

Aphids /Hemiptera, Aphidoidea/ on meadow communities from the Molinio-Arrhenatheretea class

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Introduction

Meadows are plant communities which fulfil many functions, including the grazing function and one connected with the provision of good quality fodder. From the landscape design point of view, meadows constitute an attractive and ecologically important diversification of the landscape. They also provide a nutrient basis to a rich insect fauna which feed on nectar and pollen. Because of the rich plant fauna, in the meadow communities there are many insect species feeding on plant juice. Aphids, which are severe crop plant pests and dangerous virus disease vectors, are an important insect group to be found in meadows. Aphids are also an important link in the food chain of many beneficial insects which occur in agrocenoses.

Research concerning the connections of aphids with different plant communities was carried out by KLIMASZEWSKI *et al.* (1980); CZYŁOK (1983); CZYŁOK & WOJCIECHOWSKI (1996); HAŁAJ & WOJCIECHOWSKI (1996); DURAK & WOJCIECHOWSKI (2005). Since the research pointed out to the dependencies between aphids and meadow communities which they settle was not so extensive it seems justifiable to carry out subsequent observations.

The aim of this research was to determine the species composition, number and dynamics of Molinio-Arrhenatheretea class meadow communities.

Material and methods

The research was carried out in 2006-2007, in a selected meadow community, in the Bukówka river valley in the village of Mniszek, which is situated in the Czarnków-Trzcianka district in the region of Wielkopolska (mid-west of Poland). In the studied 100 ha area, a community of the Molinio-Arrhenatheretea class was selected. Floristic analysis in the given community was assessed on the basis of phytosociological photographs taken with the Braun-Blanquet method. Community naming was given according to the classification by MATUSZKIEWICZ (2006), and for plants according to MIREK *et al.* (1995).

The studied meadow community is an antropogenic, mezotrophic and temporarily humid habitat which has an extensive species diversity. Two plant communities are distinguished here.

The first community is Arrhenatheretum elatioris with a sub-community Arrhenatherum elatius elatioris typicum, in which Arrhenatheretum elatius is a dominating species. *Bromus hordeaceus*, *Elymus repens* and *Taraxacum officinale* have a large share in this community. Other herbs, weeds, grasses and papilionaceous plants are also present in large numbers. The second sub-community is Arrhenatheretum elatioris dactylidosum glomeratae, in which *Dactylis glomerata* and *Arrhenatherum elatius* with *Elymus repens* are the dominating species.

The second community is Alopecuretum pratensis, which has the highest share of species in undergrowth in which plants, herbs and weeds constitute as much as 53.8%, whereas papilionaceous plants only about 9%. The meadow foxtail is here a characteristic species which obtains the highest constancy and cover plant coefficient.

In order to find out more about the aphid fauna three research methods were applied. In 2006 and 2007 aphids were caught into Moericke traps applying 5 dishes each time. In 2006 the material was taken out 2 or 3 times a month, and in 2007 twice a month from May to October. The methods of the using of sweep net (in which one sample consisted of 4 x 25 beats) and direct collection from plants were applied in 2007.

Species of the collected specimens was identified using: HEIE'S (1980; 1982; 1986; 1992; 1994; 1995) and TAYLOR'S (1980) keys.

Out of all the insect catches into Moericke traps, only aphid species connected with meadow communities are mentioned in the paper.

Results

By means of the Moericke traps 4.308 specimens were collected. In 2006, 66 aphid species were collected (Tab. 1), and in 2007 – 72 aphid species or species groups (Tab. 2). By the use of sweep nets on the herbaceous plants 32 aphid

species were collected (Tab. 3), whereas direct collecting from plants resulted in recording 8 different aphid species (Tab. 4).

Rhopalosiphum padi (Linnaeus, 1758) was the most numerous collected species that was caught in Moericke traps (it constituted 58% of the captured aphids in 2006 and 31% in 2007). In both years *Aphis fabae* Scopoli, 1763 was also numerous (about 9% in 2006 and 18% in 2007) as well as aphids from the *Aphis* genus (6.3% in 2006 and 12.7% in 2007). *Phorodon humuli* (Schrank, 1801) was also quite numerous in the 2006 season (about 11%) and *Tubaphis ranunculina* (Walker, 1852) was popular (about 5%) in 2007 (Tab. 1 and 2).

All the remaining species were represented less numerously. The most numerous samples from the Moericke traps were obtained in spring and autumn during the aphids' migrant flights (Tab. 1 and 2). As far as the species composition is concerned, the wealthiest samples were noted in May and June (from 15 to 49 species in 2006 and from 17 to 37 species in the 2007 season). The smallest number of species was caught in the summer of 2006 (only 3 species in the beginning of September). Such significant decrease in the number of collected species was not recorded in the summer of 2007.

Four hundred and eighteen specimens were collected with the use of a sweep net. Here *R. padi* also turned out to be the dominating species (153 specimens) (Tab. 3). *Schizaphis graminum* (Rondani, (1847) 1852), *Macrosiphoniella sejuncta* (Walker, 1848), *Sitobion avenae* (Fabricius, 1775) and *Lipaphis erysimi* (Kaltenbach, 1843) were also numerous. Exactly the same species, which were collected by means of the previously described methods, were also collected directly from the plants. Yorkshire fog (*Holcus lanatus*) was most numerously settled by *S. avenae* and timothy-grass (*Phleum pratense*) by *S. graminum* (Tab. 4).

Table 1. Dynamics of meadow communities of the Molinio- Arrhenatheretea class aphids caught into Moericke traps in Mniszek in 2006 season

Species of aphid	Number of aphids in samples in a decade of 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	5	2	15	108	103	14	5	12	13	14	4	7	2	1	3	308	8.90	
<i>Aphis</i> sp.	6	21	11	102	31	27	8	6	2	3						217	6.27	
<i>Cavariella aegopodii</i> (Scop.)	2	14	8	2	3											29	0.84	
<i>Cavariella pastinaceae</i> (L.)	5		20	6			1				1					33	0.95	
<i>Cavariella theobaldi</i> Gill. Et Bragg	1	3	4	9											1	18	0.52	
<i>Rhopalosiphum padi</i> (L.)	8	27	3	41	20	6	11	5	5	4		94	248	499	1035	2006	57.96	
<i>Aphis sambuci</i> L.		1	1	19	3		1	1								26	0.75	
<i>Cavariella archangelicae</i> (Scop.)		1		6												7	0.20	

<i>Cryptomyzus galeopsidis</i> (Kalt.)	1														1	0.03
<i>Dysaphis</i> sp.	2														2	0.06
<i>Metopolophium dirhodum</i> (Walk.)	1						1	1	1						4	0.12
<i>Microlophium carnosum</i> (Buckt.)	1		2	1		1									5	0.14
<i>Uromelan</i> sp.	2	1	9		2		1					1			16	0.46
<i>Atheroides serrulatus</i> Hal.		4	2												6	0.17
<i>Aulacorthum solani</i> (Kalt.)		1			1										2	0.06
<i>Brachycaudus cardui</i> L.		1	5												6	0.17
<i>Brachycaudus helichrysi</i> (Kalt.)		1													1	0.03
<i>Brachycolus stellariae</i> (Hardy)		5	7	4											16	0.46
<i>Holcaphis</i> sp.		1													1	0.03
<i>Hyalopteroides humilis</i> (Walk.)		1			1			1	2						5	0.14
<i>Hyperomyzus lactucae</i> (L.)		2				1					1				4	0.12
<i>Myzus persicae</i> (Sulz.)		1	1		1	1						3	3	3	13	0.38
<i>Ovatomyzus calaminthae</i> Macch.		2	6												8	0.23
<i>Pemphigus</i> sp.		2		1											3	0.09
<i>Rhopalosiphoninus staphyleae</i> (Koch)		1													1	0.03
<i>Rhopalosiphum insertum</i> (Walk.)		1													1	0.03
<i>Schizaphis</i> sp.		1								1					2	0.06
<i>Sitobion fragariae</i> (Walk.)		1													1	0.03
<i>Thecabius affinis</i> (Kalt.)		2								1		1			4	0.12
<i>Therioaphis luteola</i> Szeleg.		1	1	1					1						4	0.12
<i>Aphis idaei</i> v.d.Goot			66	7	2	1									76	2.20
<i>Brachycaudus lychnidis</i> (L.)			5												5	0.14
<i>Brachycaudus</i> sp.		3	3												6	0.17
<i>Brevicorynae brassicae</i> (L.)			1	4	7	15									27	0.78
<i>Capitophorus elaeagni</i> (Del Gu.)			1	2	1							3	2	5	14	0.40
<i>Capitophorus similis</i> v.d. Goot			1												1	0.03
<i>Uroleucon</i> sp.			1	2		1									4	0.12
<i>Dysaphis plantaginea</i> (Pass.)			1	1	1	1	1	1			1				7	0.20
<i>Hayhurstia atriplicis</i> (L.)			2	1											3	0.09

<i>Macrosiphoniella perse- quens</i> (Walk.)				1														1	0.03
<i>Myzus cerasi</i> (F.)				5	1						1			1	2			10	0.29
<i>Ovatus crataegarius</i> (Walk.)				3	1													4	0.12
<i>Ovatus insitus</i> Walk.				1														1	0.03
<i>Phorodon humuli</i> (Schrk.)				399	3								1		1			404	11.67
<i>Protrama ranunculii</i> (Del Gu.)				1						1		2	1					5	0.14
<i>Submegoura heikinheimoi</i> (Brn.)				2														2	0.06
<i>Tubaphis ranunculina</i> (Walk.)				1														1	0.03
<i>Uroleucon taraxaci</i> (Kalt.)				11														11	0.32
<i>Anoecia corni</i> (F.)					1	1	3	1	3	2		5	4	3	8			31	0.90
<i>Anuraphis subterranea</i> (Walk.)					1	10	3	23	8	3								48	1.39
<i>Acyrtosiphon pisum</i> (Har- ris)						1	1		1							1		4	0.12
<i>Hyalopterus pruni</i> (Geoff.)						10	1	1										12	0.35
<i>Sitobion avenae</i> Brn.						1		1										2	0.06
<i>Anuraphis farfarae</i> (Koch)								8										8	0.23
<i>Aphis nasturtii</i> Kalt.								1										1	0.03
<i>Penphigus bursarius</i> L.								1										1	0.03
<i>Cryptomyzus ribis</i> (L.)										1								1	0.03
<i>Hyadaphis</i> sp.										2								2	0.06
<i>Therioaphis trifolii</i> (Mon.)										1								1	0.03
<i>Liphaphis erisimi</i> (Kalt.)												1						1	0.03
<i>Rhopalosiphum nymphaeae</i> (L.)												2	2	2	5			11	0.32
<i>Myzus lythri</i> (Schrk.)													1					1	0.03
<i>Tetraneura ulmi</i> (L.)													2					2	0.06
<i>Ceruraphis eriophori</i> (Walk.)														1				1	0.03
<i>Rhopalomyzus lonicerae</i> (Sieb.)														1				1	0.03
<i>Impatientinum asiaticum</i> (Nevsky)	27		94														1	1	0.03
Number of individuals	54	76	188	831	191	86	65	53	35	35	6	115	268	514	1065	3461			100.00
Number of species	15	22	32	49	22	19	21	15	9	12	3	10	12	12	18				

Table 2. Dynamics of meadow communities of the Molinio- Arrhenatheretea class aphids caught into Moericke traps in Mniszek in 2007 season

Species of aphid	Number of aphids in samples in the month											Total	%
	May	June		July		August		September		October			
	II	I	II	I	II	I	II	I	II	I			
<i>Acyrtosiphon pisum</i> (Harris)	2	1							1	1	1	6	0.71
<i>Anuraphis farfarae</i> (Koch)	1											1	0.12
<i>Aphis fabae</i> Scop	26	62	31	15	9	6	1	5			1	156	18.42
<i>Aphis sambuci</i> L.	3	17	2		1							23	2.72
<i>Aphis</i> sp.	5	59	15	9	6	8	4	2				108	12.75
<i>Brachycaudus cardui</i> L.	1										2	3	0.35
<i>Brachycaudus helichrysi</i> (Kalt.)	3	1										4	0.47
<i>Brachycaudus lychnidis</i> (L.)	2	3										5	0.59
<i>Cavariella pastinaceae</i> (L.)	9	1				1	3					14	1.65
<i>Hyperomyzus lactucae</i> (L.)	1		1	2								4	0.47
<i>Metopolophium dirhodum</i> (Walk.)	4	1									1	6	0.71
<i>Myzus persicae</i> (Sulz.)	2				2							4	0.47
<i>Phorodon humuli</i> (Schrk.)	3	12				1						16	1.89
<i>Protrama ranunculi</i> (Del Gu.)	2											2	0.24
<i>Rhopalosiphum padi</i> (L.)	33	4	4	5	10	1	4		40	164	265	31.29	
<i>Saltusaphis scirpus</i> Theob.	1											1	0.12
<i>Subsaltusaphis flava</i> H.R.L.	3	1										4	0.47
<i>Uromelan</i> sp.	1	1	1		1							4	0.47
<i>Dysaphis hirutissima</i> (Börn.)		1										1	0.12
<i>Aphis idaei</i> v.d.Goot		1	1	2								4	0.47
<i>Aphis plantaginis</i> Goeze		2										2	0.24
<i>Aphis taraxacicola</i> (Börn.)		7										7	0.83
<i>Aphis urticae</i> F.		4		1								5	0.59
<i>Brachycolus stellariae</i> (Hardy)		1										1	0.12
<i>Brachycaudus persicae</i> (Pass.)		1										1	0.12
<i>Brachycaudus populi</i> (d. Guerc.)		1										1	0.12
<i>Capitophorus elaeagni</i> (Del Gu.)		5							1			6	0.71
<i>Capitophorus carduinus</i> (Walk.)		1										1	0.12
<i>Cavariella theobaldi</i> Gill. et Bragg		1					1					2	0.24
<i>Cryptomyzus galeopsidis</i> (Kalt.)		1		1	2	1						5	0.59
<i>Diuraphis noxia</i> (Mordv.)		1	2									3	0.35
<i>Dysaphis plantaginea</i> (Pass.)		5							1			6	0.71
<i>Hyalopterus pruni</i> (Geoff.)		1		2	5	1						9	1.06
<i>Lipaphis erisimi</i> (Kalt.)		1							2			3	0.35

<i>Macrosiphum rosae</i> (L.)	1										1	0.12
<i>Myzus ascalonicus</i> Donc.		1									1	0.12
<i>Pleotrichophorus glandulosus</i> (Kalt.)		1									1	0.12
<i>Schizaphis graminum</i> (Rond.)		5			1			1			7	0.83
<i>Sitobion avenae</i> Börn.		1		2		1	2				6	0.71
<i>Uroleucon cirsii</i> (L.)		1									1	0.12
<i>Metopolophium albidum</i> H.R.L.		1							2		3	0.35
<i>Uroleucon</i> sp.		1							1		2	0.24
<i>Melanaphis luzulella</i> H.R.L.		1		2			1				4	0.47
<i>Brevicorynae brassicae</i> (L.)			2	1							3	0.35
<i>Cryptaphis poae</i> (Hardy)			1					1			2	0.24
<i>Macrosiphoniella tapuskae</i> (Hott.et Fris.)			2								2	0.24
<i>Macrosiphum</i> sp.			4								4	0.47
<i>Megourella purpurea</i> H.R.L.			1								1	0.12
<i>Microlophium carnosum</i> (Buckt.)			1					1		4	6	0.71
<i>Rhopalosiphoninus staphyleae</i> (Koch)			1	1						1	3	0.35
<i>Uroleucon achilleae</i> (Koch)			1			1					2	0.24
<i>Uroleucon taraxaci</i> (Kalt.)			2	1		1					4	0.47
<i>Anoecia corni</i> (F.)				2	2	2	1	6	2	10	25	2.95
<i>Subacyrthosiphon cryptobium</i> H.R.L.				1	1						2	0.24
<i>Ceruraphis eriophori</i> (Walk.)					2		1			1	4	0.47
<i>Hyadaphis foeniculi</i> (Pass.)					1	2	2	1			6	0.71
<i>Megoura viciae</i> Buckt.					1						1	0.12
<i>Rhopalosiphum nymphæae</i> (L.)					2	1		1			4	0.47
<i>Thecabius affinis</i> (Kalt.)						1			1		2	0.24
<i>Schizaphis jaroslavi</i> (Mordv.)						1					1	0.12
<i>Rhopalosiphum rufulum</i> Rich.								2			2	0.24
<i>Capitophorus similis</i> v.d.Goot								1		1	2	0.24
<i>Cavariella aegopodii</i> (Scop.)								1			1	0.12
<i>Cavariella archangelicae</i> (Scop.)								1			1	0.12
<i>Macrosiphoniella sejuncta</i> (Walk.)								4	2	1	7	0.83
<i>Ovatus insitus</i> Walk.								1			1	0.12
<i>Metopolophium festucae</i> Theob.									1		1	0.12
<i>Macrosiphoniella oblecta</i> (Börn.)									4		4	0.47
<i>Tubaphis ranunculina</i> (Walk.)									12	31	43	5.08
<i>Capitophorus hippophaes</i> (Walk.)										1	1	0.12
<i>Dysaphis</i> sp.										1	1	0.12
<i>Rhopalosiphum insertum</i> (Walk.)										2	2	0.24
Number of individuals	102	210	72	47	46	29	22	29	68	222	847	100.00
Number of species	18	37	17	15	15	15	11	15	12	15		

Table 3. Aphid species caught by the sweep net method in meadow community of the Molinio-Arrhenatheretea class in Mniszek in 2007 season

Date	Species	Number	Date	Species	Number
5.05.07	<i>Rhopalosiphum padi</i> (L.)	1	11.07.07	<i>Rhopalosiphum padi</i> (L.)	2
	<i>Lipaphis erisimi</i> (Kalt.)	15		<i>Dysaphis plantaginea</i> (Pass.)	1
23.05.07	<i>Atheroides serrulatus</i> Hal.	1	28.08.07	<i>Lipaphis erisimi</i> (Kalt.)	7
	<i>Aphis acetosae</i> L.	2		<i>Atheroides serrulatus</i> Hal.	4
	<i>Aphis epilobii</i> Kalt.	2		<i>Schizaphis graminum</i> (Rond.)	46
	<i>Rhopalosiphum padi</i> (L.)	27		<i>Anoecia corni</i> (F.)	1
	<i>Schizaphis graminum</i> (Rond.)	12		<i>Rhopalosiphum padi</i> (L.)	17
	<i>Lipaphis erisimi</i> (Kalt.)	2		<i>Uroleucon achilleae</i> (Koch)	1
	<i>Cavariella pastinaceae</i> (L.)	2	25.09.07	<i>Rhopalosiphum padi</i> (L.)	59
	<i>Myzus ornatus</i> Laing	1		<i>Schizaphis graminum</i> (Rond.)	9
	<i>Rhopalosiphum insertum</i> (Walk.)	1		<i>Cavariella theobaldi</i> Gill. Et Bragg	9
	<i>Sitobion avenae</i> Börn.	2		<i>Tubaphis ranunculina</i> (Walk.)	2
<i>Capitophorus elaeagni</i> (Del Gu.)	1	<i>Atheroides serrulatus</i> Hal.		5	
<i>Coloradoa artemisiae</i> (d. Guerc.)	11	<i>Rhopalosiphum insertum</i> (Walk.)		6	
<i>Aphis</i> sp.	2	<i>Metopolophium dirhodum</i> (Walk.)		1	
<i>Rhopalosiphum maidis</i> (Fitch)	6	<i>Lipaphis erisimi</i> (Kalt.)		7	
13.06.07	<i>Rhopalosiphum padi</i> (L.)	6	<i>Thecabius affinis</i> (Kalt.)	1	
	<i>Sitobion avenae</i> Börn.	15	<i>Hyadaphis foeniculi</i> Pass.)	1	
	<i>Schizaphis graminum</i> (Rond.)	7	<i>Macrosiphoniella sejuncta</i> (Walk.)	20	
	<i>Macrosiphoniella persequens</i> (Walk.)	1	<i>Macrosiphoniella</i> sp.	7	
	<i>Macrosiphoniella oblecta</i> (Börn.)	1	<i>Rhopalosiphum padi</i> (L.)	41	
	<i>Macrosiphum gei</i> (Koch)	1	<i>Metopolophium dirhodum</i> (Walk.)	1	
29.06.07	<i>Acyrtosiphon pisum</i> (Harris)	3	10.10.07	<i>Atheroides serrulatus</i> Hal.	5
	<i>Sitobion avenae</i> Börn.	18		<i>Tubaphis ranunculina</i> (Walk.)	1
	<i>Anoecia corni</i> (F.)	1		<i>Thecabius affinis</i> (Kalt.)	2
	<i>Schizaphis graminum</i> (Rond.)	3		<i>Sitobion avenae</i> Börn.	1
	<i>Macrosiphoniella sejuncta</i> (Walk.)	1		<i>Macrosiphoniella sejuncta</i> (Walk.)	7
	<i>Metopolophium albidum</i> H.R.L.	2		<i>Capitophorus carduius</i> (Walk.)	1
	<i>Myzus cerasi</i> (F.)	1		<i>Melanaphis luzulella</i> H.R.L.	5

Table 4. Aphid species collected from green plants in meadow community of the Molinio- Arrhenatheretea class in Mniszek in 2007 season

Date	Species of plant	Species of aphid
23.05.07	<i>Holcus lanatus</i>	<i>Rhopalosiphum padi</i> (L.)
13.06.07	<i>Holcus lanatus</i>	<i>Sitobion fragariae</i> (Walk.)
	<i>Cirsium arvense</i>	<i>Aphis fabae</i> Scop
29.06.07	<i>Dactylis glomerata</i>	<i>Sitobion fragariae</i> (Walk.)
	<i>Vicia cracca</i>	<i>Acyrtosiphon pisum</i> (Harris)
	<i>Polygonum</i> sp.	<i>Aphis fabae solanella</i> Theob.
30.07.07	<i>Raphanus raphanistrum</i>	<i>Lipaphis erysimi</i> (Kalt.)
17.08.07	<i>Sinapis alba</i>	<i>Lipaphis erysimi</i> (Kalt.)
28.08.07	<i>Phleum pratense</i>	<i>Schizaphis graminum</i> (Rond.)
25.09.07	<i>Carum carvi</i>	<i>Cavariella theobaldi</i> Gill. Et Bragg

Discussion

Rich aphid fauna was observed to occur in meadow communities of the Molinio-Arrhenatheretea. During two-year-long observations, 106 aphid species were registered. When studying aphids of the plant communities of the Western Bieszczady Mountains (south east Poland), CZYŁOK *et al.* (1988) recorded 41 species on hay-growing meadows and pastures from the Molinio-Arrhenatheretea group. The authors included the following species into a group of characteristic species, forming this community: *Anuraphis subterranea* (Walker, 1852), *Aphis lambersi* (Boerner, 1940), *Aphis taraxacicola* (Boerner, 1940), *Aulacorthum knautia* Heie, 1960, *Brachycaudus tragopogonis* (Kaltenbach, 1843), *Dysaphis anthrisci* Boerner, 1950, and *Semiaphis dauci* (Fabricius, 1775). They obtained 12 species out of semi-natural and antropogenic communities of permanently or temporarily humid hay-growing meadows of the same class of plants. Out of those species only *Rhopalomyzus lonicerae* (Siebold, 1839), *Aphis ulmariae* Schrank, 1801 and *Macrosiphum cholodkovsky* (Mordvilko, 1909) could be considered characteristic to plant communities of this order.

Out of the aphid species mentioned above only *A. subterranea*, *R. lonicerae* and *A. taraxacicola* were confirmed in the studied meadow community in the village of Mniszek. These species were scarcely present.

HAŁAJ & WOJCIECHOWSKI (1996) studied aphid communities associated with sward communities from the classes of Festuco-Brometea and Sedo Scleranthetea of the Częstochowska Upland. From 16 to 44 aphid species were collected from 9 research sites. Most species were collected from the green sward

in relation to *Cirsio-Brachypodium*, where *Pseudobrevicorynae erysimi* Holman, 1963 and *Aphis stachidis* Mordvilko, 1929 were dominating species. Neither of these species was registered in the studied site of the *Molinio-Arrhenatheretea* class.

In the research carried out in the communities of the *Molinio-Arrhenatheretea* class, *R. padi* turned out to be the dominating species. It is a heteroecious species which migrates from bird-cherry tree onto grasses. WILKANIEC (2004), who carried out research in parks and urban green areas, also referred to this species as a dominating one in these sites. Similarly, ŻURAŃSKA *et al.* (1994), who studied the presence of aphids on seed grasses, referred to this species as a sub-dominating one. She claimed that the presence of aphids in particular grass species was dependent to a large extent on the content of nitrate nitrogen in their cells. Accordingly, *S. avenae* was most likely to settle cocksfoot (*Dactylis glomerata*), while *R. padi* – meadow fescue (*Festuca pratensis*). In the research carried out in the village of Mniszek, the velvetgrass (*Holcus lanatus*) was most likely to be settled by *S. avenae*.

References

- CZYŁOK A. 1983. Zgrupowania mszyc (*Homoptera, Aphidoidea*) wybranych zbiorowisk leśnych kłoc Pińczowa. *Acta Biol.*, 13: 114-130.
- CZYŁOK A., WOJCIECHOWSKI W. 1987. Communities of Aphids (*Homoptera, Aphidoidea*) of the Xerothermic Vegetation in Niecka Nidziańska. *Acta Biol. Sil., Katowice*, 6(23): 37- 42.
- 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.
- HĄŁAJ 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, Warszawa. 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.
- TAYLOR L.R. 1984. A Handbook for Aphid Identification. Rothamsted Exp. Station, Harpenden. 171p.
- WILKANIEC B. 2004. Afidofauna Ogrodu Botanicznego w Poznaniu. [In:] P. Indykiewicz, T. Barczak. Fauna Miast Europy Środkowej 21. wieku. LOGO, Bydgoszcz: 167-177.
- ŻURAŃSKA I., KORDAN B., ŚLEDŹ D. 1994. Badania nad występowaniem mszyc (*Homoptera*, *Aphididae*) na trawach nasiennych. *PPE*, 63: 369-378.

Mszycy /Hemiptera, Aphidoidea/ zbiorowisk łąkowych z klasy Molinio-Arrhenatheretea

Streszczenie

Badania dotyczące mszyc zbiorowisk łąkowych z klasy *Molinio-Arrhenatheretea* prowadzono w miejscowości Mniszek leżącej w dolinie rzeki Bukówki w latach 2006-2007. Zastosowano 3 metody badawcze: pułapki Moerickego, czerpakowanie roślinności zielnej oraz zbiór bezpośrednio z roślin zielnych. Pozyskano 106 gatunków mszyc. Najliczniej odławianym taksonem był *Rhopalosiphum padi*, licznie odławiano także *Aphis fabae* oraz mszyce z rodzaju *Aphis*. Dość licznie w próbach pojawił się w 2006 r. *Phorodon humuli*, a 2007 r. *Tubaphis ranunculina*. Metodą czerpakowania roślin licznie w próbach odławiano *Schizaphis graminum*, *Macrosiphoniella sejuncta*, *Sitobion avenae* i *Lipaphis erisimi*. Najliczniejsze próby pozyskiwano wiosną i jesienią, a najbogatsze pod względem składu gatunkowego w maju i czerwcu.

