BioOne COMPLETE

Taxonomic, nomenclatural and chorological reports on Carex (Cyperaceae) in the Neotropics

Authors: Jiménez-Mejías, Pedro, Strong, Mark, Gebauer, Sebastian, Hilpold, Andreas, Martín-Bravo, Santiago, et al.

Source: Willdenowia, 48(1) : 117-124

Published By: Botanic Garden and Botanical Museum Berlin (BGBM)

URL: https://doi.org/10.3372/wi.48.48108

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

Downloaded From: https://complete.bioone.org/journals/Willdenowia on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

Willdenowia
Annals of the Botanic Garden and Botanical Museum Berlin

PEDRO JIMÉNEZ-MEJÍAS[1*], MARK STRONG[1], SEBASTIAN GEBAUER[2], ANDREAS HILPOLD[3], SANTIAGO MARTÍN-BRAVO[4] & ANTON A. REZNICEK[5]

Taxonomic, nomenclatural and chorological reports on *Carex* (*Cyperaceae*) in the Neotropics

Version of record first published online on 5 April 2018 ahead of inclusion in April 2018 issue.

Abstract: We present relevant data about the taxonomy, nomenclature, and chorology of nine species of the genus *Carex* from the Neotropics. We provide two new records for the South American continent, one of them an introduced species in Argentina and Uruguay (*C. divisa*), and the other an apparently naturally occurring species in Venezuela (*C. buxbaumii*), two new records for Central America in Costa Rica (*C. setigluma*) and Guatemala (*C. phalaroides*), and five other new records at the national level for Colombia (*C. larensis*, *C. ownbeyi*, *C. tachirensis*), Ecuador (*C. haematopus*) and Uruguay (*C. catharinensis*), as well as relevant regional records for two of these species in Venezuela (*C. larensis*, *C. tachirensis*). We also provide taxonomic observations on the poorly understood *C. tachirensis*. Finally, we lectotypify three names (*C. larensis*, *C. niederleiniana* and *C. phalaroides*) and propose the synonymization of *C. tucumanensis* with the earlier described *C. niederleiniana*.

Key words: Andes, *Carex*, chorology, *Cyperaceae*, distribution, Neotropics, nomenclature, sedges, taxonomy, typification

Article history: Received 28 November 2017; peer-review completed 7 February 2018; received in revised form 16 February 2018; accepted for publication 20 February 2018.

Citation: Jiménez-Mejías P., Strong M., Gebauer S., Hilpold A., Martín-Bravo S. & Reznicek A. A. 2018: Taxonomic, nomenclatural and chorological reports on *Carex* (*Cyperaceae*) in the Neotropics. – Willdenowia 48: 117–124. doi: https://doi.org/10.3372/wi.48.48108

Introduction

Carex L., with about 2000 species, is one of the largest genera of Angiosperms (e.g. Global *Carex* Group 2015, 2016). It has a cosmopolitan distribution, with more than two hundred species distributed in the Neotropics (Govaerts & al. 2018+). Despite its relative species richness, further study is still needed in Central and South America. The efforts of Reznicek (1986), Reznicek & González-Elizondo (1995) and Wheeler (1987, 1990, 1996, 2002, 2009, among many other works) have greatly clarified the taxonomy of several taxonomic groups in these regions. Yet, other groups remain understudied, as evidenced by a number of recently described new species (Jiménez-Mejías & Escudero 2016; Jiménez-Mejías & Roalson 2016; Poindexter & al. 2017).

This publication is a continuation of the revision work started with a first set of miscellaneous notes published by Jiménez-Mejías & al. (2016a). Here we continue to present new relevant taxonomic, nomenclatural, and chorological information, as a result of studying additional herbarium collections.

1 Smithsonian Institution, National Museum of Natural History, Department of Botany (MRC 166), 10th St. & Constitution Ave. NW, Washington, DC 20560, U.S.A.; *e-mail: pjimmej@gmail.com (author for correspondence).
2 Martin Luther University Halle-Wittenberg, Institute of Biology, Geobotany and Botanical Garden, Am Kirchtor 3, 06108 Halle, Germany.
3 Institut für Alpine Umwelt, Eurac Research Bolzano/Bozen, Viale Druso/Drususallee 1, 39100 Bolzano/Bozen, Italy.
4 Department of Molecular Biology and Biochemical Engineering, Universidad Pablo de Olavide, 41013, Sevilla, Spain.
5 University of Michigan, 3600 Varsity Drive, Ann Arbor, MI 48108-2228, U.S.A.

Downloaded From: https://complete.bioone.org/journals/Willdenowia on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

Material and methods

Material from the following herbaria was studied: A, BOZ, DUKE, HAL, MICH, MO, NY, SI, UPOS and US (abbreviations according to Thiers 2017+). High-resolution images available on the Internet from the herbaria CORD, F, G, K, LE, LPB and VEN were also carefully examined. Specimens were identified using the specialized taxonomic literature cited under each taxon. The species are presented in alphabetical order. The proposed synonymization is discussed at the end of the manuscript. Accepted names follow the World Checklist of *Cyperaceae* (Govaerts & al. 2018+). Terminology of the inflorescence prophylls (utricles and cladoprophylls) follows the suggestions in Jiménez-Mejías & al. (2016b).

Results and Discussion

Carex buxbaumii Wahlenb. in Kongl. Vetensk. Acad. Nya Handl. 24: 163. 1803. – Lectotype (designated by Moberg & Nilsson 1991: 291): Sweden, in Sueciae paludosis, s.d., *G. Wahlenberg* (UPS-THUNB 21771 [digital image!]).

Illustrations — Ball & Reznicek (2002: 407), Jermy & al. (2007: 451).

Remarks — First record of this Holarctic, predominantly boreal species for the South American continent, constituting the known absolute southernmost native limit of the species. *Carex buxbaumii*, *C. leptalea* Wahlenb., *C. limosa* L., *C. livida* (Wahlenb.) Willd., and *C. lurida* Wahlenb. display a remarkable trans-Caribbean disjunction, being the five species widely distributed in North America and appearing disjunct in the N Andes (Govaerts & al. 2018+), and also on the Island of Hispaniola in the case of *C. leptalea*, *C. limosa* and *C. lurida*. Such disjunction seems to be related to the bird migration via the American Atlantic flyway (Jiménez-Mejías & al. 2016a).

The coordinates provided in the voucher actually lies on the Colombian side of the border, although still pretty close to Venezuela. Since the coordinates are given as approximates and since we cannot authentically discern whether the mistake is in the coordinates or in the country citation, we cite the country as shown on the specimen label.

There is some confusion regarding the typification of the name *Carex buxbaumii* Wahlenb. and its relationship with the illegitimate *C. polygama* Schkuhr (Beschr. Riedgräs. 1: 84. 1801, nom. illeg., non *C. polygama* J. F. Gmel., Syst. Nat. ed. 13[bis]: 145. 1791). While Moberg & Nilsson (1991) correctly typified *C. buxbaumii* Wahlenb. on a Wahlenberg's herbarium material, Egorova (1999) considered that *C. buxbaumii* a replacement name for *C. polygama* Schkuhr., and thus proposed a new lectotypification through the designation of the type material of *C. polygama* Schkuhr [Egorova (1999: 389): Denmark, Zealand, in uliginosis Siaellandiae, Jul 1799, *M. Vahl s.n.* (HAL 0103626!)]. However, the case is not as straight forward as it seems. While Wahlenberg (1803) cited Schkuhr's name in the protologue of *C. buxbaumii*, he also made reference to a Buxbaum's pre-Linnaean work. Since there is no evidence that Wahlenberg wanted to prioritize one citation over the other, and that he actually created the new name after Buxbaum, *C. buxbaumii* Wahlenb. cannot simply be treated as a replacement name for *C. polygama* Schkuhr. Moreover, Schkuhr (1801) does not make any reference in his protologue to Buxbaum's work, rejecting the possibility that this name could also be based on Buxbaum's plant. As a consequence, the earlier Moberg & Nilsson (1991) typification must be considered valid for *C. buxbaumii* Wahlenb., while Egorova's (1999) typification is in form an effective lectotypification of *C. polygama* Schkuhr, but without any effect on Wahlenberg's name.

Additional specimen examined — Venezuela: Zulia: Distrito Perijá, Sierra de Perijá, Serranía de los Motilones, mesa below international boundary on main ridge, [10°00'13"N, 72°58'c.25"W], c. 3000 m, 27 Jun – 5 Jul 1974, *Tillet & Hönig 747-792* (NY).

Carex catharinensis Boeckeler in Allg. Bot. Z. Syst. 2: 191. 1896. – Lectotype (designated by Jiménez-Mejías & al. 2016a: 729): Brazil, Santa Catarina, Serra Geral, Dec 1890, *E. H. G. Ule 1610* (K 000584646 [digital image!]).

Illustrations — Silveira & Longhi-Wagner (2012: 389).

Remarks — We hereby confirm the expected occurrence of this species in Uruguay, given that it was already known north and south of Uruguay in Brazil (Silveira & Longhi-Wagner, 2012) and Buenos Aires province in Argentina (Jiménez-Mejías & al. 2016a). Herter's (1953) report of *Carex fuscula* d'Urv. was presumably a misapplication of *C. catharinensis*, and thus *C. fuscula* is most likely absent in Uruguay.

Additional specimens examined — Uruguay: Canelones Department, Arroyo del Sauce, 1 km S of km 18 on road W of Solis, 26 Nov 1943, *Bartlett 20857* (MICH, US).

Carex divisa Huds., Fl. Angl.: 384. 1762. – Lectotype (designated by Molina & al. 2006: 1010): Herb. Sloane 127: 47, second specimen from right, s.d., *W. Sherard s.n.* (BM-SL!). – Epitype (designated by Molina & al. 2006): United Kingdom, [Kent], Isle of Sheppey, s.d., *S. Goodenough s.n.* (K 000960405 [digital image!]).

Illustrations — Jermy & al. (2007: 255).

Downloaded From: https://complete.bioone.org/journals/Willdenowia on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

Remarks — This is the first citation of this presumably introduced species in South America, wherein it was apparently formerly misidentified as *Carex praegracilis* W. Boott in Río de la Plata region (Herter 1953; Myndel-Pedersen 1968; in both works named as *C. marcida* Boott). The Argentinian material unequivocally matches *C. divisa* after comparison with materials of this species and *C. praegracilis*. In addition, this voucher also matches *C. divisa* according to *Flora of North America* key (Ball & Reznicek 2002). The Uruguayan one, despite being immature, also falls much closer within the variation reported for *C. divisa* than for *C. praegracilis*. Another Eurasian *Carex* species, *C. divulsa* Stokes, is also reported as introduced in some Argentinian provinces of the Río de la Plata Region (Myndel-Pedersen 1968; Jiménez-Mejías & al. 2016a).

Additional specimens examined — Argentina: Buenos Aires: Pdo. de Magdalena, Reserva de la Biosfera "Parque Costero del Sur", Reserva "El Destino", 30 Oct 2002, *Torres Robles & García 976* (MO). — Uruguay: Montevideo, Pajas Blancas, en pradera anegada marítima, 26 Nov 1937, *Rosengurtt B2022* (NY).

Carex haematopus Jim.-Mejías & Roalson in Phytotaxa 266: 23. 2016. – Holotype: Colombia, Nariño, Municipio de Pasto, corregimiento del Encanto, Isla La Corota, 2660 m, 1 Nov 1977, *O. de Benavides 1197* (NY!).

Illustrations — Jiménez-Mejías & Roalson (2016: 25).

Remarks — These represent the first records of this recently described species for Ecuador. Two of the new records are placed close to, and both north and south, to Kükenthal's (1909) citation of *Carex aematorhyncha* É. Desv. in Ecuador ("auf Triften bei Otavalo in der Prov. Imbabura; *Sodiro 199/64*"). *Carex aematorhyncha* is similar to *C. haematopus*, but can be easily distinguished by utricle size (Jiménez-Mejías & Roalson 2016). Accordingly, we consider that the supposed record of the former very probably refers to *C. haematopus*, and that the reported presence of *C. aematorhyncha* in Ecuador (e.g. Jørgensen & León-Yánez 1999; Govaerts & al. 2018+) should be dismissed.

Additional specimens examined — Ecuador: Azuay: vicinity of the lake in the valley of the río Surucuchu (a branch of the río Matadero), 12–20 km W of Cuenca, 9800–10 300 ft, *Camp 4213* (NY, US). — Carchi: Hacienda Ingüesa, 3000–3200 m, 9 Nov 1952, *Acosta-Solís 21625* (US). — Pichincha: 3600 m, Oct 1887, *Sodiro 344* (US).

Carex larensis Steyerm. in Fieldiana, Bot. 28: 66. 1951. – **Lectotype (designated here):** Venezuela, Lara, between Buenos Aires and Páramo de las Rosas, altitude 2285–3290 m, 11 Feb 1944, *Steyermark 55470* (F 1263860 [digital image!]; isolectotypes: US!, VEN [digital image!]).

Illustrations — Steyermark (1951: 64).

Remarks — So far cited only from its type locality in the state of Lara in Venezuela, here we formally report its presence in Colombia and also in the Venezuelan state of Mérida.

Carex larensis is a distinct species from N South America and belongs to *C.* sect. *Ceratocystis* Dumort. (Steyermark 1951; Global *Carex* Group 2016). It has brown to chocolate-brown staminate and pistillate glumes and 2–3(4) mm long, elliptic to obovate, often inflated utricles, with beaks 0.3–0.7(–1.2) mm long, straight or slightly curved, all ascending-spreading, or the middle and lower ones spreading. Although these characteristics clearly distinguish *C. larensis* from the S South American *C. sagei* Phil., *C. larensis* approaches the N hemisphere *C. viridula* Michx. in these features. However, the latter has lighter glumes (pale brown, stramineous or hyaline), and the middle utricles of each spike are always spreading.

Steyermark (1951) cited two collection numbers as the type material of *Carex larensis*: "Type in herb. Chi. Nat. Hist. Mus., collected in swampy meadow, between Buenos Aires and Paramo de las Rosas, state of Lara, alt. 2285–3290 m., February 11, 1944*, Julian A. Steyermark 55470*; also same locality, *55467*". Although the semicolon separating numbers *55470* and *55467* might indicate an intention of designating the first as holotype, we understand that it is not sufficiently clear. Accordingly, we perform a formal lectotype designation on the specimen at F from the first collection.

Additional specimens examined — Colombia: Magdalena: Sierra Nevada de Santa Marta, alrededores de cabeceras de Río Ancho, Páramo de Macotama, c. 3730 m, 15 Feb 1959, *Barclay & Juajibioy 6981* (MO, US); Sierra Nevada de Santa Marta, alrededores de cabeceras de Río Ancho, Páramo de Macotama, c. 3520 m, 15 Feb 1959, *Barclay & Juajibioy 6970* (MO, US); Sierra Nevada de Santa Marta, alrededores de cabeceras de Río Ancho, Páramo de Macotama, c. 3490 m, 16 Feb 1959, *Barclay & Juajibioy 7020* (MO); La Guajira, Sierra Nevada de Santa Marta, Laguna Sabaca, nacimiento Río San Miguel, 3700–3900 m, 16 Aug 1986, *Cuadros & Gentry 2706* (MO). — Boyacá: Sierra Nevada del Cocuy, Alto Valle Lagunillas, 2750 m al NNE de la Laguna Pintada, 3920 m, 7 Oct 1972, *Cleef & Florschütz 5944* (NY). — Venezuela: Mérida: Sierra de Santo Domingo, Páramo de Mucubají, alrededores de La Laguna Grande, 3560–3600 m, 19 Nov 1959, *Barclay & Juajibioy 9593* (US); Sierra Nevada de Santo Domingo, Laguna Negra, 3750 m, *Humbert 26414*

Downloaded From: https://complete.bioone.org/journals/Willdenowia on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

(NY); E moraine above L[ake]. Mucubají, 3650 m, 17 Jul 1972, *Loveless 1675* (DUKE); E moraine above L[ake]. Mucubají, 3650 m, 17 Jul 1972, *Loveless 1828* (DUKE); c. 50 km NE of Mérida, S shore of lake Mucubají [70°49'34"S, 08°47'45"W], 19 Oct 2012, *Hilpold & al. 1657* (BOZ, UPOS).

Carex ownbeyi G. A. Wheeler in Darwiniana 40: 200. 2002. – Holotype: Bolivia, Cochabamba, Quillacollo Prov., "camino Sipe Sipe-Lipichi", 3800 m, 9 Apr 1990, *Hensen 731* (MIN; isotype: LPB [digital image!]).

Illustrations — Wheeler (2002: 202).

Remarks — This is the first citation of this poorly understood species from the N Andes. Until its recent collection from Tucumán province in Argentina (Jiménez-Mejías & al. 2016a), this species was formerly known only from the type locality in Bolivia (Wheeler 2002).

Additional specimen examined — Colombia: Boyacá: Sierra Nevada del Cocuy, 1 km N of Hacienda Retacuba, 3850 m, 8 Apr 1957, *Grubb & al. 266* (US 2322338).

Carex phalaroides Kunth, Enum. Pl. 2: 482. 1837. – **Lectotype (designated here):** Brazil, Brasilia, *Sellow s.n.* (LE 00000787 [digital image!]; isolectotypes: F 0BN013398 [digital image!], K 000584673 [digital image!], LE 00000788 [digital image!]).

Illustrations — Barros (1947: Tab. 195); Silveira & Longhi-Wagner (2012: 395 [subsp. *moesta*], 398 [subsp. *phalaroides*]).

Remarks — This same collection was reported earlier by Chater (1994) in *Flora mesoamericana* as *Carex planostachys* Kunze. This is the first record of the species for Central America, representing the northernmost limit of the species, until now only known from South America (Govaerts & al. 2018+).

The *Carex phalaroides* group is much in need of revision. The specimen we cite from Guatemala approaches Silveira & Longhi-Wagner's (2012) concept of subsp. *moesta* (Kunth) Luceño & Alves, with the spikes lanceolate and the stem sides concave.

Additional specimen examined — Guatemala: Huehuetenango, Chiantla, Llano de Tsajuala, 3200 m, 26 Aug 1976, *Smith 385* (MICH).

Carex setigluma Reznicek & S. González in Contr. Univ. Michigan Herb. 20: 222. 1995. – Holotype: Ecuador, Carchi, near El Pun Páramo, 1 Mar 1953, *G. W. Prescott 701* (MICH!; isotypes: CAS 0001340!, NY!).

Illustrations — Reznicek & González (1995: 223).

Remarks — This is the first record of the species from Central America. The Costa Rican specimen displays some achenes constricted on two sides, contrasting with the original description of *Carex setigluma* achenes as constricted at only one side. Otherwise, the specimen is typical of *C. setigluma*.

Additional specimen examined — Costa Rica: Limón, Cantón de Talamanca, Sabanas de Dúrika, margen izquierda del Río Kuk, entre los Ríos Kuk y Dipali [09°25'20"N, 83°18'10"W], 2400 m, 18 Oct 1989, *Chacón 561* (MO).

Carex tachirensis Steyerm. in Fieldiana, Bot. 28: 68. 1951. – Holotype: Venezuela, Tachirá, Páramo de Tamá, near Colombia-Venezuelan boundary, 3045–3475 m, 15 Jul 1944, *Steyermark 57367* (F [digital image!]; isotypes: US!, VEN [digital image!]).

Illustrations — Steyermark (1951: 64); Fig. 1.

Remarks — *Carex tachirensis* was described by Steyermark (1951) on the basis of small-sized plants bearing inflorescences each consisting of a single terminal androgynous spike. Accordingly, Steyermark assigned *C. tachirensis* to *C.* subg. *Primocarex* Kük. (= *C.* subg. *Psyllophora* (Degl.) Peterm.), which is the *Carex* group that embraces the great majority of unispicate taxa (Kükenthal 1909; Egorova 1999; Ball & Reznicek 2002). He discussed the affinities of *C. tachirensis* with other Neotropical and North American species of that subgenus and concluded that the relationships of *C. tachirensis* were unclear. The only material of this species known to date was the type collection.

A study of herbarium materials has revealed the existence of a *Carex* species from Venezuela and Colombia of uncertain affinities. The relevant material consists mainly of plants with inflorescences each bearing a terminal androgynous spike and one to several lateral pistillate or shortly androgynous lateral spikes. Some stems, however, rarely show a single terminal androgynous spike (e.g. *Cleef 6960*). These unispicate inflorescences provided a key hint to the identity of these collections, pointing to possible affinities with *C. tachirensis*. The detailed comparison of the utricles and glumes of these specimens with the utricles from the isotype of *C. tachirensis* at US (Fig. 1), revealed that the morphology of both materials were similar, with clear affinities in beak shape and venation pattern. Consequently, these materials bearing several-spiked inflorescences were also identified as *C. tachirensis*.

The classification of these new materials implies a significant widening of the taxonomic understanding of *Carex tachirensis*. Although the most immediate af-

Downloaded From: https://complete.bioone.org/journals/Willdenowia on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

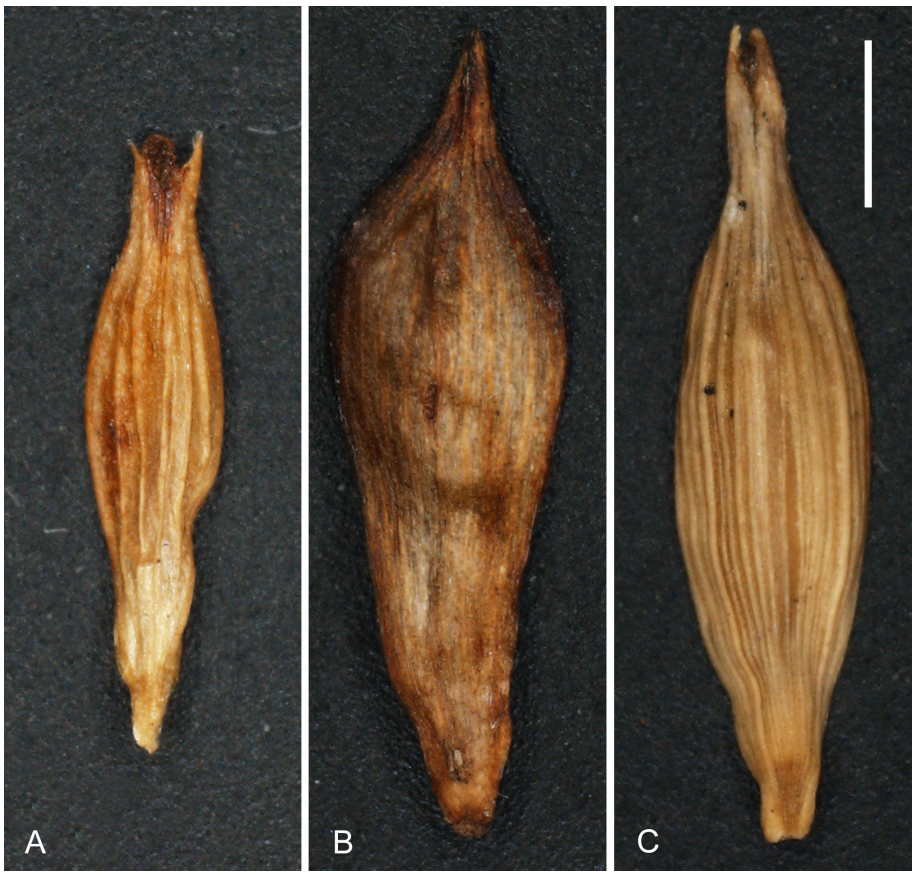


Fig. 1. *Carex tachirensis*, representative variation of utricles; A: *Steyermark 57367* (isotype US); B: *Cleef 6960* (NY); C: *Tillett & Hönig 746-738* (NY). – Scale bar = 1 cm.

finities of this taxon are still unclear, the presence of non-unispicate specimens, sheathing bracts, and tubular cladoprophylls points to *C.* subg. *Carex*. The utricles of *C. tachirensis* showed strong morphological affinities with the Central American *C. chiapensis* F. J. Herm. (Reznicek, 1986), especially regarding the raised nerves and the bidentate beak. The new materials constitute a substantial broadening of the morphological circumscription of *C. tachirensis*, with specimens having stems c. 60 cm tall, leaves flattish, up to 3 mm wide, and inflorescences with up to 7 spikes, the lowermost bract 25 cm long, and the longest spikes 4 cm long on peduncles up to 10.5 cm long.

Although certainly unusual, a few other species of *Carex* may sometimes bear one or several spikes in their inflorescences, such as *C. exilis* Dewey (Reznicek & Ball, 1980), *C. malmei* Kalela and *C. monodynama* (Griseb.) G. A. Wheeler (Wheeler, 1990; Gebauer & al., 2015), or *C. subantarctica* Speg. (Barros, 1969; Wheeler, 1987, 2009). Such variation of the inflorescence might be due, at least in part, to different growing conditions. Indeed, an overall reduction of the morphology is also known from high mountain populations of the *C. flava* group when compared with specimens inhabiting habitats with milder climatic conditions (Jiménez-Mejías & al. 2012, 2014, 2017). The majority of the labels in the studied *C. tachirensis* specimens refer to rocky outcrops and other poorly developed soils. Accordingly, the different degree of development of the different plants might be due to differences by growing on deeper versus poor shallow soils.

The specimen records provided here constitutes a considerable expansion of the range of *Carex tachirensis*, both north and south along the northernmost branch of the Andes. These localities also constitute the first citations of the species for Colombia, which, however, was expected since the species was described from Venezuela but "near the Colombia-Venezuela boundary" (Steyermark 1951).

Additional specimens examined — Colombia: Boyacá: Páramo de Pisva, Carretera Socha-La Punta km 78, c. 1 km al NE de la Laguna Colorada, 3500 m, 17 Jun 1972, *Cleef 4660* (NY); Páramo de Pisva, flanco SW de los Morros de S. Gabriel, 2 km al SW de la Laguna Batanera, 3670 m, *Cleef 4702*, 18 May 1972 (MO, NY); Páramo de La Rusia, NW-N de Duitama, Serranía Peña Negra, Hoya de la Laguna Agua Clara, lajas de arenisca, 800 m al S de esa laguna, 3935 m, 10 Dec 1972, *Cleef 6990* (NY); Páramo de La Rusia, NW-N de Duitama, Alto de Avendaño, 2 km al SE de la Laguna Negra, 3870 m, 10 Dec 1972, *Cleef 6960* (NY); Páramo de la Sarna entre Sogamoso y Vado Hondo, 5 km al NE de la Laguna de Tota, 3550 m, 29 Mar 1973, *Cleef 9204* (NY). Páramos al NW de Belén, cabeceras Quebrada Minas, 600 m al N de la Laguna El Alcohol, 3915 m, 27 Feb 1972, *Cleef* 1920 (NY). — Cundinamarca: Páramo de Sumapaz, Chisacá, cerca de la cárcel destruida, 3630 m, 12 Jul 1972, *Cleef 4933* (NY). — Venezuela: Mérida: Municipio Arzobispo Chacón, Páramos de San José y Piedra Pirela, vía Laguna Pozo Negro, 8–10 km al S de Acequias [08°21'N, 71°14'W], 3000–3460 m, 12 Apr 2013, *Gonto & al. 5254* (NY); Municipio Rangel, Páramo de Motumbo, SW of Laguna Larga (Trujillo State) along border of divide to Laguna Las Parias, Monumento Natural Teta de Niquitao, Guirigay, 3200–3500 m, 17 Sep 2003, *Stergios & al. 20526* (MICH). — Lara: Dpto Moran, trail from Humocaro to Buenos Aires (Caserío) below Páramo Las Rosas [09°40'N, 70°05'W], 3300 m, 25 Jun 1979, *Liesner &* al. (MO). — Zulia: Distrito Perijá, Sierra de los Motilones, environs of "Campa-

Downloaded From: https://complete.bioone.org/journals/Willdenowia on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

mento Frontera II", mesa below international boundary on main ridge, headwaters of Río Negro [10°00'13"N, 72°58'c.25"W], c. 3000 m, 27 Jun – 5 Jul 1974, *Tillett & Hönig 746-738* (NY).

Synonymization of *Carex tucumanensis* under *C. niederleiniana*

Carex niederleiniana Boeckeler, Beitr. Cyper. 1: 50. 1888 ≡ *Carex acutata* var. *hirtisquama* Kük. in Bot. Jahrb. Syst. 27: 549. 1899 ≡ *Carex acutata* var. *niederleiniana* (Boeckeler) Kük. in Engler, Pflanzenr. IV. 20 (Heft 38): 702. 1909, nom. superfl. – **Lectotype (designated here):** Argentina, La Rioja, Sierra Famatina, Quebrada del Vallecito, 21 Jan 1879, *Hieronymus & Niederlein 604* (CORD 00002100 [digital image!]; isolectotypes: CORD 00002101 [digital image!], G 00098281 [digital image!], K 000584758 [digital image!], SI 055592!). – Syntype: Argentina, La Rioja, Sierra Famatina, en las cercanías de La Cuesta, más arriba del Vallecito, 15–20 Jan 1879, *Hieronymus & Niederlein 657* (SI 000225!).

= *Carex tucumanensis* G. A. Wheeler in Hickenia 2: 190. 1996. – Holotype: Argentina, Tucumán, Dpto. Chicligasta, Estancia Las Pavas, 2500 m, en la barranca del Río de la Cascada, 15 Mar 1924, *Venturi 3193* (LIL 000013 [digital image!]; isotype: SI 000238!).

Illustrations — Wheeler (2009: 336).

Remarks — *Carex niederleiniana* is a poorly understood species endemic to Argentina. It was described from the pre-Andean range known as Sierra Famatina, in the province of La Rioja in N Argentina. It is further known from the northern provinces of Catamarca and Tucumán, as well as from Río Negro (Wheeler 2009; Flora del Cono Sur 2017). *Carex niederleiniana* is morphologically closely related to *C. acutata* Boott (Boeckeler, 1888), which is distributed along the Pacific side of the Andes from Chile to Ecuador (Flora del Cono Sur 2017; Govaerts & al. 2018+). *Carex niederleiniana* was described as having the terminal spike androgynous (Boeckeler 1888). Later, the terminal spike was regarded to be either gynaecandrous (Wheeler 1996) or "con flores estaminadas entremezcladas entre numerosas flores pistiladas arriba y unas pocas debajo" [with staminate flowers intermingled among numerous pistillate flowers above and a few below] (Wheeler 2009). On the other hand, *C. tucumanensis* was described by Wheeler (1996) from the also pre-Andean range of Sierra del Aconquija, in the province of Tucumán. He considered that the main differences between *C. tucumanensis* and *C. niederleiniana* were the terminal spike, which was entirely staminate in *C. tucumanensis* (but occasionally with pistillate flowers at the middle), and the size of the achenes, which were slightly smaller (1.5–1.7 × 0.6–0.9 mm in *C. tucumanensis* vs. 1.6–1.8 × 0.9–1.2 mm in *C. niederleiniana*). Since then, no additional studies have compared the two taxa. Both, *C. niederleiniana* and *C. tucumanensis* were ascribed to *C.* sect. *Pseudocypereae* Tuck. ex Kük., today mostly considered part of a widened *C.* sect. *Vesicariae* (Heuff.) J. Carey (Ball & Reznicek 2002; Global *Carex* Group 2016).

The case of the description of *Carex tucumanensis* as a species different from *C. niederleiniana* seems to be a classical example of a misunderstood morphological variation. Flower sex distribution within the inflorescences of *Carex* is a key taxonomic character in a majority of species groups, distinguishing some species from their closest counterparts, and even characterizing entire taxonomic groups (i.e. sections, e.g. Egorova 1999; Ball & Reznicek 2002). However, *C.* sect. *Vesicariae* sensu latissimo is one of the groups where sex distribution within spikes can be rather variable, especially as regards the terminal spike, such that within the same taxon (e.g. *C. pseudocyperus* L., species of former *C.* sect. *Lupulinae* Tuck. ex J. Carey) the terminal spike can vary from entirely staminate, to androgynous or gynaecandrous (Ball & Reznicek 2002; Luceño & al. 2008; S. Gebauer, pers. obs.). It seems that Wheeler was misled by deviant specimens of *C. niederleiniana* bearing a terminal staminate spike, a feature rarely observed in this species. Given the very limited presence of *C. niederleiniana* in herbaria, he probably overemphasized the importance of the terminal spike as a taxonomic character, and considered that these plants deserved formal recognition. As explained above, the distribution of sex in the terminal spike of *C. niederleiniana* itself is indeed extremely variable (see Boeckeler 1888; Barros 1947, 1969; Wheeler 1996, 2009). In fact, the lectotype collection displays stems either with a terminal spike that is androgynous (G), gynaecandrous (CORD), or "androgynaecandrous" (i.e. with staminate flowers above and below, and staminate flowers at the middle; CORD, G, SI). Moreover, Wheeler himself cited as *C. niederleiniana* a collection from a place just 400 m lower than the type locality of *C. tucumanensis* (*Venturi 4648*; Wheeler 1996). While the specimen Wheeler studied from this collection (US) displayed a terminal gynaecandrous spike, and thus he classified it as *C. niederleiniana*, other duplicates that we have studied from the same collection indistinctly bear terminal spikes that are entirely staminate (A, SI), gynaecandrous (A), or "androgynaecandrous" (A, MO).

Accordingly, we conclude that *Carex tucumanensis* must be considered part of the variation within *C. niederleiniana*, with the terminal spike entirely staminate, and the achene size within the smaller threshold of the species.

Additional specimens examined — Argentina: Tucumán: Chicligasta Department, Estancia las Pavas, 2100 m, 23 Nov 1926, *Venturi 4648* (A, MO, SI [2 sheets], US); Chicligasta Department, Estancia las Pavas-Puesto El Bayo, 3000 m, 11 Mar 1924, *Venturi 3060* (US).

Downloaded From: https://complete.bioone.org/journals/Willdenowia on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

Acknowledgements

We would like to thank two anonymous reviewers because of their constructive comments on an earlier version of this manuscript; J. C. Zamora and L. Dorr for discussion on the typification of *Carex buxbaumii* Wahlenb.; the curator and staff of the herbaria A, BOZ, DUKE, HAL, MICH, MO, NY, SI, UPOS and US for assistance when visiting their collections and/or granting materials on loan; and the curator and staff of UPS for providing detailed images of the lectotype of *C. buxbaumii*; this work has been funded through the project CGL2016-77401-P (Spanish Ministry of Economy and competitiveness) and a Smithsonian Institution postdoctoral fellowship towards P.J.-M. as well as by grants from the German Science Foundation (DFG, project numbers HO2213/3-1 and HO2213/3-2) and a scholarship from the state of Saxony-Anhalt for S.G.

References

Ball P. W. & Reznicek A. A. 2002: *Carex* L. – Pp. 254–273 in: Flora of North America Editorial Committee (ed.), Flora of North America, North of Mexico **23.** – New York: Oxford University Press.

Barros M. 1947: *Cyperaceae*. – In: Descole H. R. (ed.), Genera et species plantarum argentinarum **4(2).** – Buenos Aires: Guillermo Kraft.

Barros M. 1969: *Cyperaceae*. – Pp. 38–94 in: Correa M. N. (ed.), Flora patagónica **2.** – Buenos Aires: INTA.

Boeckeler O. 1888: Beiträge zur Kenntniss der Cyperaceen, vol. 1. *Cyperaceae* novae. – Varel a. d. Jade: Breitschädel & Vogt.

Chater A. O. 1994: *Carex* L. – Pp. 464–473 in: Davidse G. M., Sousa M. & Chater A. O. (ed.), Flora mesoamericana. Volumen **6.** *Alismataceae* a *Cyperaceae*. – México D.F.: Instituto de Biología, Universidad Nacional Autónoma de México; St. Louis: Missouri Botanical Garden; London: The Natural History Museum.

Egorova T. V. 1999: The Sedges (*Carex* L.) of Russia and Adjacent States. – Saint Louis: Missouri Botanical Garden Press.

Flora del Cono Sur. 2017+ [continuously updated]: Catálogo de las plantas vasculares. – Published at http://www.darwin.edu.ar/Proyectos/FloraArgentina/Familias.asp [accessed 14 Nov 2017].

Gebauer S., Röser M. & Hoffmann M. H. 2015: Molecular phylogeny of the species-rich *Carex* sect. *Racemosae* (*Cyperaceae*) based on four nuclear and chloroplast markers. – Syst. Bot. **40:** 433–447.

Global *Carex* Group. 2015: Making *Carex* monophyletic (*Cyperaceae*, tribe *Cariceae*): a new broader circumscription. – Bot. J. Linn. Soc. **179:** 1–42.

Global *Carex* Group. 2016: Megaphylogenetic specimen-level approaches to the *Carex* (*Cyperaceae*) phylogeny using barcode regions ITS, ETS, and *matK*: systematics implications. – Syst. Bot. **41:** 500–518.

Govaerts R., Jiménez-Mejías P., Koopman J., Simpson D., Goetghebeur P., Wilson K., Egorova T. & Bruhl J. 2018+ [continuously updated]: World Checklist of *Cyperaceae*. – Published at http://apps.kew.org/wcsp/ [accessed 14 Nov 2017].

Herter W. C. 1953: Flora del Uruguay V, Glumiflorae III. – Revista Sudamer. Bot. **47:** 129–173.

Jermy A. C., Simpson D. A., Foley M. J. Y. & Porter M. S. 2007: Sedges of the British Isles. – London: Botanical Society of the British Isles.

Jiménez-Mejías P., Benítez-Benítez C., Fernández-Mazuecos M. & Martín-Bravo S. 2017: Cut from the same cloth: the convergent evolution of dwarf morphotypes of the *Carex flava* group (*Cyperaceae*) in Circum-Mediterranean mountains. – PLoS ONE **12:** e0189769.

Jiménez-Mejías P. & Escudero M. 2016: Notes on South American *Carex* section *Schiedeanae* and description of the new species *Carex roalsoniana*. – Phytotaxa **260:** 185–192.

Jiménez-Mejías P., Fabbroni M., Donadío S., Rodríguez-Palacios G. E., Hilpold A., Martín-Bravo S., Waterway M. J. & Roalson E. H. 2016a: Taxonomic and distribution notes on *Carex* (*Cyperaceae*) from the Neotropics. – Bol. Soc. Argent. Bot. **51:** 727–739.

Jiménez-Mejías P., Luceño M. & Martín-Bravo S. 2014: Species boundaries within the southwest Old World populations of the *Carex flava* group (*Cyperaceae*). – Syst. Bot. **39:** 117–131.

Jiménez-Mejías P., Luceño M., Wilson K. L., Waterway M. J. & Roalson E. H. 2016b: Clarification of the use of the terms perigynium and utricle in *Carex* L. (*Cyperaceae*). – Syst. Bot. **41:** 519–528.

Jiménez-Mejías P., Martín-Bravo S. & Luceño M. 2012: Systematics and taxonomy of *Carex* sect. *Ceratocystis* (*Cyperaceae*) in Europe: a molecular and cytogenetic approach. – Syst. Bot. **37:** 382–398.

Jiménez-Mejías P. & Roalson E. H. 2016: Two new species of *Carex* (*Cyperaceae*) from northern South America. – Phytotaxa **266:** 21–26.

Jørgensen P. M. & León-Yánez S. (ed.). 1999: Catalogue of the vascular plants of Ecuador. – Monogr. Syst. Bot. Missouri Bot. Gard. **75.**

Kükenthal G. 1909: *Cyperaceae–Caricoideae*. – In: Engler A. (ed.), Das Pflanzenreich. Regni vegetabilis conspectus **IV. 20** (Heft **38**). – Leipzig: Wilhelm Engelmann.

Luceño M., Escudero M. & Jiménez-Mejías P. 2008: *Carex* L. – Pp. 109–250 in: Castroviejo S., Luceño M., Galán A., Jiménez-Mejías P., Cabezas F. & Medina L. (ed.), Flora iberica **18.** – Madrid: CSIC.

Moberg R. & Nilsson Ö. 1991: Typification of Nordic vascular plants. 1. Names published by G. Wahlenberg. – Nordic J. Bot. **11:** 287–299.

Molina A., Acedo C., Jarvis C. & Llamas F. 2006: Typification of some of Hudson's plant names in *Carex* L. – Taxon **55:** 1009–1013.

Downloaded From: https://complete.bioone.org/journals/Willdenowia on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

Myndel-Pedersen T. 1968: *Cyperaceae*. – Pp. 315–421 in: Cabrera A. L. (ed.), Flora de la Provincia de Buenos Aires **1.** – Buenos Aires: INTA.

Poindexter D. B., Escudero M. & Jiménez-Mejías P. 2017: A clarification of the name *Carex hypsipedos* C. B. Clarke (*Cyperaceae*) and a new name for the South American *Carex* section *Acrocystis* taxon. – Phytotaxa **291:** 287–293.

Reznicek A. A. 1986: The taxonomy of *Carex* sect. *Hymenochlaenae* (*Cyperaceae*) in Mexico and Central America. – Syst. Bot. **11:** 56–87.

Reznicek A. A. & Ball P. W. 1980: The taxonomy of *Carex* sect. *Stellulatae* in North America north of Mexico. – Contr. Univ. Michigan Herb. **14:** 153–203.

Reznicek A. A. & González-Elizondo M. S. 1995: The *Carex lurida* group (*Cyperaceae*) in the Neotropics. – Contr. Univ. Michigan Heb. **20:** 217–230.

Schkuhr C. 1801: Beschreibung und Abbildung der theils bekannten, theils noch nicht beschriebenen Arten von Riedgräsern nach eigenen Beobachtungen und vergrößerter Darstellung der kleinsten Theile. – Wittenberg: zu finden bei dem Verfasser.

Silveira G. H. & Longhi-Wagner H. M. 2012: O gênero *Carex* L. (*Cyperaceae*) no Rio Grande do Sul, Brasil. – Revista Brasil. Bioci. **10:** 373–417.

Steyermark J. A. (1951): Contributions to the Flora of Venezuela. – Fieldiana **28:** 1–242.

Thiers B. 2017+ [continuously updated]: Index Herbariorum: a global directory of public herbaria and associated staff. New York Botanical Garden's virtual herbarium. – Published at http://sweetgum.nybg.org/science/ih/ [accessed 14 Nov 2017].

Wahlenberg G. 1803: Inledning til Caricographien. – Kongl. Vetensk. Acad. Nya Handl. **24:** 138–169.

Wheeler G. A. 1987: The taxonomy of *Carex* sect. *Abditispicae* sect. nov. (*Cyperaceae*) from Austral South America. – Syst. Bot. **12:** 572–585.

Wheeler G. A. 1990: Taxonomy of the *Carex atropicta* complex (*Cyperaceae*) in South America. – Syst. Bot. **15:** 643–659.

Wheeler G. A. 1996: Three new species and a range extension for *Carex ecuadorica*. – Hickenia **2:** 189–200.

Wheeler G. A. 2002: *Carex* (*Cyperaceae*) from South America: three new species and some name changes. – Darwiniana **40:** 199–208.

Wheeler G. A. 2009: *Carex* L. – Pp. 323–338 in: Guaglianone R., Cialdella A. M. & Rúgolo de Agrasar Z. E. (ed.), Flora de San Juan **4.** Monocotiledóneas. – San Juan: Editorial Fundación Universidad Nacional de San Juan.

Willdenowia
Open-access online edition www.bioone.org/loi/will
Online ISSN 1868-6397 · Print ISSN 0511-9618 · Impact factor 0.680
Published by the Botanic Garden and Botanical Museum Berlin, Freie Universität Berlin
© 2018 The Authors · This open-access article is distributed under the CC BY 4.0 licence

Downloaded From: https://complete.bioone.org/journals/Willdenowia on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use