

## True bugs (*Hemiptera: Heteroptera*) of selected islands of the Mazurian Lake District

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### Introduction

The research concerning true bugs (Heteroptera) of the selected islands of the Mazurian Lake District was carried out during 2004-2005, and the obtained results are part of the project “Biodiversity of ecosystems: genesis and functions,” which was carried out by the Centre for Ecological Research of the Polish Academy of Sciences.

Insects were captured into Barber’s traps, a method which is rather rarely used to catch true bugs of the Heteroptera suborder and is usually only subsidiary to the standard methods of catches of this group of insects. The effectiveness of different types of traps was confirmed many times during fauna research on insects of the discussed sub-order (DOROW, 1999; KORCZ, 2003; DOROW *et al.*, 2005).

For the research purposes some of the greatest in Poland groups of islands were selected: islands of the Wigry Lake (co-ordinates: N 54°00’ – N 54°05’, E 22°01’ – E 22°09’) and the islands of the chain of the Nidzkie, Bełdany and Mikołajskie Lakes (N 54°37’ – N 53°46’, E 21°31’ – E 21°37’).

These two complexes of lakes that are over 100 km apart are clearly different. The Wigry, which is a vast and protected lake, is the heart of the Wigierski National Park, because of which the islands have a relatively primeval charac-

ter. They are grown with mature, sometimes declining trees, with many fallen as well as superb monumental trees. In some places natural renewals are formed.

Narrow, tunnel-valley Nidzkie, Bełdany and Mikołajskie Lakes are tourist centres of the Mazurian Lake District despite being formally under protection. Uncontrolled presence of tourists is principally marked in the coastal part of the isles during vacation season.

The studied islands are diversified in respect to size (ranging from a small groups of isles which are only 3m<sup>2</sup> large on the Nidzkie Lake to up to 40 ha large Ostrów island on the Wigry Lake) as well as isolation (from 5 to 500 m away from the coastal line).

Archipelagos of both lakes are dominated by highly rising over water surface (even up to a dozen meters) islands covered by mixed forest (association in relation to *Carpinion betuli*) and low situated and wet islet covered by alder forest (association in relation to *Alno-Ulmion*). The mixed forestry settings are usually strongly degraded either because of coniferous trees plantation or due to tourist impact. Some islands of the Wigry Lake were used as pastures which made the island settings more diversified. These valuable associations in relation to *Arrhenatherion* and *Cynosurion* are presently seriously endangered as pasturage ceased.

The researched islands are surrounded by vast lake waters which cause specific setting and microclimatic conditions, significantly different from the average of this area. An increased amount of rainfall, large temperature amplitudes and sudden changes of seasons are characteristic features of every microclimate. The discussed region is characterised by a long and frosty winter, late and cold spring and a short growth season (187 days), which begins in mid-April and finishes in the beginning of October (ZALEWSKI, 2000).

## **Material and methods**

The research was carried out on 13 islands on the Wigry Lake and 15 islands in the chain of three other Mazurian lakes. In each setting a transect of three traps with 25m-wide-gap between was set up. On the smallest islands it was possible to set up only one trap, and on the land areas five traps were set up in each setting. Standard Berber's traps of 0.5 l volume were used and were consequently covered with a wooden roof. The traps were controlled every 4-6 weeks from May to October of 2004 and 2005. During research also 'artificial islands' were used and located between the land and natural islands, and anchored on the bottom of the lake. Their role was to control the migration of different groups of invertebrates on water surface but it has to be marked that in case of Heteroptera bugs the previously mentioned distances of the studied

islands from the land (i.e. 5 – 500 m) did not constitute a barrier for most species. The results obtained thanks to these artificial islands were taken into account because of the fact that thanks to them 6 species that had not been previously noted in other sites were captured. ‘Artificial islands’ were made of styrene plates the size of which was 100x50 cm, and on which two Barber’s traps were placed.

## Results

In total in 2004-2005, 1236 specimens of the Heteroptera suborder were captured. Although the traps were set up on 28 islands only those on 21 islands turned out to be successful and they were located on the following lakes: Nidzkie (Koń, Królewski Ostrów, Kopanka, Górna, Ośrodek), Guzianka Mała (Śluza), Bełdany (Piaseczna, Wygryńska, Kamińska), Mikołajskim (Wierzba, Mała Wierzba) and Wigry (Mysia, Cimochoowski Grądzik, Walendziak, Ordów, Rozków, Bryzgiel, Ostrów, Krowa, Brzozowa, Kamień).

During the research the presence of 48 bug species of 17 families was proved. All the species were captured within 5 plant associations and on artificial islands (Tab. 1.).

Table 1. Index of Heteroptera species captured in particular plant associations of islands in:  
I – Carpinion betuli, II – Dicrano-Pinion, III – Alno-Ulmion, IV – Alnion

No	Species	Lakes					Land	Number of specimens
		Wigry	Bełdany	Nidzkie	Guzianka Mała	Mikołajskie		
1.	<i>Ceratocombus coleoptratus</i> (Zett.)	I, III, IV, V		I	III	III	I, II	113
2.	<i>Gerris argentatus</i> Schumm.	I, II, IV		I		I		14
3.	<i>Nepa cinerea</i> L.			I, III	III	I, III		78
4.	<i>Ilyocoris cimicoides</i> (L.)	I, IV						4
5.	<i>Saldula saltatoria</i> (L.)	IV	I	I		VI		5
6.	<i>Saldula arenicola</i> (Scholtz)					VI		1
7.	<i>Myrmedobia exilis</i> (Fall.)	IV		I			II	4
8.	<i>Loricula pselaphiformis</i> Curtis	IV						1
9.	<i>Chlamydatus pullus</i> (Reut.)	V						1
10.	<i>Halicus apterus</i> (L.)	IV, V						2
11.	<i>Lygocoris pabulinus</i> (L.)	IV						1
12.	<i>Lygocoris viridis</i> (Fall.)		I					1
13.	<i>Liocoris tripustulatus</i> (F.)			I, III				2
14.	<i>Psallus ambiguus</i> (Fall.)					I		1

15.	<i>Acalypta carinata</i> (Panz.)	I	I					25
16.	<i>Acalypta gracilis</i> (Fieb.)	I, IV	I					6
17.	<i>Acalypta marginata</i> (Wolff)	I, IV, V, VI						41
18.	<i>Derephysia foliacea</i> (Fall.)	V	I					5
19.	<i>Himacerus apterus</i> (F.)	V						1
20.	<i>Nabis flavomarginatus</i> (Scholtz)	V						1
21.	<i>Nabis pseudoferus</i> Rem.	IV						1
22.	<i>Nabis rugosus</i> (L.)	IV						2
23.	<i>Anthocoris nemorum</i> (L.)					III		2
24.	<i>Temnostethus gracilis</i> Horv.						I	1
25.	<i>Elasmucha grisea</i> (L.)	IV				I	I, III	4
26.	<i>Microporus nigrita</i> (F.)			VI				1
27.	<i>Aelia acuminata</i> (L.)	VI						1
28.	<i>Palomena prasina</i> (L.)	IV						1
29.	<i>Pentatoma rufipes</i> (L.)					VI		1
30.	<i>Eurygaster maura</i> (L.)					III, V		2
31.	<i>Eurygaster testudinaria</i> (Geoffr.)	IV						1
32.	<i>Cymus melanocephalus</i> F.					VI		1
33.	<i>Drymus brunneus</i> (Sahl.)	I, IV, V	I	I, III	III	I, III	I, III, IV	423
34.	<i>Drymus sylvaticus</i> (F.)	I, IV, V	I	I	III	I, VI	I, III, IV	52
35.	<i>Eremocoris abietis</i> (L.)	I, IV, V					IV	16
36.	<i>Eremocoris plebejus</i> (Fall.)	I, IV	I	I		I	I, II, III	74
37.	<i>Eremocoris podagricus</i> (F.)			I				1
38.	<i>Kleidocerys rosedae</i> (Panz.)	I, IV		I				6
39.	<i>Megalonotus sabulicola</i> (Thomson)			III				1
40.	<i>Plinthis pusillus</i> (Scholtz)	I						1
41.	<i>Scolopostethus affinis</i> (Schill.)	V	I					19
42.	<i>Scolopostethus puberulus</i> Horv.	IV					IV	4
43.	<i>Scolopostethus thomsoni</i> Reut.	I, IV, V	I	I		III	I, III, IV	150
44.	<i>Stygnocoris sabulosus</i> (Schill.)	I, V						2
45.	<i>Taphropeltus contractus</i> (H.-S.)	I		I				3
46.	<i>Trapezonotus arenarius</i> (L.)			I				1
47.	<i>Pyrrhocoris apterus</i> (L.)	I, IV, V	I	I				157
48.	<i>Coreus marginatus</i> (L.)					VI		1

## Discussion

The results let one claim that there was a great diversity of Heteroptera species, taking into consideration the fact that only Barber's traps were used in the catching.

Among the indexed bug species, 9 were caught on artificial islands out of which 6: *Saldula arenicola* (Scholtz), *Microporus nigrita* (F.), *Aelia acuminata* (L.), *Pentantoma rufipes* (L.), *Cymus melanocephalus* F. and *Coreus marginatus* (L.) were caught only on them. The above mentioned species were represented by macropteris specimens. *Aelia acuminata* (L.) and *Coreus marginatus* (L.) species were frequently present in a large number of specimens which highly increased the chance for their accidental spotting on the water surface, especially in meadow associations that are found on the lake shore.

Among the indexed bugs the presence of 16 accidental species which are rarely recorded was confirmed with a use of the Barber's traps. The following species connected with different species of green plants and trees were registered: *Lygocoris pabulinus* (L.), *Lygocoris viridis* (Fall.), *Liocoris tripustulatus* (F.), *Psallus ambiguus* (Fall.), *Derephysia foliacea* (Fall.), *Anthocoris nemorum* (L.), *Temnostethus gracilis* Horv., *Elasmucha grisea* (L.), *Aelia acuminata* (L.), *Palomena prasina* (L.), *Pentatoma rufipes* (L.), *Eurygaster maura* (L.), *Eurygaster testudinaria* (Geoffr.), *Cymus melanocephalus* F., *Kleidocerys rosedae* (Panz.), *Coreus marginatus* (L.).

The presence of 3 bug species in the studied material deserves particular attention: *Ceratocombus coleopratus* (Zett.), *Myrmedobia exilis* (Fall.) and *Loricula pselaphiformis* Curtis, out of which the first one was represented by 113 specimens. These species are very rarely captured with a standard method of sweep nets which results from their specific way of life (PÉRICART, 1972; MELBER & KÖHLER, 1992; ŠTYS, 1990) and a small body size.

The greatest number of caught specimens was recorded in the Lygaeidae family, which in the studied material was represented by 15 species (Tab. 1: 32-46) which constituted over 30% of the indexed bugs. Such large share in the studied material is connected with a specific way of life of the insects of this family (PÉRICART, 1999). In most cases these were species which lived at the base of plants and which moved on the ground which had impact on high effectiveness of Barber's traps. The confirmation of the effectiveness of the applied traps in case of the discussed family is the aforementioned large number of caught specimens which constituted as many as 61% of the whole material, half of which was made of insects of the *Drymus brunneus* (Sahl.) species.

A large part of the studied material consisted of insects of the *Pyrrhocoris apterus* (L.) species, one of the two representatives of the Pyrrhocoridae family that occur in Poland (GORCZYCA & TOŃCZYK, 2004). The captured specimens were exclusively represented by brachypteris forms, usually encountered among the discussed species (MOULET, 1995).

The results are part of a project 'Biodiversity of ecosystems: genesis and functions' and the data obtained throughout the studies on other groups of invertebrates will enable a better understanding of the island ecology and the way of their colonizing by different groups of animals.

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### **Pluskwiaki różnoskrzydłe (*Hemiptera: Heteroptera*) wybranych wysp Pojezierza Mazurskiego**

#### Streszczenie

Artykuł przedstawia wyniki projektu „Różnorodność biologiczna ekosystemów: geneza i funkcje” dotyczącego owadów z podrzędu *Heteroptera*. Owady odławiane były za pomocą pułapek Barbera na 21 wyspach rozmieszczonych na pięciu jeziorach Pojezierza Mazurskiego: Nidzkim, Guzianka Mała, Bełdany, Mikołajskim i Wigry. W trakcie badań stwierdzono występowanie 48 gatunków pluskwiaków różnoskrzydłych należących do 17 rodzin. Największą liczbę odłowionych osobników sta-

nowią owady należące do rodziny *Lygaeidae* reprezentowanej w badanym materiale przez 15 gatunków stanowiących ponad 30% wykazanych pluskwiaków różnoskrzydłych. Na szczególną uwagę zasługuje obecność w badanym materiale trzech gatunków: *Ceratocombus coleoptratus* (Zett.), *Myrmedobia exilis* (Fall.) oraz *Loricula pselaphiformis* Curtis, rzadko odławianych za pomocą standardowych metod.

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