

Aphid Monitoring System in the Czech Republic – recapitulate of the season in 2007

JANA OLBRECHTOVÁ

State Phytosanitary Administration
Jaselská 16, 746 82, Opava, Czech Republic
jana.olbrechtova@srs.cz

Introduction

The first suction traps were erected in the Czech Republic in 1992. Johnson-Taylor suction traps are situated at five locations in the Czech Republic. Suction traps represent all types of growing area and cover almost the whole region of the state.

Material and methods

The aphids are caught by the suction trap of Johnson-Taylor. All traps are standardised on the Rothamsted design and operate at a height of 12.2 m. The aphids are collected every day from the beginning of April to the end of November. The aphids from all suction traps are put into bottles with 70% ethanol and sent to the central laboratory in Opava where the samples are worked on. The separated aphids are processed in KOH and consequently in lactic acid.

Results and discussion

Exceptionally warm winter months, when average temperatures were 3 – 6°C higher than normal, caused only a partial suppression of plant and vital animal activities. For plants this meant that at temperatures above 0°C and

ample water supply in soil, the plant growth continued almost the entire winter period. In aphids, this meant that their hibernating parthenogenetic populations were more populous and they successfully survived till spring. This fact was first observed on the white fir (*Abies concolor*), where surprisingly strong colonies of black-grey to black aphids from the Aphididae family occurred. An exact determination has shown that they are the colonies of patch, bow-legged fir aphid *Cinara curvipes* (Patch, 1912), which hibernates with eggs or in the state of parthenogenetic females. Such strong occurrence on firs has never been documented in the Czech Republic. From the agriculturally significant species of aphids, parthenogenetic females hibernated in greater numbers in peach-potato aphid (*Myzus persicae* (Sulzer, 1776)), bird cherry-oat aphid (*Rhopalosiphum padi* (Linnaeus, 1758)) and grain aphid (*Sitobion avenae* (Fabricius, 1775)).

The exceptionally warm winter also sped up the hatching of winter eggs, which started already during March (at temperatures above 7°C). This caused the first generation of fundatrices to hatch very early. Their numbers, however, did not increase during the above-normal-temperature weather, which lasted until the end of June. Winged females prematurely left their winter hosts and started to migrate to their new host plants. At that time more numerous catches of winged aphids in suction traps were observed especially in leaf-curling plum aphid (*Brachycaudus helichrysi* (Kaltenbach, 1843)), cabbage aphid (*Brevicoryne brassicae* (Linnaeus, 1758)), Russian wheat aphid (*Diuraphis noxia* (Kurdjumov, 1913)), peach-potato aphid (*M. persicae*) and damson-hop aphid (*Phorodon humuli* (Schrank, 1801)). In general, the aphid migration to the summer host plants, compared to 2006, was somewhat weaker; this low migratory activity has continued since 2005.

Table 1. Number of aphids from April 1 to August 31, 2007

Aphid species	Location of suction trap				
	Čáslav	Chrlice	Lípa	Věrovany	Žatec
<i>Brachycaudus helichrysi</i>	399	582	145	452	258
<i>Brevicoryne brassicae</i>	619	578	355	331	612
<i>Diuraphis noxia</i>	2 549	12 188	832	3 391	1 738
<i>Myzus persicae</i>	306	293	111	189	493
<i>Phorodon humuli</i>	43	228	17	81	239

The summer weather was also not very favourable for aphid development; the weather was too dry. During that situation the numbers of the aphid populations did not significantly increase until the beginning of fall, resulting in a low to average migration to winter host plants. Stronger migration was ob-

served in of the *Aphis* spp. genus, peach-potato aphid (*M. persicae*) and bird cherry-oat aphid (*R. padi*). More aphids were in the air only until the end of October. In November a significant cooling occurred, with numerous rain and snow showers; there were only a few aphids in the air and when day temperatures dropped below 5°C and night temperatures below freezing their migration stopped altogether. This situation occurred already during the second week of November, which significantly shortened the fall aphid migration.

Table 2. Number of aphids from September 1 to November 30, 2007

Aphid species	Location of suction trap				
	Čáslav	Chrlice	Lípa	Věrovany	Žatec
<i>Aphis</i> spp.	83	94	36	87	123
<i>Myzus persicae</i>	202	113	77	168	307
<i>Rhopalosiphum padi</i>	9 440	2 021	2 360	6 807	7 363

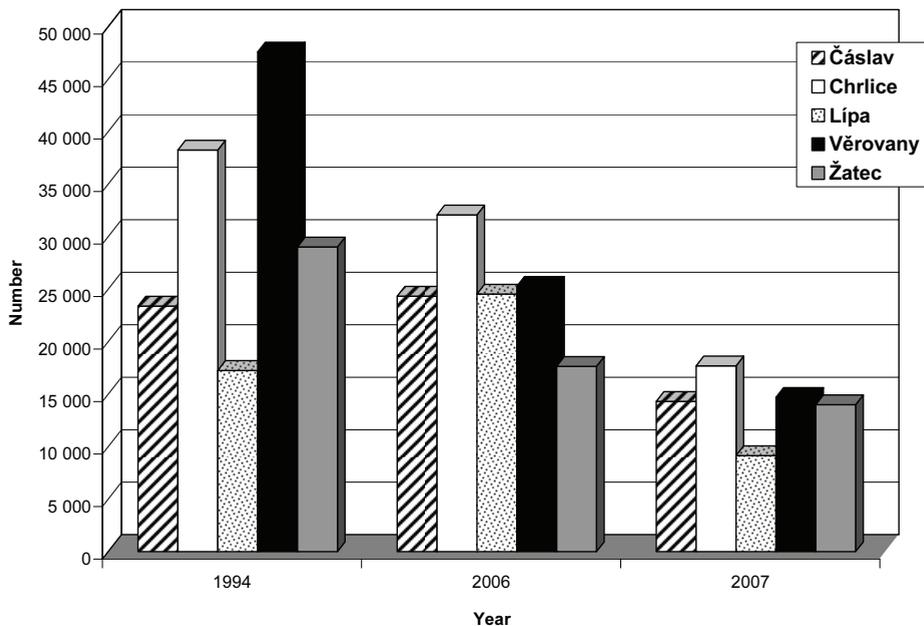


Figure 1. The flight activity of aphids in the Czech Republic in 1994, 2006 and 2007

The flight activity of aphids in 2007, according to the total number of caught and determined aphids can be described as very weak. In total, from the beginning of April to the end of November, 69 880 winged aphids were determined (Tab. 1 and 2). In 2006 this was 123 902 aphids and in 1994, which is

regarded as calamitous, 155 557 aphids (Fig. 1). During the vegetative period a short-term overpopulation of aphids occurred on apple and stone fruit trees (*Aphis* spp., leaf-curling plum aphid (*B. helichrysi*), damson-hop aphid (*P. humuli*) and aphids transmitting viral disease (peach-potato aphid (*M. persicae*), damson-hop aphid (*P. humuli*),) which brought an increased occurrence of serious viral diseases (PVY especially genus Y-NTP, PVA, PLRV) and subsequently also loss in seedlings. A great risk was also presented by the numerous fall population of bird cherry-oat aphid (*R. padi*), which meant that in areas infested with the yellow dwarf virus (BYDV) a more intense transmission of this viral infection occurred in fall cereal crops.

References

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Monitoring lotów mszyc w Republice Czeskiej w 2007 roku

Streszczenie

Rok 2007 był szesnastym z kolei rokiem całorocznego obserwowania aktywności najbardziej liczących się gatunków mszyc przy zastosowaniu ssących pułapek typu Johnson – Taylor na stacjach obserwacyjnych ÚKZÚZ Čáslav, Chrlice, Lípa u Havlíčkova Brodu, Věrovany i Žatec. Wszystkie pułapki uruchomiono na początku kwietnia 2007, a pomiary zakończono w ostatnim dniu listopada. Podobnie jak w roku ubiegłym określono 16 gatunków mszyc.

Aktywność lotów mszyc w roku 2007 ze względu na ilość złapanych i określonych gatunków mszyc można uznać za bardzo niską. W okresie od początku kwietnia do końca listopada zostało odłowionych 69 880 sztuk uskrzydłych mszyc. W roku 2006 było to 123 902 sztuki, a w roku 1994, który uważany był za wyjątkowo niesprzyjający, odłowiono 155 557 osobników mszyc.