

Gypsonoma minutana (Lepidoptera, Olethreutidae) and its natural enemies in eastern Anatolia

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Summary

Gypsonoma minutana Hbn. (Lepidoptera, Olethreutidae) is firstly recorded from, Turkey as a pest of *Populus nigra* var. *italica* DuRoi in Tortum district. From this pest one species of fungal pathogen and seven species of parasites were obtained in which, *Beauveria bassiana* (Bals.) Vuill. is obtained for the first time from this host. On the other hand, *Phytomyptera nitidiventris* Rond. (Diptera, Tachinidae) is also a first record from this host and from Turkey. The hymenopterous parasites are *Apanteles* sp., *Ascogaster* sp. (Braconidae), *Tetrastichus* spp. (2), (Eulophidae) and two species from Ichneumonidae.

Introduction

Beauveria bassiana (Bals.) Vuill., as a pathogen of various insects, has been recorded from several orders viz. Isoptera, Hemiptera, Homoptera, Coleoptera, Lepidoptera, Diptera, Hymenoptera from different countries (Tanada, 1966; Tkalich, 1967; Urban, 1967; Wickman and Hunt, 1969; Andrashchuk, 1981; Kramm and West, 1982; Lorenzato and Carseuil, 1982; Avidzba, 1983; Beavers *et al.*, 1983; Patil and Thontadarya, 1983; Ryliskiene and Zayanckauskas, 1983; Sa'to and Ikeda, 1983. In our country the fungus recorded on *Eurygaster integriceps* Put. by İren (1956) and by Kılıç (1978) in Southeastern Turkey and on *Phragmocossia albida* (Erschow) in İzmir by Kaya *et al.*, (1982). In different parts of the world this fungus is used as a mycoinsecticidal under the name of Boverin with the integration of several chemicals (Bratlief, 1979; Ignoffo *et al.*, 1979; Anderson and Roberts, 1983; Sikura and Sikura, 1983 a, b).

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On the other hand, *Gypsonoma neglectana* Dup., *G. oppressana* Dup., *G. aceriana* Dup., *Earias vernana* Hb., *Arcips confictana* Wlk., *Tortrix diversana* Hb., *Epiblema nisella* Cl. (Anonymous, 1958) from Lepidoptera were given as some pests of poplar trees. In U.S.S.R. another Lepidoptera, *Gypsonoma minutana* Hbn. was found as an important pest of *Populus tremula* (Tibattina, 1977) and in the same country for the biological control of the pest, some strains of *Bacillus thuringiensis* were tested (Chilingaryan *et al.*, 1972).

By this work the occurrence of *B. bassiana* and its host *G. minutana* Hbn. which was firstly recorded as a pest of *Populus nigra* var. *italica* DuRoi in Tortum District of Eastern Anatolia were reported. In this study also some parasites of *G. minutana* is given and some aspects in effectiveness of the natural enemies were observed.

The works on the host and insect parasites were carried out by the first author and the studies related with the fungus were done by the second author.

Materials and Methods

The materials were collected in larval stage from the leaves of *P. nigra* var. *italica* in Tortum District on 24.5.1984 and on 4.7.1984. The insects were brought to laboratory in polythene bags and the larvae were reared in 10 cm petri dishes on the leaves of the host. During the rearing the wilted and dried leaves were removed and the fresh ones were placed into the petri dishes in every three days. During this procedure the fungus on the death larvae and the pupae of parasites between the leaves were obtained. The fungus was isolated by removing a bit of mycelium and conidia, then transferring to PDA (Potato dextrose agar) with a flame sterilised needle. The fungus was maintained at 25°C. The samples both taken from the death larvae and on artificial media were stained by using 0.5 % cotton blue in lactophenol. Then they were examined under microscope and necessary photos were taken.

The pupae of the parasites were left in petri dishes after removing from the leaves. After emerging the adults were killed and prepared for microscopic studies.

The number of larvae covered by fungal colony and the number of parasitic pupae were counted and percentages were estimated.

Results and Discussion

The study of genitalia and its comparison with Pierce and Metcalfe (1960) showed that the moth is *G. minutana* Hbn.. This is the first record of

this moth in Turkey. The caterpillars feed on the leaves of *P. nigra* var. *italica* by rolling the two or three leaves of the shoots. After drying of the eaten leaves, the larvae move to other healthy shoots. The damage of the pest on the leaves of *P. nigra* var. *italica* is around 20 % in Tortum District.

During the course of rearing procedure of the caterpillars collected on 24.5.1984, some whitish fungal colonies on death caterpillars (Fig. 1) between the leaves were recorded. A detailed examination of the fungus and the literature on *B. bassiana* (Aoki, 1971; De Hoog, 1972; Aoki *et al.*, 1975), revealed that the fungus isolated from the larvae of *G. minutana* is *B. bassiana* (Fig. 2).

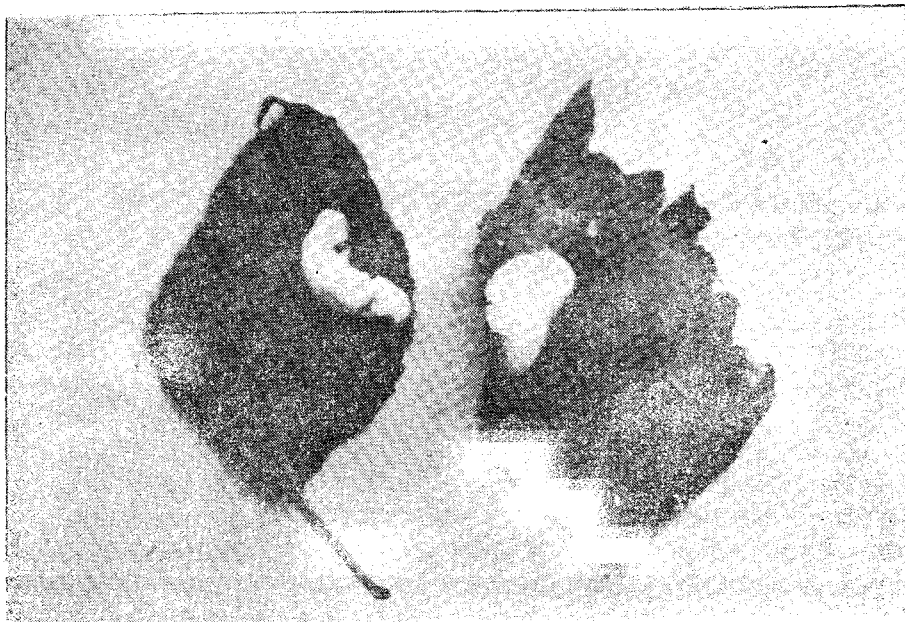


Fig. 1. *Beauveria bassiana* on the larvae of *Gypsonoma minutana*

In the section the colony is seen to consist of a dense cushion of interwoven hyphae with conidiophores and conidia which entirely covering the larvae (Fig. 3). This is the first report of the pathogen on *G. minutana* in natural population from Turkey.

The number of larvae showing fungal growth on them is about 9 % of the larvae collected on 24.5.1984. But no fungal growth was observed on the ones collected in later larval stages on 5.7.1984. This could be due to the larval death by the pathogen probably during the second or third stages.

The parasites obtained from the larvae collected on 4.7.1984 and their percentage of parasitism are as follows: *Phytomyptera nitidiventris* Rond.

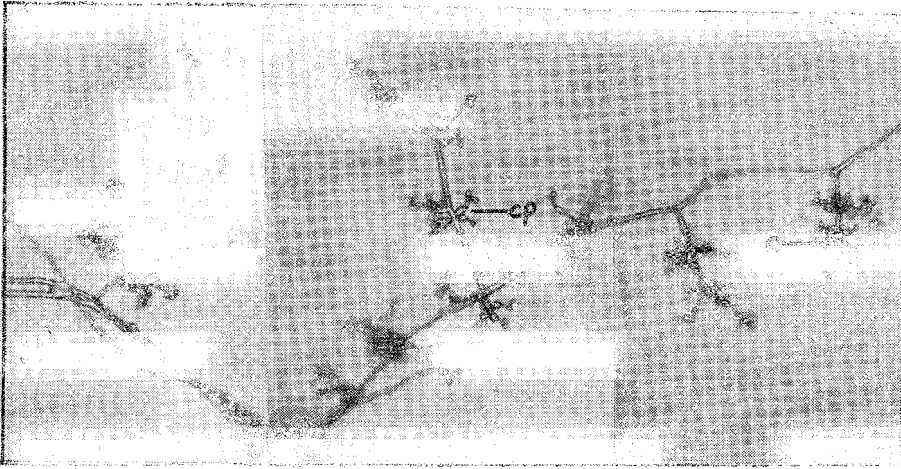


Fig. 2. *Beauveria bassiana*, conidia (c), conidiophore (cp), clusters of conidial structures (cs) x 350

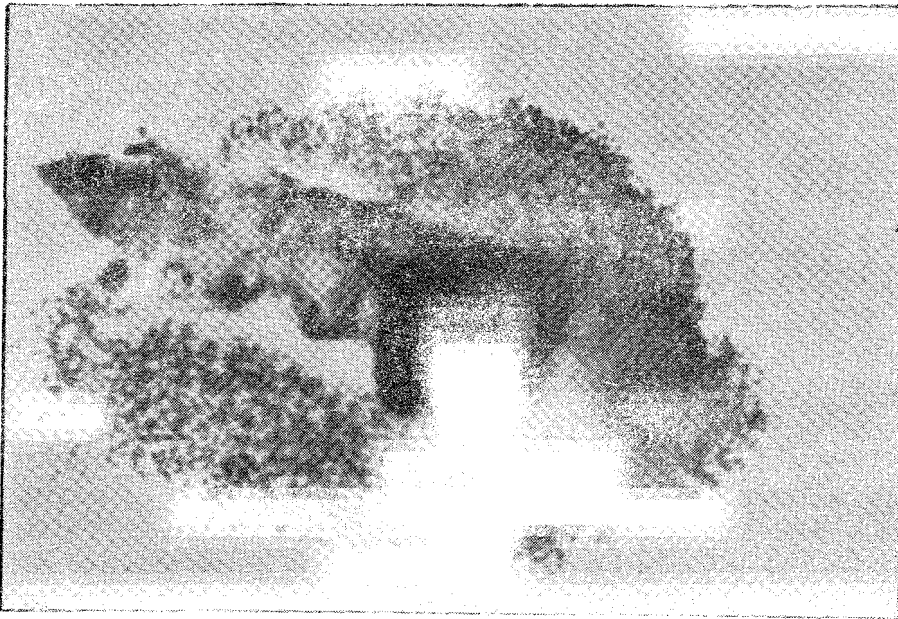


Fig. 3. Cushion of hyphae with conidiophores and conidia covering the larvae

(Diptera, Tachinidae 13 %); *Apanteles* sp. 1 %), *Ascogaster* sp. 9 %) (Hymenoptera, (Braconidae); Ichneumonidae spp. (2) 8 %) (Probably hyperparasite) 1 % (Hymenoptera, Eulophidae). *P. nitidiventris* is firstly recorded from *G. minutana* and from Turkey. Previously this parasite was recorded from four

species of microlepidoptera from England by Van Emden (1954) and from eleven species of microlepidoptera from northwest Europe by Herting (1960).

As a result *G. minutana* is a native pest of *P. nigra* var. *italica* in Eastern Anatolia and its natural enemies were kept its population in a low level.

Özet

Doğu Anadolu'da kavak zararlısı ***Gypsonoma minutana*** Hbn. (Lepidoptera: Olethreutidae) ve doğal düşmanları

Tortum, Erzurum yöresindeki *Populus nigra* var. *italica* Du Roi üzerinde zarar yaptığı saptanan ***Gypsonoma minutana*** Hbn. (Lepidoptera: Olethreutidae)'nın Türkiye faunası için yeni bir kayıt olduğu belirlenmiştir.

Bu zararlıdan bir tür fungal patojen ve yedi tür böcek parazit elde edilmiştir. Bu doğal düşmanlardan *Beauveria bassiana* (Bals.) Vuill. için bu zararlı yeni bir konukçudur. Diğer taraftan, *Phytomyptera nitidiventris* Rond. (Diptera: Tachinidae)'in de bu zararlıyı parazitlediği ilk olarak tesbit edilmiş ve Türkiye için yeni kayıt olduğu saptanmıştır.

Gypsonoma minutana tırtıllarından elde edilen hymenopter parazitler ise şunlardır: *Apanteles* sp., *Ascogaster* sp. (Braconidae); *Tetrastichus* spp. (2) (Eulophidae) ve iki tür Ichneumonidae.

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