

## TAXONOMIC AND DISTRIBUTION NOTES ON *CAREX* (CYPERACEAE) FROM THE NEOTROPICS

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**Summary:** We present relevant data about the taxonomy and distribution of 20 species of the genus *Carex* in the Neotropics from the Caribbean region to Patagonia. We provide a total of 19 new records, two of them for species not previously recorded from South America, ten species newly reported from different countries, and seven species here reported as new regional records in Argentina, Bolivia, and Chile. We lectotypify nine species names (*C. brehmeri*, *C. catharinensis*, *C. ecuadorica*, *C. firmicaulis*, *C. fuscula*, *C. mandoniana*, *C. phleoides*, *C. polysticha*, and *C. subantarctica*) and epitypify one of these names (*C. fuscula*). Finally, we propose *Carex koyamae* as a new synonym of *Carex phleoides*.

**Key words:** Neotropics, nomenclature, taxonomy, *Uncinia*

**Resumen:** Notas taxonómicas y de distribución de *Carex* (Cyperaceae) en el Neotrópico. Presentamos datos relevantes acerca de la taxonomía y distribución de 20 especies del género *Carex* en el Neotrópico (de la región Caribe a la Patagonia). Aportamos un total de 19 registros nuevos, dos de ellos para especies hasta el momento no registradas para Sudamérica, diez especies citadas como novedad para diferentes países y siete especies aquí reportadas como novedades regionales en Argentina, Bolivia y Chile. Lectotipificamos de nueve nombres de especies (*C. brehmeri*, *C. catharinensis*, *C. ecuadorica*, *C. firmicaulis*, *C. fuscula*, *C. mandoniana*, *C. phleoides*, *C. polysticha* y *C. subantarctica*) y epitypificamos uno de ellos (*C. fuscula*). Finalmente, proponemos a *Carex koyamae* como nuevo sinónimo de *Carex phleoides*.

**Palabras clave:** Neotrópico, nomenclatura, taxonomía, *Uncinia*.

### INTRODUCTION

*Carex* L. is the largest genus of Angiosperms from temperate areas: with the merger of satellite genera *Cymophyllus* Mack., *Kobresia* Willd., *Schoenoxiphium* Nees, and *Uncinia* Pers. with

*Carex* the genus comprises nearly 2000 species and 126 accepted sections (Global *Carex* Group, 2015, 2016) with nearly cosmopolitan distribution. Although *Carex* is more common and more diverse in the Northern Hemisphere, South America harbors approximately 215 species (11% of the total species

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diversity; Govaerts *et al.*, 2015), belonging to 40 different sections (32% of total number of accepted sections). *Carex* species play an important ecological role in certain cold and temperate environments of South America, especially in wetter areas where these sedges may be dominant in the vegetation. However, the current status of knowledge of the taxonomy and distribution of *Carex* in the Neotropics has been comparatively less studied in relation to Africa, Asia, Europe, and North America. Despite the impressive number of previous contributions (e.g., Wheeler, 1987, 1988, 1989, 1996a, b, 1998, 2002, 2006, 2007, 2009; Wheeler & Goetghebeur, 1995; Wheeler & Guaglianone, 2003, 2006), which greatly clarified the taxonomy of the genus in South America, some groups still show taxonomic or nomenclatural difficulties, as showed by recently published works (Jiménez-Mejías & Escudero, 2016; Jiménez-Mejías & Roalson, 2016). Our aim here is to present relevant new distributional records and taxonomic rearrangements which significantly improve the knowledge of the genus in the Neotropics.

## MATERIALS AND METHODS

Material from the following herbaria was studied: A, BOZ, CONC, E, K, LP, MA, M-MSB, MCNS, NY, SI, UPOS and WS (abbreviations according to Thiers, 2015). Additionally, a field campaign in Argentina, including the provinces of Buenos Aires, Entre Ríos, Jujuy, Salta, San Juan, and Tucumán was also carried out during January-February of 2015, and the materials were deposited in SI. Duplicates from collections from Tucumán were also deposited in LIL, and those from Salta in MCNS. Images of type material (BM, C, G, GENT, GH, H, LE, MICH, MO, MPU, P, QCA, QCNE, and S) were observed from the JSTOR Global Plants webpage (plants.jstor.org). Images of the type material of *C. maritima* were provided by TRH. Specimens were identified using the specialized taxonomic literature cited under each species. Accepted names follow the World Checklist of Selected Plant Families (Govaerts *et al.*, 2015).

New data are provided in alphabetical order of the cited taxa. The priority name under *Uncinia* is given for the taxa formerly classified under this genus according to Global *Carex* Group (2015).

## RESULTS AND DISCUSSION

1. *Carex atlantica* L. H. Bailey subsp. *capillacea* (L. H. Bailey) Reznicek, *Contr. Univ. Michigan Herb.* 14: 191. 1980. *Carex interior* L. H. Bailey var. *capillacea* L. H. Bailey, *Bull. Torrey Bot. Club* 20: 426. 1893. Type: United States. Massachusetts, Arlington, 21-VI-1885, Boot s.n. (lectotype GH, designated by Reznicek & Ball, 1980: 191).

*Iconography*: Ball *et al.*, 2002: 328.

*Distribution*: Known from eastern North America and Texas state (Ball *et al.*, 2002). Here cited as new for the Caribbean (Hispaniola island, Dominican Republic).

*Studied material*: DOMINICAN REPUBLIC. *San Juan Prov.*: eastern base of Pico Duarte in canyon west of Valle des Bones, ca. 3 km SSW of La Compartición Camp., West-facing canyon, 2250-2400 m, 11-I-1986, Grable 10731 (WS).

*Observations*: This is the first record of section *Stellulatae* Kunth in the New World outside of North America. Along with *C. atlantica*, there are Hispaniolan disjunct populations of other mainly temperate to boreal *Carex*, including *C. leptalea* and *C. limosa* (Ball *et al.*, 2002). The Pico Duarte (3175 m) and the surrounding mountains are the highest elevation in the Caribbean, resulting in environmental conditions suitable for these northern species. This isolated occurrence in the Dominican Pico Duarte may have originated from long-distance dispersal by birds following the Atlantic migration flyway (see comments under *C. leptalea*).

2. *Carex brehmeri* Boeckeler, *Allg. Bot. Z. Syst.* 2: 190. 1896. Type: Bolivia. Larecaja, vicinis Sorata, Cochipata, 3100 m, XII-1884, Mandon 1427 (lectotype here designated NY 00011459, photo!; *isolectotypes* MICH 1109115, photo! NY 00011460, photo!).

*Distribution*: Described from Bolivia, and reported recently from Colombia (Govaerts *et al.*, 2015). First cited here for Venezuela (see Observations).

*Studied material:* VENEZUELA. *Merida state:* western Venezuela, high Andes, ca. 50 km NE of Mérida, southern shore of lake Mucubají, 3580 m, 8°47'45"N 70°49'34" W, 19-X-2012, Hilpold *et al.* 1658 (BOZ).

*Observations:* This species belongs to section *Phacocystis* Dumort., one of the largest sections in genus *Carex* with about 90 recognized species (Dragon & Barrington, 2009). Only five species of section *Phacocystis* have been previously reported from South America: *C. andersonii* Boott (from Patagonia), *C. darwinii* Boott (from Patagonia), *C. decidua* Boott (from Patagonia to Bolivia), *C. brehmeri* (from Bolivia), and *C. enneastachya* C.B. Clarke (from Colombia and Ecuador). An additional species, *C. azuayae* Steyerl., has been regarded as a synonym of *C. enneastachya* (Wheeler, 1998). Wheeler (1998) considered *C. enneastachya* as the only member of section *Phacocystis* present in northern South America. It is a medium-size sedge, with stems 28-56 cm tall and 6-10 spikes (Wheeler, 1998). The Venezuelan material that we have studied is actually less than 10 cm tall and bears only three spikes (one male and two female). In addition, a recent molecular phylogeny (Global *Carex* Group, 2016) showed that this Venezuelan sample was not closely related to an Ecuadorian sample of *C. enneastachya*. Dragon & Barrington (2009) examined similar materials from Colombia ("Sierra Madre del Cocuy, Grubb *et al.* 306", US) and provisionally classified those specimens as *C. decidua*. However, their phylogenetic results showed this Colombian sample as unrelated to *C. decidua*, so the authors discussed that this sample could be better assigned to *C. brehmeri*. The examination of the type material available at JSTOR Global Plants for *C. enneastachya* and *C. brehmeri* reveals that the Venezuelan plant is morphologically more similar to *C. brehmeri*. Thus, we consider that the usage of *C. brehmeri* to refer these northern South American populations as an accurate solution until new biosystematic studies shed light on the taxonomy of section *Phacocystis* in South America.

**3. *Carex catharinensis*** Boeckeler, *Allg. Bot. Z. Syst.* 2: 191. 1896. Type: Brazil. Santa Catarina, Serra Geral, XII-1890, Ule 1610 (*lectotype* here designated K 000584646, photo!).

*Iconography:* Holff Silveira & Longhi-Wagner, 2012: 389.

*Distribution:* Known from southern Brazil. Possibly also present in Uruguay (see comments below). First cited here for Argentina (Buenos Aires province).

*Studied material:* ARGENTINA. *Buenos Aires Prov.: Tornquist Partido*, entre Sierra de la Ventana y Tornquist, Abra de la Ventana, 620 m, 38°04'25.4" S 61°59'06.2" W, 9-I-2015, Martín-Bravo *et al.* 19SMB15 (SI).

*Observations:* The identity of *C. catharinensis* as a different species from *C. fuscula* d'Urv. has been recently proposed on the basis of molecular results (Escudero & Luceño, 2009). Luceño (1999) and Hoff Silveira & Longhi-Wagner (2012) noted that the main differences between the two species were utricles 3.5-5 mm long and nerved, with a bifid beak up to 1-1.4 mm in *C. catharinensis* versus utricles approximately 3 mm long and nerveless (except the two lateral nerves), with a shortly bidentate or truncate short beak in *C. fuscula*. The studied material from Sierra de la Ventana matches the variation reported for *C. catharinensis*. This report also fits the biogeographic pattern of *C. catharinensis*, which has so far been found only in temperate Atlantic South America, whereas *C. fuscula* is a Patagonian-Andean species (see comments under that species). It is likely that the *C. fuscula* materials cited by Herter (1953) from Uruguay also belong to *C. catharinensis*.

Myndel-Pedersen (1968) cited up to three different varieties of *C. fuscula* in Buenos Aires province, all of them from Sierra de la Ventana: var. *fuscula*, var. *hieronymi* (Boeck.) Kük., and var. *distenta* (Kunth) Kük. Luceño (1999) already noted that the plants from Sierra de la Ventana named var. *hieronymi* by Myndel-Pedersen probably referred to *C. catharinensis*. In our opinion, based on Myndel-Pedersen's descriptions, what he considered to be *C. fuscula* var. *fuscula* may also refer to *C. catharinensis*. On the other hand, although the description of what Myndel-Pedersen named *C. fuscula* var. *distenta* seems to be a much better match for *C. fuscula* s.s., it might also be small-sized specimens of *C. catharinensis*. Given this, we consider the presence of *C. fuscula* in Buenos Aires province as doubtful and in need of confirmation.

**4. *Carex divulsa*** Stokes in With., *Bot. Arr. Brit. Pl.* ed. 2, 2: 1035. 1787. Type: Micheli (1729), Nov Pl. Gen. t. 33, f. 10 (*lectotype* designated by Molina *et al.*, 2008: 395). Epitype: “Gram. Cyp. spicatum minus spica longa/divulsa seu interrupta Ray 1279, 2 Petiver” (FI-M, designated by Molina *et al.*, 2008: 395).

*Iconography*: Myndel-Pedersen, 1968: 331; Molina *et al.*, 2008: 396.

*Distribution*: Western Palearctic (western, central, and eastern Europe, North Africa and southwestern Asia; Molina *et al.*, 2008). Introduced in North America (Ball *et al.*, 2002) and central-eastern Argentina (Buenos Aires; Myndel-Pedersen, 1968). Newly cited here for Entre Ríos province, in northeastern Argentina.

*Studied material*: ARGENTINA. *Entre Ríos Prov.*: Paraná Dpt., Parque Libertador San Martín, 91 m, 31°43'51.14" S 60°19'29.2" W, 15-II-2015, Rodríguez-Palacios *et al.* 103GERP15 (SI).

*Observations*: Previously reported as adventitious in Buenos Aires city and neighboring areas (Myndel-Pedersen, 1968). The materials here cited from Entre Ríos, as well as others studied from Buenos Aires city, match all the characters reported by Molina *et al.* (2008), which confirms the identity of the South American populations as *C. divulsa* s.s.

**5. *Carex ecuadorica*** Kük., *Beibl. Bot. Jahrb. Syst.* 78: 7. 1904. Type: Ecuador. “In Andibus Ecuadorensibus”, IX-1857, Spruce 5908 (*lectotype* here designated C 10010040, photo!; *isolectotypes* E 00502223, photo!, K 000584631, photo!, P 00304725, photo!, S S-R-916, photo!).

*Distribution*: Andean Ecuador, Peru, and Bolivia (Wheeler, 1996a). Here newly cited for Argentina (Jujuy and Salta provinces).

*Studied material*: ARGENTINA. *Jujuy Prov.*: Yavi Dpt., La Quiaca, 3450 m, 12-II-1940, Meyer 33290 (A); 1 km from Tres Cruces to Humahuaca, 3690 m, 22°54'43.75" S 65°34'32.00" W, 8-II-2015, Rodríguez-Palacios *et al.* 88GERP15 (MCNS, SI). *Salta Prov.*: Los Andes Dpt., Vega

Tocomar, 24°11'37" S 66°33'10,65"W, 4330 m, Fabbroni & Gauffin 333 (MCNS). ECUADOR. Auf nuffum Lasabodan [probablemente La Saboya] und Latacunga und Mulalo, 2800-3000 m, Lehmann 7689 (K 000584636, paratype); in prov. Riobamba ad basim. occid. mont. Altar, IX-1891, Sodiro 199/60 (P 00304523, paratype).

*Observations*: Wheeler (1996a) cited this species for the Argentinian province of San Juan, but he later upgraded this and other populations from southern Argentina as a new species, *C. subfuegiana* Wheeler (2006), which ranges from Patagonia to San Juan. To our knowledge, we present the first reliable reports of *C. ecuadorica* in Argentina. *Carex ecuadorica* is morphologically very close to *C. subfuegiana*. Both have been tentatively placed in section *Foetidae* (Tuck. ex L.H. Bailey) Kük. and display utricles bottle-shaped, with an elliptical body that is constricted into the beak, which are the most apparent differences from *C. macrorrhiza* Boeckeler (utricles deltoid, without a constriction between the body and the beak; Wheeler, 2006). The main differences between *C. ecuadorica* and *C. subfuegiana* are the brown to almost hyaline glumes and the utricles with a stipe approximately 0.5 mm in *C. ecuadorica* versus the ferruginous glumes, and utricles without or with a very short stipe in *C. subfuegiana* (P. Jiménez-Mejías, pers. obs.).

We selected as *lectotype* the voucher Spruce 5908 among the available syntypes (see Studied material) because it displays the most complete specimens, with fragments bearing spikes with mature utricles, as well as rhizomes.

**6. *Carex feddeana*** H. Pfeiff., *Repert. Spec. Nov. Regni Veg.* 17: 30. 1921. Type: Brazil. Parana, “Brasilia, Paraná, prope Pinhaes” [885 m, 14-X-1914], Dusén 1134a (*lectotype* BREM, designated by Wheeler, 1996b: 182; *isolectotypes* G 00098284, photo!, GH 00101838, photo!, MO 907892, photo!, NY 00011463, photo!, S S07-12248, photo!).

*Iconography*: Holff Silveira & Longhi-Wagner, 2012: 387.

*Distribution*: Reported from Paraguay, southern Brazil and northern Argentina (Flora del Cono Sur, 2015; Govaerts *et al.*, 2015). Here cited as new for Bolivia (Cochabamba department).

*Studied material:* BOLIVIA: Cochabamba Dpt.: Chapare Prov., by Rio Corani, by Bridge below Corani Pampa on road to Tablas Monte, 2200 m, 23-VI-1995, Wood & Ritter 11219 (NY).

*Observations:* This species seems to be linked to the ecoregions of Pampa and the moistest areas of the Chaco. This species shows characteristic tubercled utricles, and resembles the more widespread *C. bonariensis* Poir. Both species belong to section *Bracteosae* Pax. Wheeler (1996b) provided a key for this and other utricled species from the section in South America.

The isolectotypes housed at G, NY, and S, all from the collection 1134a, have a handwritten correction on the label: the collector “P. Dusén” has been crossed out and substituted by “G. Jönsson”. It seems to be just a conflict with the authorship of the exsiccata, as these specimens share the same label as the ones where “P. Dusén” has not been crossed out (GH, MO, S). Thus, the consideration of such material as isolectotypes should not be in doubt. Also, in the protologue, the collection was cited as “Paraná, prope Pinhaes, locis subpaludosis”. Different specimens with the number 1134a have slightly different descriptions for the habitat. Thus, the MO specimen label says “in campo paludoso” (swampy meadow), NY and G specimen labels “ad ripam fluminis” (on river shores), and the S specimen “in campo subpaludoso” (sub-swampy meadow). We understand Pfeiffer’s habitat indication as a broad collective reference, “locis subpaludosis” (sub-swampy places), which includes the habitat descriptions listed in the above-cited specimens.

**7. *Carex firmicaulis*** Kalela, *Ann. Acad. Sci. Fenn.*, ser. A 54: 53. 1940. Type: Argentina. Neuquén, Rahue, 21-XII-1937, Kalela 1539 (*lectotype* here designated H 1066601, photo!; *isolectotype* H 1066600, photo!).

*Iconography:* Wheeler, 1996a: 195 (sub *C. andicola* G. A. Wheeler).

*Distribution:* Southern Andes from Santa Cruz province in Argentina to Coquimbo region in Chile, with isolated populations at Sierra de Achala in Cordoba province (Argentina) (Wheeler, 1996a). Here cited as new for Biobío region in central Chile.

*Studied material:* ARGENTINA. Neuquén Prov.: Pulmari-Aluminé, 23-XII-1937, Kalela 1578 (H 1066606, paratype); Lipela Grande, suoretki, 22-XI-1937, Kalela 986 (H 1066605, paratype). CHILE: *Biobío Region: Biobío Prov.*, Parque Nacional Laguna del Laja, im Tal oberhalb Antuco gegen die Laguna de la Laja, 25-XI-1987, Rechinger & Rechinger 63939 (M).

*Observations:* The presence of *C. firmicaulis* in Biobío region was not unexpected given its occurrence in the adjacent Neuquén province of Argentina. When Wheeler (1996a) described *C. andicola* G. A. Wheeler, he chose a specimen from the neighboring areas to San Carlos de Bariloche (Río Negro province, Argentina). Later, he noted that the previously described *C. firmicaulis* was conspecific with his *C. andicola* (notes in herbarium tags from SI; P. Jiménez-Mejías, pers. obs.). *Carex firmicaulis* belongs to a taxonomically very difficult group tentatively placed in section *Foetidae* that includes *C. pleioneura* G. A. Wheeler, *C. nebularum* Phil., and *C. hypoleucos* E. Desv. (= *C. kurtziana* Kük.). Boundaries between species are very faint and some of these species co-occur in the same areas. In order to minimize heterogeneity between the type materials designated for each of the two names, *C. firmicaulis* and *C. andicola*, we chose among the available syntypes for *C. firmicaulis* (see Studied material) a specimen that also came from the neighboring area of San Carlos de Bariloche.

**8. *Carex fuscula*** d’Urv., *Fl. Iles Malouin.*: 28. 1825. Type: Argentina. Malvinas Islands: “Malouines, I. [island] Soledad” Dumont d’Urville s.n. (*lectotype* here designated P-00305080, photo!). Epitype here designated: Argentina, Tierra del Fuego, Tolhuin, estancia Rivadavia, cerca del lago Chepelmut, 75 m, 54°21.6’ S 67°39.0’ W, 12-I-2010, Martín-Bravo *et al.* 31SMB10 (UPOS 4262!, duplicate SI).

*Iconography:* Barros, 1969: 94.

*Distribution:* Previously reported from Patagonia and the southern Andes, with its northernmost limit in Tucumán province (Argentina and Chile; Flora del Cono Sur, 2015; see also notes below), with an isolated occurrence at the extra-Andean Sierra

de Achala (Argentina, Córdoba province; see materials in Escudero & Luceño, 2009) and the Malvinas Islands (Falkland Islands). Here first cited for Bolivia and Salta province in Argentina.

*Studied material:* ARGENTINA. *Salta Prov.: Santa Victoria Dpt.*, road from Santa Victoria to Abra de Lizoite, 3676 m, 22°15'43.7" S 65°5'12" W, 7-II-2015, Rodríguez-Palacios *et al.* 45GERP15 (MCNS, SI). BOLIVIA: *Cochabamba Dpt.*, 5 km from Monte Puncu towards Sehuencas, 2900 m, 5-II-1995, Wood 9334 (NY).

*Observations:* Previous reports of this taxon from Buenos Aires province (Argentina), Brazil, and probably also those from Uruguay, belong to *C. catharinensis* (see comments under that species). The materials reported here match the variability of *C. fuscula* s.s. according to Luceño (1999) and Hoff Silveira & Longhi-Wagner (2012) (see also comments under *C. catharinensis*). These new citations expand the range of the species more than 1000 km north.

The material selected as lectotype is a voucher of *C. fuscula* apparently collected by d'Urville himself from the Malvinas (Falkland) archipelago. Wheeler previously noted this collection to be type material under the denomination of "holotype". However, the protologue does not contain any specific reference to a particular material, so a formal lectotypification is still required. The designated lectotype is a very small immature specimen. Because the lectotype may be ambiguous in distinguishing this species from other closely related species (e.g., *C. catharinensis*), according to ICN (Art. 9.8; McNeill *et al.*, 2012) we designate as epitype a mature specimen from the neighboring island of Tierra del Fuego to ensure the precise application of the species name.

**9. *Carex laegaardii*** J.R. Starr, *Bot. J. Linn. Soc.* 179: 33. 2015. *Uncinia paludosa* G. A. Wheeler & Goetgh., *Aliso* 14: 142. 1995. nom. subs. Type: Ecuador. Chimborazo, páramo above Azul along road to Osogochi, 2°18' S 78°42' W, 4200 m, 26-IV-1988, Laegaard 71014 (*holotype* AAU; *isotypes* GENT 90032614, photo!, MIN, NY, QCA 38415, photo!, QCNE 181, photo!).

*Distribution:* Colombia, Ecuador (Wheeler &

Goetghebeur, 1995), and Peru (León *et al.*, 2010). Here cited as new for Bolivia.

*Studied material:* BOLIVIA. *La Paz Dpt.: Nor Yungas Prov.*, circa 3-4 km above Unduavi on road to La Paz-El Cumbre, 3700 m, 3-V-1997, Wood 12951 (E).

**10. *Carex leptalea*** Wahlenb., *Kongl. Vetensk. Acad. Nya Handl.* 24: 139. 1803. Type: "Hab. In America boreali, secundum herbarium Cl. Torneri". (Apparently BM, not found; Lysaght, 1971).

*Iconography:* Ball *et al.*, 2002: 564.

*Distribution:* Widely distributed in North America, south to Mexico, also in Hispaniola island (Ball *et al.*, 2002). Here cited as new record for South America in Venezuela.

*Studied material:* VENEZUELA. *Mérida state:* western Venezuela, high Andes, ca 50 km NE of Mérida, southern shore of Lake Mucubají, 3580 m, 70°49'34" W 8°47'45" N, 19-X-2012, Hilpold *et al.* 1656 (BOZ); El Rincón, oberhalb Chachopo, bei Timotes, 2920 m, 22-VIII-1968, Oberwinkler 12424 (M).

*Observations:* The South American materials of *C. leptalea* match the typical phase (Ball *et al.*, 2002) of the species (*C. leptalea* subsp. *leptalea*) with utricles 2.5-3.2 mm long, achenes obtusely angled, and spikes within the smallest variation threshold of the species (0.9-1.8 cm long). Remarkably, the southernmost occurrences of this subspecies in the North American subcontinent are reported from the highlands of North Carolina and Tennessee, whereas in most southern states such as Florida it seems to be substituted by the larger *C. leptalea* subsp. *harperi* (Fernald) W. Stone. The occurrence of the circumboreal *C. limosa* (see below under this species), as well as the Nearctic *C. leptalea*, in both the mountains of Hispaniola in the Caribbean, and in the Venezuelan Andes, illustrates the biogeographical importance of these mountains. The presence of these northern elements in these apparently anomalous isolated occurrences may be linked to long-distance dispersal mediated by birds following the Atlantic flyway between eastern North America and South America (see La Sorte *et al.*, 2014).

**11. *Carex limosa* L., *Sp. Pl.*: 977. 1753.** Type: without data (*lectotype* LINN 1100.56, designated by Egorova, 1999: 359).

*Iconography*: Ball *et al.*, 2002: 418.

*Distribution*: Circumboreal, south to the Mediterranean, central Asia, Japan and Hispaniola island (Govaerts *et al.*, 2015). Here cited as new for South America in Venezuela.

*Studied material*: VENEZUELA. *Trujillo state*: borde con Lara, Mun. Carache, arriba de Mesa Arriba, P.N. Dinira, Páramo de Jabón, 9°34'3" N 70°8'51" W, 3020 m, 7-III-1999, Riina & Duno de Stefano 489 (NY).

*Observations*: This is the first record for South America and the global southernmost known occurrence for the species. The studied material was already tentatively classified as *C. limosa* by Reznicek (2012, annotation in revision tag). The occurrence of *C. leptalea* in Andean Venezuela, as well as in the island of Hispaniola may be related to migratory birds flyways (see comments under *C. leptalea*).

**12. *Carex mandoniana* Boeckeler, *Allg. Bot. Z. Syst.* 2: 174.1896.** Type: Bolivia, Larecaja prov., "Fl. andium Boliviens" 3100-4200 m, Mandon 1429 (*lectotype* here designated LE 00000785, photo!, specimen at the upper left corner of the herbarium sheet; *isolectotypes* GH 00139550, photo!, MICH 1109138, photo!, MPU 020515, photo!).

*Distribution*: Reported from Ecuador, Peru, Bolivia and northern Argentina (Tucumán province) (Flora del Cono Sur, 2015; Govaerts *et al.*, 2015). Here cited as new for Salta province (Argentina).

*Studied material*: ARGENTINA: *Salta Prov.*: *Santa Victoria Dpt.*, Road from Santa Victoria to Abra de Lizoite, 3953 m, 22°16'22.6" S 65°6'28.3" W, 7-II-2015, Rodríguez-Palacios *et al.* 42GERP15 (MCNS, SI).

*Observations*: *Carex mandoniana* belongs to the taxonomically difficult section *Ovales* Kunth. The taxonomy of this group in South America is poorly understood. Extremes of variation may be easily

identified but the traditionally reported diagnostic taxonomic characters do not work so well for the many apparently intermediate specimens. Thus, section *Ovales* in the Neotropics is much in need of revision. Co-occurrence of different species of this group within the same population is not rare. Indeed, the studied population here cited co-occurred with the similar but much darker-glumed species, *C. pseudomacloviana* G. A. Wheeler. Here we designate a particular specimen within the *lectotype* voucher to stabilize the use of the name *C. mandoniana* according to its most common delimitation (as we observed in herbarium collections). That is, they are small plants approximately 10 cm tall, with downward curved stems, and light brown glumes with wide hyaline margins. We cannot eliminate the possibility that among the detected *isolectotypes*, or even within the *lectotype* itself, some fragments may belong to similar species as *C. bonplandii* Kunth or *C. purdiei* Boott.

**13. *Carex maritima* Gunnerus, *Fl. Norveg.* 2: 131. 1776.** Type: Oeder, 1769, Fl. Dan 3(8) t. 432 (*lectotype* designated by Jørgensen, 2012: 1090). Epitype (designated by Bakken *et al.*, 2012: 122): Norway. Finnmark, Måsøy, Maasøe, 27-VI-1767, Herbarium Gunnerii s.n. (TRH V-44006, photo!).

*Iconography*: Barros, 1969: 17 (as *C. incurva* Lightf.); Wheeler, 2009: 330.

*Distribution*: Bipolar species. In the Northern Hemisphere, circumboreal at high latitudes, confidently known to occur as far south as the European Alps; disjunct populations in the Andes south to Patagonia, being so far reported from Ecuador, and most of the Argentinian and Chilean Cordillera (Govaerts *et al.*, 2015). Here newly reported for Bolivia, plus an additional record from Salta province in Argentina, where this species seems to be rare.

*Studied material*: ARGENTINA. *Salta Prov.*: *Santa Victoria Dpt.*, road from Santa Victoria to Abra de Lizoite, 4480 m, 22°13'67.3" S 65°10'19.8" W, 7-II-2015, Rodríguez-Palacios *et al.* 46GERP15 (MCNS, SI). BOLIVIA. *Potosí Dpt.*: *Sud Lípez Prov.*, Mina Corina, Laguna Pastos Grandes, 4440 m, 15-IV-1980, without collector 954 (NY).

*Observations:* The typification performed by Jørgensen (2010) included a first attempt to epitypify with the specimen “Finnmark, Hammerfest, 22.7.1767, Herbarium Gunnerii” (TRH V-44007), which is immature. However, it seems that he cited the wrong specimen number, because the specimen TRH V-44006, which bears mature utricles, is actually labeled as the epitype (T. Prestø, pers. comm.). The mistake seems to have been realized by Bakken *et al.* (2012), who cited the correct specimen as the epitype. This later publication must be considered the valid epitype designation.

The remarkable disjunction of the South American populations of this species seems to be due to a long-distance dispersal event(s) from the North Hemisphere during the Pleistocene (Villaverde *et al.*, 2015). In Argentina it has been reported as scattered from Tierra del Fuego to Jujuy (Flora Cono Sur, 2015), and recently cited for the first time for Salta (Fabbroni, 2015) in the western part of the province. This is the second record of this species in Salta to our knowledge, from the northernmost part of the region, very close to the Bolivian border.

**14. *Carex ownbeyi*** G. A. Wheeler, *Darwiniana* 40: 200. 2002. Type: Bolivia. Cochabamba, Quillacollo Prov., “camino Sipe Sipe-Lipichi”, 3800 m, 9-IV-1990, Hensen 731 (*holotype* MIN; *isotype* LPB, photo!).

*Iconography:* Wheeler, 2002: 202.

*Distribution:* So far known only from the type locality in central Bolivia. Here newly reported for Argentina.

*Studied material:* ARGENTINA. Tucumán Prov.: Tafi del Valle Dpt., Tafi del Valle, above Cristo Redentor, 2509 m, 26°49'33.78" S 65°42'20.98" W, 29-I-15, Rodríguez-Palacios & Jiménez-Mejías 70GERP15 (LIL, SI).

*Observations:* This species belongs to section *Bracteosae*, although it can easily be mistaken for *C. mandoniana* from section *Ovales* due to its downwardly curved stems. However, the two species can be readily distinguished because species in section *Bracteosae* have androgynous spikes,

whereas the spikes are gynecandrous in section *Ovales*. From other species in section *Bracteosae*, *C. ownbeyi* can be distinguished by its ovoid to shortly oblong inflorescence less than 3 cm long, its ovate utricles, 3.5-4 mm long, without tubercles, that are conspicuously nerved at least on the abaxial side and narrowly winged at the top (so the beak looks flattish), and its brown female glumes (see complete description by Wheeler, 2002).

**15. *Carex polysticha*** Boeckeler, *Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn*: 157. 1869. Type: Brazil. Minas Gerais, Lagoa Santa, 26-IV-1864, Warming 518 (*lectotype* here designated C 10010084, photo!).

*Iconography:* Wheeler, 2009: 338; Holff Silveira & Longhi-Wagner, 2012: 399.

*Distribution:* The Americas from central Mexico to northern Argentina, absent from the Amazon basin (Govaerts *et al.*, 2015). Here cited as new for Bolivia.

*Studied material:* BOLIVIA. Santa Cruz Dpt.: Florida Prov., finca on road connecting to road ascending to El Fuerte, 18.20513° S -63.83888° W, 1964 m, 25-III-2010, Hinchliff *et al.* 794 (WS).

**16. *Carex subandrogyna*** G. A. Wheeler & Guagl., *Hickenia* 3: 163. 2003. Type: Argentina. Jujuy, Dr. Manuel Belgrano, 8 km de Lozano camino a Tiraxi, 24° 2' S 65° 22' W, 8-II-1988, Morrone *et al.* 2265 (*holotype* SI 000237!; *isotypes* M!, MIN).

*Iconography:* Wheeler & Guaglianone, 2003: 164.

*Distribution:* northern Argentina (Salta and Jujuy provinces) and southern Bolivia (Wheeler & Guaglianone, 2003, 2006). Here newly cited for the Argentinian province of Tucumán.

*Studied material:* ARGENTINA. Tucumán Prov.: Chicligasta Dpt., Parque Nacional Campo de los Alisos, estancia las Pavas, 1920 m, 27°11'47.4" S 65°56'4.9" W, 27-I-15, Rodríguez-Palacios & Jiménez-Mejías 2GERP15 (SI); Parque Nacional Campo de los Alisos, estancia las Pavas, track



between Puesto la Mesada and Puerta de los Saladillos, 1743 m, 27° 12' 34.08" S 65° 55' 40.30" W, 27-I-2015, Rodríguez-Palacios & Jiménez-Mejías 5GERP15 (LIL, SI).

*Observation:* The reported populations constitute the southernmost known limit of the species (see Wheeler & Guaglianone, 2003).

**17. *Carex subantarctica*** Speg., *Anales Mus. Nac. Buenos Aires* 7: 180. 1907. Type: Argentina. Chubut prov., "Campamento 57, 16-III-1900" (*lectotype* here designated LP-003037, photo!).

*Iconography:* Wheeler, 1987: 579; Wheeler, 2009: 326.

*Distribution:* Argentinian Patagonia, in Santa Cruz, Chubut, and Río Negro provinces, with disjunct populations in the pre-Andean mountains of Sarmiento and Calingasta departments, in San Juan province.

*Studied material:* ARGENTINA. *Chubut Prov.:* *Languiñeo Dpt.*, Río Corcovado, II/III-1900, Illin s.n. (LP). *San Juan Prov.:* *Calingasta Dpt.*, El Leoncito National Park, mountains of NE section beyond public road, 31.80290° S 69.21304° W, 21-I-2015, Waterway *et al.* 2015.020 (SI).

*Observations:* The presence of the disjunct populations of *C. subantarctica* in San Juan province has already been noted by Wheeler (1987), who cited the population from the Quebrada de los Sombreros, in Sarmiento department. Later, he cited El Leoncito National Park (Calingasta department) on the basis of a single voucher (Ruthsatz 8791, MIN) without any further indication. We provide an exact location of this very rare plant in the San Juan province. *Carex subantarctica* was growing in a small ciénaga (area with nature springs) in the mountains, with small creek flowing through it; in dense low 'cushion' style cover co-dominated by *Juncus balticus* Willd. In seven hours of intensive searching we found this species in only one of the four areas of similar habitat we observed.

The protologue of *C. subantarctica* (Spegazzini, 1902) cites two specimens: "in herbosis collinis secus Carren-leofú [...], aest 1899, N. Illin" (specimen entirely male) and "Rio S. Cruz, Mrt.

1900, C. Burmeister" (specimen entirely female). In a previous intent of typification Wheeler (1987), who in turn followed Barros (1947), selected as *lectotype* the material "río Corcovado, II/III-1900, Illin" (LP 003036, formerly LPS 16356). However, the selected specimen does not match the date in the protologue. Despite a transcription error cannot be totally ruled out, the competing specimen LP 003037 "Campamento 57, 16-III-1900" annotated as "*C. subantarctica* n.sp." seem to unequivocally be original material. We corrected the problem designating a new *lectotype* for *C. subantarctica* on the LP 003037 voucher.

**18. *Carex subdivulsa*** (Kük.) G. A. Wheeler, *Darwiniana* 40: 203. 2002. Type: Argentina. La Rioja, Famatina Dpt., Sierra Famatina, 28°20' S 67°55' W, La Hoyada, ca. 2500 m, 24/31-I-1908, Kurtz 15000 (*neotype* MIN, designated by Wheeler, 2002: 203; *isoneotypes*: CORD, SI, photo!).

*Iconography:* Wheeler, 2002: 204.

*Distribution:* So far known only from Sierra Famatina, a pre-Andean range in the Argentinian province of La Rioja. Here this species is reported for Tucumán and Salta provinces.

*Studied material:* ARGENTINA. *Salta Prov.:* *Rosario de Lerma Dpt.*, Campo Quijano, Corralito, 1750-1850 m, 24°58'54" S 65°43'40" W, 3-II-15, Rodríguez-Palacios *et al.* 21GERP15 (MCNS, SI); *Chicoana Dpt.*, Road "Cuesta del Obispo", 2380 m, 25°11'17.69" S 65°48'6.93" W, 4-II-15, Rodríguez-Palacios & Jiménez-Mejías 29GERP15 (MCNS, SI); *Santa Victoria Dpt.*, road from Santa Victoria to Abra de Lizoite, 2649 m, 22°14'21.9" S 65°00'30.2" W, 7-II-15, Rodríguez-Palacios *et al.* 33GERP15 (MCNS, SI). *Tucumán Prov.:* *Tafí del Valle Dpt.*, Tafí del Valle, above Cristo Redentor, 2509 m, 26°49'33.78" S 65°42'20.98" W, 29-I-15, Rodríguez-Palacios & Jiménez-Mejías 69GERP15 (LIL, SI).

*Observations:* Wheeler (2002) upgraded the name *C. subdivulsa*, which was previously considered to be just a form of *C. sororia* Kunth (*C. sororia* f. *subdivulsa* (Kük.) Kük.) to the rank of species. He cited the smaller utricles (up to 3.6 mm long *versus* approximately 5 mm long) and the

inflorescence shape (oblong and interrupted *versus* ovoid and congested) as the main characteristics to distinguish *C. subvidulsa* from *C. sororia*. The new materials that we collected display a large range of variation: some culms have “typical” oblong inflorescences where the lowermost spike is distant and thus separated from the rest, but most have non-interrupted inflorescences, oblong to shortly ovoid. Also the observed ecological preferences are wider than previously reported, occurring not only in moist meadows (Wheeler, 2002) but also in dry pastures. Further studies are needed to evaluate the variation among the species of section *Bracteosae* to accurately establish their morphometric limits.

**19. *Carex toroensis*** G. A. Wheeler, *Syst. Bot.* 14: 182. 1989. Type: Chile. Magallanes Region, Última Esperanza Prov., Seno Última Esperanza, Puerto Toro, W of Río Serrano, N of Ventisquero Balmaceda, 51°25' S 73°5' W, 18-I-1977, T.B.P.A. 1804 (*holotype* HIP).

*Iconography*: Wheeler, 1989: 176.

*Distribution*: So far known only from the type locality in the Chilean region of Magallanes. Here we report an additional locality for Magallanes, and we newly cite it for the neighboring region of Aysén.

*Studied material*: CHILE. *Aysén Region*: *Capitán Prat Prov.*, Villa O'Higgins, cuenca del Río Mosco, 550 m, 48°28' S 72°28' W, 23-III-2003, García 78 (CONC). *Magallanes Region*: Fiordo Parry, Parque Nacional Alberto M. de Agostini, Glaciar Reina Isabel II, 54°50' S, 69°21' W, 11-II-1996, Pisano *et al.* 8812 (CONC).

*Synonymization of C. koyamae in C. phleoides and lectotypification of C. phleoides*

***Carex phleoides*** Cav., *Icon.* 5: 40. 1799. *Uncinia phleoides* (Cav.) Pers., *Syn. Pl.* 2: 534. 1807. Type: Chile. La Concepción, Neé s.n. (*lectotype* here designated MA 475489, photo!).

= *Carex koyamae* (Gómez-Laur.) J. R. Starr, *Bot. J. Linn. Soc.* 179: 33. 2015. *Uncinia koyamae* Gómez-Laur., *Brenesia* 18: 92. 1980. Type: Costa Rica. Región Atlántica del Macizo del Chirripó, Limón, al norte del Lago Ditkebi, ca. 150 m, 18-III-1979, Gómez Laurito 4770 (*holotype* CR, photo!).

*Observations*: When Gómez-Laurito (1980) described *Uncinia koyamae* (= *C. koyamae*) from Costa Rica he explicitly mentioned the very close resemblance of this species to *U. phleoides* (= *C. phleoides*). He emphasized two facts to describe the Costa Rican plant as a new species: (1) *C. phleoides* was a South American species not found yet in Central America; and (2) the type specimens displayed a filiform bract up to 21 cm long at the base of the spike, which seemed to contrast with *C. phleoides*, which is typically bractless. Apart from the bract, the description of *C. koyamae* is a perfect match for *C. phleoides* (Myndel-Pedersen, 1968; Barros, 1969; Wheeler, 2007). Later, González-Elizondo (1983) cited the occurrence of typical specimens of *C. phleoides* outside South America, in Mexico.

The revision of herbarium material revealed the existence of a Bolivian voucher (see below) of *C. phleoides* displaying a very long filiform bract, much longer than the spike. This caused us to suspect that the appearance of such a bract might be just an abnormality. During the visit to Los Alisos National Park in February of 2015 we found intermingled among the many individuals of typical bractless *C. phleoides*, specimens that also bore a filiform bract longer than the spike. Moreover, these abnormal spikes co-existed with bractless spikes on a single plant. The instability of this character was already implicitly recorded in Flora Mesoamericana (Chater, 1994), where it is mentioned that the only other known record of *C. koyamae* (Chiapas, Volcán Tacaná, Martínez 19633, MEXU) differed from the type Costa Rican collection in having “scarcely bracteate spikes” [sic.]. Given this new evidence, we consider *C. koyamae* to simply be an aberrant form of *C. phleoides*, which sometimes may develop a bract below the spike. Indeed, Wheeler (2007) seems to already have implicitly supported such synonymization, as he considered *C. phleoides* cited from Central America on the basis of Flora Mesoamericana (Chater, 1994), whereas this flora lists only *C. koyamae* not *C. phleoides*.

Wheeler (2007) has previously noted the existence of two vouchers in Cavanilles' *Carex phleoides* type collection at MA, but he did not perform a formal lectotypification (see below). Both specimens display labels, presumably handwritten by Cavanilles, that relate the specimens with the protologue (Cavanilles, 1807), but neither of them

can be unambiguously identified as the specimen pictured in tab 464, fig. 1. The specimen MA 475488 bears three independent fragments and three labels (“Montevideo y pampas, Neé legit” [Uruguay], “ex Regno chileno, Neé iter” [Probably Chile], and “ex Cuchacucha, Neé iter” [Chile]), although it is not possible to unequivocally assign a label to a fragment. Given that, we selected the specimen MA 475489 as lectotype as it provides an unambiguously linking of the species name with a specific place (Concepción, Chile).

Wheeler (2007) avoided designating a lectotype for *C. phleoides* because he considered it to be a species aggregate. He seems to have considered *Uncinia trichocarpa* C. A. Meyer, currently recorded as a synonym of *C. phleoides* (Govaerts *et al.*, 2015), as a separate species. He advised waiting for a careful revision of the Cavanilles’ original material to perform the lectotypification of *C. phleoides*, as he said that both species are sympatric in Central Chile (Wheeler, 2007). We have studied material imaged in JSTOR Global Plants ascribed to *U. trichocarpa* by Wheeler. These plants differ from typical *C. phleoides* in having reddish-tinged glumes with more conspicuous hyaline margins, and generally narrower spikes (see Barros, 1947). The selected *C. phleoides* lectotype is a typical specimen with straw-colored glumes and a thick spike approximately 6 mm width at its widest part, which should not create problems with eventual recognition of the name *U. trichocarpa* as an independent species, if warranted.

*Additional studied materials (C. phleoides* specimens with filiform bract longer than its spike): ARGENTINA. Tucumán Prov.: Chichlingasta Dpt., Parque Nacional Campo de los Alisos, estancia las Pavas, 27°11’32.4” S 65°56’15.08” W, 2160 m, 27-I-15, Rodríguez-Palacios & Jiménez-Mejías 3GERP15 (SI). BOLIVIA. La Paz Dpt.: Camacho Prov., Cantón Ambana, Ambana 2 km hacia el sur 3500 m, 19-XII-1980, Beck 4166 (M).

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