RESEARCHES REGARDING THE INFLUENCE OF ZONE ECOLOGICAL CONCERNING THE POTATO APHID FAUNA DINAMICS FROM S.D TIMIŞOARA AND VARFURILE

CERCETARI PRIVIND INFLUENTA CONDITIILOR ECOLOGICE ZONALE ASUPRA DINAMICII AFIDOFAUNEI CARTOFULUI LA S.D. TIMISOARA SI VARFURILE

LIANA MIHAELA FERICEAN, I. PĂLĂGEŞIU, CRISTINA ZEPA

Agricultural and Veterinary University of the Banat, Timişoara, Romania

Abstract: *This paper presents data referring to the dynamics of aphid species from potato cultivations, for a period of two years 2005-2006, from Didactic Station Timisoara and Varfurile County. Between the two zone there are differences regarding the altitude and also ecological conditions. In pedoclimatic conditions of the Western part of Romania, potato aphids fauna is rich having in total a number of 42 species. In the lower plain at STN Timisoara there were collected 34 species. In the Virfurile mountain area have been collected 42 species.*

Rezumat: *Lucrarea prezintă date privind dinamica speciilor de afide din culturile de cartof pe o perioadă de doi ani, 2005-2006 de la Statiunea Didactica Timisoara si Varfurile. Intre cele doua zone sunt diferente in ceea ce priveste altitudinea, precum si conditiile ecologice. În conditiile pedoclimatice din Vestul României afidofauna culturilor de cartof este bogată însumand în total 42 de specii. În câmpia joasă la STN, Timisoara au fost colectate 34 specii de afide. În zona montană la Vârfurile au fost colectate 42 specii de afide.*

Key words**:** *potato, aphids, fauna, abundance, dominance, Timisoara Varfurile*
Cuvinte cheie: *cartof, afide, fauna, abundență, dominanță, Timisoara, Varfurile*

INTRODUCTION

Aphids are one of the most studied entomological group, as regular pests and especially as virus vector of cultivated plant.

In Romania researches were carried out at the ICCP, Brasov by DONESCU (1996), (1997), (1998), (2001) and DRAICA (1996). In the Western part of Romania, however, the aphid fauna of the potato crops have not been studied. In the climatic conditions specific for this Western zone aphids have a characteristic structure.

The knowledge regarding the potato aphid fauna, the abundance and dominance in the West Plain of Romania are not yet existent. The paper presents some data referring to the difference of potato aphid populations, structure in the two zones, in the aim of the potato fields protection.

MATERIAL AND METHODS

The researches have been carried out for a period of two years, 2005-2006 in the experimental field of the Didactic Station Timisoara (STN) and Varfurile County. The aphids have been collected with the yellow traps every two days. The monitoring of aphids began on first of May and lasted until 30th of August. The collected aphids were prepared, conserved and determined. Abundance and dominance were calculated with usual methods.

RESULTS AND DISCUSSIONS

In 2005 from the potato cultivations at STN Timisoara were collected 31 species with an annual abundance of 1434 individuals (table 1).

Regarding the monthly aphid abundance, we can observe the difference between the months. In May there were collected 19 species of aphids with total abundance of 300 individuals. In the first ten days there were collected fewer individuals and in the second period there were collected the greatest number of individuals (156).

June is characterized by the most increased fly of aphids, reaching the greatest values in the last decade (598 individuals). In this month there were collected 24 species of aphids with a total abundance of 922 individuals.

In July there were collected 15 species of aphids, with a total abundance of 162 individuals. In the first twenty days of the month the number was very low, reaching maximum of 120 individuals in last decade.

In August there were collected 15 species with a total abundance of 49 individuals.

Table 1

Abundance and dominance of aphid species at S.D, Timisoara, 2005

No.	TAXON	MAY		JUNE		JULY		AUGUST		A. Total	D Total
		A	D	A	D	A	D	A	D		
1	*Acyrthosiphum pisum*	6	2	35	3,79	2	1,23	1	1,81	44	3,05
2	*Anuraphis farfarae*			2	0,21					2	0,13
3	*Aphis acetosae*	1	0,33							1	0,06
4	*Aphis craccae*					1	0,61			1	0,06
5	*Aphis craccivora*	3	1	5	0,54	3	1,85	2	3,63	13	0,90
6	*Aphis fabae*	63	21	195	21,14	37	22,83	12	21,81	307	21,33
7	*Aphis frangulae*	23	7,66	97	10,52	12	7,40	14	25,45	146	10,14
8	*Aphis nasturtii*	8	2,66	39	4,22	9	5,55			56	3,89
9	*Aphis pomi*	1	0,33	4	0,43	3	1,85	3	5,45	11	0,76
10	*Aphis sambuci*							1	1,81	1	0,06
11	*Aulachorthum circumflexus*			3	0,32					3	0,20
12	*Aphis sp*	6	2	7	0,75	5	3,08			18	1,25
13	*Aulachortum solani*	54	18	181	19,63	13	8,02			248	17,23
14	*Brachycaudus cardui*	1	0,33			1	0,61	1	1,81	3	0,20
15	*Brachycaudus helichrysi*	5	0,33	25	2,71	2	1,23	2	3,63	34	2,36
16	*Brevicoryne brassicae*	5	1,66	17	1,84	17	10,49	3	5,45	42	2,9
17	*Cavariella aegopodii*	6	2	6	0,65	2	1,23	1	1,81	15	1,04
18	*Cavariella pastinacae*	2	0,66	1	0,10			1	1,81	4	0,27
19	*Dysaphis plantaginea*			2	0,21					2	0,13
20	*Hyalopterus pruni*					3	1,85	3	5,45	6	0,41
21	*Hyperomyzus lactucae*					1	0,61			1	0,06
22	*Macr. artemisiae*					1	0,61			1	0,06
23	*Macr. euphorbiae*	100	33,3	223	24,18	31	19,13	1	1,81	355	24,66
24	*Macrosiphum rosae*	5	1,66	5	0,54	4	2,46			14	0,97
25	*Myzus ascalonicus*			2	0,21	1	0,61	1	1,81	4	0,27
26	*Myzus persicae*	6	1,33	41	4,44	8	4,93	3	5,45	58	4,03
27	*Phorodon humuli*	9	3	17	1,84	1	0,61			27	1,87
28	*Rh. insertum*			1	0,10	3	1,85			4	0,27
29	*Rhopalosiphum padi*	2	0,66	8	0,86	1	0,61			11	0,76
30	*Schizaphis graminum*			5	0,54	1	0,61			6	0,41
31	*Sitobion avenae*			1	0,10					1	0,06
	TOTAL:	300		922		162		49		1439	

In this year the most abundant species were: *Macrosiphum euphorbiae* with an abundance of 355 individuals, *Aphis fabae* with an abundance of 307 individuals, *Aulachortum solani* with an abundance of 248 individuals and *Aphis frangulae* with an abundance of 146 individuals.

Table 2

Abundance and dominance of aphid species at Varfurile, 2005

Nr.	TAXONUL	MAI		IUNIE		IULIE		AUGUST		AB. TOT	DOM TOT
		A	D	A	D	A	D	A	D		
1	*Acyrthosiphum pisum*	2	1,69	21	3,42	1	0,52	1	1,21	25	2,49
2	*Anuraphis farfarae*			1	0,16					1	0,09
3	*Aphis acetosae*	2	1,69							2	0,19
4	*Aphis craccae*					1	0,52			1	0,09
5	*Aphis craccivora*	2	1,69	4	0,65	3	1,57	2	2,43	11	1,09
6	*Aphis fabae*	12	10,16	124	20,19	37	19,47	7	8,53	180	17,92
7	*Aphis frangulae*	17	14,40	67	10,91	12	6,31	12	14,63	108	10,75
8	*Aphis nasturtii*	8	6,77	26	4,23	9	4,73			43	4,28
9	*Aphis pomi*	1	0,84	3	0,48	3	1,57	2	2,43	9	0,89
10	*Aphis sambuci*							2	2,43	2	0,19
11	*Aulachorthum circumflexus*			1	0,16					1	0,09
12	*Aphis sp*	4	3,38	5	0,81	3	1,57			12	1,19
13	*Aulachortum solani*	23	19,49	115	18,72	8	4,21			146	14,54
14	*Brachycaudus cardui*	1	0,84			1	0,52	2	2,43	4	0,39
15	*Brachycaudus helichrysi*	1	0,84	23	3,74	18	9,47	4	4,87	46	4,58
16	*Brevicoryne brassicae*	3	2,54	13	2,11	15	7,89	3	3,65	34	3,38
17	*Cavariella aegopodii*	2	1,69	5	0,81	2	1,05	3	3,65	12	1,19
18	*Cavariella pastinacae*	2	1,69	1	0,16			1	1,21	4	0,39
19	*Dysaphis plantaginea*			2	0,32					2	0,19
20	*Hyalopterus pruni*					2	1,05	3	3,65	5	0,49
21	*Hyperomyzus lactucae*					1	0,52			1	0,09
22	*Macrosiphum artemisiae*					1	0,52			1	0,09
23	*Macrosiphum euphorbiae*	22	18,64	145	23,61	19	10	1	1,21	187	18,62
24	*Macrosiphum rosae*	5	4,23	3	0,48	4	2,10			12	1,19
25	*Myzus ascalonicus*	1	0,84	1	0,16	9	4,73	2	2,43	13	1,29
26	*Myzus persicae*			28	4,56	30	15,78	31	37,80	89	8,86
27	*Phorodon humuli*	5	4,23	14	2,28	1	0,52			20	1,99
28	*Phyllaphis fagi*	1	0,84					3	3,65	4	0,39
29	*Pterocallis alni*	2	1,69	2	0,32					4	0,39
30	*Rhopalosiphum insertum*			1	0,16	2	1,05			3	0,29
31	*Rhopalosiphum padi*	2	1,69	4	0,65	1	0,52			7	0,69
32	*Schizaphis graminum*			3	0,48	1	0,52			4	0,39
33	*Sitobion avenae*			2	0,32					2	0,19
34	*Therioaphis ononidis*					4	2,10			4	0,39
35	*Therioaphis trifolii*					2	1,05	3	3,65	5	0,49
	TOTAL:	118		614		190		82		1004	

In 2005 from the potato cultivations at Varfurile there were collected 35 species with an annual abundance of 1004 individuals (table 2).

Regarding the monthly aphid abundance, we can observe the difference between the months.

In May there were collected 21 species of aphids with total abundance of 118 individuals. In the first ten days there were collected fewer individuals and in the second period there were collected the greatest number of individuals.

June is characterized by the most increased fly of aphids, reaching the greatest values in the last decade (392 individuals). In this month there were collected 25 species of aphids with a total abundance of 614 individuals.

In July there were collected 26 species of aphids, with a total abundance of 190 individuals. In the first twenty days of the month the number was very low, reaching maximum of 129 individuals in last decade.

In August there were collected 17 species with a total abundance of 82 individuals

In this year the most abundant species were: *Macrosiphum euphorbiae* with an abundance of 187 individuals, *Aphis fabae* with an abundance of 180 individuals, *Aulachortum solani* with an abundance of 146 individuals and *Aphis frangulae* with an abundance of 108 individuals.

In 2006 from the potato cultivations at Didactic Station Timisoara (STN) there were collected 30 species with an annual abundance of 3270 individuals (table 3).

Regarding the monthly aphids abundance we can observe the differences between the months.

In May there were collected 22 species of aphids with total abundance of 2071 individuals. In this month there were collected the greatest number of individuals of 2006, *Phorodon humuli* increased to 1830.

In June there were collected 22 species of aphids with a total abundance of 351 individuals.

In July there were collected the greatest number of species 25 species of aphids, with a total abundance of 186 individuals.

In August there were collected 16 species with a total abundance of 32 individuals.

Table 3

Abundance and dominance of aphid species at STN, Timisoara, 2006

No.	TAXON	MAY		JUNE		JULY		AUGUST		A. Total	D Total
		A	D	A	D	A	D	A	D		
1	*Acyrthosiphum pisum*	3	0,11	2	0,56	4	2,15	1	3,12	10	0,30
2	*Aphis craccae*					8	4,30			8	0,24
3	*Aphis craccivora*	8	0,29	3	0,85	6	3,22	2	6,25	19	0,58
4	*Aphis fabae*	285	10,55	67	19,08	31	16,66	6	18,75	389	11,89
5	*Aphis frangulae*	130	4,81	33	9,40	10	5,37	5	15,62	178	5,44
6	*Aphis nasturtii*	275	10,18	18	5,12	4	2,15			297	9,08
7	*Aphis pomi*	2	0,07	2	0,56	8	4,30	3	9,37	15	0,45
8	*Aphis sp*	10	0,37	11	3,13	7	3,76	2	6,25	30	0,91
9	*Aphis rumicis*	1	0,03			1	0,53			2	0,06
10	*Aulachortum circumflexus*			2	0,56					2	0,06
11	*Aulachortum solani*	32	1,18	17	4,84	30	16,12			79	2,41
12	*Brachycaudus cardui*	1	0,03					1	3,12	2	0,06
13	*Brachycaudus helichrysi*	41	1,51	21	5,98	3	1,61	1	3,12	66	2,01
14	*Brevicoryne brassicae*	10	0,37	1	0,28	26	13,97	1	3,12	38	1,16
15	*Cavariella aegopodii*	7	0,25	2	0,56	5	2,68	1	3,12	15	0,45
16	*Cavariella pastinacae*	1	0,03	3	0,85	1	0,53	1	3,12	6	0,18
17	*Hyperomyzus lactucae*					3	1,61			3	0,09
18	*Hyalopterus pruni*	4	0,14					1	3,12	5	0,15
19	*Macrosiphum artemisiae*					1	0,53			1	0,03
20	*Macrosiphum euphorbiae*	15	0,55	13	3,70	13	6,98	2	6,25	43	1,31
21	*Macrosiphum rosae*	2	0,07	1	0,28	3	1,61			6	0,18
22	*Myzus ascalonicus*	1	0,03	1	0,28	1	0,53	1	3,12	4	0,12
23	*Myzus persicae*	30	1,11	28	7,97	6	3,22	3	9,37	67	2,04
24	*Phorodon humuli*	1830	67,75	100	28,49	11	5,91	1	3,12	1942	59,38
25	*Rhopalosiphoninus latysiphon*					1	0,53			1	0,03
26	*Rhopalosiphum insertum*			3	0,85	1	0,53			4	0,12
27	*Rhopalosiphum padi*	12	0,44	21	5,98	1	0,53			34	1,03
28	*Rhopalosiphum poae*	1	0,03							1	0,03
29	*Schizaphis graminum*			1	0,28	1	0,53			2	0,06
30	*Sitobion avenae*			1	0,28					1	0,03
	TOTAL:	2071		351		186		32		3270	

In this year the most abundant species was *Phorodon humuli* with an abundance of 1942 individuals followed by *Aphis fabae* with an abundance of 389 individuals, *Aphis nasturti* with an abundance of 298 individuals and *Aphis frangulae* with an abundance of 178 individuals

In 2006 from the potato cultivations at Varfurile there were collected 33 species with an annual abundance of 622 individuals (table 4).

Regarding the monthly aphids abundance we can observe the differences between the months.

In May there were collected 21 species of aphids with total abundance of 118 individuals.

In June there were collected 25 species of aphids with a total abundance of 614 individuals.

In July there were collected the greatest number of species 27 species of aphids, with a total abundance of 244 individuals.

In August there were collected 16 species with a total abundance of 48 individuals

In this year the most abundant species was *Aphis fabae* with an abundance of 85 individuals, *Aulachortum solani* with an abundance of 73.

Table 4

Abundance and dominance of aphid species at Varfurile, 2006

No	TAXON	MAY		JUNE		JULY		AUGUST		A. Total	D Total
		A	**D**	**A**	**D**	**A**	**D**	**A**	**D**		
1	*Acyrthosiphum pisum*	11	8,20	3	1,53	8	3,27	1	2,08	23	3,69
2	*Anuraphis farfarae*					4	1,63			4	0,64
3	*Aphis craccivora*	14	10,44	11	5,61	5	2,04	2	4,16	32	5,14
4	*Aphis fabae*	10	7,46	35	17,85	27	11,06	13	27,8	85	13,66
5	*Aphis frangulae*	9	6,71	34	17,34	9	3,68	5	10,41	57	9,16
6	*Aphis nasturtii*	10	7,46	10	5,10	8	3,27			28	4,50
7	*Aphis pomi*	2	1,49	4	2,04	3	1,22	4	8,33	13	2,09
8	*Aphis idaei*			8	4,08					8	1,28
9	*Aphis sp*	8	5,97			7	2,86	2	4,16	17	2,73
10	*Aphis rumicis*	1	0,74			1	0,40			2	0,32
11	*Aphis verbasci*	1	0,74	1	0,51					2	0,32
12	*Aulachortum solani*	13	9,70	26	13,26	34	13,93			73	11,73
13	*Brachycaudus cardui*	1	0,74					2	4,16	3	0,48
14	*Brachycaudus helichrysi*	14	10,44	13	6,63	4	1,63	1	2,08	32	5,14
15	*Brevicoryne brassicae*	10	7,46	1	0,51	29	11,88	3	6,25	43	6,91
16	*Cavariella aegopodii*	3	2,23	2	1,02	40	16,39	1	2,08	46	7,39
17	*Cavariella pastinacae*	1	0,74	4	2,04	2	0,81	2	4,16	9	1,44
18	*Dysaphis plantaginea*			1	0,51	1	0,40			2	0,32
19	*Hyalopterus pruni*	4	2,98					1	2,08	5	0,80
20	*Eriosoma ulmi*			1	0,51	1	0,40			2	0,32
21	*Hyperomyzus lactucae*					3	1,22			3	0,48
22	*Macr. euphorbiae*	7	5,22	9	4,59	13	5,32	2	4,16	31	4,98
23	*Macrosiphum rosae*	2	1,49	1	0,51	3	1,22			6	0,96
24	*Myzus ascalonicus*	1	0,74	1	0,51	3	1,22	2	4,16	7	1,12
25	*Myzus persicae*			11	5,61	24	9,83	6	12,5	41	6,59
26	*Phorodon humuli*	1	0,74	1	0,51	3	1,22	1	2,08	6	0,96
27	*Phyllaphis fagi*			1	0,51	1	0,40			2	0,32
28	*Rh. latysiphon*					2	0,81			2	0,32
29	*Rh. insertum*			3	1,53	2	0,81			5	0,80
30	*Rhopalosiphum padi*	9	6,71	11	5,61	4	1,63			24	3,85
31	*Rhopalosiphum poae*	2	1,49							2	0,32
32	*Schizaphis graminum*			2	1,02	3	1,22			5	0,80
33	*Sitobion avenae*			2	1,02					2	0,32
	TOTAL:	134		196		244		48		622	

CONCLUSIONS

In the two years of the investigations at Varfurile the most frequent species was *Aphis fabae*. The most dangerous species, *Myzus persicae,* has presented in 2005 an abundance of 89 individuals and in 2006 an abundance of 41 individuals.

At STN Timisoara there were collected a lower number of species than at Varfurile, but the abundance was bigger at STN Timisoara.

In 2005 at STN Timisoara the most abundant species were: *Macrosiphum euphorbiae* with an abundance of 355 individuals, *Aphis fabae* with an abundance of 307 individuals, *Aulachortum solani* with an abundance of 248 individuals and *Aphis frangulae* with an abundance of 146 individuals.

At Varfurile in this year the most abundant species were: *Macrosiphum euphorbiae* with an abundance of 187 individuals, *Aphis fabae* with an abundance of 180 individuals, *Aulachortum solani* with an abundance of 146 individuals and *Aphis frangulae* with an abundance of 108 individuals.

In 2006 at STN Timisoara the most abundant species was *Phorodon humuli* with an abundance of 1942 individuals followed by *Aphis fabae* with an abundance of 389 individuals, *Aphis nasturti* with an abundance of 298 individuals and *Aphis frangulae* with an abundance of 178 individuals.

At Varfurile in this year the most abundant species was *Aphis fabae* with an abundance of 85 individuals, *Aulachortum solani* with an abundance of 73 individuals.

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