

Hymenopter parasites of some lepidopterous pests in eastern Anatolia

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Summary

In this work, 11 species of Braconidae, *Rogas circumscriptus* Nees, *Chleoneilla nitens* Rhd., *Microplitis lugubris* (Ruthe), *Bracon* sp. *Apanteles spurius* (Wesm.), *A. vanessae* Rhd., *A. vitripennis* (Curt.) *A. tibialis* (Curt.), *A. solitarius* (Ratz.) *A. glomeratus* L. and *Apanteles* spp. (4); 11 species of Ichneumonidae, *Hyposoter ebeninus* Grav., *Venturia canescens* Grav. and 9 unidentified species; 5 species of Pteromalidae, *Pteromalus puparum* (L.), *Pteromalus* sp. nr. *semotus* (Walk.), *Catalaccus ater* Ratz., *Psychophagus omnivorus* (Walk.) and *Trijapitzinia leucomae* Dzhankmen; 4 species of Eulophidae, *Tetrastichus galactopus* (Ratz.) *T. evonymellae* Bouche, *Tetrastichus* sp., *Pediobius bruchicida* (Rond.); a species of Torymidae, *Monodontomerus aereus* Walk. and a species of Encyrtidae, *Ageniaspis fuscicollis* (Dalm.) were reared from 14 species of Lepidoptera in various parts of Eastern Anatolia.

Some biological informations of the hymenopter parasites were given.

Introduction

In the Turkish fauna of parasitic Hymenoptera, so many works have not been done. However, some workers such as Çakıllar (1959), İren (1960), Altay (1966), Öncüer *et al.* (1977, 1978) reared some hymenopterous parasites from their host and gave some biological informations about them. In recent years, Tuatay *et al.* (1972) and Soydanbay - Tunçyürek (1976, 1978) prepared the lists of parasitic and predatory insects from the Turkish Fauna.

In this work, 14 species of Braconidae; 11 species of Ichneumonidae; 5 species of Pteromalidae; 4 species of Eulophidae; a species of Torymidae

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and a species of Encyrtidae were reared 14 species of their lepidopterous hosts from various parts of Eastern Anatolia.

Some biological informations of the parasitic species were given under the name of each host species.

The species were identified by the following scientists:

Braconidae by Dr. Max Fisher, Naturhistorisches Museum, Burgring 7, A-1014 Wien, Austria.

Ichneumonidae by Dr. Klaus Horstmann, 87 Würzburg, Röntgenring 1 D, West Germany.

Chalcidoidea by Dr. Zdenek Boucek, Commonwealth Institute of Entomology, c/o British Museum (Natural History), Cromwell Road, London SW7 5BD, England and by the author.

Material and Methods

Late instar larvae of lepidopterous species on their host plant were collected by hand from the fields in the region. The caterpillars collected with their hosts were placed in a nylon-bag and brought to laboratory. In laboratory each species of the collected material were placed in a separate wire-screened cage in order to rear through adult. The parasites emerged from each host were counted, and the levels of parasitism of each species were obtained.

The adults of species of Lepidoptera and Hymenoptera were killed, pinned, labeled and preserved in collection boxes for working on their taxonomy.

Results and discussions

Host : *Pieris brassicae* L. (Pieridae)

Parasites : *Apanteles glomeratus* L. (Braconidae)

Altay (1966) recorded it as a parasite of *Laspeyresia molesta* Busck in Bursa district. In Eastern Anatolia, *A. glomeratus* is the most important one of parasites of *P. brassicae*, and parasitizes about 20-30 % of host populations. The adults emerge from the yellowish cocoons spinned on the sides of the killed host larva in a number of 7-27 (20.7) and in the period from August to November in the regions where cabbage can be grown. The parasite has at least two generations in a year.

Hyposoter ebeninus Grav. (Ichneumonidae)

In Adana Tuatay *et al.* (1972) and in İzmir Soydanbay - Tunçyürek (1976) also reared this parasite from the same host. In Erzurum and Gümüşhane - Bayburt districts, it plays an important role in the parasitic complex of *P. brassicae*. In both districts, the adults appear at the end of August. Presumably, it has one generation in a year.

Pteromalus puparum (L.) (Pteromalidae)

This parasite which was also reared from the same host in Bursa district by Tuatay *et al.* (1972) has parasitized the chrysalis of *P. brassicae* at low level. The adults appear in September. The number of generations in a year of the species is unknown.

Tetrastichus galactopus (Ratz.) (Eulophidae)

In Ankara this parasite was recorded as a primary parasite of *Pieris rapae* L. by Tuatay *et al.* (1972). However, it was obtained as a common and effective parasite of *A. glomeratus* in Eastern Anatolia. The adults emerge from the cocoons of *A. glomeratus* in the period from the end of August to the beginning of October. It has at least two generations in a year.

Host : *Pieris rapae* var. *atamaria* Frhst. (Pieridae)

Parasite : *Pteromalus puparum* (L.) (Pteromalidae)

This parasite was also - reared from *P. brassicae* in Bursa district (Tuatay *et al.*, 1972) and in Erzurum district. It is a pupal parasite of the host. The larval development is completed in chrysalis, and the adults emerge by opening one or two holes on the skin of chrysalis in September.

Host : *Nymphalis urticae turcica* Stgr. (Nymphalidae)

Parasites : *Apanteles vanessae* Rhd. (Braconidae)

This parasite is very common species in Erzurum Province and the most important one of the parasites of the host. The ratio of parasitism is mainly low about 20 - 30 % of host populations. The adults emerge from the white cocoons spinned on the sides of the killed host larvae in a number of 6 - 42 (19) and in the period from June to September. It has at least two generations in a year in the Province.

Catalaccus ater Ratz. (Pteromalidae)

This is a very common species in Erzurum district. The ratio of parasitism is mainly low, about 20 - 30 % of the host populations. It was also obtained as a hyperparasite of *A. vanessae*. It is, may be, a main factor

restricting the abundance of *A. vanessae* in the district. The adults emerge from the hosts in the period from July to September. It has at least two generations in a year.

One unidentified species from each of Ichneumonidae and *Apanteles* were also reared in a small number from the larvae in Erzurum.

Host : *Vanessa cardui* L. (Nymphalidae)

Parasite : *Apanteles vanessae* Rhd.

This parasite was also reared from *Nymphalis urticae* var. *atamaria* Frhst. in Erzurum Province. It is also very common a larval parasite of *V. cardui*. Biological data of this species are same as that given before.

Host : *Leucoma salicis* L. (Lymantriidae)

Parasites : *Trijapitzinia leucomae* Dzhankmen (Pteromalidae)

This is a very common parasite of the host larvae, develops in the larvae and pupate inside the pupal skin of the host. The adults emerge from the host pupae by cutting one hole in August in Erzurum district. It has mainly moderate level parasitism, about 45-50 % of host populations. Presumably, it has only one generation a year.

Monodontomerus aereus Walk. (Torymidae)

Soydanbay - Tunçyürek (1976) recorded as a primary parasite of *Porthetria dispar* L. in Izmir and, of *Euproctis chrysorrhoea* L. in Çanakkale and Öncüler *et al.* (1978) reared it from the pupae of *E. chrysorrhoea* and *Alsomyia nidicola* Townsend (Diptera : Tachinidae) which is a larval parasite of *E. chrysorrhoea* in Ege Region. In Eastern Anatolia it is a very common pupal parasite of *L. salicis* but also parasitizes the pupae of *Exorista segregata* Rond. (Diptera : Tachinidae) which is very important larval parasite of *L. salicis*, and of *Malacosoma franconica* D. and S. (Lepidoptera : Lasiocampidae) and of *Porthetria dispar* L. (Lepidoptera : Lymantriidae). The adults of the first generation emerge from the pupae of *M. franconica* and, of *P. dispar* in the the period from May to the beginning of June in Erzurum province. The adults of the second generation emerge from the pupae of *L. salicis* and *E. segregata* the period from the end of August to the beginning of October. May be, it has more than two generations in the Province.

Apanteles solitarius (Ratz.) (Braconidae)

This is very rare solitary parasite of the host larvae. Only four adults were obtained in the period from July to August in Erzurum district.

Parasitism was very low about less than 1 %. May be, it has only a generation in a year.

Rogas circumscriptus Nees (Braconidae)

This is also very rare solitary larval parasite of *L. salicis* in Erzurum district. Only 3 adults were reared in August. Presumably it has only a generation in a year.

Pediobius bruchicida (Rond.) (Eulophidae)

This is also a rare pupal parasite of *L. salicis* and of *T. leucomae*. An adult emerges from the white, newly pupated, *T. leucomae* by cutting a small hole on the dorsum of thorax of the pupa. This parasite is more important as a secondary parasite than that as primary parasite. However its parasitisms are very low in the district. The number of generation of this species is unknown.

Only a specimen of an unidentified ichneumonid species was also reared from the larvae on 25. VII. 73 in Erzurum.

Host : *Euproctis chrysorrhoea* L. (Lymantriidae)

Only two specimens of an unidentiifed species of *Apanteles* was reared as a solitary parasite from the host larvae collected from Başaklı - Oltu - Erzurum.

Host : *Porthetria dispar* (L.) (Lymantriidae)

Parasites : *Monodontomerus aereus* Walk. (Torymidae)

This is a very common pupal parasite of the host in Bitlis district. But the parasitism is low, 10 %. However, it is also parasitizes the pupae of *Sturmia scutellata* B. D. (Diptera : Tachinidae). The other biological data was given before.

An unidentified species of *Tetrastichus* was also reared in a very large number from the egg masses of *P. dispar* collected from oak trunk in Bingöl district. However, the parasitism of this species was low, about 20 % of eggs in a mass. No information is available about the number of its brood.

Host : *Ocnogyne loewi* Zell. (Arctiidae)

Parasites : *Apanteles vitripennis* (Curtis) (Braconidae)

This is the most common gregarious parasite of the larvae in Horasan, Erzurum. However, the parasitism is very low, about 5 %. The adults emerge from the white cocoons spinned at the sides of the killed host larvae in a

number of 12 - 50 (29) and in the period from the beginning of June to the end of July. The parasite has only a generation in a year on the host.

Apanteles tibialis (Curtis) (Braconidae)

This gregarious parasite was reared from only larvae of more than a hundred caterpillars collected in Horasan, Erzurum. Thirty four adults emerged from the white cocoons spinned on the killed host larvae in July. The parasite has only a generation in a year on the host.

Microplitis lugubris (Ruthe) (Braconidae)

Four adults of this solitary parasite were obtained from more than a hundred specimens collected in Horasan, Erzurum district. Adult emerges from cocoon in June. On the host, it has only a generation in a year.

Host : *Simyra dentinosa* Freyer (Noctuidae)

Parasites : *Apanteles spurius* Wesm. (Braconidae)

This gregarious parasite is widely distributed all over Eastern Anatolia. It was reared from 7 species of Lepidoptera, namely *Malacosoma castrensis* L., *M. castrensis kirghisica* Stgr., *M. franconica* D. S., *M. alpicola* Stgr., *M. neustria* L., *Symira dentinosa* Freyer, and *Tethea* or D. S. from the region. The adults emerge from the white cocoons spinned on the killed host larvae in a number of 2 - 41 (16,6) and in the period from the beginning of June to the end of August. The parasitism is not very low, about 30 - 40 % of the host populations in Erzurum province. It has at least two generations in a year.

Undetermined two gregarious species of *Apanteles* and a solitary species of *Bracon* were also reared from the hosts in the region. *Bracon* sp. also parasitizes *M. castrensis* in the region.

Catalaccus ater Ratz. (Pteromalidae)

For this species, Boucek (1970, 1977) stated that it is a hyperparasite of Lepidoptera through cocoons of Braconidae (mainly *Apanteles* spp.) and Ichneumonidae and widely distributed in Europe. The observations in this study are different from Dr. Boucek's statement that the larvae of the parasite develop in the host larvae together with that of *Apanteles*. This shows that it is also a primary gregarious parasite of the host. However, the parasite also parasitizes the cocoons of *Apanteles* spp. Due to this it is also a hyperparasite of the host. *C. ater* is very common in Erzurum district, and the adults emerge from the cocoons in the period from the end of July

to the end of September. It has at least two generations in a year in the region.

Host : *Acrionicta aceris* L. (Noctuidae)

Parasite : *Psychophagus omnivorus* Walk. (Pteromalidae)

Boucek (1977) stated this species as a primary or secondary parasite of *Malacosoma neustria* L., *Hyphantria cunea* Dru., *Stilpnotia salicis* L. and *Lymantria dispar* L. in Yugoslavia. He also noted that it is widely distributed in Europe. This parasite was reared from the pupae of the host as a primary parasites in Erzurum district. The adults emerge from the pupae in the period from the beginning of April to the beginning of May. It has only a generation in a year on *A. aceris*, but it may move to its other hosts in the region, and may have some more generations.

Host : *Tethea* or D. and S. (Thyatiridae)

Parasite : *Apanteles spurius* Wesm. (Braconidae)

This species was rarely reared from this host in the region. The biological informations had been given before under *S. dentinosa*.

Host : *Dipsosphesia ichneumoniformis* F. (Aegeriidae)

Parasites : *Chelonella nitens* Rhd. (Braconidae)

Only 5 adults of this solitary parasite were reared from the larvae of the host collected in Erzurum. The adults emerge from pupae in the period from July to October. It has at least two generations in a year on the host. The parasitism was less than 5 % of the host populations.

Undetermined 3 species of Ichneumonidae were also reared from the host larvae in a small number in the region.

Host : *Hyponomeuta malinella* Zell. (Yponomeutidae)

Parasites : *Ageniaspis fuscicollis* (Dalman) (Encyrtidae)

Çakıllar (1959) reared this parasite from *Prays oleae* Bern. in Marmara Region, and İren (1960) from Ankara, Soydanbay - Tunçyürek (1976) from Kağızman, Kars recorded this species as a parasite of *H. malinella*. Boucek (1977) stated that this is a parasite of *Prays oleallus* F., *Hyponomeuta malinella* Zell. and *H. padella* L. in Yugoslavia. He also noted that it is a polyembryonic egg - larval parasite of some small Lepidoptera, mainly of *Hyponomeuta* spp. and is *Holarctic*, but recorded also from some other parts of the world (? introduced). In this study, this parasite was reared in a large number from the larvae of the host collected from Oltu, Erzurum and

from Iğdır, Kağızman, Kars. The adults emerge from the larvae of the host in July. Presumably, it has only a generation in a year.

Tetrastichus evonymellae (Bouché)

İren (1960) from Ankara and Boucek (1977) from Yugoslavia noted this species as a parasites of *H. malinella*, *H. padella*, and İren (1960) also recorded it as a parasite of *H. rorella* Hb., from Ankara. Boucek (1977) also stated that it is a parasite of *Hyponomeuta* spp. and of their primary parasites (e.g. Ichneumonidae) and is distributed whole Europe to Transcaucasia. In this work *T. evonymellae* was reared from the larvae of *H. malinella* collected from Tercan, Erzincan and Iğdır, Kars districts. The adults emerge from the host in July. Presumably it has only a generation in a year on the host.

Pteromalus sp. nr. *semotus* Walk. (Pteromalidae)

This parasite was reared in a small number from the larvae of *H. malinella* collected from Iğdır, Kars district. The adults emerge from the host in July.

Four species of the undetermined species of Ichneumonidae were reared in a small number from the host collected from Iğdır, Kars; Tercan, Erzincan; Aşkale, Erzurum and Torul - Gümüşhane districts.

Host : *Plodia interpunctella* (Hbn.) (Pyralidae)

Parasite : *Venturia canescens* Grav. (Ichneumonidae)

Three adults of this parasite were reared from the host in Adana. The adults emerge from the larvae of the host in June.

Acknowledgements

The author wishes to thank Dr. Max Fisher, Dr. Klaus Horstmann and Dr. Zdenek Boucek for identifying the species.

Ö Z E T

Doğu Anadolu'da bazı lepidopter zararlılarında saptanan
hymenopter parazitler

Bu çalışmada 14 tür Braconidae: *Rogas circumscriptus* Nees, *Chelonella nitens* Rhd., *Microplitis lugubris* (Ruthe), *Bracon* sp., *Apanteles spurius* (Wesm.) A. *vanessae* Rhd., *A. vitripennis* (Curt.) *A. tibialis* (Curt.), *A. solitarius* (Ratz.),

A. glomeratus L. ve *Apanteles* spp. (4); 11 tür Ichneumonidae; *Hyposoter ebeninus* Grav., *Venturia canescens* Grav. ve 9 tanımlanamamış tür; 5 Pteromalidae: *Pteromalus puparum* (L.), *Pteromalus* sp. nr. *semotus* (Walk.), *Catalaccus ater* Ratz., *Psychophagus omnivorus* (Walk.) ve *Trijapitzinia leucomae* Dzkanokmen; 4 tür Eulophidae: *Tetrastichus galactopus* (Ratz.), *T. evonymellae* Bouche, *Tetrastichus* sp. ve *Pediobius bruchicida* (Rond.); bir tür Torymidae: *Monodontomerus aereus* Walk. ve bir tür Encyrtidae: *Ageniaspis fuscicollis* (Dalm.), Doğu Anadolu'nun çeşitli yörelerinde bulunan 14 tür Lepidoptera'dan elde edilmiştir.

Hymenopter parazitlerle ilgili bazı biyolojik bilgiler de her konukçu türü müteakiben verilmiştir.

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