

## COMPOSITION AND SEASONAL DYNAMICS OF APHIDOPHAGOUS INSECTS IN SUNFLOWER FIELDS IN VOJVODINA

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Sunflower is an important industrial crop and Vojvodina is the leading sunflower-producing area in Yugoslavia. Although two species of aphids Brachycaudus huli chrysi Kalt. and Aphis fabae Scop. occur on sunflower fields (SF) every year, this crop is never or rarely treated to control aphids. Being a crop of large flowering heads, sunflower is a highly attractive plant for many insect species, therefore, sunflower crops may be considered as an ecological reservoir especially at the blooming period. The main aim of this work was to determine the composition of predaceous insects accompany aphids in SF.

The complex of aphidophagous insects was monitored by inspecting and visual observations of SF in Vojvodina, during the period of 1981-1984. The study area was located at the south region of the Province, surroundings of the hills Fruška Gora which may be considered as the only suitable hibernation sites of coccinellids in this region. A twelve SF were examined and six observations on each were made every year. The observations were made regularly throughout the season at two weeks intervals, and each time the species composition and number of predators from 100 plants (10x10) was recorded. At the same time the number of aphids was estimated by visual or by sapling 25 randomly infested plants.

During the observation period the following predatory insects were recorded: COCCINELLIDAE: In total 13 species of coccinellids were observed on SF in Vojvodina. Most of them were aphidophagous, but no one species is closely associated with sunflower crop. The most critical period for the action of coccinellid is at the early stages of aphid infestation. In this phase plants have only 1-3 pairs of leaves and the adults can easily penetrate into the small colonies of aphids. Meanwhile, ability of adults to regulate aphid densities is largely dependent on the abundance of aphids. The most common species in this period are Coccinella septempunctata L., Hippodamia variegata Goeze and Scymnus rubromaculatus L. Our observations showed that the aphid population level is very low to keep predators on the crop. Due to the searching behavior and the great mobility of coccinellid they leave the crop after a few days and search for food in neighbouring habitats. But in June and early July the abundance of coccinellids increase again with increasing aphid density. During July the most abundant species was Propylea quatuordecimpunctata L. and second ranked species usually H. variegata while C. septempunctata and Semiadalia undecimnotata Schn. at the third and fourth position. By contrast in 1984, the most common species was H. variegata followed by S. undecimnotata and P. quatuordecimpunctata. On the basis of a more detailed observations it is possible to distinguish another group of coccinellids which appear sporadically on sunflower. This group was consisted of the following:

Hippodamia tredecimpunctata L.: This species appears on SF adjoined to lucerne fields. But also sporadically during the second half of the season. It is somewhat higher incidence in more humid localities.

Coccinula quatuordecimpunctulata L.: Some individuals of this species were recorded mainly on SF neighbouring by lucerne crops. It was more abundant during the second half of the season, especially in August.

Adalia bipunctata L.: This coccinellid can be met within the fields only in exceptional cases. It was abundant in the field borders which adjoined to hop stands or a small orchards. It appears during July and August with a mixed populations consisted of overwintering and new adults.

Calvia quatuordecimnotata L.: Only 3 adults were recorded on sunflower in 1984. This species occurs in small numbers on trees especially on walnut trees infested with aphids. So individuals caught on sunflower probably got there by chance.

Scymnus rubromaculatus L.: Adults were recorded on sunflower during May and early June. But, at the end of vegetation this species can be met also as a larvae.

Scymnus apetzii Muls., Hyperaspis campestris Hbst. and Tytthaspis sedecempunctata L.: During the period of investigation these species were observed in a far lesser abundance. All individuals were caught at the edges of SF. Their presence on sunflower should be regarded as accidental.

Thea vigintiduopunctata L.: This mycophagous species occurs in few numbers during August and September. It is more abundant when sunflower neighbouring by sugar-beet fields.

**CHRYSOPIDAE:** From this family Chrysopa carnea Steph. is the most abundant species on sunflower. The first adults appear in mid June and the larvae at the end of June or early July. They remain on plants upto the late September.

**SYRPHIDAE:** In total 5 species of predacious syrphid were recorded. Metasyrphus corollae F., Episyrphus balteatus Deg., Scaeva pyrastris L. Sphaerophoria scripta L. and Syrphus ribesii L. Among the species mentioned M. corollae was predominant throughout the season. In late July and during August syrphid larvae appear to be the most efficient predators of aphids on sunflower.

**CECIDOMYIIDAE:** A small numbers of Aphidoletes aphidimyza Rond. were collected from aphid colonies. This species is more abundant on single heavy infested plant during July or August.

**CHAMAEMYIIDAE:** One species belongs to the genus Leucopis sp was found in a small numbers in between aphid colonies. More numbers of larvae were recorded when plants heavily infested by aphids.

**ANTHOCORIIDE:** Two species of predatory anthcorids appear on sunflower every year. Orius niger Walff. and O. majusculus Reuter. These bugs are polyphagous and they prey upon aphids, thrips, mites and other small insects. The first adults appear in early June. Number of adults nymphs and larvae reaches maximum during late July and August. It was observed that bugs of small importance for checking the population level of aphids.

**NABIDAE:** The most common species were Nabis pseudoferus Rem. and N. feroides Rm. Both adults and nymphs were collected on buttons and later on flowering heads. The mass appearance of nabids was not related to the increase in aphid numbers. During the studies the following predacious insects also were noted: The carabid Lebia crux-minor L., the staphylinid Tachyporus hypnorum F. and the earwig Forficula auricularia L.

Based on these findings, during the 4-year investigation we found a similar community structure of predatory insects on sunflower. The colonization of SF by aphidophagous insects was determined largely by the presence of aphids, but also by another factors such as climatic conditions, plant density and the presence of another essential prey. Observations indicate that coccinellids would start oviposition only when a certain quantity of aphids was available (1984). More predacious insects on SF appear in a narrow belt near margins neighbouring with sparse crops or uncultivated area.