

## FLEA BEETLES SPECIES ASSOCIATED WITH *AMARANTHUS* SPP. AND SURROUNDED CULTIVATED AND WILD PLANT SPECIES

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### Summary

Sweep net collection of the *Alticinae* flea beetle from various cultivated and wild plant species revealed that the most common genus was *Chaetocnema* spp. To the predominant species was *Chaetocnema tibialis* (Ill.). Another two *Chaetocnema* species, *C. concinna* (Marsh) and *C. laevicollis* Thoms., did not overcome more than one percent of *C. tibialis* population on *Amaranthus* spp., *Chenopodium* spp. and *Beta vulgaris* L. Their share on *Medicago sativa* L. was 14%, on *Zea mays* L. and *Urtica dioica* L. 11%. Next six flea beetles species – *Altica oleracea* (L.), *Longitarsus pellucidus* Foudras, *Phyllotreta atra* (F.), *P. cruciferae* (Goeze), *P. nigripes* (F.) and *P. vittula* (Redt.), were swept on *Amaranthus* spp. *P. cruciferae* was not present in sweep net collection of *B. vulgaris* and *Chenopodium* spp., *P. nigripes* on *M. sativa*, *A. oleracea* on *Z. mays* and *Altica oleracea*, *L. pellucidus*, *Phyllotreta nigripes* on *U. dioica*.

**Key words:** crop plants, weeds, species composition, flea beetles, *Alticinae*

### Introduction

*Alticinae* are highly specialized and phytophagous insects. Both the adults and larval stages feed on stems, leaves and roots of almost all of higher plants families. The majority of the flea beetles are oligophagous, more rarely polyphagous, and only a few species are unequivocally monophagous (Warchalowski, 1978).

Flea beetles occur virtually everywhere, in almost all type of habitats, even in deserts and arctic environs, but the majority of genera and species occur in the tropical regions of South America, Africa and Asia. The palearctic fauna is relatively poor. Here, the richest flea beetle communities occur in open spaces near forests or scrubland, often associated with rivers or lakes, and various kind of meadows (Konstantinov & Vandenberg, 1996).

The aim of our study was to compare species composition of *Alticinae* flea beetles occurring on *Amaranthus* spp. with surrounding cultivated and wild plant species in Slovak conditions.

### Methods

Occurrence of *Alticinae* flea beetles on various cultivated and wild plant species was observed during July and August 1996 at Dolná Malanta 14 kilometres eastern from Nitra. The locality is characterised according to Konček (1980) as a warm and temperate dry. Insects were collected by net sweeping (3x100 sweepings). One sweeping on *Beta vulgaris* L. (*Chenopodiaceae*), *Medicago sativa* L. (*Fabaceae*), *Urtica dioica* L. (*Urticaceae*) and *Zea mays* L. (*Poaceae*) was about 1m long. One sweeping in case of weed *Amaranthus* spp. (*Amaranthaceae*) and *Chenopodium* spp. (*Chenopodiaceae*) corresponded to one plant. Each swept plant was approximately same sized, with a stem length of about 1m. Collected insects were put to death, sorted and identified.

### Results

Sweep net collection of the *Alticinae* flea beetle from various cultivated and wild plant species revealed, that the most common genus, especially on *Amaranthus* spp. (*Amaranthaceae*), sugar beet (*Chenopodiaceae*) and particularly on *Chenopodium* spp. (*Chenopodiaceae*) was *Chaetocnema*. To the predominant species belonged *C. tibialis* (Ill.), another two *Chaetocnema* species, *C. concinna* (Marsh.) and *C. laevicollis* Thoms., did not overcome more than one percent of *C. tibialis* population. Next six flea beetles species – *Altica oleracea* (L.), *Longitarsus pellucidus* Foudras, *Phyllotreta atra* (F.), *P. cruciferae* (Goeze), *P. nigripes* (F.) and *P. vittula* (Redt.), were swept on *Amaranthus* spp. The same flea beetles were found on sugar beet and *Chenopodium* spp., except of *P. cruciferae*.

*Chaetocnema* spp. created 94-97,70% of the flea beetles found on *Amaranthus* plants. The rest portion was represented by the remained six flea beetle species, from which *P. vittula* was the most abundant (2,52%). Similar situation was observed on sugar beet, where *C. tibialis* created 95,20-96% of all *Alticinae* flea beetles. Different result was obtained from the plants of the same family as sugar beet – *Chenopodium* spp. On this weed species, *Chaetocnema* spp. number formed 6,25% flea beetle population in July to 89,5% flea beetle population in August. From the remained flea beetles species observed on plants from the family *Chenopodiaceae*, *P. vittula* was the most abundant again, sharing maximum 4,20% on sugar beet, but more than 56% on *Chenopodium* spp.

The numbers of *Chaetocnema* species on sugar beet at the end of July and August were comparable, while on *Chenopodium* their number till August increased and on *Amaranthus* decreased.

On *Z. mays* the same flea beetles species, were found as those on *Chenopodiaceae*, excluding *A. oleracea*. Among the *Alticinae* species collected by net sweeping on maize, *P. vittula* shared 18-65,71%. Portion of *Chaetocnema* spp. was 34,29-56%, from which *C. concinna* and *C. laevicollis* created 11%.

Another two plant species - *M. sativa* and *U. dioica*, were swept in August. The predominant *Chaetocnema* species represented 68,5 and 89,8%, respectively. On these plants were observed higher numbers of *C. concinna* and *C. laevicollis*. Their share on *M. sativa* was 14%, and on *U. dioica* 11%. Share of *P. vittula* was from 6,12 to 22%.

*A. oleracea*, *L. pellucidus*, *P. nigripes* was not present in sweep net collection of *U. dioica*. and *P. nigripes* on *M. sativa*.

### Discussion

The observed plant species serve as a host for 9 *Alticinae* flea beetle at locality Dolná Malanta, while during 1995-1997 was 13 species identified at 10 localities throughout Slovakia on *Amaranthus* spp. (Cagáň et al. 2000). Among the absenting species belonged *Longitarsus longipennis* Kutsch., *L. melanocephalus* Deg., *L. nasturtii* (F.) and *Psylliodes chrysocephala*.

*C. tibialis* and *C. concinna* are important pests of sugar beet (Warchalowski, 1978). Except of *Chenopodiaceae*, another host plants for *C. tibialis* are *Amaranthus* spp. (Nonweiler 1960, 1978, Praslička 1996), *Z. mays* (Naibo, 1974), *Hordeum vulgare* L. (Sevagina, 1991; Sobakar & Timoghina, 1991) Host plants for *C. concinna* are the plants from family *Polygonaceae* (Warchalowski, 1978), but also *M. sativa* (Mostovaya 1994). The occurrence of *C. concinna* at locality Dolná Malanta was higher on *M. sativa* (14% of *Chaetocnema* population) and *U. dioica* (11% of *Chaetocnema* population) than on sugar beet or *Amaranthus* spp. (1% of *Chaetocnema* population). However, *U. dioica* is not mentioned as a host plant in the literature.

*Phyllotreta* species found on swept plants are mostly the pests of the family *Brassicaceae* (Warchalowski, 1978), but *P. vittula* is also pest of cereals (*Poaceae*) (Naibo, 1974; Warchalowski, 1978). In our observations it was found on each plant species, with highest abundance on maize.

From four *Longitarsus* species found on *Amaranthus* plants throughout Slovakia only *L. pellucidus* was present at locality Dolná Malanta. The species is known on *Convolvulus arvensis* L. (Warchalowski, 1978).

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