# Aphids (Homoptera, Aphidodea) inhabiting the trees Crataegus x media Bechst. in the urban green area. Part I. The population dynamics

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## Summary

The studies were conducted in the years 1999-2001 in the green areas of Lublin, on the trees of *Crataegus* x *media* Bechst. The purpose of the studies was to establish the species composition and the population dynamics of aphids inhabiting hawthorn in the street and park sites. The studies found out the presence of four aphid species on the examined trees, namely *Aphis pomi* De Geer, aphids from the genus *Dysaphis* Börn., *Ovatus crataegarius* (Walk.) and *Rhopalosiphum insertum* (Walk.). More aphid species and bigger populations were found in the street site (A) as compared with the park site (B). The weather conditions (air temperatures of over 30°C and stormy rainfalls) limited the population of all aphid species. On the other hand, a mild winter and a warm spring with the rainfalls within the norm caused that the number of aphids decreased considerably.

Key words: aphids, *Aphis pomi* De Geer, *Ovatus crataegarius* (Walk.), *Rhopalosiphum insertum* (Walk.), *Dysaphis* Börn., trees of *Crataegus* x *media* Bechst., urban green areas

## INTRODUCTION

In Poland a few thousand different species of trees and decorative shrubs occur in the city's green areas. One of them is *Crataegus* x *media* Bechst. and other numerous varieties, both growing in gardens and in the wild in parks, squares, lawns and along the transportation tracks. Their full, pink or red, flowers are valued for their ornamental character and honey yield.

In cities, the number of the phytophagous with the stinging-sucking mouth apparatus decreases (Cichocka and Goszczyński 1991). The most dangerous of

them include aphids, considering the number of harmful species, their reproductive potential and a (relatively?) small number of their natural enemies.

The purpose of the present studies was to establish the species composition and the dynamics of the aphid population inhabiting the trees of *Crataegus* x *media* Bechst. throughout the vegetation season in the street and park sites in the area of Lublin.

## MATERIAL AND METHODS

Observations were carried out in the years 1999-2001 in the green area of Lublin in two sites: a street site – A (the area of the Rector's Office of the Agricultural University) and a park site – B (the Museum of the Lublin Countryside). In each site, five trees of *Crataegus* x *media* Bechst. growing close to each other were selected. In each tree, five shoots (of similar length) were selected at random and the winged and wingless aphids (including the larvae) were counted on them. The plants were monitored from very early spring till late autumn, after the leaves had fallen. Observations were carried out in 10-day intervals on average. The examined trees were not subjected to any chemical treatments.

The keys of Blackman and Eastop (2000), Müller (1976) and Szelę-giewicz (1968) were used to mark the species of aphids.

Meteorological data were obtained from the Department of Agrometeorology of the Agricultural University in Lublin.

### RESULTS

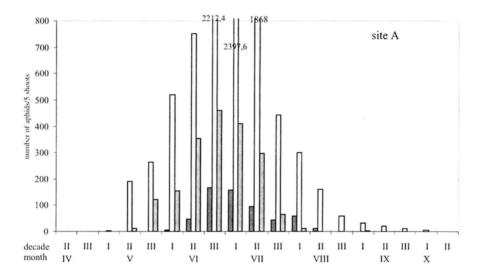
Four aphid species, namely *Aphis pomi* De Geer, *Ovatus crataegarius* (Walk.), *Rhopalosiphum insertum* (Walk.) as well as the aphids from the genus of *Dysapis* Börn. were found on the examined trees of *Crataegus* x *media* Bechst.

Figure 1-4 present the population dynamics of four aphid species inhabiting the studied trees, and Figure 5 shows the course of the weather in the years of studies.

## Aphis pomi De Geer (Photo 1)

In 1999, after a delayed period of vegetation and a cool spring, yellow-green aphids appeared in the first decade of June in both sites (Figure 1). Then, they inhabited the leaves and young shoots. Their maximum was found out to be in the third decade of June (in site A-165.6 aphids/5 shoots, and in site B-104.0 aphids/5 shoots). After the heat in July and numerous rainfalls, the number of aphids decreased rapidly. In site B aphids disappeared in the third decade of July, and in site A in the first decade of September. Single individuals were observed again only in site A in the third decade of September.

In 2000, after a mild winter and a warm spring, aphids appeared in both sites in the first decade of May. Their maximum was observed in the first decade of July (in site A-2397.6 aphids/5 shoots, and in site B-31.2 aphids/5 shoots). In site B the colonies of this one-home aphid remained with varying intensity until the second decade of August,



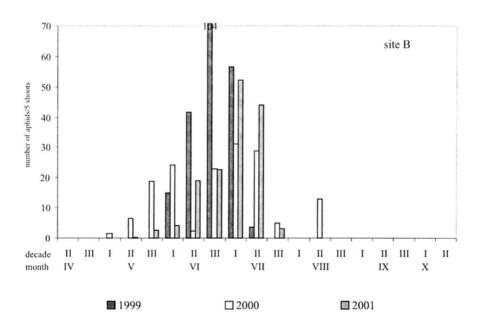


Fig. 1. Dynamics of *Aphis pomi* De Geer population on *Crataegus* x *media* Bechst. in the years 1999-2001



Photo 1. Aphis pomi De Geer on Crataegus x media Bechst.

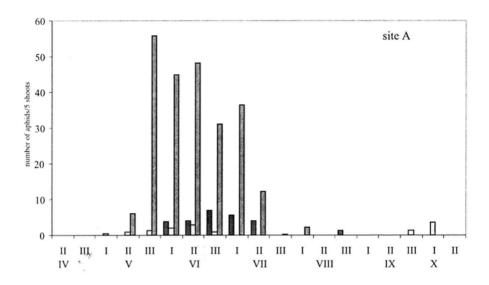
and in site A much longer, until the second decade of October. The aphids' disappearance was observed in the third decade of August and in the third decade of October, respectively.

In 2001, a mild winter and a warm spring were conducive to the development of aphids. In site A their presence was found out in the second decade of April, and in site B a month later. A slow increase of the number of aphids in the successive observations could have been connected with heavy showers in May, when aphids were washed away off the shoots and some leaves. The maximum numbers were observed in the third decade of June in site A (462.4 aphids/5 shoots), and in site B in the first decade of July (52.2 aphids/5 shoots). In subsequent observations the aphid population decreased, which could have been caused by high temperatures of the air and showers in the middle of July (Figure 5). The disappearance of aphids in site B was observed as early as on the first decade of August, probably due to the weather conditions. In site A single individuals remained until the second decade of September.

## Ovatus crataegarius (Walk.) (Photo 2)

In 1999, first green aphids of this species were observed in site A in the first decade of June (Figure 2). The maximum (7.0 aphids/5 shoots) was found three weeks after the first occurrence (third decade of June). They occurred until the end of August, with changing intensity. No aphids *O. crataegarius* were observed in site B.

In 2000 the aphids of this species appeared only in site A, like in the previous year. First, scarce individuals were observed in the first decade of May and they remained until the third decade of June. The disappearance of summer colonies took place in the first decade of July. In autumn, their presence was found out since the third decade of September till the second of October. Their maximum was observed in the first decade of October -3.6 aphids/5 shoots.



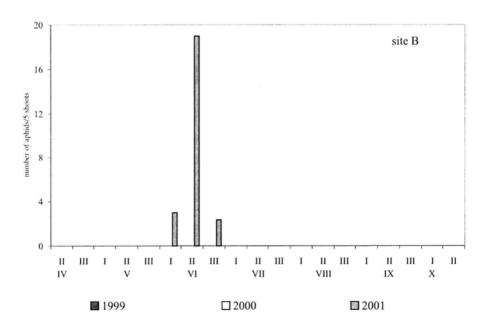


Fig. 2. Dynamics of *Ovatus crataegarius* (Walk.) population on *Crataegus* x *media* Bechst. in the years 1999-2001



Photo 2. Colony of Ovatus crataegarius (Walk.) aphids on Crataegus x media Bechst.

In 2001 the first aphids in site A were observed in the second decade of May, and their maximum occurred already in the third decade of that month (55.8 aphids/5 shoots). The aphid colonies remained until the second decade of July and single specimens were observed until the first decade of August. In the second decade of August, the disappearance of the aphids of this species took place. In site B, the presence of *O. crataegarius* was found out only in that year of studies. They appeared in the first decade of June, and their maximum was observed in the second decade of that month (19.0 aphids/5 shoots). The disappearance of aphids took place in the first decade of July.

## Rhopalosiphum insertum (Walk.)

In the years 1999-2001 this species occurred in small numbers, and only in site A (Figure 3).

In 1999 yellow-green aphids were observed only in spring. The first specimens were found at the turn of May and June, and their disappearance took place a month later.

In the spring of 2000 the studies found the presence of single specimens only during one observation. In autumn, on the other hand, aphids stayed on plants since the second decade of September until the first decade of October.

In 2001 the appearance of first aphids was observed in the second decade of May and their disappearance took place already in the third decade of June. In autumn, single aphids were observed only during one observation (second decade of September).

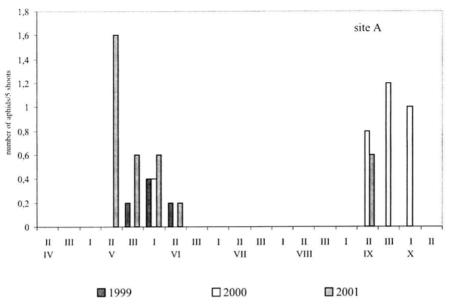


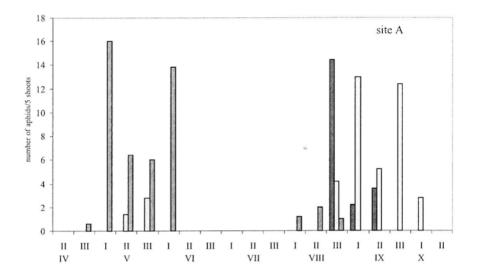
Fig. 3. Dynamics of *Rhopalosiphum insertum* (Walk.) population on *Crataegus* x *media* Bechst. in the years 1999-2001

## Dysaphis Börner

In the case of aphids belonging to the genus *Dysaphis* Börn, the species composition, which is possible only on the basis of studies finding out their secondary hosts, was not established because of the similarity in their appearance and the manner of preying.

In 1999 grey-violet aphids from the genus *Dysaphis* occurred in site A in the first decade of September and at the same time it was the maximum (14.4 aphids/5 shoots) (Figure 4). They disappeared after a month, in the first decade of October. In site B, on the other hand, the appearance of first aphids was observed in spring, in the second decade of May. They were scarce until the second decade of June. The presence of single specimens was found again in September, and the maximum was observed in the second decade of that month (6.0 aphids/5 shoots). They disappeared in the first decade of October.

In 2000 the first aphids were observed in site A in the second decade of May. Those were scarce individuals that preyed in the red protuberances of leaves until the third decade of May. The spring disappearance of aphids took place in the first decade of June. They appeared again in the third decade of August. They were most numerous in the first decade of September (13.0 aphids/5 shoots). Although the period of vegetation was very long, their presence on the examined plants was observed only until the first decade of October. In site B, aphids were observed since the first decade of September until the third decade of October. The maximum was observed in the third decade of September (32.6 aphids/5 shoots), and their disappearance in the first decade of November.



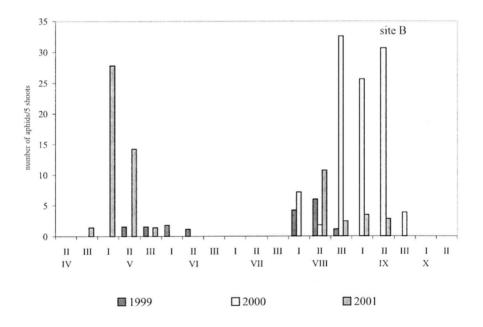
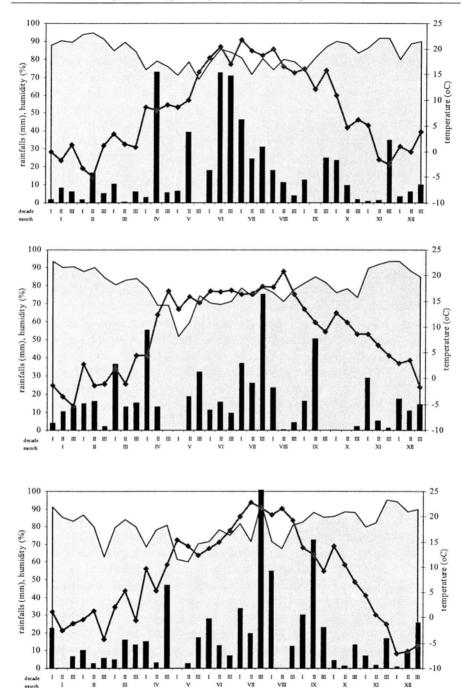


Fig. 4. Dynamics of *Dysaphis* Börn. population on *Crataegus* x *media* Bechst. in the years 1999-2001



dekadowa suma opadów – decade sum of rainfalls

frednia dekadowa temperatura – mean decade temperature

Fig. 5. General decadly information about the weather in the years 1999-2001

średnia dekadowa wilgotność - mean decade humidity

In 2001 the period of vegetation began in the first decade of April, which probably affected the earlier appearance of aphids belonging to the genus *Dysaphis* as compared to the previous years of studies. In both sites their presence was observed already in the third decade of April. In a subsequent observation, in the first decade of May, the studies found out the maximum (in site A-16.0 aphids/5 shoots, and in site B-27.8 aphids/5 shoots). The disappearance of spring colonies took place in site B in the first decade of June and in site A in the second decade of that month. The next appearance of aphids was observed in the first (site A) and in the second (site B) decade of September and it lasted about a month. The disappearance was found out in the first and third decade of October, respectively.

#### DISCUSSION

Crataegus x media Bechst. was inhabited by the following aphids: Aphis pomi De Geer, Ovatus crataegarius (Walk.), Rhopalosiphum insertum (Walk.) and the aphids from the genus Dysaphis Börn. In the area of Lublin the studies did not find Stagona pini (Burm.) or Aphis fabae Scop. observed in Warsaw and Gdańsk by Goszczyński et al. (2000) and Tykarska (2001).

Aphis pomi De Geer is a common species in Poland. It inhabits the trees and shrubs from the family Rosaceae (Cichocka 1980, Haley and Hogue 1990). Their presence on Cotoneaster sp., Chaenomeles sp. and Crataegus sp. is reported by Bogatko (1984), Goszczyński et al. (2000), Jaśkiewicz (1997), Łabanowski and Soika (1998), Ripka et al. (1998). Aphids of this species preyed on the studied hawthorn trees since spring till late autumn, and they were more numerous in summer.

Ovatus crataegarius (Walk.) was reported as a pest on hawthorn by Goszczyński et al. (2000), Ripka et al. (1998) and Tykarska (2001). Cichocka (1980) reports that it is a two-home species migrating from hawthorn onto mint.

Rhopalosiphum insertum (Walk.) occurs in apple orchards in early spring (Cichocka 1980). It is reported on decorative trees and shrubs by Goszczyński et al. (2000), Łabanowski and Soika (1998) and Tykarska (2001). The present studies observed scarce aphids of this species in spring and autumn.

The species composition of aphids from the genus *Dysaphis* Börn. is established properly when their secondary hosts are found. They are similar in respect of the morphological structure and the damage caused by them is almost identical (Müller 1976, Szelęgiewicz 1968). These aphids are common on hawthorn (Goszczyński et al. 2000, Łabanowski and Soika 1998, Ripka et al. 1998, Szelęgiewicz 1968, Tykarska 2001). They occurred in each year of observations and were more numerous in autumn than in spring. The following conclusions were formed:

- 1. On the trees of *Crataegus* x *media* Bechst. the studies found the presence of four aphid species, namely *Aphis pomi* De Geer, *Ovatus crataegarius* (Walk.), *Rhopalosiphum insertum* (Walk.) and aphids from the genus *Dysaphis* Börn.
- 2. More aphid species and their bigger populations were observed in the street site (A) as compared to the park site (B).

3. After a mild winter and a warm spring with the rainfalls within the norm the aphid population was bigger. A negative effect on the population dynamics of aphids was exerted by the delayed period of vegetation, air temperatures of above 30°C and stormy rainfalls.

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# Mszyce (Homoptera, Aphidodea) zasiedlające drzewa Crataegus x media Bechst. na terenie zieleni miejskiej. Część I. Dynamika liczebności populacji

### Streszczenie

Badania prowadzono na drzewach głogu pośredniego (*Crataegus* x *media* Bechst.) w latach 1999-2001 na terenach zieleni miejskiej Lublina, na stanowisku

przyulicznym A i parkowym B. Stwierdzono, że na drzewach *C.* x *media* wystąpiły cztery gatunki mszyc: *Aphis pomi* De Geer, mszyce z rodzaju *Dysaphis* Börn., *Ovatus crataegarius* (Walk.) i *Rhopalosiphum insertum* (Walk.). Więcej gatunków mszyc i wyższą ich liczebność obserwowano na stanowisku przyulicznym – A.

Na dynamikę liczebności wszystkich gatunków mszyc duży wpływ miały warunki pogodowe. Łagodna zima i ciepła wiosna z opadami w granicach normy sprawiała, że liczebność mszyc znacznie wzrastała. Temperatury powietrza powyżej 30°C oraz opady typu burzowego wyraźnie hamowały rozwój populacji poszczególnych gatunków mszyc.