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## *Carex buekii* WIMM. (*Cyperaceae*) IN THE FLORA OF CROATIA

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This paper deals with the species *Carex buekii* Wimm., the occurrence of which in Croatia has previously been uncertain. *Carex buekii* Wimm. was found on the banks of the Kupa River at Vukova Gorica and Gornje Prilišće, villages in the west-north-west part of Croatia.

**Key words:** *Carex buekii* Wimm. (*Cyperaceae*), Flora, Croatia

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Članak govori o vrsti *Carex buekii* Wimm. za koju se dosad nije sa sigurnošću znalo raste li u Hrvatskoj. Vrsta *Carex buekii* Wimm. nađena je na obali rijeke Kupe kod sela Vukova Gorica i Gornje Prilišće u zapadno-sjeverozapadnom dijelu Hrvatske.

**Ključne riječi:** *Carex buekii* Wimm. (*Cyperaceae*), flora, Hrvatska

### INTRODUCTION

*Carex buekii* Wimm. is generally distributed in the E. and S.E. parts of Central Europe (CHATER, 1980), thus belonging to the South – East European floral element (PIGNATTI, 1982). According to many local and general floristic works (HEUFFEL, 1858; ASCHERSON, 1866; ASCHERSON & GRAEBNER, 1902–1904; POSPICAL, 1897; NYÁRÁDY, 1966; JOVANOVIĆ-DUNJIĆ 1976; CHATER, 1980; SCHULTZE-MOTEL, 1980; PIGNATTI, 1982; ADLER *et al.*, 1994) it is distributed in Poland, Czech Republic, Slovakia, Hungary, Austria, Germany, North Italy (Italian Alps), Slovenia, Serbia, Bosnia, Bulgaria, Romania, Caucasia, Kazakhstan, Ukraine and South Russia.

This plant species is rare inside its wide range. Probably it is often overlooked or mistaken for similar species (cf. SCHULTZE-MOTEL, 1980). *C. buekii* Wimm. grows along riversides, small backwaters, by lakes, intermittently flooded places, moist

meadows and wood edges. It prefers periodically damp, rich, sandy and loamy soils with little lime (CASPER *et al.*, 1980).

According to ROSSI (1924, 1932) this species grows on swamp meadows in Selce near Karlovac. We found and examined his herbarium material (only one sheet Nr 12101 from May 14. 1895 deposited in ZA, a duplicate of which is deposited in BP). But Rossi's specimens are not *C. buekii* Wimm., but *C. elata* All. The utricels have distinct longitudinal veins, the lower bract of inflorescence is distinctly shorter than the lower female spike, and rhizomes are not present. The basal sheaths are not distinctly reticulately fibrous, as they usually are in this species, although this characteristic can be absent in plants growing on relatively dry habitats (SCHULTZE-MOTEL, 1980).

In floristic literature, no other information exists about the occurrence of this plant species in Croatia. CHATER (1980), SCHULTZE-MOTEL (1980) and GARCKE (1972) quote former Yugoslavia (of which Croatia was a constituent until 1991) as a part of the range of *C. buekii* Wimm., but this refers to other parts of former Yugoslavia. For Slovenia it is quoted by MAYER (1952) as being rare and very dispersed (Štajersko, Primorsko: Furlanska nižina), by SCHULTZE-MOTEL (1980) for Štajersko and Primorsko, and by MARTINČIĆ & SUŠNIK (1984) for a moist meadow near Slovenj Gradec. JOVANOVIĆ-DUNJIĆ (1976) quotes *C. buekii* Wimm. as rare for Serbia but gives no other information about the local distribution of this plant species. HAYEK (1933) quotes Serbia and Bosnia and Herzegovina without further information. Bosnia is also quoted by ASCHERSON & GRAEBNER (1902–1904).

Accordingly, these findings along the Kupa River, in Vukova Gorica and Gornje Prilišće, are the first certain evidence of the existence of *C. buekii* Wimm. in Croatia. Herbarium material is deposited in ZA.

## LOCALITIES OF *Carex buekii* WIMM. IN CROATIA

The plant (Fig. 1) was firstly collected in April 1997 in Gornje Prilišće (UTM WL23; 45° 27' 52"N, 15° 21' 07"E; 150 m as.) ca. 20 m downstream from a small waterfall (Fig. 2). Further downstream the plant was found along the Kupa River bank over a length of ca 500 m. The plants do not form a continuous band along the river, growing in few separate patches. A few days later we found three new localities in Vukova Gorica, about 1,5 and 2 km upstream from the first locality in Gornje Prilišće.

The occurrence of the plant was confirmed at all localities during May 1998.

The plants grow on moist, sandy alluvial sediment immediately by the river, so they are submerged about one third of the year. They grow in clusters, but without forming tussocks. The number of individuals is very difficult to estimate because of the vegetative propagation (rhizomes) of the plant. In every locality there are few hundred stems.

In Gornje Prilišće *C. buekii* Wimm. is accompanied by the following species: *Alnus incana* (L.) Moench, *Alnus glutinosa* (L.) Gaertner, *Salix alba* L., *Euonymus euro-*

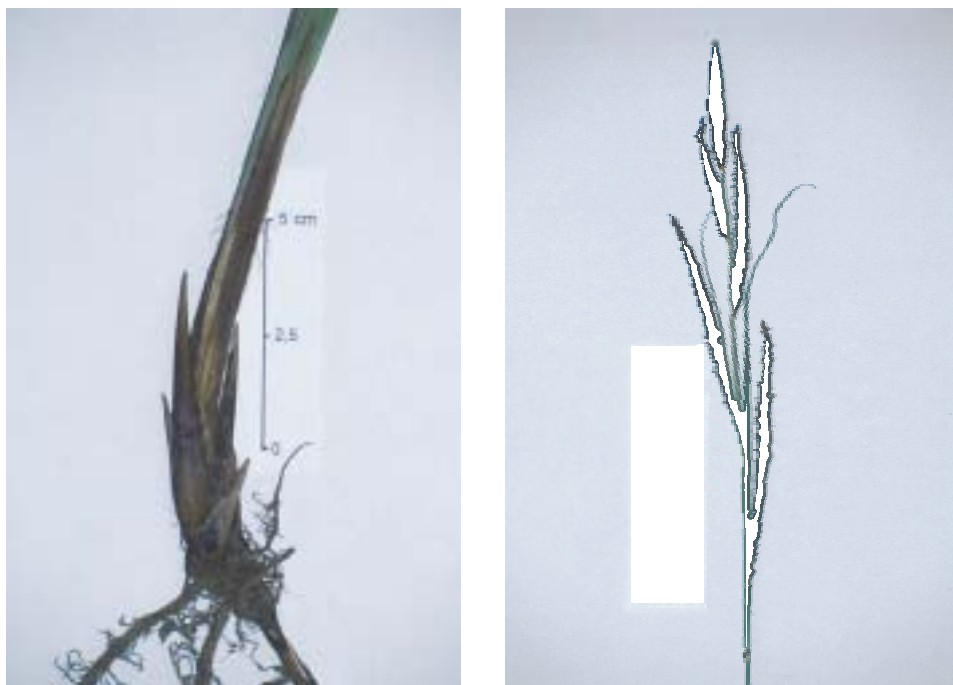


Fig. 1. Basal parts (A) and inflorescence (B) of *Carex buekii* Wimm.

*paeus* L., *Fraxinus excelsior* L., *Crataegus monogyna* Jacq., *Acer campestre* L., *Ulmus minor* Miller, *Deschampsia caespitosa* (L.) Beauv., *Scrophularia nodosa* L., *Agrostis capillaris* L., *Cymbalaria muralis* P. Gaertner, B. Meyer & Scherb. (on *Salix alba*). Maize fields form the background vegetation.

In Vukova Gorica *C. buekii* Wimm. is accompanied by: *Populus nigra* L., *Alnus glutinosa* (L.) Gaertner, *Acer campestre* L., *Fraxinus excelsior* L., *Cornus sanguinea* L., *Corylus avellana* L., *Euonymus europaeus* L., *Humulus lupulus* L., *Salix purpurea* L., *Impatiens noli-tangere* L., *Galium aparine* L., *Urtica dioica* L., *Equisetum sylvaticum* L., *Lamium galeobdolon* (L.) Ehrend. & Polatschek, *Aegopodium podagraria* L., *Allium ursinum* L., *Rudbeckia laciniata* L., *Phalaris arundinacea* L., *Circaea lutetiana* L., *Calystegia sepium* (L.) R. Br., *Lycopus europaeus* L., *Tamus communis* L., *Echinocystis lobata* (Michx) Torrey & A. Gray, *Impatiens glandulifera* Royle, *Cirsium oleraceum* (L.) Scop., *Festuca gigantea* (L.) Vill., *Stachys sylvatica* L., *Angelica sylvestris* L., *Lunaria rediviva* L., *Agrostis stolonifera* L., *Hedera helix* L., *Sanicula europaea* L. Beech wood (*Lamio orvalae-Fagetum*) forms the background vegetation.

It may be assumed that *C. buekii* Wimm. grows in similar habitats in Croatia, being overlooked or mistaken for similar *Carex* species, as in Austria for example (MELZER, 1989). More attention should be paid, then, to this plant species in future floristic and vegetation investigations along rivers and other wet places.

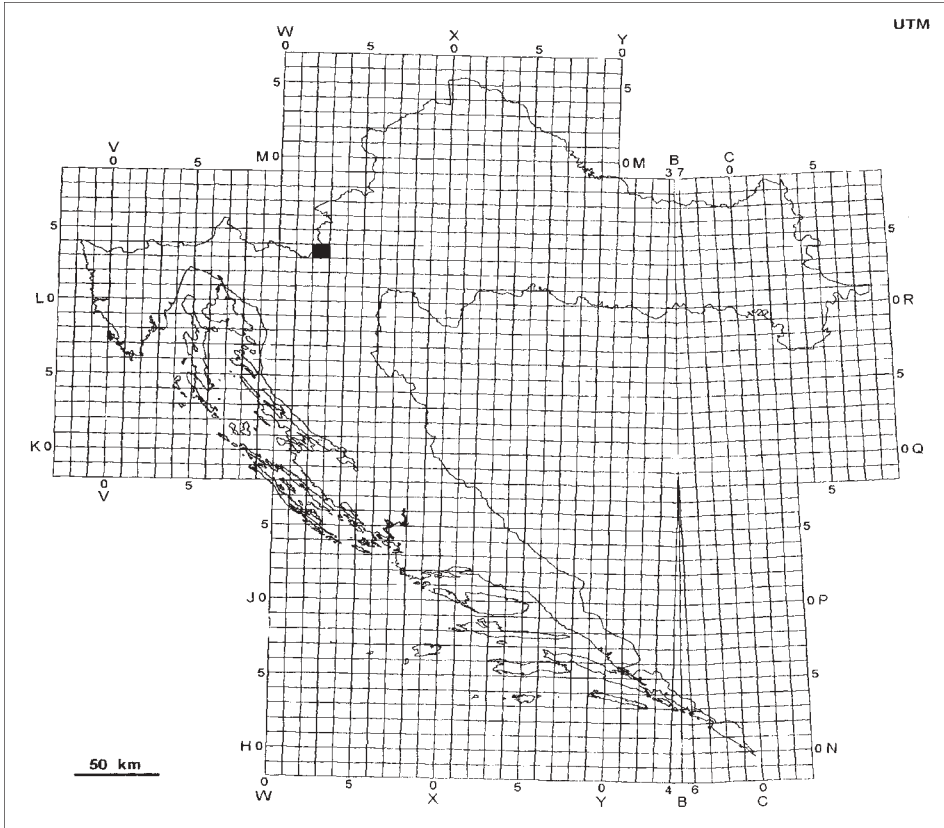


Fig. 2. Locality of *Carex buekii* Wimm. in Croatia

## SIMILAR SPECIES

*Carex buekii* Wimm., according to CHATER (1980) belongs to subgen. *Carex*, sect. *Phacocystis* Dumort. (sect. *Acutae* (Fries) Christ.) or, according to ADLER *et al.*, to *C. buxbaumii* agg. The species most similar to *C. buekii* Wimm. are *C. acuta* L. and *C. elata* All. (Tab.1). The most evident difference between *C. elata* All. and *C. buekii* Wimm. is the absence of rhizomes in *C. elata* All., so it grows densely, is caespitose and tussock-forming in contrast to *C. buekii* Wimm. The most evident differences between *C. acuta* L. and *C. buekii* Wimm. are the absence of the reticular sheet and the presence of laminas on basal sheaths, which are bright brown in *C. acuta* L. Contrarily to these features, *C. buekii* Wimm. always has conspicuously reticulately-fibrous and strongly keeled, reddish-brown, acute basal sheaths without laminas and veinless utricles.

**Tab. 1.** Morphological characteristics of *Carex buekii* Wimm. and the closely related species, *C. elata* All. and *C. acuta* L.

characteristics	<i>C. elata</i> All.	<i>C. buekii</i> Wimm.	<i>C. acuta</i> L.
stems height/ cm	20 – 120	40 – 120	30 – 120 (–150)
rhizomes	not present	stout, creeping	long, stout
basal sheaths	reticulately fibrous	reticulately fibrous	entire
colour of basal sheaths	yellowish brown	reddish or blackish brown	pale to dark reddish – brown
lamina of basal sheaths	not present	not present	usually present
utricles length/ mm	2,5 – 4	2 – 2,5	2 – 3,5
utricles shape	narrowly elliptical to obovate	ovate or obovate	elliptical to broadly ovate
veins on utricles	veinless or with slender veins	veinless	slender but distinct
leaves width/ mm	(1–) 2 – 6	4 – 10	(3–) 5 – 10
male spikes number	1 – 2 (–3)	1 – 3	(1–) 2 – 4
male spikes length/ mm	20 – 50 (–70)	25 – 60	20 – 60
female spikes number	2 – 4	3 – 5	2 – 4 (–8)
female spikes length/ mm	15 – 70	40 – 100	30 – 100 (–150)

For the practical distinction of these three species, the following key can be used:

1. Plant without creeping rhizomes, densely caespitose. Basal sheaths yellowish-brown (never reddish brown), reticulately fibrous, but often inconspicuous, especially on plants growing in relatively dry habitats. The lowest bract distinctly shorter than the inflorescence.

*Carex elata* All.

- 1.\* Plant with creeping rhizomes. Plants often grow densely, but are never caespitose. Basal parts reticulately fibrous or not, reddish to blackish-brown.

2

2. Basal sheaths with laminas, not reticulately fibrous, pale to dark reddish-brown. The lowest bract longer than the inflorescence. Utricles with slender but distinct veins.

*Carex acuta* L.

- 2.\* Basal sheaths without laminas, strongly keeled, very distinctly reticulately fibrous, reddish or blackish-brown. The lowest bract shorter than the inflorescence. Utricles without veins.

*Carex buekii* Wimm.

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## S A Ž E T A K

*Carex buekii* Wimm. (*Cyperaceae*) u hrvatskoj flori

A. L. Alegro &amp; Lj. Marković

Vrsta *Carex buekii* Wimm. je biljka istočnih i jugoistočnih dijelova srednje Europe, za koju dosad nije bilo sa sigurnošću dokazano da raste u Hrvatskoj. Mnoge opće flore navode bivšu Jugoslaviju kao dio areala te vrste, ali jedini literaturni podaci za Hrvatsku potječu od ROSSIJA (1924, 1932). Rossijevi herbarski primjerci (pohranjeni u ZA, duplikat u BP) označeni kao *Carex buekii* Wimm. ne pripadaju međutim toj vrsti, već se radi o srodnoj vrsti *Carex elata* All.

Vrstu *Carex buekii* Wimm. našli smo 1997. uz rijeku Kupu pored sela Vukova Gorica i Gornje Prilišće. Biljke rastu na vlažnom, pjeskovitom naplavnom sedimentu neposredno uz rijeku, u gustim sklopovima, no ne tvore busenove.

Za pretpostaviti je da vrsta *Carex buekii* Wimm. raste i u drugim dijelovima Hrvatske na sličnim staništima, te joj u budućim florističkim i vegetacijskim istraživanjima valja posvetiti veću pozornost budući da ju je lako zamijeniti za slične vrste roda *Carex*, osobito za vrste *C. acuta* L. i *C. elata* All. Za razlikovanje te tri vrste predlažemo sljedeći ključ:

1. Gusto busenasta biljka bez puzećeg podanka. Prizemni rukavci žućkastosmeđi (nikad crvenocrni) s mrežastim ovojem, koji je često neupadljiv, osobito kod biljaka koje rastu na srazmjerno sušim staništima. Najdonja brakteja kraća od cvata.

*Carex elata* All.

- 1.\* Biljka s puzećim podankom, često raste u gustim skupinama, no nikad ne tvori busenove. Prizemni rukavci s mrežoliko isprepletenim vlakancima ili bez njih, crveno do crnosmeđi.

2

2. Prizemni listovi s plojkama, njihovi rukavci nisu obavijeni mrežoliko isprepletenim vlakancima, svijetlo do crvenosmeđi. Najdonja brakteja duža od cvata. Plodne vrećice sa slabim, ali vidljivim žilama.

*Carex acuta* L.

- 2.\* Prizemni listovi bez plojki, njihovi rukavci oštro grebenasti, obavijeni jasno vidljivim mrežoliko isprepletenim vlakancima, crveno do crnosmeđi. Najdonja brakteja malo kraća od cvata. Plodne vrećice uvijek bez žila.

*Carex buekii* Wimm.