

## **CYPERUS STRIGOSUS (CYPERACEAE), A NATURALIZED SPECIES NEW TO BULGARIA**

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**Abstract:** *Cyperus strigosus* L., an American species, is recorded from two localities in the Danube valley in northern Bulgaria. In Europe it had previously been recorded only from Italy.

**Key words:** *Cyperus strigosus*, anthropophyte, Danube valley, Bulgaria, Europe

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During a fieldwork in the Danube valley in the years 2000 and 2001, one of us (R.T.) found in two localities an interesting *Cyperus* which had not previously been recorded from Bulgaria (Fig. 1). We identified it as *C. strigosus* L., an American species, known in Europe only as a naturalized taxon in Italy (DeFilipps 1980). Bulgarian plants matched the descriptions of the species both in standard American floras (Gleason 1952; Cronquist 1969; Kolstad 1986) and *Flora Europaea* (DeFilipps 1980); they have also been compared with herbarium specimens of native origin.

*Cyperus strigosus* is widespread in North America (Canada and the United States) and extends to tropical South America. The first documentation of the species in Europe was in 1915, from Piedmont in north Italy (Mattiolo 1915). Since then it has spread in the northwestern part of the country from the province of Lomellina in the east to the province of Turin in the west, distributed mainly in the Po valley (Pignatti 1997). Pistarino *et al.* (1999) list the species from the provinces of Novara, Vercelli, Alessandria and Pavia. As in its natural habitat it was found in wet places – moist fields, swamps, on the banks of large streams, in ditches etc., from sea level to 300 m (Pignatti 1997).

In Bulgaria *Cyperus strigosus* was found on the right bank of the Danube river, in the area of Hisarlik, 4 km west of Belene and near the village of Novgrad, ca 45 km east of the first-named locality (Fig. 1). The population in Hisarlik, discovered in autumn 2000, consisted of ca 50 individuals scattered on wet alluvial sand, occupying an area of 1000–1500 m<sup>2</sup>. Other plants growing nearby were *Cyperus glomeratus* L., *C. fuscus* L., *Plantago altissima* L., *Astragalus contortuplicatus* L., *Persicaria maculata* (Rafin.) A. Löve & D. Löve, *Crypsis alopecuroides* (Pill. & Mitt.) Schrad., *Bidens*

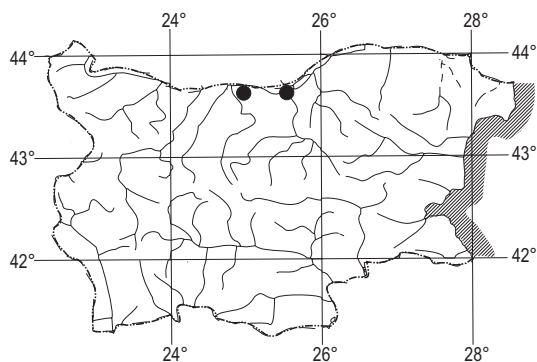


Fig. 1. Distribution map of *Cyperus strigosus* L. in Bulgaria.



**Fig. 2.** Specimen of *Cyperus strigosus* L. collected in Bulgaria (*Tzonev s.n.*, KRAM); scale bar = 5 cm. Inset – spikelets of *C. strigosus* (*Tzonev s.n.*, KRAM); scale bar = 3 mm. Phot. D. Tomaszewski.

*tripartita* L., *Echinochloa crus-galli* (L.) Beauv., *Digitaria ischaemum* (Schreb.) Muhl. etc. It was the early October but the plants were still flowering and only few mature fruits were present.

The second locality, situated at the former estuary of the Yantra river, was found in summer 2001. Here the population of *C. strigosus* is much larger than in the previous site. The plants grew on trunks of dead and living trees of *Populus nigra* L. and *Salix alba* L. lying in the shallow water of the old river bed. The basin which also has a rich community of *Salvinia natans* (L.) All., has no connection with the present-day Yantra river bed or with the Danube river.

The origin of *C. strigosus* in Bulgaria is unknown. One can presume that it was transported by the Danube or by water birds. It is most prob-

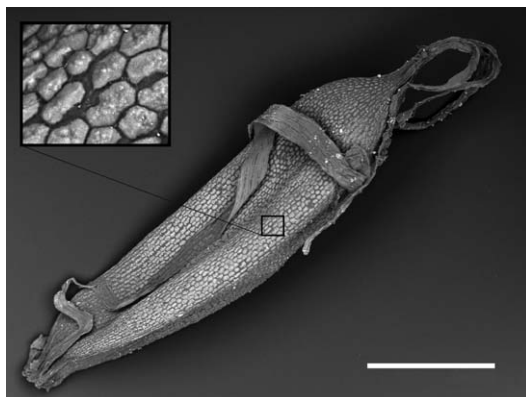
able that in the near future the species will be found in other parts of Europe.

A description based on material collected in Bulgaria follows:

Caespitose perennial; stems triquetrous, smooth. Leaves crowded at base, 6–8 mm broad, the longest ones exceeding stems. Bracts 4–6, the outer exceeding inflorescence, *ca* 10 mm broad at base. Rays 6–8, up to 4 cm long. Spikes broadly cylindrical, 1.0–1.5 cm long. Spikelets narrowly linear, with (2–)3–6 flowers, ascending to patent. Rhachilla winged. Glumes oblong-lanceolate, 2.5–3.0 mm long, acuminate, brown, 3–5-veined, with greenish keel. Stamens 3. Stigmas 3. Achenes linear-oblong, trigonous, *ca* 2.0 × 0.5 mm, grey. Epiderma cells obtusely angular, usually ± elongated, their tangential walls dark, distinctly thickened, forming a distinct reticulum; external walls with irregular obtuse protuberances (Fig. 3).

The species is easily distinguished from other members of the genus by its narrowly linear, ascending to patent spikelets (Fig. 2) and narrow, linear-oblong achenes (Fig. 3).

**MATERIAL COLLECTED:** NORTH BULGARIA, Hissarlik, 4 km W of Belene, October 2000, *R. Tzonev s.n.* (SO, KRAM); near Novgrad, in the old estuary of Yantra river, 30 August 2001, *R. Tzonev s.n.* (SO 10634, 10635).



**Fig. 3.** Young fruit of *Cyperus strigosus* L. (stigma and filament visible). Inset – epidermal cells (*Tzonev s.n.*, KRAM), SEM. Scale bar = 0.5 mm. Phot. D. Tomaszewski.

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