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Heteroptera of the peat-bog reserve "Bagno Serebryskie" (Serebryskie Swamp) near Chełm

Pluskwiaki różnoskrzydłe rezerwatu torfowiskowego „Bagno Serebryskie" koło Chełma

SUMMARY

The carbonate peatbogs of the Chełm vicinity (Lubelskie voivodeship) are unique because of the alkaline reaction of the peat, their peculiar vegetation and a mosaic structure of their communities where beside bog habitats there are xerothermic communities. The studies of the *Heteroptera* fauna carried out in the years 1996–1998 resulted in recording 82 species of this order. In waterlogged habitats (*Cladietum marisci*, *Caricetum davallianae*, *Betulo-Salicetum repentis*), the most frequently occurring were polytopous *Stenodema calcaratum* and *Trigonotylus caelestialium*. More scarcely represented were typical hygrophiles. The fauna of xerothermic habitats was characterised by a high share of *Coptosoma scutellatum* and *Adelphocoris lineolatus*, the species most frequently dominating in like environments.

STRESZCZENIE

Torfowiska węglanowe okolic Chełma (woj. lubelskie) są terenem unikatowym, o czym decyduje zasadowy odczyn torfu, specyficzna roślinność oraz mozaikowaty układ zbiorowisk, w którym obok siedlisk bagiennych występują zbiorowiska kserotermiczne. W wyniku badań nad fauną *Heteroptera* prowadzonych w latach 1996–1998 stwierdzono występowanie 82 gatunków tego rzędu. W siedliskach podmokłych (*Cladietum marisci*, *Caricetum davallianae*, *Betulo-Salicetum repentis*) najliczniej występowały politopowe *Stenodema calcaratum* i *Trigonotylus caelestialium*. Mniej

licznie reprezentowane były tutaj typowe higrofile. Fauna siedlisk kserotermicznych cechowała się wysokim udziałem *Coptosoma scutellatum* i *Adelphocoris lineolatus*, gatunków najczęściej dominujących w podobnych środowiskach.

K e y w o r d s: *Heteroptera,* numerical force, frequency.

INRODUCTION

The Bagno Serebryskie reserve was established in 1991 in order to protect rare plant communities developing in carbonate peatbogs. The unique character of the peatbogs located in the vicinity of Chełm is determined by their being situated on the border of the moist Lublin Polesie region, rich in bog areas, and the Lublin Upland located on cretaceous sediments. The uniqueness of the flora and fauna is also an effect of the alkaline reaction of the peats, unusual for bog areas. Vegetation communities with radically different needs intermingle here, and they range from hygrophilous communities developing in local depressions to xerothermic vegetation growing on elevated cretaceous hillock (1).

The variety of habitats and the richness of potential host plants favour the occurrence of rich entomofauna, which is evidenced by the few studies conducted here (1, 2, 7, 9, 10).

METHODS AND STUDY AREA

The studies of the fauna of the *Heteroptera* of the reserve were carried out from 1996 to 1998. The insects were caught with an entomological net, assuming that one sample consisted of a series of 8×25 sweeps. The samples were collected every three weeks. The zoocenological characteristics included two indexes: 1° numerical force (n′) — the mean number of insects in 25 sweeps of the net; 2° frequency (F) — the number of samples containing the species compared to the total number of samples collected in the studied plant community (in %).

The study covered the following plant communities: *Cladietum marisci*, *Caricetum davalliane*, *Betulo-Salicetum repentis*, *Brachypodio-Teucrietum,* and a degraded idle land habitat of a floristic composition similar to the *Festuco-Brometea* class. A detailed characteristics of the floristic conditions is given in a study by Grądziel (6).

RESULTS AND DISSCUSSION

In the course of the three-year studies 2,403 specimens were captured and divided into 82 species (Table 1). The differentiation of composition and structure of the *Heteroptera* fauna in each habitat is given below.

Table 1. The numerical force and frequency of *Heteroptera* recorded in the peatbog reserve Bagno Serebryskie (Serebryskie Swamp)

No.	Species/stand	I		II		III		IV		V	
		n′	F	n′	F	n′	F	n′	F	n′	F
1	2	3	4	5	6	7	8	9	10	11	12
1	*Saldula saltatoria* (L.)							+	5.9		
2	*Acalypta nigrina* (Fall.)					+	5.6				
3	*Lasiacantha capucina* (Gerem.)							0.01	5.9	0.01	10.0
4	*Tingis cardui* (L.)			+	4.2						
5	*Catoplatus fabricii* (Stal)							+	5.9		
6	*Agramma ruficorne* (Germ.)			0.07	12.5	0.07	38.9	0.05	29.4		
7	*Stenodema calcaratum* (Fall.)	0.25	58.3	0.23	37.5	0.86	83.3	0.26	41.2	0.09	60.0
8	*S. laevigatum* (L.)	0.01	8.3								
9	*S. virens* (L.)	0.01	8.3	0.04	12.5	0.14	22.2	0.14	17.6		
10	*Notostira erratica* (L.)			0.06	20.8	0.03	11.1	0.02	11.8	0.05	30.0
11	*Trigonotylus caelestialium* (Kirk.)	0.08	33.3	0.20	29.2	2.13	55.6	0.73	35.3	0.11	40.0
12	*Phytocoris nowickyi* Fieb.			+	4.2						
13	*Ph. varipes* (Boh.)							0.02	5.9		
14	*Adelphocoris lineolatus* (Goeze)	0.01	8.3	0.03	12.5	0.03	11.1	0.68	52.9	0.06	50.0
15	*A. quadripunctatus* (F.)	0.01	8.3	+	4.2	0.02	5.6				
16	*A. seticornis* (F.)			+	4.2	0.05	16.7	+	5.9		
17	*A. ticinensis* (M.-D.)			0.03	12.5	0.01	11.1				
18	*Lygus pratensis* (L.)	0.01	8.3	+	4.2	0.08	27.8	0.07	35.3	0.09	20.0
19	*L. rugulipennis* Popp.	0.06	25.0	0.09	20.8	0.61	38.9	0.49	41.2	0.40	40.0
20	*Orthops campestris* (L.)					0.01	5.6				
21	*O. kalmii* (L.)					0.17	27.8	0.04	17.6	0.14	30.0
22	*Charagochilus gyllenhali* (Fall.)							0.08	29.4		
23	*Polymerus nigritus* (Fall.)					0.01	5.6				
24	*P. palustris* Reut.			0.10	20.8	+	5.6	+	5.9		
25	*P. unifasciatus* (F.)			0.02	8.3	0.05	22.2	0.06	11.8		
26	*P. vulneratus* (Panz.)			+	4.2						
27	*Halticus apterus* (L.)			0.11	20.8	0.68	50.0	0.57	41.2	0.14	20.0
28	*H. pusillus* (H.-S.)							+	5.9		
29	*Orthocephalus saltator* (Hahn)									0.01	10.0
30	*Plagiognathus chrysanthemi* (Wolff)			0.04	16.7	0.11	22.2	0.37	35.3	0.13	30.0

Table 1 — contd

1	2	3	4	5	6	7	8	9	10	11	12
31	*Monosynamma bohemani* (Fall.)			0.02	8.3	0.70	11.1				
32	*Chlamydatus pulicarius* (Fall.)					0.03	11.1	0.09	23.5	0.02	20.0
33	*Ch. pullus* Reut.					+	5.6	+	5.9		
34	*Megalocoleus pilosus* (Schrank)							0.01	11.8		
35	*Stalia boops* (Schiödte)			+	4.2						
36	*Nabicula lineata* (Dahlb.)	0.02	8.3	0.08	29.2	+	5.6	0.01	11.8	0.01	10.0
37	*N. limbata* (Dahlb.)			+	4.2	+	5.6				
38	*N. flavomarginata* (Scholtz)			0.01	4.2						
39	*Nabis ferus* (L.)	0.04	25.0	0.13	29.2	0.10	33.3	0.08	35.3	0.02	20.0
40	*N. pseudoferus* Rem.	0.04	12.5	0.17	45.8	0.30	66.7	0.17	58.8	0.06	40.0
41	*N. punctatus* A. Costa			0.01	8.3	+	5.6	0.02	11.8		
42	*Orius niger* (Wolff)			+	4.2	0.05	5.6				
43	*Coranus subapterus* (De Geer)					+	5.6			0.01	10.0
44	*Piesma maculatum* (Lap.)			+	4.2	0.01	11.1	+	5.9		
45	*Berytinus clavipes* (F.)					0.01	11.1	0.50	41.2		
46	*B. crassipes* (H.-S.)							+	5.9		
47	*Neides tipularius* (L.)					0.01	11.1	+	5.9		
48	*Ortholomus punctipennis* (H.-S.)			+	4.2			0.01	11.8		
49	*Kleidocerys resedae* (Panz.)							+	5.9		
50	*Cymus aurescens* Dist.			0.02	12.5	+	5.6				
51	*C. claviculus* (Fall.)					+	5.6				
52	*C. glandicolor* Hahn			0.02	4.2						
53	*Geocoris dispar* (Waga)									0.01	10.0
54	*Pachybrachius fracticollis* (Schill.)			0.17	12.5	0.02	11.1	+	5.9	0.01	10.0
55	*P. luridus* (Hahn)			+	4.2	0.02	5.6				
56	*Rhyparochromus pini* (L.)							0.04	17.6		
57	*Peritrechus geniculatus* (Hahn)			+	4.2						
58	*Megalonotus chiragra* (F.)							+	5.9		
59	*Coreus marginatus* (L.)					0.01	11.1				
60	*Coriomeris scabricornis* (Panz.)							+	5.9		
61	*Alydus calcaratus* (L.)							0.01	11.8		

Table 1 — contd

1	2	3	4	5	6	7	8	9	10	11	12
62	*Megalotomus junceus* (Scop.)			+	4.2	0.02	11.1	0.02	5.9		
63	*Rhopalus maculatus* (Fieb.)			0.15	58.3	0.09	22.2	0.04	17.6	0.01	10.0
64	*Rh. parumpunctatus* Schill.					0.01	11.1	0.05	29.4	0.01	10.0
65	*Myrmus miriformis* (Fall.)							0.04	5.9		
66	*Stictopleurus punctaton-ervosus* (Goeze)			+	4.2			+	5.9	0.01	10.0
67	*Coptosoma scutellatum* (Geoffr.)							0.88	64.7	0.11	20.0
68	*Thyreocoris scarabaeoides* (L.)							+	5.9		
69	*Eurygaster maura* (L.)							0.01	5.9		
70	*E. testudinaria* (Geoffr.)	0.01	8.3	0.02	16.7	0.03	22.2			0.04	30.0
71	*Sciocoris cursitans* (F.)									0.01	10.0
72	*S. microphthalmus* Flor					+	5.6	0.10	35.3		
73	*Aelia acuminata* (L.)					+	5.6	0.01	11.8		
74	*Neottiglossa pusilla* (Gmel.)			+	4.2						
75	*Eysarcoris aeneus* (Scop.)			0.01	4.2	0.29	51.1	0.18	52.9	0.11	40.0
76	*Palomena viridissima* (Poda)							+	5.9		
77	*Holcostethus vernalis* (Wolff)							+	5.9	0.01	10.0
78	*Carpocoris fuscispinus* (Boh.)							0.01	11.8		
79	*C. purpureipennis* (De Geer)			+	4.2	0.03	22.2	0.09	29.4	0.05	40.0
80	*Dolycoris baccarum* (L.)			0.04	16.7	0.02	16.7	0.05	17.6		
81	*Eurydema oleraceum* (L.)			+	4.2	0.02	5.6				
82	*Picromerus bidens* (L.)							0.03	11.8		
	Total	0.55		1.96		6.92		6.21		1.73	

Explanation: I — *Cladietum marisci*; II — *Caricetum davallianae*; III — *Betulo-Salicetum repentis*; IV — *Brachypodio-Teucrietum*; V — degraded idle land habitat; n′ — numerical force; F — frequency; + — numerical force less than 0.01.

Cladietum marisci

The grouping of the *Heteroptera* of this association was characterised by a very low numerical force ($n' = 0.55$) and a poor species composition (12

species). In the quantitative structure, there dominated two trophic species associated with grasses — *Stenodema calcaratum* (44.4% of the quantitative composition) and *Trigonotylus caelestialium* (14.8%) as well as the polyphagous phytophage *Lygus rugulipennis* (11.1%). A high degree of occurrence constancy, equaling 58.3%, was only recorded for *S. calcaratum*. In the case of the remaining species of the grouping, the index ranged from 8.8 to 33.3%.

Caricetum davallianae

Heteropterofauna of this association was characterised by a rather small numerical force ($n' = 1.96$), but quite a considerable species differentiation (43 species). In the dominance structure, the leading position was occupied by *Stenodema calcaratum* (11.7%) and *Trigonotylus caelestialium* (10.0%). Worth mentioning for this habitat is quite a big share of hygrophiles — *Rhopalus maculatus* — 7.7% (trophically associated with *Comarum palustre* and *Cirsium palustre*), *Pachybrachius fracticollis* — 8.5% (feeding on the sap of plants of the *Eriophorum* genus) as well as *Polymerus palustris* — 5.3% (feeding on *Galium palustre*). The class of high share species also included the polyphagous phytophage *Halticus apterus* as well as zoophages *Nabis ferus* and *N. pseudoferus.* The species with the highest value of the occurrence constancy index was *Rhopalus maculatus* (58.3%), and for the remaining ones the parameter ranged from 45.8 to 4.2%.

Betulo-Salicetum repentis

The fauna of *Heteroptera* of this community was characterised by the strongest numerical force among all the studied communities ($n' = 6.92$) and it consisted of 47 species. In the dominance structure, there was a very high share of *Trigonotylus caelestialium* (30.7%). Beside it, two other species were in a great numerical force, and so had a high dominance index value — *Stenodema calcaratum* (12.4%) and *Monosynamma bohemani* (10.0%). The latter species is biologically associated with willow shrubs *(Salix repens, S. rosmarinifolia*). Also quite strongly represented were the polyphages *Lygus rugulipennis* and *Halticus apterus.* In this community, high occurrence constancy was reached by four species: *S. calcaratum* (83.3%), *N. pseudoferus* (66.7%), *T. caelestialium* (55.6%) and *H. apterus* (50%).

Brachypodio-Teucrietum

This association's grouping was the richest in species (55 taxons) and was characterised by a great numerical force of insects ($n' = 6.21$). In the dominance

structure, the leading positions were occupied by species trophically and reproductively associated with plants from the *Fabaceae* family — *Coptosoma scutellatum* (14.1%), *Adelphocoris lineolatus* (11.0%) and *Berytinus clavipes* (8.1%). There was also a high share of *Trigonotylus caelestialium* (11.7%), and of the polyphagous phytophages — *Halticus apterus* (9.2%), *Plagiognathus chrysanthemi* (5.9%) and *Lygus rugulipennis* (7.9%). The highest values of the occurrence constancy index were reached by *C. scutellatum* and *A. lineolatus* (64.7% and 52.9%, respectively).

Idle land community

The *Heteroptera* grouping of this habitat was characterised by a small numerical force ($n' = 1.73$) and a small number of participating species (27 taxons). Clearly dominating in the numerical force was *Lygus rugulipennis* (22.7%); among the more numerous elements were also *Orthops kalmii* (7.8%), *Halticus apterus* (7.8%), *Plagiognathus chrysanthemi* (7.1%), *Trigonotylus caelestialium* (6.4%), *Coptosoma scutellatum* (6.4%), and *Eusarcoris aeneus* (6.4%). The distinctive feature of this grouping was a low degree of constancy of occurrence of the participating species, the value of which did not exceed 40% for any of the species.

The diversity of the abundance and numerical force of the *Heteroptera* species in the analysed habitats is mainly a consequence of the biotic conditions. The extreme poverty of the fauna of the twig rush is a reflection of its floristic homogeneity, as this type of community practically consists of one species. Another aspect having an effect on the impoverishment of the fauna are frequent fires caused by burning grasses. The dominance structure of the *Heteroptera* groupings of *Caricetum davallianae* and *Betulo-Salicetum repentis* associations is similar to the proportions recorded in identical communities located in a different peatbog in the Chełm vicinity, in Zawadówka (10). In both cases, there was a group of species characteristic of waterlogged communities (*Rhopalus maculatus*, *Pachybrachius fracticollis*, *P. luridus*, *Agramma ruficorne*, *Polymerus palustris*, *Monosynamma bohemani*, *Cymus aurescens*, *C. glandicolor*). Their position in the dominance structure is clearly marked in the small-sedge swamp, however, even here they do not achieve such a high dominance and frequency as in other similar habitats of Eastern Poland (4, 5, 10).

On the other hand, the quantity relations recorded in the *Heteroptera* grouping of mid-swamp xerothermic turfs were of great interest. In spite of the fact that they are surrounded on all sides by peatbog communities and their surface is relatively small (the sum of it for two patches does not exceed 1 ha), the dominance structure of *Heteroptera* in the turfs is similar to the structure recorded multiple times for xerothermic communities developing on Cretaceous and loess slopes (3, 5,

8, 11). Its characteristic feature is a high degree of dominance and frequency of *Coptosoma scutelletum* and *Adelphocoris lineolatus*. This may evidence the relatively small influence of migration on the profile of the fauna.

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