Dielsiochloa floribunda* (Pilg.) Pilg.] is transferred to *Festuca* as **Festuca floribunda** (Pilg.) P.M. Peterson, Soreng & Romasch., **comb. nov.** Specimens examined (Argentina, Bolivia, Chile, Peru) are included.

Pilger (1906) described *Trisetum floribundum* based on two syntypes collected by A. Weberbauer [nos. 1028 & 2811] from Peru. Hitchcock (1927) effectively chose *Weberbauer 1028* as a lectotype in his treatment of the Grasses of Ecuador, Peru, and Bolivia but did not cite a herbarium. Thirty-seven years later Pilger (1943) erected the new genus *Dielsiochloa* Pilg., with a single species [*D. floribunda*] and three varieties. He also stated that *Weberbauer 1028* was "Typus der Art." Pilger (1943, p. 100) mentioned that *Deilsiochloa* was roughly similar to species in *Bromus* sect. *Stenobromus* Griseb. (= *Bromus* sect. *Genea* Dumort., including *B. sterilis* L. and *B. madritensis* L.; see Soreng et al. 2018), in which the upper florets within a spikelet are sterile with an irregularly disarticulating rachilla, and he concluded that the genus belonged in tribe Aveneae s. l. near *Trisetum*.

Most systematists have followed this phylogenetic assessment of the species (Nicora 1975; Clayton & Renvoize 1986; Nicora & Rúgolo de Agrasar 1987; Tovar 1993; Chiapella 2012). *Dielsiochloa floribunda* is characterized in having 6−10-flowered spikelets (only the lower 2 or 3 fertile, upper sterile and diminished), 1-veined glumes shorter than the spikelet, 5-veined lemmas bearing a single erect awn (5−10 mm long) arising dorsally below a bifid apex (notch 1−3.2 mm deep with aristate, hyaline teeth), glabrous ovaries, and a dorsally compressed caryopses with an adherent pericarp (Clayton et al. 2006).

Currently, the United States National Herbarium is being rearranged in a new classification following Soreng et al. (2017) and we came to *Dielsiochloa*, a taxon we have known was embedded within *Festuca* L. for over 10 years (Quintanar et al. 2007; Döring 2009; Refulio et al. 2012; Saarela et al. unpubl. (sequences in GenBank); Romaschenko et al. unpubl. (sequences in GenBank)). In a molecular DNA study using *trnTL-trnLF* and ITS markers, Minaya (2017) found *D. floribunda* deeply embedded in a derived clade of northern South American festucas and sister to *Festuca cuzcoensis* Stančík & P.M. Peterson, a species known only from the higher elevations (3200−3850 m) of Bolivia and Peru (Stančík & Peterson 2002). We believe the species belongs in *Festuca* and make the new combination below.

FESTUCA FLORIBUNDA (Pilg.) P.M. Peterson, Soreng, & Romasch., **comb. nov.** *Trisetum floribundum* Pilg., Bot. Jahrb. Syst. 37: 505. 1906. *Dielsiochloa floribunda* (Pilg.) Pilg., Bot. Jahrb. Syst. 73: 99. 1943. **LECTOTYPE** (designated by Hitchcock in Contr. U.S. Natl. Herb. 24: 359. 1927): **Peru.** Prov. Sandia: unterhalb Ananea, auf sehr durftig bewachsenem, steinigen Boden, 4800 m, 15 May 1902, *A. Weberbauer 1028* (B, image B100250163!; isolectotypes: S image S-R-6247!, SGO image SGO000000770!).

The species is found in the Cordillera de los Andes of northwestern Argentina, Bolivia, northern Chile, and Peru at 4000−5100 m. It grows on steep, rocky, gravelly slopes, talus slopes, rock outcrops, wet meadows, and lake shores associated with *Festuca*, *Poa*, *Cinnagrostis* (syn. *Calamagrostis* Adans., *Deyeuxia* Clarion ex P. Beauv.), *Anatherostipa*, *Jarava*, *Pappostipa*, *Azorella*, *Lepidophyllum*, *Polylepis*, and *Pycnophyllum*.

Festuca floribunda shares with other members of the genus lemmas with a rounded back, a glabrous callus that is blunt and annulated, and a dorsoventrally compressed rachilla (Watson & Dallwitz 1992; Clayton et al. 2006). *Festuca casapaltensis* Ball, a Peruvian endemic, is morphologically similar to *F. floribunda* in having short tufted culms, lemmas with long slender awns, and glumes longer than the lower floret with attenuate apices (Tovar 1972, 1993).

Specimens examined: **ARGENTINA. Jujuy.** Dpto. Famatina. Sierra de Famatina, *Krapovickas 6241* (BAA); Dpto. Humahuaca: 150 m below cumbre del Aguilar, *Ruthsatz 493* (BAA). **BOLIVIA**. **La Paz**. Prov. Murillo, La Paz, hacia la Cumbre, 10 Jul 2004, *Beck & Beck 31058* (LPB, US); Prov. Murillo, Nevado Chacaltalya al norte de La Paz, 6 Feb 1989, *Beck 14695* (LPB, US); Prov. Murillo, Mina Milluni, 15 May 1985, *Beck 11197* (LPB, US); Prov. Murillo, the dam at Lago Zongo, 17 Apr 1985, *Solomon 13367* (MO, US); Prov. Murillo, 6.6 km N of the road to Valle del Zongo, on the road to Chacaltaya, 15 Mar 1984, *Solomon 11784, Stein & Uehlong* (MO, US). **Potosí**. Prov. Sud Chichas, 20 mi E of Atocha and 1.5 mi above Santa Barbara on the southwest face of Nevada Choroloque, 15 Mar 1993, *Peterson 12939, Annable, Soreng, Laegaard & Rojas-Ponce* (LPB, US); Sud Lipez, 2 mi N of San Antonio de Lepiz, 20 Mar 1993, *Peterson 13024, Soreng & Laegaard* (LPB, US); Sud Lipez, 27 mi SW of San Antonio de Lipez and 22 mi NE of Quentena Chico, 21 Mar 1993, *Peterson 13053, Soreng & Laegaard* (LPB, US). **CHILE. Region I.** 26 km E of Zapahuira on top of Cerro Chapiquiña, 18°20’7.1”S, 69°30’3.6”W, 1 Apr 2001, *Peterson 15721 & Soreng* (CONC, US); 92 km NE of Huara on road towards Colchane, 19°37’55.3”S, 69°4’11.5”W, 26 Mar 2001, *Peterson 15636 & Soreng* (CONC, US); 106 km NE of Huara on road towards Colchane, 19°34’53.2”S, 68°58’1.1”W, 26 Mar 2001, *Peterson 15653 & Soreng* (CONC, US). **Region II.** km 45 on road from San Pedro to Paso Jama, 22°55’30’S, 67°45’41”W, 16 Mar 2001, *Peterson 15526, Soreng & Judziewicz* (CONC, US). **PERU.** Between Culini and Obrajillo, Wilkes Expedition (US-868484); 21 km E of Pachacofo on road towards Hullanca, 9°52’59.0”S, 77°12’4.5”W, 21 Mar 2004, *Peterson 17912, Refulio Rodriguez, Cano, LaTorre & Salinas* (US, USM). **Ancash.** Bolognesi Prov., Paso Chonta, 29 Apr 1956, *Tovar 2663* (USM, US); Bolognesi Prov., Abra Yanashallas, W of Huallanca and 55 km E of Conococha, 9°51’36.1”S, 77°4’41.6”W, 24 Mar 2004, *Peterson 17947 & Refullio Rodriguez* (US, USM); Bolognesi Prov., 5 km NW of Abra Yanashalash on road towards Antimina, 9°50’3.5”S, 77°6’57.6”W, 25 Mar 2004, *Peterson 17963 & Refulio Rodriguez* (US, USM); Recuay Prov., Huascarán National Park, Quebrada Quenua Ragra, 10 May 1985, *Smith 10652, Valencia & Gonzales* (MO, US); Yungay Prov., Cordillera Negra, Cerro Chonta, at head of Quebrada Teclio, 9°17’50.3”S, 77°48’30.4”W, 14 Mar 2008, *Peterson 21668, Soreng, LaTorre & Rojas Fox* (US, USM); Yungay Prov., Cordillera Blanca, on road to pass E of Lago Llanganuco and Yanama, 9°2’39.9”S, 77°35’47.3”W, 16 Mar 2008, *Peterson 21761, Soreng, LaTorre & Rojas Fox* (US, USM). **Arequipa.** Nevado de Chachani, 14 Apr 1925, *Pennell 13313* (US); Arequipa Prov., 11 km NE of Patahuasi on road towards Chivay, 15°57’59.1”S, 71°22’45.9”W, 11 Apr 2004, *Peterson 18258 & Refulio Rodriguez* (US, USM); Caylloma Prov., 15 km SE of Callalli on road towards Condoroma, 15°28’14”S, 71°22’26.9”W, 12 Apr 2004, *Peterson 18274 & Refulio Rodriguez* (US, USM); Caylloma Prov., 10 km SE of Callalli on road towards Condoroma, 15°29’26”S, 71°23’5.9”W, 12 Apr 2004, *Peterson 18261 & Refulio Rodriguez* (US, USM); Caylloma Prov., Bosque de Rocas, S of Imata, 12 km on road to Pati, 75 air km NE of Arequipa, 15°54’37.4”S, 71°2’38”W, 1 Apr 2007, *Peterson 20758, Soreng, Romaschenko & Gonzalez Elizondo* (US, USM); Caylloma Prov., S of Imata, 17 km on road to Pati, 6 km S of Bosque de Rocas, 73 air km NE of Arequipa, 15°57’40”S, 71°2’14.4”W, 1 Apr 2007, *Peterson 20769, Soreng, Romaschenko & Gonzalez Elizondo* (US, USM). **Ayacucho.** Cangallo Prov., just S of Abra Apacheta, 84 km W of Ayacucho on road to Pisco, 13°21’28.9”S, 74°43’57.1”W, 22 Mar 2002, *Peterson 16661 & Refulio Rodriguez* (US, USM); Cangallo Prov., 0.5 km E of Abra Apacheta on road towards Ayacucho, 13°21’28.8”S, 74°43’57.2”W, 5 Apr 2004, *Peterson 18165 & Refulio Rodriguez* (US, USM); Lucanas Prov., 51 km SE of Puquio and 24

km NW of Chavina, 14°52’2.2”S, 73°55’40.2”W, 27 Feb 2002, *Peterson 16313, La Torre, Ramirez & Susanibar Cruz* (US, USM); Lucanas Prov., 55 km E of Puquio on road towards Cuzco, 14°38’15.5”S, 73°49’51.3”W, 12 Mar 2002, *Peterson 16464 & Refulio Rodriguez* (US, USM); Lucanas Prov., 4 km N of Pedregal and 49 km S of Putajasa, 14°24’30.4”S, 74°24’23.5”W, 23 Feb 2002, *Peterson 16197, Cano, LaTorre, Ramirez & Susanibar Cruz* (US, USM); Lucanas Prov., 28 km W of Lucanas at jtn of road to Saisa, 14°39’40.1”S, 74°19’8.8”W, 8 Apr 2004, *Peterson 18195 & Rufulio Rodriguez* (US, USM); Parinacochas/Paucar del Sara Sara Prov., S and SE slopes of Nevado Sara Sara, 15°21’16.9”S, 73°28’47.2”, 2 Mar 2002, *Peterson 16365, La Torre, Ramirez & Susanibar Cruz* (US, USM). **Huancavelica.** Castrovirreyna Prov., Laguna Choclococha, 2 May 1958, *Tovar 2825, 2850* (USM, US); Castrovirreyna Prov., 49 km SW of Huancavelica above Laguna Pultoc, 13°4’53.5”S, 75°2’57.9”W, 8 Mar 2002, *Peterson 16411 & Tovar* (US, USM); Castrovirreyna Prov., 4 km S of Choclococha and 8 km N of Santa Ines, 13°10’44”S, 75°5’15.3”W, 5 Apr 2004, *Peterson 18144 & Refulio Rodriguez* (US, USM); Castrovirreyna Prov., 12 km S of Pucapampa at Abra Chonta, 13°4’53.2”S, 75°2’57.7”W, 4 Apr 2004, *Peterson 18134 & Refulio Rodriguez* (US, USM); Castrovirreyna Prov., 3 km S of Pucapampa on road towards Abra Chonta, 13°3’6.5”S, 75°3’58.1”W, 4 Apr 2004, *Peterson 18130 & Refulio Rodriguez* (US, USM); Castrovirreyna Prov., Abra Conota, E side of Hwy 3, 24 km N of Santa Ines and 57 km SSW of Huancavelica, 13°4’53”S, 75°2’58”W, 13 Mar 2007, *Peterson 20445, Soreng, Romaschenko & Susanibar Cruz* (US, USM); Huancavelica Prov., Nevado de Ajchi, 3 Aug 1961, *Tovar 3424* (USM, US); Huancavelica Prov., Cerro entre Huaytanayoco and Manta, 9 May 1956, *Tovar 2540* (USM, US); Huaytara Prov., N of new Hwy 24 from Pisco to Ayacucho, 124 air km E of Pisco and 21 air km E of San Antonio de Cusicancha, 13°28’47”S, 75°5’9”W, 12 Mar 2007, *Peterson 20417, Soreng, Romaschenko & Susanibar Cruz* (US, USM). **Junin.** Huaytapallana, Acopalca, 4 May 1961, *Tovar 3388* (US, USM); Junin Prov., Huampucocha, 8 May 1948, *Aguilar s.n.* (US); Yauli Prov., 134 km W of Lima on Hwy 20 towards La Oroya at Abra Anticona, 5 Apr 1997, *Peterson 14032 & Tovar* (US, USM); Yauli Prov., above Morococha, 11 Jun 1940, *Asplund 11580* (US). **Lima.** Casapalca, 21 May 1922, *Macbride & Featherstone 851* (F, US); Canta Prov., 24 km E of Cullhuay on road towards Junin, 11°20’43.3”S, 76°26’14.1°, 29 Mar 2004, *Peterson 18023 & Refulio Rodriguez* (US, USM). **Moquegua.** 82 km W of Mazo Cruz on road towards Humajalso, 16°52’57.3”S, 70°26’51”W, 17 Apr 2004, *Peterson 18307 & Refulio Rodriguez* (US, USM); Mariscal Nieto Prov., 2 km E of El Cruce on road towards Huayfire and Puno, 1 Mar 1999, *Peterson 14566, Refulio Rodriguez & Salvador Perez* (US, USM); Mariscal Nieto Prov., 45 km E of Torata on road towards El Cruce, 2 Feb 1999, *Peterson 14555, Refulio Rodriguez & Salvador Perez* (US, USM). **Pasco.** Pasco Prov., 6 km W of Santa Rosario at Abra Antajirca, 11°2’26.7”S, 76°31’43”W, 30 Mar 2004, *Peterson 18053 & Refulio Rodriguez* (US, USM). **Puno.** Cerro Ichuasi, Coccachara, SW of Llave, 25 Oct 1946, *Pearson & Pearson 66* (US); Coccachara, SW of Llave, 27 Nov 1946, *Pearson & Pearson 100* (US); El Callao Prov., 4 km W of San Jose Ancomarca on road towards Capaso, 9 Mar 1999, *Peterson 14710, Refulio Rodriguez & Salvador Perez* (US, USM); Carabaya Prov., Fauchinta, Allinccapac, 10 Apr 1948, *Vargas 7176* (US). **Tacna.** Tacna Provincia, 19 km W of Alto Peru on road towards Tacna, 14 Mar 1999, *Peterson 14782, Refulio Rodriguez & Salvador Perez* (US, USM); Tarata Prov., 5 km SW of Cano on road towards Yabroco, 17 Mar 1999, *Peterson 14827, Refulio Rodriguez & Salvador Perez* (US, USM); Tarata Prov., Laguna Calere, 3 km NE of Cano, 17 Mar 1999, *Peterson 14824, Refulio Rodriguez & Salvador Perez* (US, USM); Tarata Prov., Cordellera del Barroso, 26 Mar 1998, *Cano 8155, LaTorre, Córdova & Baldeviano* (US, USM); Tarata Prov., 20 km NE of Tarata, 28 Jan 1952, *Pearson & Pearson 52-60* (US).

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