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HANNA PIEKARSKA-BONIECKA

NATURAL CONTROL OF ROSE TORTRIX MOTH *ARCHIPS ROSANUS* (L.) OCCURRING IN AN APPLE ORCHARD IN ROSNOWO

From Department of Entomology
The August Cieszkowski Agricultural University of Poznań

ABSTRACT. The studies were carried out in an apple orchard in Rosnowo in 2002. Two pupae of *Ichneumonidae* species were reared from *Archips rosanus* (L.). The pupae of *A. rosanus* were parasitized by *Ichneumonidae* in 17.6%. *Itoplectis maculator* (F.) was the dominant parasitoid.

Key words: *Ichneumonidae*, *Archips rosanus*, parasitoids, parasitization, apple

Introduction

Rose tortrix moth *Archips rosanus* (L.) is a species definitely dominating in the complex of leaf-rollers occurring in apple orchards of Poznań environs (**Piekarska** 1989, **Piekarska** and **Kuśmierczak** 1990). Parasitoids of *Ichneumonidae* family (*Hymenoptera, Parasitica*) are among factors that affect the size of butterfly populations of Tortricidae family, so the studies undertaken in 1999 were aimed at investigating the natural population control of rose tortrix moth occurring in the apple orchard in Rosnowo. Their results were presented in an earlier publication (**Piekarska-Boniecka** et **al.** (2002). This report contains the results from the last year of studies on the natural regulation of rose tortrix moth.

The research objective was to determine the parasitization degree of tortrix pupae by parasitoids and define the participation of species belonging to *Ichneumonidae* family (*Hymenoptera*, *Parasitica*) in the control of its number.

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Material and methods

The research was performed in the apple orchard in Rosnowo from mid-May to mid-July 2002. The orchard composed of 30-year-old apple trees grows on an area of 13 ha. The experimental quarter consisted of apple trees of Cortland, Idared and Wealth cultivars, which were protected only against diseases with the use of the following fungicides: Delan 700 WG, Discus 500 WG, Miedzian 50 WP, Mythos 300 SC and Rubigan 12 EC as recommended by the Institute of Plant Protection. From the apple trees, feeding focuses with pupae of tortrix and cocoons of parasitoids were collected and subsequently, they were reared in the insectarium of the Department of Entomology.

Results

Several tens of parasitoid coccons and 432 pupae of rose tortrix moth were collected. From the cocoons, three species of first degree parasitoids and one species of superparasitoid of tortrix caterpillar were reared.

First degree parasitoids comprised the following species:

– *Gregopimpla inquisitor* (Scop.) (*Pimplinae*), ectoparasitoid, polyphagous, 6 ♀♀, 2 ♂♂;

– *Scambus calobatus* (Grav.) (*Pimplinae),* ectoparasitoid, polyphagous, 4 ♀♀;

– *Tranosema rostralis* Brischke (*Campopleginae*), endoparasitoid of *Lepidoptera*, 2 ♀♀.

The superparasitoid was represented by *Itoplectis maculator* (F.) (*Pimplinae*) (1 ♀, 1 ♂); it was reared from *Tranosema rostralis*.

Pupae of rose tortrix moth were parasitized in 20.9% by the parasitoid individuals belonging to families: *Ichneumonidae*, *Chalcidoidea* (*Hymenopoptera*) and *Tachinidae* (*Diptera*). *Ichneumonidae* limited the number of tortrix by 17.6%, *Tachinidae* by 2.8% and *Chalcidoidea* by 0.5%. Two species of first degree parasitoids and two species of superparasitoids from tortrix pupae were reared. Some of the pupae (7.8%) dried up.

First degree parasitoids comprised following species:

– *Apechthis quadridentata* (Thoms.) (*Pimplinae*), endoparasitoid of *Lepidoptera* and *Symphyta*, 1 ♂;

– *Itoplectis maculator* (F.) (*Pimplinae*), endoparasitoid, polyphagous, 69 ♀♀, 6 ♂♂.

The most effective parasitoid of rose tortrix moth was species *Itoplectis maculator*; it parasitized tortrix by 17.4%. *Apechthis quadridentata* species limited the population size of tortrix by 0.2%.

Superparasitoids of tortrix pupae included: *Scambus buolianae* (Htg.) (*Pimplinae*) (2 ♂♂) and *Gelis agilis* F. (*Cryptinae*) (1 ♀), which parasitized larvae of *Ichneumonidae.*

Discussion

The results of studies carried out in 2002 confirmed the significant participation of parasitoids of *Ichneumonidae* family in the natural control of the number of rose tortrix moth in apple orchards in Rosnowo, since the earlier studies of **Piekarska-Boniecka** et **al.** (2002) showed that this tortrix was parasitized by *Ichneumonidae* in the range from 20.6% to 37.7%. Also **Miczulski** and **Anasiewicz** (1972), while studying the parasitization of tortrix feeding on currant and gooseberries, set the parasitization of larvae and pupae of this species on the levels from 10% to 35%. The present studies confirmed also the effectiveness of *Itoplectis maculator* (F.) species in the limitation of the number of rose tortrix moth, as this species even earlier prevailed among the parasitoids of this tortrix (**Miczulski** and **Anasiewicz** 1972, **Piekarska-Boniecka** et **al.** 2002). The present studies confirmed the participation of *Apechthis quqdridentata* (Thoms.) species in the complex of rose tortrix moth parasitoids, since this species was shown earlier from this host by **Piekarska-Boniecka** et **al.** (2002). The results of the present studies and the earlier studies of **Piekarska-Boniecka** et **al.** (2002) confirm that a group of parasitoids has been developed which parasitize rose tortrix moth in its stage of pupae. This group includes species from the genera of *Pimpla* Fabricius, 1804, *Itoplectis* Foerster, 1868 and *Apechthis* Foerster, 1868, and within this group, in the successive years, there follows an exchange of the numerously occurring species exerting an impact on the number of rose tortrix moth population.

Conclusions

The results of studies have confirmed the great extent of parasitized pupae of rose tortrix moth (*Archips rosanus* (L.)), the highest effectiveness of parasitoids from *Ichneumonidae* family and the domination of *Itoplectis maculator* (F.) species in the limitation of the number of this tortrix occurring in apple orchard in Rosnowo.

References

Miczulski B., Anasiewicz A. (1972): Materiały do znajomości pasożytniczej entomofauny kompleksu motyli zwójkowatych (*Tortricidae*) występujących na porzeczce czarnej – *Ribes nigrum* L. i czerwonej – *R. rubrum* L. oraz na agreście – *R. grossularia* L. w okolicach Lublina. Pol. Pismo Entomol. 42, 1: 211-222.

Piekarska H. (1989): Gąsieniczniki (*Hymenoptera*, *Ichneumonidae*) pasożytujące na zwójkówkach „liściowych" jabłoni w sadach okolic Poznania. Rocz. AR Pozn. 202, Ogrodn. 17: 153--162.

Piekarska H., Kuśmierczak B. (1990): Przyczynek do poznania fauny gąsieniczników (*Hymenoptera*, *Ichneumonidae*) pasożytujących na zwójkówkach „liściowych" jabłoni w sadach okolic Poznania. Rocz. AR Pozn. 217, Ogrodn. 18: 53-64.

Piekarska-Boniecka H., Wilkaniec B., Borowiak-Sobkowiak B., Trzciński P. (2002): Regulacja naturalna liczebności zwójki różóweczki (*Archips rosanus* (L.)) występującej w środowisku sadowniczym okolic Poznania. Progr. Plant Prot./Post. Ochr. Rośl. 42, 1: 223-227.

NATURALNA REGULACJA LICZEBNOŚCI ZWÓJKI RÓŻÓWECZKI *ARCHIP ROSANUS* (L.) WYSTĘPUJĄCEJ W SADZIE JABŁONIOWYM W ROSNOWIE

S t r e s z c z e n i e

Badania nad naturalną regulacją liczebności zwójki różóweczki *Archips rosanus* (L.) prowadzono w sadzie jabłoniowym w Rosnowie w 2002 roku. Wyhodowano trzy gatunki parazytoidów larw: *Gregopimpla inquisitor* (Scop.), *Scambus calobatus* (Grav.) (*Pimplinae*) i *Tranosema rostralis* Brischke (*Campopleginae*) oraz dwa gatunki parazytoidów poczwarek, do których należały: *Itoplectis maculator* (F.) i *Apechthis quadridentata* (Thom.) (*Pimplinae*). Ogólne spasożytowanie poczwarek przez parazytoidy z rodziny *Ichneumonidae*, nadrodziny *Chalcidoidea* (*Hymenoptera*) i rodziny *Tachinidae* (Diptera) wyniosło 20,9%. Do najliczniej występujących parazytoidów należały owady z rodziny *Ichneumonidae*, które spasożytowały zwójkę w 17,6%. Gatunek *I. maculator* ograniczył liczebność zwójki w 17,4% i *A. quadridentata* w 0,2%.