FAUNISTIC COMPOSITION AND NUTRITION TYPES OF THE HYMENOPTERA COMPLEX IN A PLUM ORCHARD (II)

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Abstract

In the plum orchards the faunistic composition of Hymenoptera insects was studied using yellow sticky traps. As a result, the presence of 26 families was indicated including three dominant, containing many potentially important species in protection against plum pests.

Key words: Hymenoptera, parasitoids, nutrition, plum orchard

Introduction

The plum is the most important stone fruit culture in the Republic of Moldova. The total plum plantations' area is estimated at 23 thousand hectares with a plum production of 93 thousand tones as of 2017 [1]. Hymenoptera is a large and extremely important group of insects which embodies numerous species, both noxious (sawflies) and beneficial (bees, parasitic wasps). The beneficial parasitic Hymenoptera, such as parasitoid wasps, influence directly the plum pests' composition and structure. That is why the study of parasitic Hymenoptera is of a great importance for agriculture.

Materials and methods

The goal of the present paper was to study the Hymenoptera complex faunistic composition and their nutrition preferences. During 2016, 2017 we had been studying the faunistic composition of hymenopterans (Insecta, Hymenoptera) in two plum orchards in the village of Băcioi (vicinity of Chisinau, Republic of Moldova). One orchard is comprised of Cacanska rana variety, another one - with Stanley. The orchards were treated with phytopharmaceutical products intensively starting from early spring until the middle of June. We had been using six yellow sticky traps in each orchard for Hymenoptera monitoring. Traps were hung in the middle of a tree crown. They were replaced once in two weeks from April to August 2017. Further, traps were examined in the laboratory conditions. The exemplars were keyed till the family taxon, rarely till lower taxa, using microscope magnification (4.5 x 10). As a key we used "Hymenoptera of the world: An identification guide to families" [2]. The results of 2016 were presented earlier [3]. This new report deals with the results of 2017.

Results and discussions

Below, the list of 26 Hymenoptera families collected in the plum orchards is presented. There were 1948 exemplars studied of which 1848 were keyed till the family taxon. In brackets the percentage (%) out of the total number of exemplars and the type of nutrition are indicated. Hymenoptera collected in the plum orchard: *Mymaridae* (22.1%; endoparasitism); *Platygastridae* (16.3%; endoparasitism); *Ceraphronidae* (16.3%; endoparasitism); *Encyrtidae* (13.0%; endoparasitism); *Cynipidae* (9.2%; phytophagous); *Aphelenidae* (5.4%; endo-, ecto- and autoparasitism); *Trichogrammatidae* (3.2%; endo- and hyperparasitism); *Eulophidae* (2.2%; endo- and ectoparasitism, some – phytophagous); *Tenthredinidae* (1.1%; phytophagous); *Megaspilidae*, *Pteromalidae* (both 1.0%; hyperparasitism); *Braconidae* (1.0%; endo- and ectoparasitism); *Eupelmidae* (1.0%; endo-, ecto- and hyperparasitism); *Ichneumonidae* (1.0%; endoparasitism); *Bethylidae* (0.5%; ectoparasitism); *Formicidae* (0.4%; predators); *Roproniidae* (0.2%; endoparasitism); *Chrysididae* (0.2%; cleptoparasitism); *Diapriidae* (0.2%; endoparasitism); *Chalcididae* (0.2%; hyperparasitism); *Eurytomidae* (0.2%; ecto- and hyperparasitism, some – phytophagous); *Torymidae* (0.2%; ecto- and hyperparasitism, some – phytophagous); *Liopteridae* (0.1%; parasitoids on wood-boring insects); *Figitidae* (0.1%; endoparasitism); *Charipidae* (0.1%; hyperparasitism); *Signiphoridae* (0.1%); undetermined exemplars – 5.1%.

Several exemplars were keyed till the subfamily – *Elasminae* (Eulophidae), *Aphidiinae*, *Ophioninae* (Braconidae), *Eucoilinae* (Figitidae) and genus taxa – *Ascogaster* sp. (*Cheloninae*: Braconidae).

Of the studied exemplars 81.0% have a parasitoid type of nutrition, 12.0% are phytophagous (two families – *Cynipidae* and *Tenthredinidae*), 8.0% have a mixed type of nutrition (some species parasitic, others – phytophagous).

Mymaridae leads in both years. Comparing to 2016 *Platygastridae* and *Ceraphronidae* mutually replaced their positions in 2017. The fourth place in both seasons is occupied by *Encyrtidae*. The number of phytophagous *Cynipidae* was extremely high in 2017 comparing to previous year, especially in first two decades of April. Both years share three “core” families – *Mymaridae*, *Platygastridae* and *Encyrtidae*, which contain many key species important for biological control of the plum [4]. There were five additional families registered in 2017 (*Chrysididae*, *Liopteridae*, *Figitidae*, *Roproniidae*, *Torymidae*) comparing to 2016.

Conclusions

1. Faunistic composition of plum orchards is comprised of 26 *Hymenoptera* families.
2. The three main parasitic *Hymenoptera* families – *Mymaridae*, *Platygastridae* and *Encyrtidae* comprise vast majority (51.4%) of the beneficial fauna of the orchards. These families contain many potentially important species for the plant protection programmes.
3. Totally, parasitoids with potentially beneficial species for pests’ control form 86.1% out of the total number of the *Hymenoptera* in the plum orchards. Thorough further study of their fauna is needed.

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Bibliography

1. Studiu. Analiza internă și externă a sectorului producerii de fructe al Republicii Moldova. Federația Agricultorilor din Moldova ”AGROinform”, Chișinău, 2018
https://madr.gov.md/sites/default/files/Documente%20atasate%20Advance%20Pagines/Studiu%20Sector%20Pomicol%20RM%20-%20%20APM_FARM%20final.pdf (visited 26.09.2021).
2. *Hymenoptera of the world: An identification guide to families*. Ottawa, 1993, 670 p. ISBN 0-660-14933-8.
3. ELISEEV, S.E., SUMENCOVA, V. V. BATCO, M. G., IORDOSOPOL, E. I. Faunistic composition and nutrition types of the *Hymenoptera* complex in a plum orchard. IX з’їзд Українського ентомологічного товариства. 2018, Kharkiv, 149. ISBN 978-617-7555-73-4.
4. ДЮРИЧ, Г.Ф., ЯЗЛОВЕЦКИЙ, И. Г., СУМЕНКОВА, В. В., ЯКИМЧУК, А. П., ИОРДОСОПОЛ, Е. И. Привлечение энциртид (*Hymenoptera*, *Chalcidoidea*: *Encyrtidae*) в агроценоз персикового сада в Республике Молдова. Энтомологическое обозрение. 2015. – Том 94(4), С.-Пб., 839-847. ISSN 0367-1445.