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New records of Southeast European *Carex* L. (Cyperaceae)

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Summary. As part of taxonomical studies of *Carex* L. by the authors, a study of herbarium specimens (BEO, BUNS, SOM) was conducted, which uncovered interesting floristic records for three *Carex* species for Southeastern Europe. *Carex atherodes* is reported for the first time for the flora of Central Europe (Vojvodina, Serbia) and the Balkan Peninsula (Bosnia-Herzegovina). *Carex buekii* is listed as a data record for the flora of the Republic of Macedonia. Finally, two populations of the recently described *Carex castroviejoi* were found for first time in Albania.

Keywords: Albania, Balkan Peninsula, Bosnia-Herzegovina, *Carex atherodes*, *Carex buekii*, *Carex castroviejoi*, Macedonia, new floristic records, Serbia.

Introduction

The genus *Carex* L. (Cyperaceae) is one of the most diverse and widely distributed angiosperm, especially in the temperate regions of the Northern Hemisphere. It consists of more than 2000 species, which have colonized a great range of habitats (Egorova 1999). In addition to a significant level of diversification, the taxonomy of this genus is highly complex, partially because of extremely reduced reproductive structures that hinder correct taxa identification (Ball and Reznicek 2002). Thus, reliable identification of species occurring in a particular area is essential for an accurate assessment of distributional patterns. This is especially true for *Carex*, since literature data and floristic records are frequently unreliable due to misidentification of herbarium specimens. Here we present the finding of specimens of three species of genus *Carex* from areas where they were not previously cited, contributing to the overall knowledge of this genus and the unraveling of its taxonomy in the southern part of Central Europe and the Balkan peninsula.

Materials and methods

This revision was conducted using three herbarium collections: the Herbarium of the Institute for Botany of the Bulgarian Academy of Science (SOM), the Herbarium of the Natural Museum in Belgrade (BEO) and the Herbarium of the Faculty of Sciences of the University of Novi Sad (BUNS). Identification, nomenclature surveys, and distribution studies were performed using the keys and descriptions provided in Schultze-Motel (1969), Chater (1980) and Egorova (1999).

Results and Discussion

Carex atherodes Spreng.

BOSNIA-HERZEGOVINA: prope opp. Tuzla; VI.1940, N. Muravjov (BEO).

SERBIA: Vojvodina, Novi Sad, Petrovaradin, Tekije Rit; 23.VI.1971, B. Butorac (BUNS).

Carex atherodes is a circumboreal element, widely distributed throughout North America and Asia

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(Reznicek and Catling 2002), which becomes progressively rare towards Europe, where its' hitherto known westernmost limit is in NE Germany and its' southernmost limit is in Ukraine (Chater 1980).

Carex atherodes is included in sect. *Carex*, and belongs to a small group of well-defined taxa which are characterised by creeping rhizomes, oblong to cylindrical female spikes, generally present female glumes, and more or less inflated utricles (pubescent or not), with a bifid beak (Chater 1980; Egorova 1999). *Carex atherodes* can be distinguished from related taxa by the presence of glabrous glumes, a utricle beak of 1.5-3.5 mm which is equally cleft in both ad- and abaxial sides, and flat leaves (3)4-8(10) mm wide (Egorova 1999). The known chromosome number for this species is *2n* = 74 (Löve and Löve, 1981).

The indumentum of *C. atherodes* is quite variable (Egorova 1999), which could have caused the previous misidentification of the Serbian specimen as *C. pseudocyperus* L. Both studied vouchers showed short hairs only over the ligule; while, in contrast, utricles, stems, leaves and remains of basal sheaths were completely glabrous.

Interestingly, these new records were made more than 1350 km south of the previously reported southernmost limit (Ukraine, 48º N; Chater 1980), and constitute the first report of *C. atherodes* for Central Europe (Vojvodina, Serbia) and the Balkan Peninsula (Bosnia-Herzegovina).

Carex buekii Wimm.

REPUBLIC OF MACEDONIA: Porec, Kapina; 30.III.1926, H. Oehm (BEO).

This species is included in sect. *Phacocystis* Dumort., a group which has complex taxonomy due to diffuse morphological limits and frequent hybridization processes (Luceño and Jiménez-Mejías, 2008). This section is easily distinguished from their relatives in the subgenus *Carex* by the presence of cylindrical to oblong-ovoid female spikes and lenticular utricles with two stigmata (Chater 1980; Egorova 1999; Luceño and Jiménez-Mejías 2008). The main morphological features which distinguish *C. buekii* are the presence of coriaceous, carinate, reddish basal sheaths that split in a ladder-fibrosille structure, faintly nerved or nerveless papillose utricles, and 4-10 cm long female spikes (Chater, 1980; Egorova, 1999). The most reliable chromosome number report for this species is *2n* = 64 (Stoeva et al. 2005).

Carex buekii is distributed throughout Central and Eastern Europe, and eastward to Kazakhstan, the Transcaucasus (Egorova 1999) and Anatolia (Jiménez-Mejías and Luceño 2011). In the former Yugoslavia, previous reports of this taxon were made in Croatia (Alegro and Marković 1999) and Slovenia (Schultze-Motel 1969; Martinčič and Sušnik 1984). However, only one record of *Carex buekii* has been reported among the flora of the Republic of Macedonia - v. Lukovica-Kozjak, 370 m. 1.05.1999 (Teofilovski 2007). In addition, although *Carex buekii* has been also observed in Bosnia-Herzegovina and Serbia (Ascherson Graebner 1902–1904; Hayek 1933), these records are in need of confirmation (no vouchers in the BEO, BEOU and BUNS herbaria). Moreover, the closest known populations to the one reported here are in Bulgaria, where it is considered a scattered taxon (Stoeva et al. 2005; Assyov and Petrova 2006).

Carex castroviejoi Luceño et Jim.Mejías

ALBANIA: Gramsh, Guri i Topit, 2000 m. serpentine; 23.VII.1956, Muzeumi I Shkencave te Natyrës 453 (SOM). Fushë e Qerit, 1700 m. serpentine; 28.VII.1956, Muzeumi I Shkencave te Natyrës 459 (SOM).

This is the first record of this recently described taxon (Jiménez-Mejías and Luceño 2009) outside of Greece. *Carex castroviejoi* was previously reported to grow on ultrabasic substrates (ophiolitic rocks) in the Pindhos range of Northern Greece. Interestingly, the two new populations reported in the present study were found in Albania, approximately 80 km north of the previously known Greek localities, and were observed to grow on serpentines.

This species is included in sect. *Ceratocytis* Dumort., which is both one of the most intensively studied groups within the genus *Carex*, and also one of the most taxonomically complex. Within this section, the systematics of the so-called *C. flava* group (to which *C. castroviejoi* belongs) are highly controversial, because of faint morphological limits and hybridization processes among its taxa (Schmid 1982, 1984; Hedrén and Prentice 1996; Luceño and Jiménez-Mejías 2008). Plants belonging to this group are small to medium-size sedges with subglobose female spikes, and are mainly distributed across temperate areas of the Northern Hemisphere (Schmid 1983; Crins and Ball, 1989). Ma-

ture specimens of *C. castroviejoi* may be distinguished from other related species by the presence of deflexed utricles with bent and smooth beaks, and a widely fusiform male spike, at least 3 mm wide (Jiménez-Mejías and Luceño 2009).

Another species of the *C. flava* group (*C. lepidocarpa* Tausch.) was recently recorded in Albania (locality Guri i Topit; Barina and Pifkó 2008). In our opinion, this new record of *C. castroviejoi* from Albania suggests that it is necessary to re-examine those specimens in order to discard possible misidentifications.

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