

THREE NEW *CAREX* NOTHOSPECIES (CYPERACEAE) DISCOVERED IN THE CZECH REPUBLIC

Radomír Řepka¹ 

¹ Department of Forest Botany, Dendrology and Geobiocenology, Faculty of Forestry and Wood Technology, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic

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Abstract

The article presents three newly discovered interspecific hybrids of sedges found in the Czech Republic. The finds of two of them (*Carex ×helenae* and *C. ×ploegii*) are the result of authors' field work and subsequent revision of specimens in large institutional Czech herbaria, while the third, *C. ×alluvialis*, was documented by a herbarium specimen in the BRNU herbarium, collected in 1998. The finds of these wetland hybrid sedges are a supplement to the treatment of the genus *Carex* for the Flora of the Czech Republic, Vol. 9. For each of the hybrids, a detailed morphological description compiled on the basis of Czech plants is given and the location of the voucher specimens is mentioned.

Keywords: *Carex ×alluvialis*, *Carex ×helenae*, *Carex ×ploegii*, hybridisation, wetland sedges

INTRODUCTION

Wetlands are an essential component of any landscape and often represent biodiversity hotspots (Cartwright, 2019). Typical and well-known wetland plants include sedges (*Carex* L., Cyperaceae) (Klötzli, 1988). As many as 58 out of 86 sedge species found in the Czech Republic to date are regarded to be wetland species (Grulich *et al.*, 2024). Of all these species, 34 are endangered in different categories of the Red List (Grulich, 2017) and 11 species are protected by the legislation of the Czech Republic, i.e. in Decree no. 395 to Act no. 114/1992. However, human activity brings further interventions in the landscape, disturbance of habitats, and in recent decades also an unwanted nutrient load affecting ecosystems. As a result, the assembly spectrum of wetland sedges (ecologically distinctive plants) has changed. Some sensitive species continue to decline (e.g. *C. hostiana* DC., *C. lepidocarpa* Tausch), others occupy newly created habitats and spread across the landscape (e.g. *C. acuta* L., *C. vesicaria* L. and *C. ×vratislaviensis* Figert) (Grulich and Řepka, 2018). Sedges are also known for their promiscuity, i.e. interspecific sedge hybrids are relatively abundant

in nature, although their frequency is very likely overestimated (Cayouette and Cattling, 1992; Řepka and Taraška, 2023). According to Koopman (2022), 225 sedge species are known in Europe and another 295 taxa have been described as hybrids. An interesting fact is that crossbreeds are very common in particular sections [mainly *Phacocystis* Dumortier, but also *Ceratocystis* Dumortier, *Spirostachyae* (Drejer) L. H. Bailey and *Vesicariae* (Heuffel) J. Carey], while they have been found rarely or are completely absent in other sections. Hybrids between species within some sections may be sterile, partially or even fully fertile (e.g. in section *Phacocystis*), or were stabilized in nature to completely fertile, separate hybridogenous species (e.g. *C. recta* Boott – Korpelainen *et al.*, 2010).

According to Grulich *et al.* (2024), recorded sedge hybrids from the Czech Republic can be divided into 3 groups:

- 1) hybrids confirmed by revisions of herbarium specimens (36 taxa);
- 2) incorrectly identified hybrids or combinations reported in the literature although the herbarium material is not clearly identifiable (7 taxa);



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3) hybrids which are mentioned in the literature but herbarium specimens of which have not been found, or such hybrids as have only been assumed for the territory, but have not yet been found there (e.g. Dostál, 1989) (42 taxa).

In 2023, a study of Czech herbariums and field work led to revelation of three new sedge hybrids which had not yet been reported from the Czech Republic (*C. ×alluvialis* Figert, *C. ×helenae* Jac. Koopman *et al.*, and *C. ×ploegii* Jac. Koopman). The aim of this article is to publish the finds of these wetland sedges as a supplement of the treatment of the genus *Carex* to the Flora of the Czech Republic, Vol. 9 (Grulich *et al.*, 2024).

MATERIALS AND METHODS

Morphological features of the here discussed sedge hybrids and their parent species were studied during a revision of herbarium specimens in all large institutional herbariums in the Czech Republic (BRNL, BRNM, BRNU, PR, PRC; abbreviations according to NYBG 2023). Quantitative morphological characters necessary for description were measured manually with a ruler or using a magnifying glass with a scale (12.5×, Zeiss Jena). Descriptions of these hybrids are based on the characteristics of plants found in the Czech Republic only. For *C. ×helenae*, the description is based on the plants found near the village of Vracov. Herbarium labels originally written in Czech were translated to English, and the localities were georeferenced with GPS coordinates (WGS-84). Collection dates are given in format YYYY-MM-DD. Nomenclature follows Koopman (2022).

RESULTS

Below, three newly found and distinguished sedge nothospecies from the Czech Republic are presented, each with a morphological description compiled according to the characters of the plants found in the Czech Republic. Furthermore, the deposition place of the original material, the exact location of the find, or other revised herbarium specimens of the hybrid (*C. ×helenae*) in the Czech Republic are mentioned here.

1) *Carex ×alluvialis*

Figert in Allg. Bot. Z. Syst. 13: 4, 1907
[*C. buekii* Wimm. × *C. elata* All.]

Type

The name has not yet been typified and the likely locality of the type is on the lower course of the Katzbach river near the village of Parchwitz, now Prochowice (Figert E., 27. 5. 1898, the place of deposition of the name original material is unknown); probable paratypes were collected on the lower reaches of the Olawa River near Wrocław in the spring of 1896 (Figert, 1907: 4).

Description

Plant forming tussocks, stems ca 90 cm long, sharply rough only under the inflorescence, sharply triangular in cross-section, 7–8 mm thick at the base, 1.8–1.9 mm in the central part. Basal leaf sheaths scaly, light grey-brown to straw-coloured, with a whitish net on the edges, scales 3.6–4.7 cm long; stem leaves 3, flat to weakly grooved, part of the leaf sheath against the blade white membranous, fragmented, sheath apex convex, blades stiff, 3.2–3.4 mm wide, with elongated tip. Inflorescence 16 cm long, with 2–3 male spikes at the top, 2–3 female spikes below. Male spikes linear, 17–58 mm long, scales of male flowers brown with a reddish tinge, lanceolate, 3.4–3.8 mm long, with a light, narrow median stripe. Female spikes 2–3, elongated, narrow, cylindrical, 36–44 mm long, rarely with male flowers at the apex, 3.8–4.8 mm wide, lower female spike supported by a leafy bract 50–66 mm long and 1.7–2.0 mm wide, almost reaching or slightly exceeding top of lower female spike. Lower female spike interrupted at the base, with peduncle 11–14 mm long. Utricles *C. elata*-like, ovoid to almost round in outline, biconvex (lenticular), more flattened on the abdomen side, here with three weak veins, with five prominent veins on the back, 2.4–2.8 × 1.6–1.8 mm large, grey-green, gradually tapering into a 2–4 mm long toothless beak. Scales of female flowers narrow, lanceolate, black, ca 2.6 mm long, with narrow, whitish central stripe, narrower and shorter than male scales of male flowers, conspicuously narrower than utricle, scale tip reaching base of beak. On the date of collection, the utricles were already fully developed (phenologically identical to *C. elata*) (Fig. 1).

Locality in the Czech Republic

Kroměříž distr., village of Záhlinice, in depressions on margin of Filena forest, 2 km south of the village, 180 m a.s.l., GPS: 49°16'18.769"N, 17°28'45.064"E ± 200 m, coll. Otýpková Z., 1998-05-16, BRNU 568020.

2) *Carex ×helenae*

Jac. Koopman *et al.* in Gorteria 43: 65, 2021
[= *C. demissa* Hornem. × *C. oederi* Retz.]

Type

Netherlands, Prov. Fryslân: Hoornsterzwaag, Miedweg, "aan slootje" [along small ditch], coll. Neve J. F., 1963-06-08, L.

Description

Densely tufted plant. Stems straight or bent, 25–30(–40) cm long, obliquely erect, with 1–2 leaves at the base only, smooth throughout, obtusely triangular to almost round in cross section, 1.0 mm in diameter. Leaves of sterile shoots shorter than stems (intermediate nothoform) or as long as stems (plant closer to *C. demissa*), 2.3–2.9 mm wide. Inflorescence composed of a single short-stalked or sessile male

1: Herbarium specimen of *Carex x alluvialis* from the Czech Republic (BRNU no. 568020)



2: Herbarium specimen of *Carex x helenae* (locality of Vracov, the Czech Republic, BRNL s. n.)

spike and 2–3 clustered female spikes or with lower spike remoted, placed down to about 2/3 of the stem height. Male spike 15–20 mm long, female spikes oval in outline, 9–12 × 4–6 mm large, sometimes with male flowers at the apex. Lower bract of inflorescence 4–9 cm long, pointing upwards, to the side or obliquely downwards, 1.5–2 mm wide, with short sheath up to 10 mm long at the base. Utricles 2.5–3.1 mm long, abruptly narrowed into a beak 0.8–0.9 mm long, at the apex with almost imperceptible teeth. Utricles sometimes sterile, but often fertile, straw-coloured, with a missing achene and persisting on the plant until the end of the growing season. If achene created, ovoid, grey, 1.4 mm long (Fig. 2).

Locality in the Czech Republic

Hodonín distr., Vracov town, exposed sandy bottom of small pond by forest road to the village of Vacenovice, 2.56 km SW of the railway station, 196 m a.s.l., GPS: 48°57'37.052"N, 17°11'40.948"E ± 5 m, coll. Řepka R. and Řepka J., 2023-09-07, BRNL s.n.

Other localities of *Carex ×helenae* in the Czech Republic

(based on revised herbarium specimens; arranged by phytogeographical division of the Czech Republic, see Skalický 1988):

11a. Všetatské Polabí subdistrict

Všetaty village, in wet ditch along railway (direction SW) to the town of Stará Boleslav, GPS: 50°16'34.575"N, 14°34'18.845"E, coll. Staněk S., 1954-08-17 (sub *C. oederi* and *C. demissa*), BRNM 692427;

18a. Dyjsko-svratecký úval subdistrict

Brno-Komárov village, Ráječek forest S of the town, GPS: 49°9'56.007"N, 16°38'33.229"E, coll. Teuber F., 1902-06-03 (sub *C. oederi*), BRNM 15732;

18b. Dolnomoravský úval subdistrict

Dubňany town, in wetland named Jazero SW of the town, 180 m a.s.l., GPS: 48°54'37.103"N, 17°4'51.920"E, coll. Staněk S., 1946-05-28 (sub *C. demissa*), BRNM 392877; *ibid.*, coll. Staněk S., 1946-06-28 (sub *C. oederi*), BRNM 392874; Mílotice village, fen meadow on bank of the Pročtený rybník pond, GPS: 48°57'42.263"N, 17°9'6.590"E, coll. Staněk S., 1922-06-04 (sub *C. oederi* and *C. demissa*), BRNM s.n.; Moravský Písek village, population of low sedges in meadow below Písek railway station, N of road to the town of Veselí nad Moravou, 170 m a.s.l., GPS: 48°58'29.6"N, 17°19'19.4"E, coll. Staněk S., 1946-06-16 (sub *C. demissa*), BRNM 392357; Moravský Písek village, site named Vypálenky, 170 m a.s.l., GPS: 48°58'33.060"N, 17°19'20.678"E, coll. Staněk S., 1946-06-16 (sub *C. demissa*), BRNM 394585; Ratiškovice village, wet meadow in pine forest by spring in small dry valley SE of the village, 195 m a.s.l., GPS: 48°54'52"N, 17°10'47.7"E, coll. Staněk S., 1946-06-29 (sub *C. demissa*), BRNM s.n.; Ratiškovice village, meadows near the Písečný rybník pond, GPS: 48°57'42.263"N, 17°9'6.590"E, coll. Šmarda F., 1959-08 (sub *C. serotina*), BRNM 166261; Ratiškovice village,

in pasture named Roztrhánky by road to Rohatec railway station, 205 m a.s.l., GPS: 48°54'26.035"N, 17°10'57.827"E, coll. Staněk S., 1946-06-29 (sub *C. demissa*), BRNM 392886; Rohatec village, wet ditch along railway near site named Soboňky, NE of the village, 195 m a.s.l., GPS: 48°54'5.318"N, 17°12'49.558"E, coll. Staněk S., 1946-07-15 (sub *C. demissa*), BRNM 392372; Vacenovice village, wet part of pasture towards Růdníček forest, 215 m a.s.l., GPS: 48°55'59.6"N, 17°10'35.9"E, coll. Staněk S., 1946-06-06 (sub *C. demissa*), BRNM s. n.; Vacenovice village, wet meadow at N margin of Růdníček forest, S of the village, 210 m a.s.l., GPS: 48°56'12.343"N, 17°10'37.310"E, coll. Staněk S., 1944-09-17 and 1945-09-30 (sub *C. demissa*) BRNM s.n.; Vacenovice village, fen meadow NE of the village, 195 m a.s.l., GPS: 48°57'12.697"N, 17°11'5.675"E, coll. Staněk S., 1946-06-02 (sub *C. demissa*), BRNM 392942;

19. Bílé Karpaty stepní district

White Carpathians, Uherský Brod town, wet meadow near the village of Horní Němčí, GPS: 48°55'21.569"N, 17°38'12.907"E, coll. Skřivánek V., 1942-07-04 (sub *C. flava* L.), BRNM 166299.

21b. Hornomoravský úval subdistrict

Olomouc, military shooting range near Olomouc, GPS: 49°36'25.931"N, 17°15'0.195"E, coll. Podpěra J., 1908-06 (sub *C. tumidicarpa* Anders.), BRNM s. n.;

39. Třeboňská pánev district

Veselí nad Lužnicí town, peatbog by main road to the village of Lomnice nad Lužnicí opposite to the village of Vlkov, 415 m a.s.l., GPS: 49°8'53.704"N, 14°43'36.398"E, coll. Pokluda L., 1961-07-05 (sub *C. demissa*), BRNM 155329;

52. Ralsko-bezdězská tabule district

Staré Splavy village near Máchovo jezero lake, peat bog in littoral belt of bay E of collis Šroubný (+372), GPS: 50°35'37.653"N, 14°38'48.107"E, coll. Pokluda L., 1963-06-25 (sub *C. serotina* Mérat), BRNM 166273;

53a. Českolipská kotlina subdistrict

Provodín village, sand pit, GPS: 50°37'7.050"N, 14°35'37.591"E, coll. Lustyk P., 1989-06-18 (sub *C. serotina*), BRNM 688299; Provodín village, sand pit between railway line and road, 0.6 km NW of Jestřebí railway station, 265 m a.s.l., GPS: 50°37'7.050"N, 14°35'37.591"E, coll. Řepka R., 1991-07-01 (sub *C. demissa*), BRNM 538565; Jestřebí village, swampy places at the parking lot north of the Jestřebí–Staré Splavy road, GPS: 50°35'13.145"N, 14°37'25.722"E, coll. Sutorý K., 1994-06-15 (sub *Carex* sp.), BRNM 596556;

74b. Opavská pahorkatina subdistrict:

Opava town, meadows near the village of Zábřeh between the villages of Kravaře and Dolní Benešov, GPS: 49°55'11.072"N, 18°4'15.002"E, coll. Šmarda J., 1951-06-19 (sub *C. oederi*), BRNM 67662; *Caricetum oederiae* in wet place in meadow SE of the village of Zábřeh towards the Opava River, GPS: 49°55'2.835"N, 18°5'18.237"E, coll. Staněk S., 1950-08-25 (sub *C. oederi* and *C. demissa*), BRNM 392419.



3: Herbarium specimen of *Carex x ploegii* from the Czech Republic (BRNM no. 820662)

3) *Carex* ×*ploegii*

Jac. Koopman in *Gorteria* 35: 175, 2011
 [= *C. otrubae* Podp. × *C. paniculata* L.]

Type

Netherlands, Prov. Friesland, Makkum, Makkumer Noordwaard, coll. Rudolph F. and van der Ploeg D.T.E., 1970-06-29, L, s.n.).

Description

Plant with dense elongated tussock. Shoots mostly fertile, 5–7 mm thick at the base, here covered with fragmented, dark brown scaly sheaths (partly resembling sheaths of *C. paniculata*). Stems up to 20 cm from the base with leaves with short blades 8–18 cm long, ligule elongated, triangular, rounded at the top, 3–4 mm long, whitish with darker edge. Apex of leaf sheath concave, leaf sheath opposite the blade herbaceous. Leaves flat, grey-green after drying, slightly rough or smooth on the edges and in upper half, at the top with elongated triangular tip, 4.5–5.5 mm wide, leaves from the previous year straw-coloured. Stems 65–90 cm tall, triangular in cross-section with flat sides, rough edges only in their upper part below inflorescence. Structure of inflorescence resembling that of *C. otrubae*, i. e. spike-like and ± continuous, 11–38 mm long, but in lower part with sessile spikes composed of several spikelets (which may resemble the inflorescence of *C. paniculata*), lower spike supported by a bristly bract longer than adjacent spikelet (as in *C. otrubae*). Scales of female flowers ovate, light brown with broad membranous edge and wedge-shaped stripe in the middle, tapering into a sword-like point or just acute at the top. Utricles not developing further after flowering but drying up in the spikes, achenes not developed and plant completely sterile (Fig. 3).

Locality in the Czech Republic

Brno-venkov distr., Hrušovany village near Brno, wet fen meadow in ditch between pond and railway, 1.0 km N of the railway station, 190 m a.s.l., GPS: 49°2'39.962"N, 16°35'29.431"E, coll. Řepka R., 1986-05-25, BRNM 820662.

DISCUSSION***Carex* ×*alluvialis***

The plant found in the Czech Republic clearly shows the characters of both parent species: after *C. buekii*, it has narrow and longer, stalked female spikes interrupted at the base, and typical scales of female flowers, while it has a very rough stem, conspicuously rigid, shiny and pale basal sheaths after *C. elata*, and inflorescences supported by a slender, short leaf-like bract as an intermediate character between both species (Fig. 1). The utricles are similar in shape, size and phenology to *C. elata*.

Figert (1907: 4–5) compares this hybrid with both parent species. According to the protologue, most

characters of the vegetative organs are closer to *C. elata* with the exception of the basal leaf sheaths, which are brown (closer to *C. buekii*). Also the colour of the net, which is formed by a breakdown of the basal sheaths, is closer to *C. buekii*. The inflorescence is closer to *C. buekii* including the width and interrupted base of the female spikes, but their length is stated to be shorter than it was observed on the plant from the Czech Republic. In this plant, the form of the inflorescence and the female spikes are intermediate. The lower bract of the inflorescence is sometimes a little longer or shorter than the inflorescence (similar to *C. buekii*), while it is rather of an intermediate nature, i.e. more reminiscent of *C. elata* in its length. Although it is not mentioned exactly in the original description, it follows from the text that the utricles are *C. buekii*-like, in contrast to our plant, whose utricles have characters of *C. elata* (Fig. 1).

It is a very rare hybrid, so far only found at one locality in the Czech Republic. In 2023, my son and I searched meticulously for this plant at the site from where it had been collected by Z. Otýpková, but we did not find it. Parent species *C. buekii* grows here in large stands and various morphological forms. The other parent species *C. elata* has not been recorded here, not even in the past, and is not documented in herbaria, but the habitat is very suitable for it. For the time being, this nothospecies should be considered “missing” from the flora of the Czech Republic. Koopman *et al.* (2018) report finding (verifying) this plant at a joint excursion to the localities of *C. buekii* hybrids in the Odra basin near Wrocław (Poland), but they do not mention the specific place or morphological characters of the find.

Outside Poland, the hybrid *C. ×alluvialis* has so far been found in Austria and Italy (POWO, 2023). The Czech Republic is therefore the fourth country where this hybrid is known to occur.

Carex* ×*helenae

Koopman *et al.* (2021) mention in the protologue an inflorescence length of up to 12 cm (since the type plant is closer to *C. demissa* and has distant female spikes on the stem); the developed but empty utricles are straw-coloured, similarly it is in our plants. At the locality Vracov was found four bigger tussock of hybrid, their utricles are small with a very short beak. In our plants closer to *C. demissa*, the utricles and their beaks are longer. In agreement with the protologue, the utricles of the plants found in the vicinity of the village of Vracov are completely empty, without achenes, and remaining in the spikes for a very long time and not falling off. They are thus well noticeable even at the end of the growing season, when the utricles of other taxa of the *C. flava* group have long since fallen off.

At the Vracov locality, intermediate sterile plants were found together with the parental species. They were conspicuous by the not yet decayed female spikes with the colour of dry grass, and also by stems

which were longer than in both parental species (unique feature) (Fig. 2). At the time of discovery, the leaves of the hybrid were bright green, but their stems had turned yellow, especially in their upper half. Some plants resembled *C. demissa* in their spikes, utricles, and the length and width of the leaves, but were sterile and presumably belonged to reverse hybrids within the hybrid swarm. Some hybrid plants morphologically closest to *C. oederi* had an additional female spike at the top of their inflorescence instead of one male spike; this was assumed to be an abnormality resulting from hybridisation. These plants were partially fertile. I also consider the proportion of male flowers at the top of the female spikes in the hybrid to be a unique feature caused by hybridisation.

Koopman (2015) lists the following distribution of *C. ×helenae* in Europe: Estonia, Finland, Germany, Latvia, the Netherlands, Norway, Slovakia, Spain, Sweden, and UK. Its detailed distribution in the Netherlands is presented by Koopman *et al.* (2022a).

Carex ×helenae will probably be found in the Czech Republic at more localities where both species meet, which is confirmed by the overview of revised herbarium specimens (see above). The most common habitats are moist, exposed sandy banks of water reservoirs, bottoms of abandoned sand pits, and disturbed sandy places (basin of the Labe River, Dolnomoravský úval lowland) as well as disturbed parts of fen meadows. From a study of herbarium specimens, it follows that both sterile and fertile plants originating from hybrid swarms can be found at the sites and the second ones can spread spontaneously. Hybrids are very common in the group to which both parent species belong (section *Ceratocystis*, *Carex flava* agg.), and partially or completely fertile plants with characters of both parent species are known to exist (Schmid, 1982; Stace *et al.*, 2015; Blackstock and Ashton, 2010; Więclaw and Wilhelm, 2014).

Carex ×ploegii

Koopman (2011: 175) mentions in the protologue morphological characters intermediate between the both parental species. The basal sheaths of the stems are shiny in the plant described in protologue, but they are rather dull and not as prominent as in *C. paniculata* in our plant. Stems are characterised as sharply triangular, sharply rough in the upper part, flat to slightly concave on the sides, whereas our plant has flat stem sides and the stems are not sharply rough. As stated Koopman (2011), leaf blades should be wider and thinner than in *C. paniculata*, weakly grooved and rounded. In our plants, dry leaves are grey-green and rather

flat and more similar to *C. otrubae*. The figure of the lectotype (Koopman, 2011a: 176) shows two types of inflorescence – two stems with a branched, paniculate inflorescence, and one with a spike-like inflorescence, probably collected from two variable plants. The description also includes specific dimensions and other features of developing utricles, which we cannot study in our plants because of completely dry inflorescences. The lectotype plant is sterile, which is also confirmed in our plant. The different characters of our plant compared to the protologue must be considered a variation, which is common in hybrids whose parent species are morphologically different. At the above-mentioned locality, the only one in the Czech Republic so far, one striking tussock of *C. ×ploegii* was found in the neighbourhood of *C. otrubae*, which, unlike this hybrid plant, was fully fertile with maturing utricles and a different colour of the basal sheaths. The hybrid are completely sterile, but compared to *C. otrubae* inflorescence are shortened, although they are slightly paniculate in the lower part, which resembles *C. paniculata*. Neither recently nor historically the other parent species, *C. paniculata*, has been known to grow here or in the vicinity. However, it is very likely that there were formerly wet meadows at the site of the current ponds in the floodplain of the Šatava stream where this species could have grown. The hybrid plant was correctly identified only later, almost 40 years after its discovery. Koopman (2011a) also notes that the plant of this hybrid can be easily recognised by intermediate characters, which is confirmed in our plant. Unfortunately, during the revision of the locality near the village of Hrušovany in 2020, the plant was not found again. Therefore, similarly to *C. ×alluvialis*, this hybrid could be considered “missing” from the flora of the Czech Republic.

Carex ×ploegii is so far known from the Netherlands. Koopman (2011a) lists 18 localities of the hybrid documented by herbarium specimens which he revised in the herbarium of the University of Leiden (L). It is also reported from the British Isles (Wallace, 1975), but its existence in this territory has later been rejected (see Jermy *et al.*, 2007: 58). It was previously also found in Sweden (Sylvén, 1958).

In the interim between finding of this hybrid in the Czech Republic (1986) and its determination by author (2023) and publication in this article, its occurrence was listed in Koopman (2011b: 359) and now also appears on the POWO website (2023). This situation arose from the author's written communication about the finding of previously dubious hybrid *C. otrubae* × *C. paniculata* to J. Koopman.

CONCLUSION

In 2023, three new *Carex* interspecific hybrids were distinguished for the Czech Republic in the field and by studying specimens in institutional herbaria. They include *C. ×alluvialis* [= *C. buekii* × *C. elata*] found at one locality near the village of Záhlinice (central Moravia) in 1998, *C. ×helenae* [= *C. demissa*

× *C. oederi*] found near the village of Vracov (southern Moravia) in 2023 and further documented from 14 localities (in Bohemia and Moravia) in the BRNM herbarium, and *C. ×ploegii* [= *C. otrubae* × *C. paniculata*] collected in 1986 in the vicinity of the village of Hrušovany near Brno (southern Moravia) by the current author. The article is a supplement to the overview of *Carex* hybrids in the Flora of the Czech Republic, Vol. 9 (Grulich *et al.*, 2024).

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Contact information

Radomír Řepka: repka@mendelu.cz,  <https://orcid.org/0000-0002-9993-0042> (corresponding author)