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SPIDERS (ARANEAE) OF THE FISHPOND EULITTORAL ZONE

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Abstract

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A study was made of spiders living in vegetation (*Phragmites australis*, *Typha angustifolia* and *Carex*) of the eulittoral zone of ponds in the Czech Republic. Specimens were collected from floating pitfall traps, by beating vegetation and by hand collection. In total, 38 spider species were recorded, and ten of these are considered to be specialised inhabitants of the eulittoral zone. The spider assemblage of tall sedge vegetation exhibited the highest abundance and species diversity.

Introduction

Various types of wetlands have been studied in the Czech Republic. Bogs were studied intensively by KŮRKA (e.g. 1990, 1995) and (MILLER, 1951), wet meadows by RŮŽIČKA (1987). MILLER, OBRTEL (1975) investigated the terrestrial zone of fishpond reed marshes. The arachnofauna of the eulittoral zone of fishpond vegetation has not been studied previously in the Czech Republic.

SZINETÁR (1993) summarised the literature on spiders of moorlands in Hungary. SZINETÁR (1995) published interesting faunistic data for the reed beds of Lake Balaton. RENNER, BELLMAN (1995) investigated the spider fauna of the lake „Schmiechener See". Spider communities of the Danube Delta were investigated by WEISS et al. (1998). The distribution pattern of hygrophilous species of the genus *Pirata* was described by RENNER (1986) and that of *Tetragnatha* species in the Danube Delta by UHL et al. (1992). Data on the ecology and distribution of species of the genus *Dolomedes* were summarised by HELSDINGEN (1993) and DUFFEY (1995).

T a b l e 1. List of spider species recorded in vegetation stands of *Cx -Carex, Ta- Typha angustifolia, Pa-Phragmites australis.* – A: in small numbers and locally distributed, B: in small numbers and widespread, C: abundant and locally distributed, D: abundant and widespread. * eulitoral specialists.

	Cx	***Ta***	***Pa***
Araeoncus crassiceps (WEST.)	A		
Antistea elegans (BL.)	B	B	B
Aphileta misera (O. P.-C.)	A		
Bathyphantes approximatus (O. P.-C.)	D	B	B
Bathyphantes gracilis (BL.)	D	B	B
**Clubiona juvenis* SIMON		A	A
Clubiona phragmitis C. L. K.	B	D	D
Dismodicus bifrons (BL.)	A		
Dolomedes fimbriatus (CL.)	A		
**Dolomedes plantarius* (CL.)	D		
**Donacochara speciosa* (TH.)	B	D	D
Enoplognatha caricis (FICK.)	A		
Gnathonarium dentatum (WIDER)	B	B	B
Gongylidiellum murcidum SIMON	A	A	A
Hypomma bituberculatum (WIDER)	D	B	B
Kaestneria pullata (O. P.-C.)	A	A	A
Larinioides folium (SCH.)	B	B	B
Lophomma punctatum (BL.)	A		A
**Marpissa radiata* (GRUBE)	B	A	A
**Microlinyphia impigra* (O. P.-C.)	B	B	B
Neriene clathrata (SUND.)	D	B	B
Pachygnatha clercki SUND.	D	B	B
Pardosa prativaga (L. K.)	B	B	B
Pardosa sphagnicola (F. D.)	A		
Pirata piraticus (CL.)	D	D	D
Pirata piscatorius (CL.)	B	B	
Pirata tenuitarsis SIMON	C	C	C
Porrhomma pygmaeum (BL.)	A	A	A
**Rugathodes instabilis* (O. P.-C.)	C	C	A
Silometopus elegans (O. P.-C.)	A		A
Sitticus floricola (C. L. K.)	B	A	A
Taranucnus setosus (O. P.-C.)	A		
Tetragnatha extensa (L.)	D	B	B
**Tetragnatha shoshone* LEVI	A	C	C
**Tetragnatha striata* L. K.	C	C	C
**Theridion hemerobius* SIMON	A	D	A
**Theridiosoma gemmosum* (L. K.)	B	B	B
Tibellus maritimus (MENGE)	A	A	A
total number of species	**37**	**28**	**29**

I studied spiders in three different types of littoral vegetation. Selected faunistic data were published by RŮŽIČKA, HOLEC (1998).

Material and methods

Spiders were collected from the vegetation by hand, and by beating the vegetation. Floating pitfall traps (RŮŽIČKA, 1982; RENNER, 1986) were used in order to collect spiders walking on the water surface. Spiders were collected from the end of April to July in 1996 and 1997. 702 determinable individuals representing 38 species were collected. Thirteen stands of vegetation in eight ponds in different parts of the Czech Republic were investigated. Spiders were collected from three types of littoral vegetation - *Phragmites australis* (five plots), *Typha angustifolia* (three plots) and stands with *Carex* (three plots vegetated by *Carex acutiformis* and two by *Carex elata*).

Abundance data were treated semi-quantitatively, and coded as follows; - A: species in small numbers and locally distributed, B: in small numbers and widespread, C: abundant and locally distributed, D: abundant and widespread. This classification is based on our own data and on the literature (BUCHAR, 1989).

Results and discussion

38 species were recorded (Table 1). 10 of these have not been recorded before in terrestrial habitats or in wetlands in the Czech Republic. These species are considered to be specialists of the eulittoral zone (these species are marked by an asterisk in Table 1).

Tetragnatha shoshone LEVI and *Tetragnatha striata* L. KOCH were

collected predominantly at the water's edge near reed and cattail stands. *Donacochara speciosa* (Thorell), *Clubiona juvenis* Simon were associated mainly with reed and dense cattail stands. *Theridion hemerobius* Simon was collected in highest numbers in the canopy layers of cattail. *Marpissa radiata* (Grube) prefers sedge, although it seems to be more terrestrial than the other species. Holec (unpubl.) observed several females with cocoons in a pea field surrounding large reed marshes. Bílek (in Buchar, 1989) collected this species from oak seedlings near a pond. Records of *M. radiata* from the Czech Republic are rare, its occurrence in sedge is relatively common, and I consider this species to be a specialist of the eulittoral zone. *Theridiosoma gemmosum* (L. Koch) is a widespread species, but usually very time-consuming to find. Although I searched intensively in reed, sedge and cattail stands, I never found large numbers of specimens. *T. gemmosum* was recorded in higher numbers (about 50 subadult males in five minutes) in grass overhanging the banks of channels (Holec, Růžička,1998). Similarly, Boggild (Boggild, Crocker, 1971) collected it in higher numbers (40 specimens in half an hour), although none were found in the first half hour. *Dolomedes plantarius* (Clerck) was recorded only among sedges along eutrophic fishponds or among water lilies, surrounded by sedge stands. Our results correspond with Duffey (1995), who showed that *D. plantarius* is a species of mesotrophic/eutrophic wetlands. There is no firm evidence for *D. plantarius* coexisting with *D. fimbriatus* (Clerck) anywhere in Europe (Duffey, 1995). Three localities were recorded where both species were caught together at the same site and in the same habitat (flooded sedge) in the Czech Republic. Two records were from South Bohemia (1 ex. *D. plantarius* and 1 ex. *D. fimbriatus*, Potěšil pond, lgt. Růžička; 1 ex. *D. plantarius* and 1 ex *D. fimbriatus,* Velký Tisý pond, lgt. Holec) and two were from North Bohemia (1 ex. *D. plantarius* and 1 ex. *D. fimbratus*, Břehyně ponds, lgt. Holec; 4 ex. *D. plantarius* and 2 ex. *D. fimbriatus*, Hradčanské rybníky ponds, lgt. Holec). Kůrka (1997) investigated pine bogs surrounding both North Bohemian ponds mentioned and recorded only *D. fimbriatus*.

Coexistence of both species at ponds can probably be common at localities where the bog habitat of *D. fimbriatus* shows a gradual transition to the pond habitat of *D. plantarius*.

Renner, Bellman (1995) described two main factors influencing the spider fauna at Schmiechener See in Southern Germany. The first factor is the presence of extensive stands of *Carex elata* and the second is an extreme fluctuation of water level. Despite methodological problems with data collection, it seems that permanently flooded sedge tussock stands are unique habitats for retaining species diversity. Thirty seven species were recorded here and the abundance of most species also seemed to be higher.

Similarly, Luff (1966), Bossenbroek et al. (1977), Kessler et al. (1988) and Denis et al. (1998) found that grass or sedge tussock can harbour rather large numbers of invertebrates under adverse weather conditions. Tussocks of *Carex elata* and *C. acutiformes* are typical of permanently high water and sedges provide relative stable biotopes. The high degree of spatial variability of sedge tussocks is evident. Most spiders are associated with the zone of overhanging old leaves.

The eulittoral zone of reed vegetation is a relatively homogeneous habitat without much spatial variability. High water level can be much more important here than in the case of sedge tussocks. The water level determines the spatial variability of the ground zone where

there is reed litter. Narrow-leaved cattail grows in permanently deeper water. Its lowest layer is thin and only rarely emerges from the deep water. Most of its diversity is associated with higher leaf canopy layers.

I can confirm the importance of both factors. More detailed studies on the structure of pond vegetation and faunistics studies are needed to understand its diversity.

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