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# The Lepidoptera (INSECTA) Fauna of Düzce Province, Turkey

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**Abstract:** The lepidopteran species of Düzce province were investigated. To collect specimens, a sweep net and light traps were used. A total of 109 species belonging to 17 families of the order Lepidoptera were identified. The family Geometridae was represented by the highest number of species (20), followed by Noctuidae (19), Lycaenidae (12) and Nymphalidae (12). This was the first study to determine the Lepidoptera fauna of Düzce.

**Key Words:** Lepidoptera, Düzce, fauna, distribution

## Düzce Çevresi Lepidoptera (INSECTA) Faunası

**Özet:** Bu çalışmada Düzce yöresinin Lepidoptera türleri belirlenmiştir. Bu amaçla atrap ve ışık tuzağı kullanılmıştır. Lepidoptera takımına ait 17 familyadan toplam 109 tür teşhis edilmiştir. Toplanan örnekler içerisinde en fazla türe sahip olan familyalar, Geometridae (20), Noctuidae (19), Lycaenidae (12) ve Nymphalidae (12) olarak sıralanabilir. Bu çalışma, Düzce ilinin Lepidoptera faunasını belirlemek için yapılan ilk çalışmadır.

**Anahtar Sözcükler:** Lepidoptera, Düzce, fauna, yayılış

## Introduction

Lepidoptera –butterflies and moths– are very common insects and are well known because of their very attractive colors and patterns on their wings. It is recognized as one of the largest orders of insects (Romoser and Stoffolana, 1994), having more than 150,000 described species (Demirsoy, 1992). It can be divided into the suborders Frenatea and Jugatea on the basis of wing coupling mechanisms. Some authors divide Lepidoptera into two different suborders; Rhopalocera (butterflies and skippers) and Heterocera (moths) (Romoser and Stoffolana, 1994).

Some lepidopteran species are considered to be economically important pests. The larvae of most species are phytophagous and some of them are very serious pests of agricultural plants, while the adults of many species may serve as inspiration sources for many artists and designers (Borror et al., 1989). Because of their very attractive colors and patterns, many amateur collectors like to collect these insects from different parts of the world.

Although Lepidoptera is one of the largest orders among insects in terms of the number of species, studies

carried out in Turkey to determine the fauna and distribution of Lepidoptera are not complete. Even though some studies have been carried out in different parts of Turkey, mostly regional, still some parts remain unknown (Mathew, 1881; Staudinger, 1881; Rebel, 1903, 1913; Graves, 1925, 1926; Zukowsky, 1941; DeLattin, 1950, 1951; Keyder, 1961; Kansu, 1963; Güneyi and Şengün, 1972; Mol, 1977; Doğanlar et al., 1981; Hacker, 1985, 1986a, 1986b, 1987; Kornoşor, 1987; Baş and Selmi, 1990; Koçak and Seven, 1990; Hakyemez, 1994; Okyar and Kornoşor, 1994, 1997; Hesselbarth et al., 1995; Avcı, 1997; Mol and Avcı, 1997; Selek, 1998; Okyar and Aktaş, 1998, 1999; Şimşek, 2000a, 2000b, 2002). There are also several studies in particular on the Lepidoptera fauna of Marmara and the eastern Black Sea regions but some of them are limited with only one family's species or particular forest types and trees (Mol, 1977; Baş and Selmi, 1990; Öymen, 1990; Hakyemez, 1994; Hesselbarth et al., 1995; Avcı, 1997; Mol and Avcı, 1997; Özay, 1997; Selek, 1998). There is no specific study investigating the Lepidoptera fauna of Düzce province.

Düzce is located between longitudes 30° 49' and 31° 50' east and between latitudes 40° 37' and 41° 07'

north. It is also located in an important transitional area between Europe and Asia and has a very large research potential because of having different ecosystem types in both forest and agricultural lands. Having different ecosystems should provide unlimited habitat types for animals and plants, which may increase the diversity of living organisms. On the other hand, the continuing illegal use of forests and incorrect land use practices threaten to destroy the diversity of ecosystems and organisms in Düzce. Therefore, detailed studies should be carried out as quickly as possible to determine the biological diversity of Düzce province.

For these reasons, the objectives of this study were to investigate the Lepidoptera fauna of Düzce province in particular, to determine the distribution of Lepidoptera species during the seasonal activity period and to contribute to the knowledge of the Lepidoptera fauna of Turkey in general.

## Materials and Methods

This study was conducted between March 2001 and March 2002 in 22 different localities and habitat types in Düzce province. Specimens were collected using a sweep net and light trap (simply one light source and one piece of white cloth) and by hand picking. Collected specimens were killed in killing jars with ethyl acetate. During the collection, the collection date, name of the locality, vegetation type and altitude were noted on a piece of envelope for every specimen. Each specimen was then put into this envelope and all materials were brought to the laboratory for preparation and identification. Each specimen was pinned using a no: 2 insect pin and the wings were mounted on a spreading board. After the specimens dried, they were numbered and placed in insect boxes. Each lepidopteran specimen was identified using an Olympus stereomicroscope. For identification, different studies (Spuller, 1908, 1910; Beirne, 1954; Mol, 1977; Chinery, 1984, 1986; Hesselbarth et al., 1995; Alford, 1995; Funet, 2001) were used. The Lepidoptera collections of the Department of Biology at Trakya University were used to identify some specimens. Some important forest pests among the collected species were also reported.

The specimens of the identified species are stored at the Collection Room of the Forest Entomology and Protection Unit, Düzce Forest Faculty, Abant İzzet Baysal University, Düzce, Turkey.

## Abbreviations

M: Mountain, V: Village, T: Town, C: City, R: Region, A: Adult

## Results

A total of 1388 Lepidoptera specimens were collected from 22 different localities in Düzce province. A total of 109 species belonging to 17 families of the order Lepidoptera were identified and are listed as follows. Although family names are listed according to phylogenetic rules, species in each family are listed alphabetically. The highest number of species belongs to Geometridae (20, 18%), following by Noctuidae (19, 17%), Lycaenidae (12, 11%), and Nymphalidae (12, 11%). For each species, location, altitude (m), collection date and the number of specimens (in parentheses) are given in that order. Vegetation type is not reported in this article because some species were found in every vegetation type, which would make the article much longer.

## HESPERIOIDEA Latreille, 1809

### HESPERIIDAE Latreille, 1809

#### 1. *Hesperia comma* (Linnaeus, 1758)

Güzeldere Waterfall: 750 m, 01.07.2001, (1)

#### 2. *Muschampia tessellum* (Hübner, [1803])

Gölyaka T.: 130 m, 14.07.2001, (2); Çiçekli R.: 1250 m, 27.06.2001, (1)

#### 3. *Ochlodes venatus* (Bremer & Grey, 1853)

Nalbantoğlu V.: 300 m, 03.06.2001 (2); Kurugöl R.: 500 m, 10.06.2001, (3); Güzeldere Waterfall: 750 m, 01.07.2001, (2); Çınarlı V.: 150 m, 14.07.2001, (3); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (3); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (1); Düzorman Forest Depot: 400 m, 11.09.2001, (3)

#### 4. *Pyrgus malvae* (Linnaeus, 1758)

Taşköprü V.: 120 m, 26.05.2001, (2); Nalbantoğlu V.: 300 m, 03.06.2001 (2); Bakacak V.: 750 m, 21.06.2001, (3); Güzeldere Waterfall: 750 m, 01.07.2001, (2); Gölyaka T.: 130 m, 14.07.2001, (3); Çınarlı V.: 150 m, 14.07.2001, (4); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (4); Cumayeri T.

(Dokuzdeğirmen V.): 100 m, 20.08.2001, (1);  
Düzorman Forest Depot: 400 m, 04.08.2001, (2)

##### 5. *Pyrgus melotis* (Duponchel, [1834])

Taşköprü V.: 120 m, 26.05.2001, (5); Nalbantoğlu V.: 300 m, 03.06.2001, (4); Bakacak V.: 750 m, 21.06.2001, (3); Çınarlı V.: 150 m, 14.07.2001, (2); Düzorman Forest Depot: 400 m, 04.08.2001, (2); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (3); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (2).

##### 6. *Pyrgus sidae* (Esper, [1784])

Taşköprü V.: 120 m, 26.05.2001, (2); Bakacak V.: 750 m, 21.06.2001, (1); Gümüşpınar V.: 200 m, 24.06.2001, (4); Çiçekli R.: 1000 m, 27.06.2001, (3); Pürenli R.: 1200 m, 20.07.2001, (2).

##### 7. *Thymelicus sylvestris* (Poda, 1761)

Taşköprü V.: 120 m, 26.05.2001, (3); Aşaköy V.: 150 m, 30.05.2001, (1); Nalbantoğlu V.: 300 m, 03.06.2001 (2); Düzce C.: 130 m, 06.06.2001, (1); Gümüşpınar V.: 200 m, 17.06.2001, (4); Bakacak V.: 750 m, 21.06.2001, (6); Çiçekli R.: 1250 m, 27.06.2001, (4); Beçiyörükler V.: 250 m, 04.07.2001, (3); Çınarlı V.: 150 m, 14.07.2001, (5); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (6)

#### PAPILIONOIDEA Latreille, [1802]

##### PAPILIONIDAE Latreille, [1802]

##### 8. *Iphiclides podalirius* (Linnaeus, 1758)

Güzeldere Waterfall: 750 m, 01.07.2001, (2); Beçiyörükler V.: 250 m, 04.07.2001, (1); Tatlıdere R.: 750 m, 18.07.2001, (2); Çiçekli R.: 1000 m, 25.07.2001, (2); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (1); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (3)

##### PIERIDAE Duponchel, [1835]

##### 9. *Aporia crataegi* (Linnaeus, 1758)

Beçiyörükler V.: 250 m, 19.05.2001, (2); Nalbantoğlu V.: 300 m, 03.06.2001, (1); Gümüşpınar V.: 200 m, 24.06.2001, (4); Gölyaka T.: 130 m, 14.07.2001, (2); Çınarlı V.: 150 m, 14.07.2001, (1)

##### 10. *Colias crocea* (Fourcroy, 1785)

Aşaköy V.: 150 m, 21.05.2001, (2), 23.05.2001, (3), 30.05.2001, (2); Taşköprü V.: 120 m, 26.05.2001,

(2); Nalbantoğlu V.: 300 m, 03.06.2001 (2); Düzce C.: 150 m, 04.06.2001, (4); Düzce C.: 130 m, 06.06.2001, (4); Kurugöl R.: 500 m, 10.06.2001, (5); Gümüşpınar V.: 200 m, 17.06.2001, (3), 24.06.2001, (4); Çiçekli R.: 1400 m, 27.06.2001, (4), 1250, 25.07.2001, (5); Güzeldere Waterfall: 750 m, 01.07.2001, (7); Gölyaka T.: 130 m, 14.07.2001, (7); Çınarlı V.: 150 m, 14.07.2001, (4); Tatlıdere R.: 750 m, 18.07.2001, (3); Pürenli R.: 1200 m, 20.07.2001, (5); Gölyaka (Yanık R.): 1000 m, 20.07.2001, (4); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (8); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (8); Kabalak V.: 750 m, 05.09.2001, (3)

##### 11. *Gonepteryx rhamni* (Linnaeus, 1758)

*G. r.* subs. *miljonowskii* (Nekrutenko, 1966): Kurugöl R.: 500 m, 10.06.2001, (2); Gümüşpınar V.: 200 m, 24.06.2001, (1); Tatlıdere R.: 750 m, 18.07.2001, (2); Çiçekli R.: 1500 m, 25.07.2001, (1)

##### *G. r.* subs. *tasiens* (Verity, 1913)

Gümüşpınar V.: 200 m, 24.06.2001, (1)

##### 12. *Leptidea sinapis* (Linnaeus, 1758)

Nalbantoğlu V.: 300 m, 03.06.2001, (2); Gümüşpınar V.: 200 m, 17.06.2001, (1); Beçiyörükler V.: 250 m, 04.07.2001, (1); Gölyaka T.: 130 m, 14.07.2001, (2); Çınarlı V.: 150 m, 14.07.2001, (2); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (1); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (2); Kabalak V.: 750 m, 05.09.2001, (1)

##### 13. *Pieris brassicae* (Linnaeus, 1758)

Aşaköy V.: 150 m, 23.05.2001, (2); Taşköprü V.: 120 m, 26.05.2001, (2); Nalbantoğlu V.: 300 m, 03.06.2001 (2); Düzce C.: 130 m, 06.06.2001, (1); Gümüşpınar V.: 200 m, 24.06.2001, (1); Çiçekli R.: 1400 m, 27.06.2001, (1); Güzeldere Waterfall: 750 m, 01.07.2001, (2); Gölyaka T.: 130 m, 14.07.2001, (3); Bakacak V.: 750 m, 16.07.2001, (1); Tatlıdere R.: 750 m, 18.07.2001, (1); Gölyaka (Yanık R.): 1000 m, 20.07.2001, (2); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (2); Kabalak V.: 750 m, 05.09.2001, (1)

##### 14. *Pieris napi* (Linnaeus, 1758)

Düzce C.: 150 m, 28.04.2001, (2); Beçiyörükler V.: 250 m, 19.05.2001, (3), 04.07.2001, (6); Aşaköy V.: 150 m, 21.05.2001, (3), 23.05.2001, (2), 30.05.2001, (3); Taşköprü V.: 120 m, 26.05.2001, (2); Beyköy T.:

150 m, 27.05.2001, (3); Nalbantoğlu V.: 300 m, 03.06.2001 (10); Düzce C.: 150 m, 04.06.2001, (5); Düzce C.: 130 m, 06.06.2001, (3); Kurugöl R.: 500 m, 10.06.2001, (8); Gümüşpınar V.: 200 m, 17.06.2001, (4), 24.06.2001, (3); Bakacak V.: 750 m, 21.06.2001, (4), 16.07.2001, (7); Çiçekli R.: 1400 m, 27.06.2001, (3), 1250 m, 25.07.2001, (5); Güzeldere Waterfall: 750 m, 01.07.2001, (5); Gölyaka T.: 130 m, 14.07.2001, (12); Çınarlı V.: 150 m, 14.07.2001, (7); Tatlıdere R.: 750 m, 18.07.2001, (3); Pürenli R.: 1200 m, 20.07.2001, (3); Gölyaka (Yanık R.): 1000 m, 20.07.2001, (3); Çiçekli R.: Düzorman Forest Depot: 400 m, 04.08.2001, (3); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (3); Kabalak V.: 750 m, 05.09.2001, (2)

**15. *Pontia edusa* (Fabricius, 1777)**

Taşköprü V.: 120 m, 26.05.2001, (1); Nalbantoğlu V.: 300 m, 03.06.2001 (6); Düzce C.: 130 m, 06.06.2001, (2); Kurugöl R.: 500 m, 10.06.2001, (3); Gümüşpınar V.: 200 m, 17.06.2001, (2), 24.06.2001, (1); Bakacak V.: 750 m, 21.06.2001, (1), 16.07.2001, (4); Çiçekli R.: 1250 m, 27.06.2001, (1); Güzeldere Waterfall: 750 m, 01.07.2001, (1); Gölyaka T.: 130 m, 14.07.2001, (6); Çınarlı V.: 150 m, 14.07.2001, (4); Tatlıdere R.: 750 m, 18.07.2001, (2); Pürenli R.: 1200 m, 20.07.2001, (1); Gölyaka (Yanık R.): 1000 m, 20.07.2001, (2); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (3); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (1)

**LYCAENIDAE [Leach], [1815]**

**16. *Celastrina argiolus* (Linnaeus, 1758)**

Beçiyörükler V.: 250 m, 19.05.2001, (5); Aşaköy V.: 150 m, 23.05.2001, (4); Taşköprü V.: 120 m, 26.05.2001, (3); Nalbantoğlu V.: 300 m, 03.06.2001 (4); Düzce C.: 130 m, 06.06.2001, (1); Gümüşpınar V.: 200 m, 17.06.2001, (3); Bakacak V.: 750 m, 21.06.2001, (4); Çınarlı V.: 150 m, 14.07.2001, (2); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (4); Kabalak V.: 750 m, 05.09.2001, (3)

**17. *Cupido (Everes) argiades* (Pallas, 1771)**

Aşaköy V.: 150 m, 30.05.2001, (5); Taşköprü V.: 120 m, 26.05.2001, (4); Nalbantoğlu V.: 300 m, 03.06.2001 (5); Kurugöl R.: 500 m, 10.06.2001, (2); Düzce C.: 150 m, 18.06.2001, (3); Bakacak V.: 750 m, 21.06.2001, (2); Gümüşpınar V.: 200 m, 24.06.2001,

(4); Çiçekli R.: 1250 m, 27.06.2001, (3); Beçiyörükler V.: 250 m, 04.07.2001, (4); Gölyaka T.: 130 m, 14.07.2001, (6); Çınarlı V.: 150 m, 14.07.2001, (4); Düzorman Forest Depot: 400 m, 04.08.2001, (2); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (1); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (4)

**18. *Cupido osiris* (Meigen, 1829)**

Aşaköy V.: 150 m, 23.05.2001, (1); Taşköprü V.: 120 m, 26.05.2001, (4); Nalbantoğlu V.: 300 m, 03.06.2001 (3); Kurugöl R.: 500 m, 10.06.2001, (2); Bakacak V.: 750 m, 21.06.2001, (5); Gümüşpınar V.: 200 m, 24.06.2001, (2); Çiçekli R.: 1250 m, 27.06.2001, (4); Beçiyörükler V.: 250 m, 04.07.2001, (5); Gölyaka T.: 130 m, 14.07.2001, (4); Çınarlı V.: 150 m, 14.07.2001, (3); Tatlıdere R.: 750 m, 18.07.2001, (1); Gölyaka (Yanık R.): 1000 m, 20.07.2001, (4); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (4); Kabalak V.: 750 m, 05.09.2001, (1)

**19. *Leptotes pirithous* (Linnaeus, 1767)**

Nalbantoğlu V.: 300 m, 03.06.2001 (4); Kurugöl R.: 500 m, 10.06.2001, (1); Bakacak V.: 750 m, 21.06.2001, (2); Gümüşpınar V.: 200 m, 24.06.2001, (2); Çiçekli R.: 1400 m, 27.06.2001, (2); Beçiyörükler V.: 250 m, 04.07.2001, (2); Gölyaka T.: 130 m, 14.07.2001, (3); Çınarlı V.: 150 m, 14.07.2001, (4); Düzorman Forest Depot: 400 m, 04.08.2001, (5); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (3); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (1); Kabalak V.: 750 m, 05.09.2001, (2)

**20. *Lycaena dispar* (Linnaeus, 1758)**

Nalbantoğlu V.: 300 m, 03.06.2001 (2); Kurugöl R.: 500 m, 10.06.2001, (2); Bakacak V.: 750 m, 21.06.2001, (2); Çiçekli R.: 1400 m, 27.06.2001, (2); Güzeldere Waterfall: 750 m, 01.07.2001, (3); Beçiyörükler V.: 250 m, 04.07.2001, (1); Pürenli R.: 1200 m, 20.07.2001, (1)

**21. *Lycaena phlaeas* (Linnaeus, 1761)**

Beçiyörükler V.: 250 m, 19.05.2001, (3); Taşköprü V.: 120 m, 26.05.2001, (3); Nalbantoğlu V.: 300 m, 03.06.2001 (3); Gümüşpınar V.: 200 m, 17.06.2001, (6); Bakacak V.: 750 m, 21.06.2001, (3); Çiçekli R.: 1400 m, 27.06.2001, (2); Düzce C.: 150 m, 10.07.2001, (3); Gölyaka T.: 130 m, 14.07.2001, (2); Çınarlı V.: 150 m, 14.07.2001, (3); Gölyaka (Yanık R.):

1000 m, 20.07.2001, (2); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (1)

**22. *Plebejus (Aricia) agestis*** ([Denis & Shiffermüller], 1775)

Bakacak V.: 750 m, 21.06.2001, (3); Çiçekli R.: 1250 m, 27.06.2001, (4); Düzorman Forest Depot: 400 m, 04.08.2001, (4); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (1); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (2)

**23. *Plebejus anteros*** (Freyer, [1838])

Taşköprü V.: 120 m, 26.05.2001, (2); Nalbantoğlu V.: 300 m, 03.06.2001 (3); Düzce C.: 150 m, 04.06.2001, (3); Düzce C.: 130 m, 06.06.2001, (3); Gümüşpınar V.: 200 m, 17.06.2001, (6); Bakacak V.: 750 m, 21.06.2001, (2); Çiçekli R.: 1400 m, 27.06.2001, (2); Güzeldere Waterfall: 750 m, 01.07.2001, (2); Gölyaka T.: 130 m, 14.07.2001, (3); Çınarlı V.: 150 m, 14.07.2001, (4); Düzorman Forest Depot: 400 m, 04.08.2001, (4); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (2); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (3); Kabalak V.: 750 m, 05.09.2001, (4)

**24. *Plebejus sephirus*** (Frivaldszky, 1835)

Ağaköy V.: 150 m, 23.05.2001, (5); Taşköprü V.: 120 m, 26.05.2001, (4); Düzce C.: 150 m, 04.06.2001, (1); Düzce C.: 130 m, 06.06.2001, (3); Kurugöl R.: 500 m, 10.06.2001, (1); Güzeldere Waterfall: 750 m, 01.07.2001, (2); Gölyaka T.: 130 m, 14.07.2001, (2); Çınarlı V.: 150 m, 14.07.2001, (3); Bakacak V.: 750 m, 16.07.2001, (3); Çiçekli R.: 1400 m, 25.07.2001, (3); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (1); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (2)

**25. *Polyommatus icarus*** (Rottemburg, 1775)

Taşköprü V.: 120 m, 26.05.2001, (2); Beyköy T.: 150 m, 27.05.2001, (3); Ağaköy V.: 150 m, 30.05.2001, (3); Nalbantoğlu V.: 300 m, 03.06.2001 (3); Düzce C.: 130 m, 06.06.2001, (2); Kurugöl R.: 500 m, 10.06.2001, (3); Gümüşpınar V.: 200 m, 17.06.2001, (1); Bakacak V.: 750 m, 21.06.2001, (3); Çiçekli R.: 1250 m, 27.06.2001, (2); Güzeldere Waterfall: 750 m, 01.07.2001, (3); Beçiyörükler V.: 250 m, 04.07.2001, (1); Gölyaka T.: 130 m, 14.07.2001, (6); Çınarlı V.: 150 m, 14.07.2001, (1); Tatlıdere R.: 750 m, 18.07.2001, (1); Pürenli R.: 1200 m,

20.07.2001, (2); Gölyaka (Yanık R.): 1000 m, 20.07.2001, (1); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (2); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (2); Kabalak V.: 750 m, 05.09.2001, (1)

**26. *Polyommatus thersites*** (Cantener, [1835])

Ağaköy V.: 150 m, 23.05.2001, (1); Nalbantoğlu V.: 300 m, 03.06.2001 (3); Düzce C.: 130 m, 06.06.2001, (2); Kurugöl R.: 500 m, 10.06.2001, (5); Gümüşpınar V.: 200 m, 17.06.2001, (7); Bakacak V.: 750 m, 21.06.2001, (3); Güzeldere Waterfall: 750 m, 01.07.2001, (3); Beçiyörükler V.: 250 m, 04.07.2001, (1); Gölyaka T.: 130 m, 14.07.2001, (3); Çınarlı V.: 150 m, 14.07.2001, (2); Tatlıdere R.: 750 m, 18.07.2001, (2); Pürenli R.: 1200 m, 20.07.2001, (3); Gölyaka (Yanık R.): 1000 m, 20.07.2001, (1); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (2); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (2); Kabalak V.: 750 m, 05.09.2001, (1)

**27. *Satyrium ilicis*** (Esper, [1779])

Taşköprü V.: 120 m, 26.05.2001, (4); Kurugöl R.: 500 m, 10.06.2001, (2); Gümüşpınar V.: 200 m, 17.06.2001, (2); Bakacak V.: 750 m, 21.06.2001, (3); Çiçekli R.: 1400 m, 27.06.2001, (3); Güzeldere Waterfall: 750 m, 01.07.2001, (3); Çınarlı V.: 150 m, 14.07.2001, (2); Gölyaka T.: 130 m, 14.07.2001, (3); Düzorman Forest Depot: 400 m, 04.08.2001, (2)

**SATYRIDAE** Boisduval, 1833

**28. *Chazara persephone*** (Hübner, [1805])

Çiçekli R.: 1500 m, 27.06.2001, (2)

**29. *Coenonympha arcania*** (Linnaeus, 1761)

Kurugöl R.: 500 m, 10.06.2001, (2); Bakacak V.: 750 m, 21.06.2001, (1); Gümüşpınar V.: 200 m, 24.06.2001, (2); Çiçekli R.: 1500 m, 27.06.2001, (2); Gölyaka T.: 130 m, 14.07.2001, (1); Çınarlı V.: 150 m, 14.07.2001, (2)

**30. *Coenonympha pamphilus*** (Linnaeus, 1758)

Ağaköy V.: 150 m, 21.05.2001, (1), 23.05.2001, (1); Taşköprü V.: 120 m, 26.05.2001, (3); Nalbantoğlu V.: 300 m, 03.06.2001 (2); Kurugöl R.: 500 m, 10.06.2001, (2); Bakacak V.: 750 m, 21.06.2001, (2); Gümüşpınar V.: 200 m, 24.06.2001, (1); Beçiyörükler V.: 250 m, 04.07.2001, (1); Gölyaka T.: 130 m, 14.07.2001, (1); Çınarlı V.: 150 m, 14.07.2001, (3);

Tatlıdere R.: 750 m, 18.07.2001, (1); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (2); Kabalak V.: 750 m, 05.09.2001, (1)

**31. *Hipparchia statilinus*** (Hufnagel, 1766)

Beçiyörükler V.: 250 m, 10.08.2001, (1)

**32. *Lasiommata petropolitana*** (Fabricius, 1787)  
Çiçekli R.: 1000 m, 25.07.2001, (1)

**33. *Maniola jurtina*** (Linnaeus, 1758)

Ağaköy V.: 150 m, 21.05.2001, (3), 23.05.2001, (2), 30.05.2001, (4); Taşköprü V.: 120 m, 26.05.2001, (2); Beyköy T.: 150 m, 27.05.2001, (1); Nalbantoğlu V.: 300 m, 03.06.2001 (6); Düzce C.: 150 m, 04.06.2001, (4); Kurugöl R.: 500 m, 10.06.2001, (2); Gümüşpınar V.: 200 m, 17.06.2001, (1), 24.06.2001, (2); Bakacak V.: 750 m, 21.06.2001, (2), 16.07.2001, (3); Çiçekli R.: 1400 m, 27.06.2001, (3); Güzeldere Waterfall: 750 m, 01.07.2001, (3); Gölyaka T.: 130 m, 14.07.2001, (7); Çınarlı V.: 150 m, 14.07.2001, (4); Tatlıdere R.: 750 m, 18.07.2001, (2); Pürenli R.: 1200 m, 20.07.2001, (1); Düzorman Forest Depot: 400 m, 04.08.2001, (1); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (1)

**34. *Melanargia galathea*** (Linnaeus, 1758)

Güzeldere Waterfall: 750 m, 01.07.2001, (1)

**35. *Pararge aegeria*** (Linnaeus, 1758)

Ağaköy V.: 150 m, 21.05.2001, (1), 23.05.2001, (1), 30.05.2001, (2); Taşköprü V.: 120 m, 26.05.2001, (11); Beyköy T.: 150 m, 27.05.2001, (1); Nalbantoğlu V.: 300 m, 03.06.2001 (7); Düzce C.: 150 m, 04.06.2001, (5); Düzce C.: 130 m, 06.06.2001, (4); Kurugöl R.: 500 m, 10.06.2001, (7); Gümüşpınar V.: 200 m, 17.06.2001, (5), 24.06.2001, (4); Bakacak V.: 750 m, 21.06.2001, (3), 16.07.2001, (5); Çiçekli R.: 1250 m, 1400 m, 27.06.2001, (6); Güzeldere Waterfall: 750 m, 01.07.2001, (3); Beçiyörükler V.: 250 m, 04.07.2001, (6); Gölyaka T.: 130 m, 14.07.2001, (7); Çınarlı V.: 150 m, 14.07.2001, (8); Tatlıdere R.: 750 m, 18.07.2001, (3); Pürenli R.: 1200 m, 20.07.2001, (1); Gölyaka (Yanık R.): 1000 m, 20.07.2001, (4); Düzorman Forest Depot: 400 m, 04.08.2001, (1)

**NYMPHALIDAE** Swainson, 1827

**36. *Aglais urticae*** (Linnaeus, 1758)

Çiçekli R.: 1400 m, 27.06.2001, (1)

**37. *Argynnis pandora*** ([Denis & Shiffermüller], 1775)

Güzeldere Waterfall: 750 m, 01.07.2001, (2); Çınarlı V.: 150 m, 14.07.2001, (2); Bakacak V.: 750 m, 16.07.2001, (1); Tatlıdere R.: 750 m, 18.07.2001, (2); Pürenli R.: 1200 m, 20.07.2001, (1); Gölyaka (Yanık R.): 1000 m, 20.07.2001, (1); Çiçekli R.: 1500 m, 25.07.2001, (1); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (2)

**38. *Argynnis paphia*** (Linnaeus, 1758)

Çiçekli R.: 1450 m, 27.06.2001, (1); Güzeldere Waterfall: 750 m, 01.07.2001, (2); Tatlıdere R.: 750 m, 18.07.2001, (1); Gölyaka (Yanık R.): 1000 m, 20.07.2001, (1); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (1)

**39. *Clossiana euphrosyne*** (Linnaeus, 1758)

Çınarlı V.: 150 m, 14.07.2001, (2); Gölyaka T.: 130 m, 14.07.2001, (3); Bakacak V.: 750 m, 16.07.2001, (2); Gölyaka (Yanık R.): 1000 m, 20.07.2001, (1); Çiçekli R.: 1500 m, 25.07.2001, (1)

**40. *Inachis io*** (Linnaeus, 1758)

Ağaköy V.: 150 m, 30.05.2001, (1); Gölyaka T.: 130 m, 14.07.2001, (1);

**41. *Issoria lathonia*** (Linnaeus, 1758)

Bakacak V.: 750 m, 21.06.2001, (2); Gümüşpınar V.: 200 m, 24.06.2001, (2); Çiçekli R.: 1400 m, 27.06.2001, (1); Güzeldere Waterfall: 750 m, 01.07.2001, (2); Gölyaka T.: 130 m, 14.07.2001, (1)

**42. *Melitaea didyma*** (Esper, 1779)

Nalbantoğlu V.: 300 m, 03.06.2001 (1); Gümüşpınar V.: 200 m, 17.06.2001, (3); Güzeldere Waterfall: 750 m, 01.07.2001, (2); Beçiyörükler V.: 250 m, 04.07.2001, (1); Gölyaka T.: 130 m, 14.07.2001, (2); Çınarlı V.: 150 m, 14.07.2001, (2); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (1); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (1)

**43. *Melitaea interrupta*** Kolenati, 1846

Taşköprü V.: 120 m, 26.05.2001, (3); Beyköy T.: 150 m, 27.05.2001, (1); Kurugöl R.: 500 m, 10.06.2001, (2); Gümüşpınar V.: 200 m, 17.06.2001, (2); Bakacak V.: 750 m, 21.06.2001, (3)

**44. *Melitaea trivialis*** ([Denis & Shiffermüller], 1775)

Nalbantoğlu V.: 300 m, 03.06.2001 (2); Düzce C.: 130 m, 06.06.2001, (1); Kurugöl R.: 500 m, 10.06.2001, (2); Gümüşpınar V.: 200 m, 17.06.2001, (2); Gölyaka T.: 130 m, 14.07.2001, (1); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (1); Kabalak V.: 750 m, 05.09.2001, (2)

**45. *Polignia c-album*** (Linnaeus, 1758)

Çiçekli R.: 1400 m, 27.06.2001, (1); Güzeldere Waterfall: 750 m, 01.07.2001, (2); Beçiyörükler V.: 250 m, 04.07.2001, (1); Gölyaka T.: 130 m, 14.07.2001, (2); Çınarlı V.: 150 m, 14.07.2001, (2); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (2); Kabalak V.: 750 m, 05.09.2001, (1)

**46. *Vanessa atalanta*** (Linnaeus, 1758)

Taşköprü V.: 120 m, 26.05.2001, (2); Ağaköy V.: 150 m, 30.05.2001, (2); Nalbantoğlu V.: 300 m, 03.06.2001, (1); Düzce C.: 130 m, 06.06.2001, (1); Beçiyörükler V.: 250 m, 04.07.2001, (1); Gölyaka T.: 130 m, 14.07.2001, (2)

**47. *Vanessa cardui*** (Linnaeus, 1758)

Taşköprü V.: 120 m, 26.05.2001, (4); Ağaköy V.: 150 m, 30.05.2001, (5); Beyköy T.: 150 m, 27.05.2001, (1); Nalbantoğlu V.: 300 m, 03.06.2001 (3); Düzce C.: 150 m, 04.06.2001, (4); Düzce C.: 130 m, 06.06.2001, (5); Kurugöl R.: 500 m, 10.06.2001, (5); Gümüşpınar V.: 200 m, 17.06.2001, (3), 24.06.2001, (5); Bakacak V.: 750 m, 21.06.2001, (2), 16.07.2001, (3); Çiçekli R.: 1250 m, 27.06.2001, (4), 1450 m, 25.07.2001, (6); Güzeldere Waterfall: 750 m, 01.07.2001, (8); Beçiyörükler V.: 250 m, 04.07.2001, (2); Gölyaka T.: 130 m, 14.07.2001, (10); Çınarlı V.: 150 m, 14.07.2001, (7); Tatlıdere R.: 750 m, 18.07.2001, (3); Pürenli R.: 1200 m, 20.07.2001, (3); Gölyaka (Yanık R.): 1000 m, 20.07.2001, (3); Düzorman Forest Depot: 400 m, 04.08.2001, (4), 08.08.2001, (2); Çilimli T. (Hızardere V.): 300 m, 19.08.2001, (3); Cumayeri T. (Dokuzdeğirmen V.): 100 m, 20.08.2001, (4); Kabalak V.: 750 m, 05.09.2001, (1)

**DREPANOIDEA** Meyrick, 1895**DREPANIDAE** Meyrick, 1895**48. *Habrosyne pyritoides*** (Hufnagel, 1766)

Çiçekli R.: 1000 m, 25.07.2001, (1)

**ZYGAENOIDEA** Latreille, 1809**ZYGAENIDAE** Latreille, 1809**49. *Adscita mannii*** (Lederer, 1853)

Bakacak V.: 750 m, 21.06.2001, (1)

**50. *Anthrocera ephialtes*** (Linnaeus, 1767)

Güzeldere Waterfall: 750 m, 01.07.2001, (2)

**PYRALOIDEA** Latreille, 1809**PYRALIDAE** Latreille, 1809**51. *Catoptria pinella*** (Linnaeus, 1758)

Çiçekli R.: 1000 m, 25.07.2001, (1)

**52. *Crambus pratellus*** (Linnaeus, 1758)

Düzce C.: 130 m, 06.06.2001, (1); Kurugöl R.: 500 m, 10.06.2001, (1); Gölyaka T.: 130 m, 14.07.2001, (1); Çiçekli R.: 1000 m, 25.07.2001, (1)

**53. *Eurrhynx hortulata*** (Linnaeus, 1758)

Düzce C.: 130 m, 29.06.2001, (1)

**54. *Myelois circumvoluta*** (Fourcroy, 1785)

Düzorman Forest Depot: 400 m, 08.08.2001, (1)

**55. *Oncocera semirubella*** (Scopoli, 1763)

Nalbantoğlu V.: 300 m, 03.06.2001 (2); Düzce C.: 150 m, 04.06.2001, (2); Düzce C.: 130 m, 06.06.2001, (3); Kurugöl R.: 500 m, 10.06.2001, (2); Düzce C.: 150 m, 18.06.2001, (2); Bakacak V.: 750 m, 21.06.2001, (5); Beçiyörükler V.: 250 m, 04.07.2001, (1); Çınarlı V.: 150 m, 14.07.2001, (3)

**56. *Pleuroptya ruralis*** (Scopoli, 1763)

Düzce C.: 130 m, 29.06.2001, (4)

**BOMBYCOIDEA** Latreille, [1803]**LASIOCAMPIDAE** Harris, 1841

**57. *Lasiocampa trifolii*** (Denis & Shiffermüller, 1775)

Beçiyörükler V.: 250 m, 10.08.2001, (2)

**SATURNIIDAE** Boisduval, 1837**58. *Saturnia pavonia*** (Linnaeus, 1758)

Düzce C.: 150 m, 20.03.2001, (1)



**GEOMETROIDEA** Leach, [1815]

**GEOMETRIDAE** Leach, [1815]

59. *Abraxas sylvatus* (Scopoli, 1763)  
Çiçekli R.: 1000 m, 25.07.2001, (1)
60. *Anaitis praeformata* (Hübner, 1826)  
Gümüşpınar V.: 200 m, 24.06.2001, (1);  
Beçiyörükler V.: 250 m, 07.09.2001, (1)
61. *Aspilates ochrearia* (Rossi, 1794)  
Düzorman Forest Depot: 400 m, 11.09.2001, (1);
62. *Asthena candidata* ([Denis & Schifferüller], 1775)  
Çiçekli R.: 1000 m, 25.07.2001, (1); Düzorman Forest Depot: 400 m, 04.08.2001, (1)
63. *Biston strataria* (Hufnagel, 1767)  
Beçiyörükler V.: 250 m, 04.03.2002, (1)
64. *Chlorissa viridata* (Linnaeus, 1758)  
Nalbantoğlu V.: 300 m, 03.06.2001 (1)
65. *Cyclophora albiocellaria* (Hübner, 1789)  
Çiçekli R.: 1000 m, 25.07.2001, (1)
66. *Cyclophora linearia* (Hübner, [1799])  
Çiçekli R.: 1000 m, 25.07.2001, (1)
67. *Ematurga atomaria* (Linnaeus, 1758)  
Beçiyörükler V.: 250 m, 19.05.2001, (3),  
04.07.2001, (1); Nalbantoğlu V.: 300 m, 03.06.2001  
(2); Kurugöl R.: 500 m, 10.06.2001, (2); Gölyaka T.:  
130 m, 14.07.2001, (1); Çınarlı V.: 150 m,  
14.07.2001, (1); Düzorman Forest Depot: 400 m,  
08.08.2001, (1)
68. *Euphyia unangulata* (Haworth, 1809)  
Düzce C.: 150 m, 16.06.2001, (1)
69. *Fritzwagneria dalmatina* (Wagner, 1909)  
Çiçekli R.: 1000 m, 25.07.2001, (1)
70. *Idaea ochrata* (Scopoli, 1763)  
Güzeldere Waterfall: 750 m, 01.07.2001, (1)
71. *Lomasipilis marginata* (Linnaeus, 1758)  
Bakacak V.: 750 m, 21.06.2001, (1); Çiçekli R.:  
1000 m, 25.07.2001, (1); Güzeldere Waterfall: 750 m,  
01.07.2001, (1); Düzce C.: 130 m, 29.06.2001, (1)

72. *Opisthograptis luteolata* (Linnaeus, 1758)

Çiçekli R.: 1000 m, 25.07.2001, (1)

73. *Protorhoe unicata* Guenée, 1857

Çiçekli R.: 1000 m, 25.07.2001, (1); Çiçekli R.:  
1250 m, 27.06.2001, (1)

74. *Rheumaptera undulata* (Linnaeus, 1758)

Çiçekli R.: 1000 m, 25.07.2001, (1)

75. *Rhodostrophia vibicaria* (Clerck, 1759)

Düzorman Forest Depot: 400 m, 23.11.2001, (1)

76. *Scopula imitaria* (Hübner 1799)

Düzorman Forest Depot: 400 m, 23.11.2001, (1)

77. *Selenia dentaria* (Fabricius, 1775)

Çiçekli R.: 1000 m, 25.07.2001, (1)

78. *Semiothisa notata* (Linnaeus, 1758)

Düzce C.: 150 m, 18.06.2001, (1)

**SPHINGOIDEA** Latreille, [1802]

**SPHINGIDAE** Latreille, 1802

79. *Agrilus convolvuli* (Linnaeus, 1758)

Düzorman Forest Depot: 400 m, 04.08.2001, (2)

80. *Deilephila elpenor* (Linnaeus, 1758)

Düzce C.: 150 m, 14.07.2001, (1)

81. *Macroglossum stellatarum* (Linnaeus, 1758)

Düzce C.: 130 m, 06.06.2001, (1); Gümüşpınar V.:  
200 m, 24.06.2001, (1); Güzeldere Waterfall: 750 m,  
01.07.2001, (1); Gölyaka T.: 130 m, 14.07.2001, (1);  
Tatlidere R.: 750 m, 18.07.2001, (1); Çiçekli R.: 1000  
m, 25.07.2001, (1); Cumayeri T. (Dokuzdeğirmen V.):  
100 m, 20.08.2001, (2); Kabalak V.: 750 m,  
05.09.2001, (1)

82. *Marumba quercus* ([Denis & Schiffermüller],  
1775)

Beçiyörükler V.: 250 m, 04.07.2001, (1)

**NOCTUOIDEA** Latreille, 1809

**THAUMETOPOEIDAE** Stephens, 1920

83. *Thaumetopoea pityocampa* (Denis &  
Schiffermüller, 1775)

Düzorman Forest Depot: 450 m, 08.08.2001, (1);  
11.09.2001, (2)

LYMANTRIIDAE Hampson, [1893]

84. *Arctornis l-nigrum* (Müller, 1764)

Çiçekli R.: 1250 m, 25.07.2001, (1)

85. *Orgyia antiqua* (Linnaeus, 1758)

Düzorman Forest Depot: 450 m, 08.08.2001, (1)

ARCTIIDAE Leach, [1815]

86. *Atolmis rubricollis* (Linnaeus, 1758)

Çiçekli R.: 1000 m, 25.07.2001, (1)

87. *Lithosia lurideola* Zincken, 1817

Nalbantoğlu V.: 300 m, 03.06.2001 (1)

88. *Lithosia quadra* (Linnaeus, 1758)

Çiçekli R.: 1000 m, 25.07.2001, (1)

89. *Phragmatobia placida* (Frivaldszky, 1835)

Düzorman Forest Depot: 400 m, 11.09.2001, (1)

90. *Spiris striata* (Linnaeus, 1758)

Çiçekli R.: 1000 m, 25.07.2001, (1)

NOCTUIDAE Latreille, 1809

91. *Amphipyra pyramidea* (Linnaeus, 1758)

Düzce C.: 150 m, 04.09.2001, (1);

92. *Autographa gamma* (Linnaeus, 1758)

Ağaköy V.: 150 m, 23.05.2001, (4); Taşköprü V.:  
120 m, 26.05.2001, (5); Nalbantoğlu V.: 300 m,  
03.06.2001 (3); Düzce C.: 130 m, 06.06.2001, (3);  
Gümüşpınar V.: 200 m, 17.06.2001, (2); Düzce C.: 150  
m, 18.06.2001, (4); Bakacak V.: 750 m, 21.06.2001,  
(4), 16.07.2001, (2); Çiçekli R.: 1400 m, 27.06.2001,  
(6), 25.07.2001, (2); Güzeldere Waterfall: 750 m,  
01.07.2001, (1); Beçiyörükler V.: 250 m, 04.07.2001,  
(3); Gölyaka T.: 130 m, 14.07.2001, (3); Çınarlı V.: 150  
m, 14.07.2001, (3); Pürenli R.: 1200 m, 20.07.2001,  
(2); Düzorman Forest Depot: 400 m, 04.08.2001, (8),  
08.08.2001, (5); Çilimli T. (Hızardere V.): 300 m,  
19.08.2001, (3); Cumayeri T. (Dokuzdeğirmen V.): 100  
m, 20.08.2001, (1); Kabalak V.: 750 m, 05.09.2001,  
(1)

93. *Bena parasinana* (Linnaeus, 1758)

Çiçekli R.: 1000 m, 25.07.2001, (1); Düzorman  
Forest Depot: 400 m, 08.08.2001, (2)

94. *Catocala elocata* (Esper, [1787])

Beçiyörükler V.: 250 m, 26.08.2001, (3)

95. *Diachrysia chrysitis* (Linnaeus, 1758)

Çiçekli R.: 1000 m, 25.07.2001, (1)

96. *Dysgonia algira* (Linnaeus, 1758)

Düzce C.: 150 m, 16.06.2001, (1); Beçiyörükler V.:  
250 m, 04.07.2001, (1)

97. *Emmelia trabealis* (Scopoli, 1763)

Çiçekli R.: 1000 m, 25.07.2001, (1)

98. *Euclidia glyphica* (Linnaeus, 1758)

Ağaköy V.: 150 m, 30.05.2001, (1); Kurugöl R.: 500  
m, 10.06.2001, (1); Bakacak V.: 750 m, 21.06.2001,  
(4); Çınarlı V.: 150 m, 14.07.2001, (1); Çiçekli R.: 1000  
m, 25.07.2001, (1)

99. *Helicoverpa armigera* (Hübner, 1808)

Düzce C.: 150 m, 04.09.2001, (1)

100. *Heliothis peltigera* ([Denis & Shiffermüller],  
1775)

Kurugöl R.: 500 m, 10.06.2001, (1)

101. *Melanchra persicariae* (Linnaeus, 1761)

Çiçekli R.: 1000 m, 27.06.2001, (1)

102. *Mythimna unipuncta* (Haworth, 1809)

Beçiyörükler V.: 250 m, 04.07.2001, (1); Düzce C.:  
150 m, 04.09.2001, (1)

103. *Noctua fimbriata* (Schreber, 1759)

Düzce C.: 150 m, 10.07.2001, (1)

104. *Noctua pronuba* (Linnaeus, 1758)

Beçiyörükler V.: 250 m, 07.09.2001, (1)

105. *Ochropleura leucogaster* (Freyer, [1831])

Düzce C.: 150 m, 29.04.2001, (1)

106. *Orthosia gothica* (Linnaeus, 1758)

Beçiyörükler V.: 250 m, 07.09.2001, (1)

107. *Orthosia incerta* (Hufnagel, 1766)

Laboratuvar, 27.02.2002, (1)

108. *Paradrina clavipalpis* (Scopoli, 1763)

Düzorman Forest Depot: 400 m, 04.08.2001, (1);  
Düzce C.: 150 m, 09.09.2001, (1)

109. *Tyta luctuosa* (Denis & Schiffermüller, 1775)

Düzce C.: 150 m, 18.06.2001, (1); Düzce C.: 130 m, 29.06.2001, (1)

### Discussions

In this research, 109 species belonging to 17 families of Lepidoptera were determined in Düzce province. Most of the species were from two families: Geometridae (18%) and Noctuidae (17%). All the collected and identified species were previously reported for Turkey in different studies (Mol, 1977; Kornoşor, 1987; Hakyemez, 1994; Okyar and Kornoşor, 1994, 1997; Mol and Avcı, 1997; Selek, 1998; Okyar and Aktaç, 1998, 1999; Beşkardeş, 2000; Şimşek, 2000a, 2000b, 2002; Koçak and Seven, 2002). However, this is the first study to determine the Lepidoptera fauna of Düzce province. Some studies were conducted in different places near Düzce but no specimen collection from Düzce was reported.

Insects are the largest group of living organisms. The number of species actually present in world is not known but there are some estimates ranging from between 5 and 10 million to 30 million or more (Erwin, 1988; Borror et al., 1989; Gaston, 1991). The Lepidoptera fauna of the world consists of more than 150,000 species and is considered to be the second largest order of insects (Demirsoy, 1992). It is difficult to predict the exact number of species for any part of the world. The Lepidoptera fauna of Turkey has been studied by several scientists. According to their reports, the Lepidoptera fauna of Turkey consists of more than 4440 species (4441 described species) (Koçak and Seven, 2002). In the current study, we found 109 lepidopteran species belonging to 17 families in Düzce. All species found in this study were reported previously for different parts of Turkey.

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In the current study, Lepidoptera species were collected in different localities (city to mountain), vegetation types (agricultural crops to conifer or broad-leaved forests) and altitudes (100 to 1550 m) for the best sampling of Düzce province. All these characteristics (locality, vegetation type, altitude and time) have an effect on the distribution of any living organisms, including insects. Düzce has a very high ecosystem diversity in both forest and agricultural lands. During this study, collections were also performed at different times of the year (spring, summer, autumn). Most of the species were collected during summer months and the number of specimens decreased through the autumn, which could be related to the biological activity period of Lepidoptera species.

Among the lepidopteran species collected, 26 are considered pests of forest trees. These species are *A. crataegi* (Pieridae), *S. ilicis* (Lycaenidae), *Polygonia c-album* (Nymphalidae), *C. albiocellaria*, *C. linearia*, *R. undulata*, *A. candidata*, *A. sylvatus*, *L. marginata*, *S. notata*, *S. dentaria*, *O. luteolata*, *E. atomaria*, *B. strataria* (Geometridae), *M. quercus* (Sphingidae), *T. pityocampa* (Thaumetopoeidae), *Actornis l-nigrum*, *O. antiqua* (Lymantriidae), *A. pyramidea*, *A. gamma*, *D. algira*, *C. elocata*, *B. parasinana*, *O. incerta*, *O. gothica* and *N. fimbriata* (Noctuidae). In particular, *T. pityocampa* is one of the most important pests of pine forests of Turkey, causing a large amount of needle loss every year, which results in decreases in the annual growth of trees. If this outbreak occurs in several consecutive years, it may kill trees.

In conclusion, this study indicates that insect diversity is quite high in Düzce. New studies considering other insect orders should be carried out before agricultural and forest ecosystems are destroyed. Scientific and taxonomic studies about Düzce are very limited in number. This study makes a very important contribution to the Lepidoptera fauna of Düzce.

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