

Aphids /Hemiptera, Aphidoidea/ in meadow communities from the *Phragmitetea* and *Artemisietea* classes

BEATA BOROWIAK-SOBKOWIAK*, MIECZYŚLAW GRZELAK**, ROMA DURAK***

*Department of Entomology, University of Life Sciences
Dąbrowskiego 159, 60-594 Poznań, Poland
borowiak@up.poznan.pl

**Department of Grassland, University of Life Sciences,
Wojska Polskiego 38/42, 60-627 Poznań, Poland

***Department of Invertebrata Zoology, University of Rzeszów
Pigonia 6, 35-959 Rzeszów, Poland

Abstract

Research concerning aphids of meadow communities of *Phragmitetea* and *Artemisietea* classes was carried out in the village of Mniszek in 2006-2008. The following three methods were applied to catch the aphids: Moericke's traps, sweep net method as well as a direct collecting from herbal plants. Thirty aphid species were collected by the sweep net method in years 2007-2008. The following species were recorded most often *Microlophium carnosum*, *Rhopalosiphum padi*, *Cavariella pastinaceae*, *Sitobion fragariae*, *Aphis fabae solanella*, *Schizaphis graminum* and *Atheroides serrulatus*. Ninety-four aphid species were collected by means of Moericke's traps. *Rhopalosiphum padi* was the most numerous species collected in 2006. Other frequently collected aphid species were *Phorodon humuli*, *Aphis fabae* and *Microlophium carnosum*. In 2007 *A. fabae* dominated, *Microlophium carnosum*, *Rhopalosiphum padi*, *Tubaphis ranunculina* and a group of species of the *Aphis* genus were also numerous.

Introduction

Meadow is a plant community comprising dense grass turf in which there are also other monocotyledonous plant species and perennial herbs and moss.

Plant communities owe their creation and formation mainly to different forms of man's activity, including mowing, grazing or fertilizing (Nawara, 2006). In Poland plant communities contribute to air cleanliness, they moderate temperature extremes and air humidity. Dense meadow turf protects soil against erosion and in some parts of the country meadows constitute water reservoirs. They play an important role in economy, delivering fodder for animal breeding. Due to the richness of flora, meadows are also a source for rich entomofauna. Species feeding on plant juices are part of an important group of insects, such as aphids which are not only crop plant pests, but also virus vectors.

Research on the dependencies between aphids and plant communities which they settle was carried out inter alia by Klimaszewski *et al.* (1980), Czyłok (1983), Hałaj & Wojciechowski (1996), Durak & Wojciechowski (2005) and Borowiak-Sobkowiak *et al.* (2008). However, these were few and so it seems necessary to conduct further research in this matter.

The aim of this research was to study aphid fauna in the selected meadow communities.

Material and methods

The research was carried out in years 2006-2008 in a meadow community from the *Phragmitetea* and *Atemisietea* classes in the village of Mniszek, which is located in the river Bukówka valley flowing on the edge of Notecka Forest. On the studied area of a 40 ha size a community from the *Phragmitetea* and *Atemisietea* classes was selected. Floral analysis in a given community was assessed on the basis of phytosociological photographs taken using the Braun-Blanquet method. Community nomenclature was supplied according to classification by Matuszkiewicz (2006), and for plants according to Mirek *et al.* (1995).

The studied meadow community belongs to grass rushes, great-sedges rushes and splendid perennial dicotyledonous plants and nitrophilous and rural-herbal communities. The following four plant communities were selected:

First group *Phragmitetum australis* was characterized by plant scarcity (5-22 species). *Phragmitetum australis* is a dominating and characteristic species there. Other species such as: *Rumex hydrolapathum*, *Glyceria maxima*, *Phalaris arundinacea*, or *Carex gracilis* were present in smaller amounts.

The second community *Glycerietum maximae* was also floristically poor. *Glyceria maxima*, *Phragmites australis*, *Galium palustre* and *Phalaris arundinacea*, were most numerous here.

The third community *Phalaridetum arundinaceae* was a community highly diversified floristically and particular sub-communities differed from each other with respect to fodder value and its importance for environmental protection. *Phalaris arundinacea* was a dominating species, while *Poa trivialis* was a characteristic one.

The fourth community – *Urtico-Aegopodietum podagrariae* of *Artemisietea* class. This community was numerous in the studied area in irregular patches, frequently appeared in strips on the border between pine and swamp birch forests. In all the patches *Urtica dioica* was present, other characteristic species were as follows: *Poa pratensis*, *Holcus lanatus*, *Trifolium pratense*, *Taraxacum officinale*, *Cirsium oleraceum*, *Geum rivale*, or *Plantago major*.

In order to compare the aphid fauna three research methods were applied. In the years 2007 and 2008 sweep net sampling was applied, in which one sample was made with 4x25 beats as well as sampling by 'deer-stalking'. Samples were collected monthly. Additionally, in 2006 and 2007 aphids were collected into Moericke's traps, using 5 bowls each time. Material was taken out twice a month from May until October. The species of the collected specimens were identified using the keys by HEIE (1980, 1982, 1986, 1992, 1994, 1995) and TAYLOR (1980). For an analysis of the results of catches into Moericke's traps, only aphid species connected with meadow communities were taken into account.

Results

In years 2007-2008 in total 30 aphid species were collected using the sweep net method from meadow community of *Phragmitetea* and *Artemisietea* classes. The following species were the most numerous: *Microlophium carnosum* (Buckton, 1876), *Rhopalosiphum padi* (Linnaeus, 1758), *Cavariella pastinaceae* (Linnaeus, 1758), *Sitobion fragariae* (Walker, 1848), *Schizaphis graminum* (Rondani, 1847), *Macrosiphoniella millefolii* (De Geer, 1773), *Sitobion avenae* (Fabricius, 1775), *Aphis fabae solanella* Theobald, 1914, *Atheroides serrulatus* Haliday, 1838, *Uroleucon cirsii* (Linnaeus, 1758) (Tabs. 1, 2). These species were included in a group of species permanently connected with the researched community (Tabs. 1, 2). It was confirmed by research carried out by a 'deer stalking' method by means of which 15 aphid species were collected from herbal plants (Tab. 3). They were most likely to settle: *Urtica dioica*, *Cirsium oleraceum* and *Chaerophyllum temulum* (Tab. 3). The research carried out by means of Moericke's traps broadened the list of species or species groups which could settle the studied plant community up to 94.

In 2006, 2171 specimens were collected out of 65 taxons (Tab. 4) and in 2007 – 855 specimens of 50 species (Tab. 5).

R. padi constituted species which were most frequently caught in colour traps in 2006, amounting to 38% of the collected material. Other numerous species that were caught included *Phorodon humuli* (Schrank, 1801), *Aphis fabae* Scopoli, 1763 and *Microlophium carnosum*. They constituted 32%, 8% and 5.7% respectively (Tab. 4).

Although in 2007 *A. fabae* dominated (24%), the following species were also numerous: *M. carnosum* (16.8%), *R. padi* (8%), *Tubaphis ranunculina* (Walker, 1852) (4.5%) and a group of species of the *Aphis* genus (18%) (Tab. 5).

Discussion

Meadow communities of *Phragmitetea* and *Artemisietea* classes are characterized by a rich aphid fauna. Out of the researched plant community more than 90 aphid species were collected using all the research methods. When studying aphids of the meadow communities of the *Molinio-Arrhenatheretea* class in the same village BOROWIAK-SOBKOWIAK *et al.* (2008) registered over 100 aphid species. On the basis of a three-year-long observation a group of 10 aphid species was distinguished which are permanently associated with this plant community. Aphid species which were included there are connected by food quality with plants which are characteristic or dominate in the researched *Phragmitetea* and *Artemisietea* classes (Tab. 3). Many aphid species which are permanently associated with this plant community feed on different species from the grasses' family e.g. on *Holcus lanatus*, *Poa pratensis*, *Phragmites communis*, and their presence may depend on the content of nitrate nitrogen in their tissues (ŻURAŃSKA *et al.*, 1994). The knowledge of host plants of the collected aphid species enables a proper analysis of the data concerning the material obtained by means of the remaining research methods.

When studying aphids of plant communities of the Western Bieszczady Mountains CZYŁOK *et al.* (1988) recorded 6 aphid species on rush plants of *Phragmitetea* class. The following species were considered to be characteristic: *Hyalopterus pruni* (Geoffroy, 1762), *Rhopalosiphum nymphaeae* (Linnaeus, 1761) and *Schizaphis scirpi* (Passerini, 1874). However, these researchers recorded 38 aphid species on plants of the *Artemisietea* class. The following were considered to be characteristic: *Cryptosiphum artemisiae* Buckton, 1879, *Macrosiphoniella absinthii* (Linnaeus, 1758), *M. artemisiae* (Boyer De Fonscolombe, 1841), *M. oblonga* (Mordvilko, 1901), *M. tanacetaria* (Kallenbach, 1843), *Metopeurum fuscoviride* Stroyan, 1950, *Pleotrichophorus glandulosus* (Kallenbach, 1843), *Trama troglotydes* Heydel, 1837 and *Uroleucon tanacetii* (Linne, 1758). Out of all the above mentioned aphid species only *H. pruni* oraz *R. nymphaeae* were recorded in the studied meadow community in the village of Mniszek. Here also other species of the genus *Schizaphis*, *Macrosiphoniella* or *Uroleucon* were registered.

The analysis of materials obtained by means of the colour traps supplemented the list of species which are potentially associated with a given plant community. These species, while being the reservoir of the community may often appear in it, at times even in large numbers especially during spring and

autumn. Some of the recorded species may be considered to be part of a group permanently associated with the community, though the degree of association ought to be still confirmed in further research. The material obtained by means of colour traps supplements and broadens the information collected by other research methods.

Table 1. Aphid species caught by the sweep net method in meadow community of the *Phragmitetea* and *Artemisietea* class in Mniszek in 2007

2007	Species	Numbers of individuals
May	<i>Cavariella pastinaceae</i> (L.)	2
	<i>Rhopalosiphum padi</i> (L.)	21
	<i>Sitobion avenae</i> F.	5
	<i>Sitobion fragariae</i> (Walk.)	5
	<i>Subsalsusaphis flava</i> H.R.L.	1
	<i>Aphis urticae</i> F.	7
	<i>Microlophium carnosum</i> (Buckt.)	14
	<i>Schizaphis graminum</i> (Rond.)	12
June	<i>Sitobion fragariae</i> (Walk.)	6
	<i>Atheroides serrulatus</i> Hal.	1
	<i>Aphis fabae solanella</i> Theob.	1
	<i>Microlophium carnosum</i> (Buckt.)	11
	<i>Sitobion avenae</i> F.	10
	<i>Rhopalosiphum padi</i> (L.)	6
	<i>Dysaphis plantaginea</i> (Pass.)	1
	<i>Macrosiphoniella millefolii</i> (De Geer)	6
	<i>Uroleucon cirsii</i> (L.)	5
July	<i>Anoecia corni</i> (F.)	3
	<i>Macrosiphoniella millefolii</i> (De Geer)	10
August	<i>Acyrtosiphon pisum</i> (Harris)	1
	<i>Uroleucon cirsii</i> (L.)	8
	<i>Rhopalosiphum padi</i> (L.)	6
	<i>Macrosiphoniella sejuncta</i> (Walk.)	3
	<i>Tetraneura ulmi</i> (L.)	1
	<i>Anoecia corni</i> (F.)	1
	<i>Macrosiphoniella millefolii</i> (De Geer)	8
	<i>Schizaphis graminum</i> (Rond.)	9
	<i>Microlophium carnosum</i> (Buckt.)	94

September	<i>Cryptomyzus galeopsidis</i> (Kalt.)	1
	<i>Atheroides serrulatus</i> Hal.	5
	<i>Schizaphis graminum</i> (Rond.)	9
	<i>Sitobion avenae</i> F.	2
	<i>Tubaphis ranunculina</i> (Walk.)	4
	<i>Uroleucon cirsii</i> (L.)	6
	<i>Rhopalosiphum padi</i> (L.)	1
	<i>Capitophorus carduinus</i> (Walk.)	1
	<i>Eriosoma patchae</i> (Börn. Et Blunck)	1
	<i>Microlophium carnosum</i> (Buckt.)	24
October	<i>Schizaphis graminum</i> (Rond.)	12
	<i>Tetraneura ulmi</i> (L.)	1
	<i>Microlophium carnosum</i> (Buckt.)	243
	<i>Atheroides serrulatus</i> Hal.	14
	<i>Metopolophium dirhodum</i> (Walk.)	1
	<i>Capitophorus horni</i> Börn.	5
	<i>Uroleucon cirsii</i> (L.)	3
<i>Myzus persicae</i> (Sulz.)	1	

Table 2. Aphid species caught by the sweep net method in meadow community of the *Phragmitetea* and *Artemisietea* class in Mniszek in 2008

2008	Species	Numbers of individuals
May	<i>Cavariella theobaldi</i> Gill. Et Bragg	1
	<i>Cavariella pastinaceae</i> (L.)	52
	<i>Rhopalosiphum padi</i> (L.)	3
	<i>Microlophium carnosum</i> (Buckt.)	1
	<i>Dysaphis plantaginea</i> (Pass.)	1
June	<i>Rhopalosiphum padi</i> (L.)	100
	<i>Sitobion fragariae</i> (Walk.)	42
	<i>Macrosiphum rosae</i> (L.)	12
	<i>Megoura viciae</i> Buckt.	2
	<i>Hyalopterus pruni</i> (Geoff.)	3
	<i>Cavariella pastinaceae</i> (L.)	1
	<i>Aphis fabae solanella</i> Theob.	24
	<i>Atheroides serrulatus</i> Hal.	1
	<i>Macrosiphoniella millefolii</i> (De Geer)	3
	<i>Phorodon humuli</i> (Schrk.)	4
	<i>Microlophium carnosum</i> (Buckt.)	2

July	<i>Anoecia corni</i> (F.)	3
	<i>Rhopalosiphum padi</i> (L.)	6
	<i>Tetraneura ulmi</i> (L.)	1
	<i>Hyalopterus pruni</i> (Geoff.)	8
	<i>Sitobion avenae</i> F.	4
	<i>Sitobion fragariae</i> (Walk.)	1
	<i>Microlophium carnosum</i> (Buckt.)	5
September	<i>Atheroides serrulatus</i> Hal.	1
	<i>Cryptomyzus ribis</i> (L.)	1

Table 3. Aphids species collected from the herbal plants by 'deer stalking' method in meadow community of the *Phragmitetea* and *Artemisietea* class in Mniszek

Species of plant	Species of aphid
<i>Cirsium oleraceum</i> (L.) Scop	<i>Uroleucon cirsii</i> (L.)
<i>Cirsium arvense</i> (L.) Scop	<i>Uroleucon cirsii</i> (L.)
<i>Rumex crispus</i> L.	<i>Aphis fabae solanella</i> Theob.
<i>Rumex acetosae</i> L.	<i>Aphis acetosae</i> L.
<i>Holcus lanatus</i> L.	<i>Sitobion fragariae</i> (Walk.)
<i>Holcus lanatus</i> L.	<i>Schizaphis graminum</i> (Rond.)
<i>Holcus lanatus</i> L.	<i>Rhopalosiphum padi</i> (L.)
<i>Phragmites communis</i> L.	<i>Hyalopterus pruni</i> (Geoff.)
<i>Chaerophyllum temulum</i> L.	<i>Aphis fabae</i> Scop
<i>Chaerophyllum temulum</i> L.	<i>Cavariella pastinaceae</i> (L.)
<i>Achillea millefolium</i> L.	<i>Macrosiphoniella millefolii</i> (De Geer)
<i>Galeopsis pubescens</i> Besser	<i>Cryptomyzus galeopsidis</i> (Kalt.)
<i>Carduus crispus</i> L.	<i>Uroleucon aeneum</i> H.R.L.
<i>Urtica dioica</i> L.	<i>Microlophium carnosum</i> (Buckt.)
<i>Urtica dioica</i> L.	<i>Aphis urticae</i> F.
<i>Poa pratensis</i> L.	<i>Rhopalosiphum padi</i> (L.)
<i>Polygonum</i> sp.	<i>Aphis fabae</i> Scop
<i>Lythrum salicaria</i> L.	<i>Myzus lythri</i> (Schrk.)

Table 4. Dynamics of aphids of meadow communities of the *Phragmitetea* and *Artemisietea* class caught into Moericke traps in Mniszek in 2006

Species of aphid	Number of aphids in samples in the month															Total	%
	May		June		July			August			September			October			
	II	III	II	III	I	II	III	I	II	III	I	II	III	II	III		
<i>Aphis fabae</i> Scop	6	85	7	36	25	2	4		2	5		2	3	2	1	180	8.29
<i>Aphis</i> sp.	9	24	3	14	4	3	3	5	2	3						70	3.22
<i>Hyperomyzella rhinanthi</i> (Schout)	1															1	0.05
<i>Rhopalosiphum padi</i> (L.)	5	15	4	9	1		2	2		2	1	44	94	400	246	825	38.00
<i>Anuraphis farfarae</i> (Koch)		2														2	0.09
<i>Anuraphis subterranea</i> (Walk.)		1														1	0.05
<i>Brachycaudus cardui</i> L.		2		11												13	0.60
<i>Brachycaudus</i> sp.		1														1	0.05
<i>Cavariella aegopodii</i> (Scop.)		1														1	0.05
<i>Cavariella pastinaceae</i> L.		2	8													10	0.46
<i>Cavariella theobaldi</i> Gillet Bragg		1		8												9	0.41
<i>Cryptomyzus</i> sp.		1														1	0.05
<i>Dysaphis</i> sp.		1														1	0.05
<i>Hyperomyzus pallidus</i> (L.)		1		1												2	0.09
<i>Microlophium carnosum</i> (Walk.)		112	4	6	2											124	5.71
<i>Phorodon humuli</i> (Schrk.)		1		687												688	31.69
<i>Subsalsusaphis flava</i> H.R.L.		2	2													4	0.18
<i>Thecabius affinis</i> (Kalt.)		2	1		1					2	3	3				12	0.55
<i>Acyrtosiphon pisum</i> (Harris)			2			1	1		1	1						6	0.28
<i>Aphis idaei</i> v.d.Goot			1	22	2					1						26	1.20
<i>Cavariella archangelicae</i> (Scop.)			1	5												6	0.28
<i>Hyperomyzus lactucae</i> (L.)			1									1	1	4	1	8	0.37
<i>Megourella tribulis</i> (Walk.)			1													1	0.05
<i>Myzus cerasi</i> (F.)			1	1									2	1		5	0.23
<i>Ovatus craraegarius</i> (Walk.)			1	1									3		3	8	0.37
<i>Pemphigus borealis</i> Tullgr.			1	1								4			1	7	0.32
<i>Pemphigus</i> sp.			1												1	2	0.09
<i>Amphorophora idaei</i> (Börner)				1				1								2	0.09
<i>Aphis sambuci</i> L.				2	1				2							5	0.23
<i>Atheroides serrulatus</i> Hal.				1												1	0.05
<i>Brachycaudus helichrysi</i> (Kalt.)				4												4	0.18
<i>Brachycaudus lychnidis</i> (L.)				2												2	0.09
<i>Brachycaudus</i> sp.				8												8	0.37
<i>Capitophorus elaeagni</i> (Del Gu.)				1								2	3	7	13	0.60	
<i>Dysaphis plantaginea</i> (Pass.)				1			2									3	0.14
<i>Eriosoma patchae</i> (Börn. et Blunck)				3												3	0.14
<i>Hyadaphis foeniculi</i> (Pass.)				1												1	0.05
<i>Hyalopterus pruni</i> (Geoff.)				1	1					1						3	0.14
<i>Megoura viciae</i> Buckt.				1												1	0.05

<i>Melanaphis luzulella</i> H.R.L.				1													1	0.05	
<i>Protrama ranunculi</i> (Del Gu.)				6							1						1	8	0.37
<i>Rhopalosiphoninus ribesinus</i> v.d.Goot				1						1								2	0.09
<i>Rhopalosiphoninus tulipaellus</i> (Theob.)				1														1	0.05
<i>Uroleucon muralis</i> (Buckt.)				1														1	0.05
<i>Uroleucon taraxaci</i> (Kalt.)				2														2	0.09
<i>Uroleucon tussilaginis</i> (Walk.)				1														1	0.05
<i>Wahlgreniella arbuti</i> Davidson				1														1	0.05
<i>Anoecia corni</i> (F.)					1			1	3	3	2	1	4	3	7			25	1.15
<i>Brevicoryne brassicae</i> (L.)					3	3	8	1										15	0.69
<i>Rhopalosiphoninus staphyleae</i> (Koch)				2														2	0.09
<i>Uroleucon cirsii</i> (L.)				1														1	0.05
<i>Uroleucon</i> sp.				1														1	0.05
<i>Uromelan</i> sp.				1		1											1	3	0.14
<i>Macrosiphoniella persequens</i> (Walk.)						1												1	0.05
<i>Sitobion avenae</i> F.						1												1	0.05
<i>Coloradoa inodorella</i> Oss.							1											1	0.05
<i>Myzus persicae</i> (Sulz.)							1						2	2	9	14		14	0.64
<i>Protrama flavescens</i> (Koch)							1											1	0.05
<i>Metopolophium dirhodum</i> (Walk.)									1						3	1	5	5	0.23
<i>Brachycolus stellariae</i> (Hardy)										1								1	0.05
<i>Hyadaphis</i> sp.										2								2	0.09
<i>Rhopalosiphum nymphaeae</i> (L.)										1	2	1	5	5	14			14	0.64
<i>Tetraneura ulmi</i> (L.)										1				1				2	0.09
<i>Kaltenbachiella pallida</i> (Hal.)														2				2	0.09
<i>Hyalopteroides humilis</i> (Walk.)																1	1	1	0.05
<i>Rhopalosiphum insertum</i> (Walk.)																2	2	2	0.09
Number of individuals	21	254	39	842	46	11	24	10	11	22	8	58	112	427	286	2171	100.00		
Number of species	4	17	16	33	14	6	10	5	6	11	5	8	9	12	14				

Table 5. Dynamics of aphids of *Phragmitetea* and *Artemisietea* class meadow communities caught into Moericke traps in Mniszek in 2007

Species of aphid	Aphid individuals in numbers in the month											Total	%
	May	June		July		August		September		October			
	II	I	II	I	II	I	II	I	II	I			
<i>Aphis fabae</i> Scop.	21	61	85	26		5	4	3		2	207	24.21	
<i>Aphis</i> sp.	10	41	70	24	6	3	4				158	18.48	
<i>Atheroides serrulatus</i> Hal.	1									1	2	0.23	
<i>Aulacorthum solani</i> (Kalt.)	1										1	0.12	
<i>Brachycaudus cardui</i> L.	1	1								1	3	0.35	
<i>Brachycaudus helichrysi</i> (Kalt.)	3	1		1							5	0.58	
<i>Brachycaudus lychnidis</i> (L.)	1	1	1	3	1						7	0.82	
<i>Cavariella aegopodii</i> (Scop.)	1		1				8	10			20	2.34	
<i>Cavariella pastinaceae</i> (L.)	5					2	5				12	1.40	
<i>Dysaphis plantaginea</i> (Pass.)	1	1	4	1	2					1	10	1.17	
<i>Hyperomyzus lactucae</i> (L.)	1	1								1	3	0.35	
<i>Metopolophium dirhodum</i> (Walk.)	1	1	1							1	4	0.47	
<i>Myzus persicae</i> (Sulz.)	1			1					4		6	0.70	
<i>Phorodon humuli</i> (Schrk.)	3	11	1								15	1.75	
<i>Rhopalosiphum nymphaeae</i> (L.)	2				1	3	1				7	0.82	
<i>Rhopalosiphum padi</i> (L.)	10	20	13	7	4		3	2	3	7	69	8.07	
<i>Schizaphis graminum</i> (Rond.)	2		2	1		1	2				8	0.94	
<i>Subsaltusaphis flava</i> H.R.L.	1	2									3	0.35	
<i>Tubaphis ranunculina</i> (Walk.)	2	2	1					1	8	25	39	4.56	
<i>Acyrtosiphon pisum</i> (Harris)		1									1	0.12	
<i>Aphis sambuci</i> L.		2									2	0.23	
<i>Capitophorus elaeagnii</i> (Del Gu.)		2	6	3	1			1			13	1.52	
<i>Cryptomyzus ribis</i> (L.)		1			1	1					3	0.35	
<i>Megourella purpurea</i> H.R.L.		2	2								4	0.47	
<i>Uroleucon cirsii</i> (L.)		1	7	1						1	10	1.17	
<i>Anoecia corni</i> (F.)			1	8	4	1	1	4	2	6	27	3.16	
<i>Aphis idaei</i> v.d.Goot			4								4	0.47	
<i>Brevicoryne brassicae</i> (L.)			2	3							5	0.58	
<i>Hayhurstia atriplicis</i> (L.)			1	1							2	0.23	
<i>Rhopalosiphoninus ribesinus</i> v.d.Goot			1								1	0.12	
<i>Sitobion avenae</i> F.			1	1	6						8	0.94	
<i>Submegoura heikinheimoi</i> (Börn.)			2								2	0.23	
<i>Tetraneura ulmi</i> (L.)			7	2	1			1		3	14	1.64	
<i>Uroleucon campanulae</i> Kalt.			1	2							3	0.35	
<i>Aphis urticae</i> F.				3	1		1				5	0.58	
<i>Capitophorus similis</i> v.d.Goot				1							1	0.12	
<i>Melanaphis pyrraria</i> (Pass.)				2		3					5	0.58	
<i>Microlophium carnosum</i> (Buckt.)				1	1			6	17	119	144	16.84	

<i>Pemphigus</i> sp.				1							1	0.12
<i>Macrosiphum gei</i> (Koch)					1						1	0.12
<i>Ovatus mentharius</i> v.d.Goot					1						1	0.12
<i>Therioaphis trifolii</i> (Mon.)					1						1	0.12
<i>Therioaphis riehmi</i> (Börn.)					1						1	0.12
<i>Cavariella archangelicae</i> (Scop.)								8			8	0.94
<i>Hyadaphis tataricae</i> Aizenb.								2			2	0.23
<i>Salusaphis scirpus</i> Theob.								1			1	0.12
<i>Uroleucon taraxaci</i> (Kalt.)								1			1	0.12
<i>Hyadaphis foeniculi</i> (Pass.)								2		1	3	0.35
<i>Macrosiphoniella sejuncta</i> (Walk.)								1			1	0.12
<i>Myzus cerasi</i> (F.)									1		1	0.12
Number of individuals	68	152	214	93	33	19	41	31	35	169	855	100.00
Number of species	19	18	22	21	16	8	13	10	6	13		

References

- BOROWIAK-SOBKOWIAK B., DURAK R., GRZELAK M. 2008. Aphids (*Hemiptera*, *Aphidoidea*) on meadow communities from the *Molinio-Arrhenatheretea* class. *Aphids and Other Hemipterous Insects*, 14: 51-61.
- CZYŁOK A. 1983. Zgrupowania mszyc (*Homoptera*, *Aphidoidea*) wybranych zbiorowisk leśnych okolic Pińczowa. *Acta Biol. Sil.*, 13: 114-130.
- CZYŁOK A., HAŁAJ R., WOŹNICA A. 1988. Mszyce (*Homoptera*, *Aphidomorpha*) zbiorowisk roślinnych Bieszczadów Zachodnich. *Acta Biol. Sil.*, 10 (27): 93-109.
- DURAK R., WOJCIECHOWSKI W. 2005. Aphid (*Hemiptera*, *Aphidoidea*) communities in different forest associations (*Vaccinio-Piceetea* and *Quercu-Fagetea* classes) of the Kolbuszowa Plateau. *Aphids and Other Hemipterous Insects*, 11: 39-52.
- HAŁAJ R., WOJCIECHOWSKI W. 1996. Zgrupowania mszyc (*Homoptera*, *Aphidinae*) związane ze zbiorowiskami murawowymi z klas *Festuco-Brometea* i *Sedo-Scleranthetea* Wyżyny Częstochowskiej. *Acta Biol. Sil.*, Katowice, 29(46): 83-105.
- HEIE O. E. 1980. The *Aphidoidea* (*Hemiptera*) of Fennoscandia and Denmark. I. *Fauna ent. Scan.* 9: 1-236.
- HEIE O. E. 1982. The *Aphidoidea* (*Hemiptera*) of Fennoscandia and Denmark. II. *Fauna ent. Scan.* 11: 1-175.
- HEIE O. E. 1986. The *Aphidoidea* (*Hemiptera*) of Fennoscandia and Denmark. III. *Fauna ent. Scan.* 17: 1-314.
- HEIE O. E. 1992. The *Aphidoidea* (*Hemiptera*) of Fennoscandia and Denmark. IV. *Fauna ent. Scan.* 25: 1-189.
- HEIE O. E. 1994. The *Aphidoidea* (*Hemiptera*) of Fennoscandia and Denmark. V. *Fauna ent. Scan.* 25: 1-239.
- HEIE O. E. 1995. The *Aphidoidea* (*Hemiptera*) of Fennoscandia and Denmark. VI. *Fauna ent. Scan.* 31: 1-217.

- KLIMASZEWSKI S. M., WOJCIECHOWSKI W., CZYŁOK A., GĘBICKI C., HERCZEK A., JASIŃSKA J. 1980. Zgrupowania wybranych grup pluskwiaków równoskrzydłych (Homoptera) i różnoskrzydłych (Heteroptera) w lasach rejonu huty Katowice. *Acta Biol.*, Katowice, 8: 22-40.
- MATUSZKIEWICZ W. 2006. Przewodnik do oznaczania zbiorowisk roślinnych Polski. PWN, 537p.
- MIREK Z., PIĘKNOŚ-MIRKOWA H., ZAJĄC A., ZAJĄC M. 1995. Polish Botanical Studies Vascular Plants of Poland. A. Checklist. Guidebook series, 15: 1-303.
- NAWARA Z. 2006. Rośliny łąkowe. Multico Oficyna Wydawnicza, Warszawa, 272p.
- TAYLOR L. R. 1984. A Handbook for Aphid Identification. Rothamsted Exp. Station, Harpenden, 171p.
- ŻURAŃSKA I., KORDAN B., ŚLEDZ D. 1994. Badania nad występowaniem mszyc (*Homoptera*, *Aphididae*) na trawach nasiennych. *PPE*, 63: 369-378.

**Mszycy /Hemiptera, Aphidoidea/ zbiorowisk łąkowych z klasy
Phragmitetea i *Artemisietea***

Streszczenie

Badania dotyczące mszyc zbiorowisk łąkowych z klasy *Phragmitetea* i *Artemisietea* prowadzono w miejscowości Mniszek w latach 2006-2008. Do odłowu zastosowano 3 metody: pułapki Moerickego, czerpakowanie roślinności zielnej oraz bezpośredni zbiór z roślin zielnych. Metodą czerpakowania roślin w latach 2007-2008 odłowiono 30 gatunków mszyc. Najliczniej występował *Microlophium carnosum*, *R. padi*, *Cavariella pastinaceae*, *Sitobion fragariae*, *A. fabae solanella*, *Schizaphis graminum* i *Atheroides serrulatus*. Z pułapek Moerickego pozyskano 94 gatunki mszyc. Gatunkiem najliczniej odławianym w 2006r. był *Rhopalosiphum padi*. Kolejnymi licznie odnotowanymi gatunkami były *Phorodon humuli*, *Aphis fabae* oraz *Microlophium carnosum*. Natomiast w 2007r. dominował *A. fabae*, licznie występował *Microlophium carnosum*, *Rhopalosiphum padi*, *Tubaphis ranunculina* oraz grupa gatunków z rodzaju *Aphis*.