

# Contribution to Neuroptera (Insecta) Fauna of Tokat Province of Turkey

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## Abstract

In this study, a total of 641 Neuroptera were collected between May and August 2005, in order to determine the Neuroptera fauna of the Tokat province. Collected specimens were determined to belong to 44 species, 24 genera and 6 families, which is 21 percentage of the number of neuropteroids recorded in Turkey. Occurrence of two species (*Chrysopa hungarica* and *Hemerobius (H.) gilvus*) previously reported from the area, has not been confirmed during the fieldwork of this study. 41 species are the first records for the Neuroptera fauna of Tokat province. The most abundant and most frequent species living on coniferous trees and deciduous trees were *Chrysoperla carnea*. *Osmylus elegantissimus* have here their western distribution in Turkey. Abundance, dominance and frequency for each species are added.

*Osmylus elegantissimus* have here their western distribution in Turkey.

**Keywords:** Neuroptera, Turkey, Tokat, faunistics, abundance, dominance

## Tokat İli Neuroptera (Insecta) Faunasına Katkılar (Türkiye)

## Özet

Bu çalışmada, Tokat ili ve çevresinde 2005 yılı Mayıs ve Ağustos ayları arasında Neuroptera Faunasını belirlemek amacıyla 641 örnek toplanmıştır. Toplanan örneklerin teşhisleri sonucunda 6 familyanın 24 cinsine ait 44 tür tespit edilmiştir. Türkiye'de kaydedilen neuropteroids sayısının % 21'idir. Daha önce bölgeden kaydı verilen iki tür (*Chrysopa hungarica* ve *Hemerobius (H.) gilvus*) bu çalışmanın arazi çalışmalarında bulunamamıştır. 41 tür Tokat ili Neuroptera faunası için yeni kayıttır. Çalışmada, en bol bulunan *Chrysoperla carnea* türü hem iğne yapraklı hemde geniş yapraklı ağaçlarda bulunmuştur. *Osmylus elegantissimus* Türkiye'de en batıdaki yayılışına ulaşmıştır. Her bir türün bolluk ve baskınlık frekanslarında verilmiştir.

## Anahtar

## Kelimeler:

Neuroptera, Türkiye, Tokat, fauna, bolluk, baskınlık

## 1. INTRODUCTION

The order Neuroptera is one of the smallest and primitive among the holometabolic insects. The adults and larvae from most families are predators, which make them very interesting to many entomologists, since some can have a considerable value as predators to be used in biological control programs [1]. The order Neuroptera includes 687 species and 17 subspecies in the Palearctic region and about 6000 species in the world [2].

The first Turkish faunal data on Neuroptera was published in the paper by Schneider [3]. Later on, around the turn of the 1900s, especially Esben-Petersen [4] was revealed to exist in the Turkish fauna.

From the 1960s on, however, the exploration of the local fauna to the increased dynamically started in the ensuing years, Aspöck and Aspöck [5-9], Aspöck et al. [10, 11], Gepp [12, 13], Hölzel [14-20], Koçak [21], Meinander [22], Popov [23], Rausch et al. [24], Rausch and Aspöck [25], Şengonca [26-29] are given the new species and faunistic records from Anatolia. In addition to these studies, Aistleitner [30], Aspöck et al. [31], Hölzel [32, 33], Kacirek [34], Kıyak and Özdikmen [35], Monserrat and Hölzel [36], Şengonca [37, 38] has contributed to the importance.

Since 2000, Turkish neuropterologists has started to increase works on the Neuroptera, among these Abraham and Mészáros [39], Arı and Kıyak [40, 41], Canbulat and Kıyak [42-49], Canbulat and Öz Saraç [50], Koçak and Kemal [51], Onar and Aktaş [52], Satar et al. [53], Satar and Özbay [54-56], Kemal and Koçak [57], Kovancı and Kovancı [58], Dobosz and Abraham [59], Dobosz [60, 61], Kovancı and Canbulat [62], Arı et al. [63-65], Canbulat [66-70], Rausch and Weißmair [71], Koçak and Kemal [72], Dobosz and Abraham [73] have been provided new additional records.

By 2013, as a result of the above Neuroptera research is represented by 11 families in Turkey. These families; Sisyridae, Coniopterygidae, Osmylidae, Berothidae, Mantispidae, Dilaridae, Hemerobiidae, Chrysopidae, Myrmeleontidae, Nemopteridae, Ascalaphidae. 203 species and 6 subspecies belonging to 11 families have been known in Turkey.

In previous studies, *Chrysopa hungarica* Klapálek, 1899, *Chrysoperla carnea* (Stephens, 1836), *Cunctochrysa baetica* (Hölzel, 1972), *Coniopteryx (Metaconiopteryx) arcuata* Kis, 1965, *Hemerobius (Hemerobius) gilvus* Stein, 1863 are recorded from Tokat province [8, 14, 18, 29, 37]. But none of the studies focused specifically on the Neuroptera of this region.

The objective of this study is to provide detailed information on the fauna Neuroptera and their distribution in the Tokat province.

## 2. MATERIAL AND METHODS

The specimens mentioned in this study were collected from 81 randomly located sampling in the Tokat province. A total of 641 specimens of 44 species were collected between May-August in 2005.

Specimens were killed in jars that were filled with ethyl acetate, prepared and labeled according to the standard procedures for museum material.

For determining the species of examples, the diagnostic keys and descriptions in the related literatures were used [11, 7, 8, 14, 18, 22, 32].

Coordinates of species "Microsoft Office Excel" program and transferred to the "ESRI ArcView GIS version 3.1" map program, on the map localities of the species caught were processed by treatment (Figure 1). Specimens are deposited in Sakarya University's zoology museum.

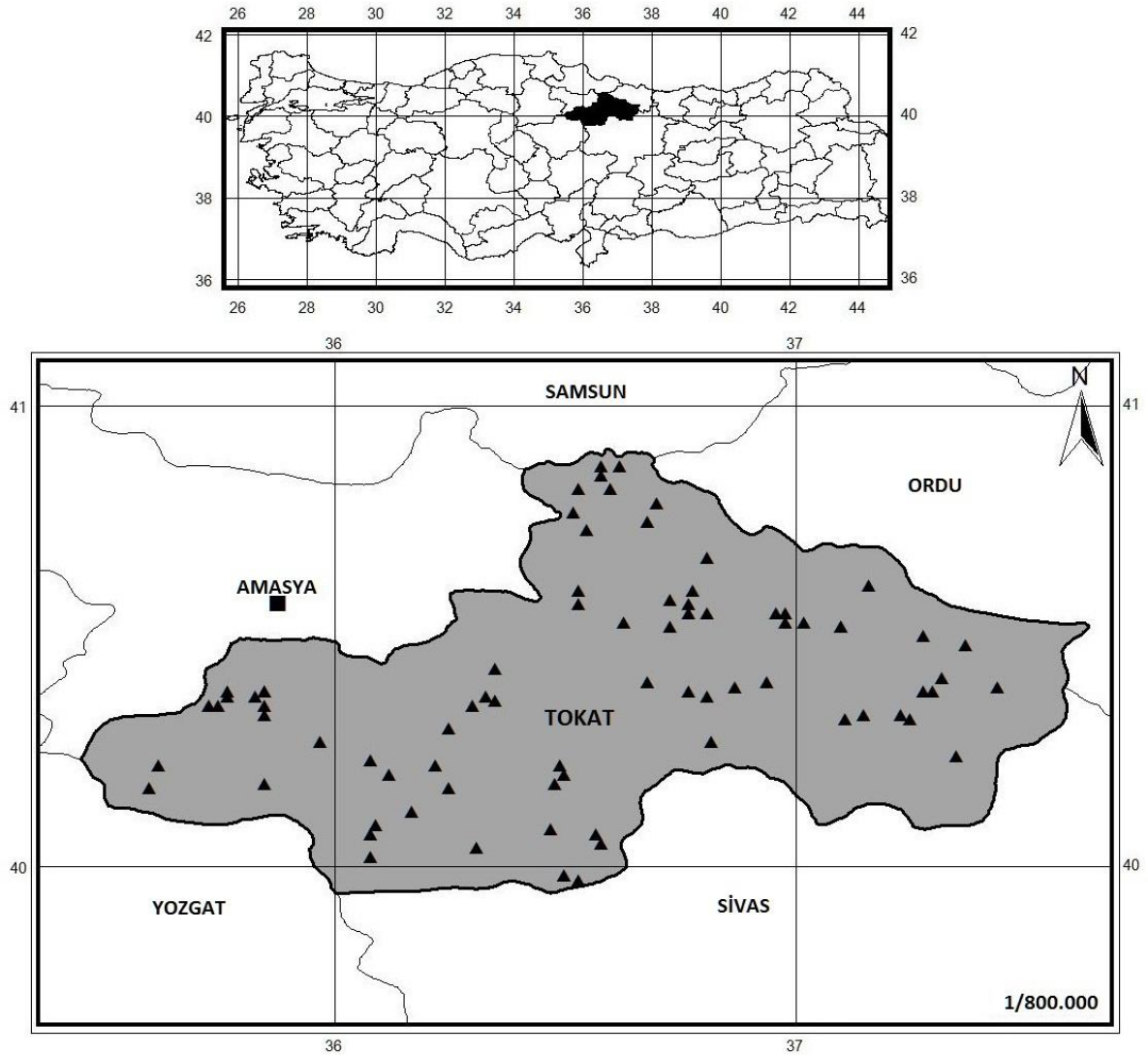


Figure 1. Collecting localities in Tokat province.

### 3. RESULTS

At the end of this study, 44 species which belong to six families of Neuroptera have been determined. The following distributions of these species, host plants and observations are given separately for each species. Villages in the text abbreviated as "V".

## Family Chrysopidae Schneider, 1851

### *Chrysopa dorsalis* Burmeister, 1839

**Materials examined:** 1♀, Tokat, Merkez, Dayılıhacı V., 40°12'893''N/36°30'491''E, 1085 m, 24.07.2005, *Pinus sylvestris*; 1♀, Tokat, Merkez, road Sivas-Tokat, Çamlıbel Pass, Highways Care House, 40°01'496''N/36°32'015''E, 1620-1690 m, 13.08.2005, *Acacia melanoxylon*; 1♀, Tokat, Almus, Kuruseki V., 40°23'288''N/36°57'078''E, 800 m, 17.08.2005, *Pinus sylvestris*; 1♂, Tokat, Turhal, north of Dökmetepe V., 40°19'N/36°18'E, 950 m, 18.08.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Niksar, north of Sulugöl V., 40°33'341''N/36°58'575''E, 800 m, 23.07.2005, *Quercus petraea* ssp. *iberica*.

### *Chrysopa formosa* Brauer, 1851

**Materials examined:** 1♂, 2♀♀, Tokat, Niksar, north of Sulugöl V., 40°33'341''N/36°58'575''E, 800 m, 23.07.2005, *Quercus petraea* ssp. *iberica*.

### *Chrysopa nigricostata* Brauer, 1851

**Materials examined:** 1♂, 1♀, Tokat, Merkez, road Sivas-Tokat, Çamlıbel Pass, Highways Care House, 39°57'496''N/36°32'015''E, 1620-1690 m, 15.07.2005, *Pyrus communis*, *Acacia melanoxylon*; 1♀, Tokat, Turhal, Kat V., 40°22'240''N/36°19'424''E, 1270 m, 18.08.2005, *Quercus petraea* ssp. *iberica*.

### *Chrysopa pallens* (Rambur, [1838])

**Materials examined:** 1♀, Tokat, Zile, between Kervansaray-Karakaya V., 40°23'N/35°46'E, 1100 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Merkez, Dayılıhacı V., 40°12'893''N/36°30'491''E, 1085 m, 24.07.2005, *Pinus sylvestris*; 1♀, Tokat, 2. km from Çamlıbel Pass to İhsaniye, 39°59'N/36°60'E, 1470 m, 14.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, Tokat, Başçiftlik, 3. km from Hasanbeyli V. to Başçiftlik, 40°31'N/37°06'E, 1200 m, 16.08.2005, *Quercus infectoria* ssp. *infectoria*; 2♂♂, 2♀♀, Tokat, Turhal, Kat V., 40°22'240''N/36°19'424''E, 1270 m, 18.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 1♀, Tokat, Zile, north of Sofular V., 40°21'664''N/35°44'183''E, 1250 m, 19.08.2005, *Quercus petraea* ssp. *iberica*.

### *Chrysopa perla* (Linnaeus, 1758)

**Materials examined:** 2♂♂, 2♀♀, Tokat, Zile, north of Sofular V., 40°21'664''N/35°44'183''E, 1250 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Erbaa, between Çatalan-Gökal V., Düden Lake shore, 40°49'728''N/36°36'089''E, 1164 m, 23.07.2005, *Fagus orientalis*.

### *Chrysopa viridana* Schneider, 1845

**Materials examined:** 1♂, Tokat, Sulusaray, between Devecikargın-Arpaçıkaraçay V., 40°04'N/36°05'E, 1280 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 1♂, Tokat, 8. km from Zile to Amasya, 40°21'N/35°51'E, 1300 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 1♂, 2♀♀, Tokat, 18. km from Zile to Amasya, Yünlü V., 40°23'081''N/35°51'730''E, 1027 m, 17.07.2005, *Fagus orientalis*; 1♀, Tokat, Zile, north of Sofular V., 40°21'664''N/35°44'183''E, 1250 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 2♀♀, Tokat, Erbaa, Ortaköy V., Tıkaç fountain, 40°52'378''N/36°37'193''E, 920 m, 23.07.2005, *Fagus orientalis*; 1♀, Tokat, Niksar, Yerköprü V., 40°40'053''N/36°47'882''E, 500 m, 23.07.2005, *Quercus petraea* ssp. *iberica*; 3♂♂, 2♀♀, Tokat, Merkez, Çamlıbel, Aktepe V. Dam, 40°04'N/36°34'E, 1180 m, 14.08.2005, *Quercus petraea* ssp. *iberica*, *Corylus avellana*, *Salix alba*; 2♂♂, Tokat, Merkez, Kızılınış site, 40°16'N/36°37'E, 1200 m, 14.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 2♂♂, Tokat, Niksar, Gökçeli V., 40°35'N/36°44'E, 600 m, 15.08.2005, *Quercus infectoria* ssp. *infectoria*; 2♂♂, Tokat, Niksar, Tepeyatak V., 40°36'N/36°47'E, 780 m, 15.08.2005, *Cornus mas*; 3♂♂, 2♀♀, Tokat, Niksar, Eryaba V., 40°33'568''N/36°46'081''E, 915 m, 15.08.2005, *Quercus infectoria* ssp. *infectoria*; 2♂♂, Tokat, Niksar, north of Sulugöl V., 40°33'341''N/36°59'575''E, 800 m, 16.08.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Reşadiye, Yolüstü V., 40°27'N/37°18'E, 900 m, 16.08.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, 1♀, Tokat, Reşadiye, Sazak V., 40°19'595''N/37°15'531''E, 1035 m, 17.08.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Almus, Gemaleönü V., 40°19'N/37°06'E, 880 m, 17.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, 1♀, Tokat, Almus, Kuruseki V.,

40°23'288''N/36°57'078''E, 800 m, 17.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 1♀, Tokat, Merkez, north of Büyükyıldız V., 40°22'640''N/36°21'680''E, 900 m, 18.08.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, 3♀♀, Tokat, Turhal, Kat V., 40°22'240''N/36°19'424''E, 1270 m, 18.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*.

### *Chrysoperla carnea* (Stephens, 1836) s.l.

**Materials examined:** 2♂♂, 3♀♀, Tokat, Merkez, road Sivas-Tokat, Çamlıbel Pass, Highways Care House, 39°57'496''N/36°32'015''E, 1620-1690 m, 15.07.2005, *Pinus sylvestris*, *Crateagus monogyna*, *Acacia melanoxylon*; 1♀, Tokat, Merkez, 2. km from Çamlıbel Pass to İhsaniye, 39°59'N/36°30'E, 1470 m, 15.07.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 2♀♀, Tokat, Merkez, Çamlıbel, Dereği V., 40°05'986''N/36°28'308''E, 1122 m, 15.07.2005, *Salix alba* and *Elaeagnus angustifolia*; 2♂♂, 3♀♀, Tokat, Merkez, road Çamlıbel-Tokat, 40°11'N/36°29'E, 1110 m, 15.07.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, 1♀, Tokat, Artova, Yenice V., 40°10'N/36°15'E, 1110 m, 15.07.2005, *Pinus sylvestris* and *Quercus petraea* ssp. *iberica*; 2♂♂, Tokat, Artova, Ahmetkanişment V., 40°07'N/36°10'E, 1300 m, 16.07.2005, *Pinus sylvestris* and *Quercus petraea* ssp. *iberica*; 1♂, 5♀♀, Tokat, Sulularay, Devecikargın V., 40°05'N/36°05'E, 1220 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, 1♀, Tokat, Sulularay, between Devecikargın-Arpacıkaraçay V., 40°04'N/36°05'E, 1280 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, 5♀♀, Tokat, Sulularay, Alpu dere V., Ulupınar site, 40°01'188''N/36°05'055''E, 1029 m, 16.07.2005, *Elaeagnus angustifolia*; 1♂, 1♀, Tokat, Zile, Akkılış V., 40°10'N/35°36'E, 1180 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 1♂, 1♀, Tokat, 5. km from Zile to Amasya, 40°20'367''N/35°51'732''E, 1027 m, 16.07.2005, *Prunus cerasus* and *Quercus petraea* ssp. *iberica*; 1♂, Tokat, 8. km from Zile to Amasya, 40°21'N/35°51'E, 1300 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 1♂, 1♀, Tokat, 17. km from Zile to Amasya, 40°22'N/35°50'E, 1200 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 3♂♂, 2♀♀, Tokat, 18. km from Zile to Amasya, Yünlü V., 40°23'081''N/35°51'730''E, 1027 m, 17.07.2005, *Fagus orientalis*; 2♀♀, Tokat, Zile, between Kervansaray-Karakaya V., 40°23'N/35°46'E, 1100 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Zile, between Karakaya-Sofular V., 40°22'N/35°46'E, 1250 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, 2♀♀, Tokat, Zile, north of Sofular V., 40°21'664''N/35°44'183''E, 1250 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 2♀♀, Tokat, Erbaa, Ortaköy V., Tikaç fountain, 40°52'378''N/36°37'193''E, 920 m, 23.07.2005, *Fagus orientalis*; 1♀, Tokat, Erbaa, between Çatalan-Gökal V., Düden Lake shore, 40°49'728''N/36°36'089''E, 1164 m, 23.07.2005, *Fagus orientalis*; 1♂, Tokat, Çatalan, Tortepe forest recreation area, 40°48'N/36°34'E, 1250 m, 23.07.2005, *Cedrus libani*; 1♂, 1♀, Tokat, Merkez, Musullu V., 40°32'531''N/36°38'683''E, 1018 m, 24.07.2005, *Fagus orientalis* and *Quercus petraea* ssp. *iberica*; 2♀♀, Tokat, Merkez, Dayılıhacı V., 40°12'893''N/36°30'491''E, 1085 m, 24.07.2005, *Pinus sylvestris*; 5♀♀, Tokat, Merkez, road Sivas-Tokat, Çamlıbel Pass, Highways Care House, 40°01'496''N/36°32'015''E, 1620-1690 m, 13.08.2005, *Pinus sylvestris*, *Crateagus monogyna*, *Cornus mas*; 3♀♀, Tokat, 2. km from Çamlıbel Pass to İhsaniye, 39°59'N/36°60'E, 1470 m, 14.08.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, 1♀, Tokat, Merkez, Çamlıbel, Aktepe V. Plateau, 40°03'565''N/36°35'190''E, 1246 m, 14.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, 1♀, Tokat, Merkez, Kızılınış site, 40°16'N/36°37'E, 1200 m, 14.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 2♂♂, 1♀, Tokat, Başçiftlik, 3. km from Hasanbeyli V. to Başçiftlik, 40°31'N/37°06'E, 1200 m, 16.08.2005, *Quercus infectoria* ssp. *infectoria*; 4♂♂, 3♀♀, Tokat, Reşadiye, Bereketli, 40°30'N/37°17'E, 1300 m, 16.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, 1♀, Tokat, Reşadiye, Yolüstü V., 40°27'N/37°18'E, 900 m, 16.08.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, Tokat, Reşadiye, 5. km from Reşadiye to Sazak, 40°22'978''N/37°17'144''E, 850 m, 17.08.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Reşadiye, Sazak V., 40°19'595''N/37°15'531''E, 1035 m, 17.08.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Reşadiye, Çat V., 40°20'N/37°14'E, 890 m, 17.08.2005, *Quercus petraea* ssp. *iberica*; 2♀♀, Tokat, Almus, Dereköy, 40°18'965''N/37°10'018''E, 827 m, 17.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, 1♀, Tokat, Almus, Kuruseki V., 40°23'288''N/36°57'078''E, 800 m, 17.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 1♀, Tokat, Almus, Serince V., 40°23'N/36°50'E, 1000 m, 17.08.2005, *Quercus petraea* ssp. *iberica*; 4♂♂, 2♀♀, Tokat, Turhal, Sarıçiçek V. Plateau, 40°26'N/36°21'E, 1250 m, 18.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, Tokat, Turhal, between Sarıçiçek-Kat V., 40°23'526''N/36°20'790''E, 1360 m, 18.08.2005, *Pinus sylvestris*; 1♂, 4♀♀, Tokat, Turhal, north of Dökmetepe V., 40°19'N/36°18'E, 950 m, 18.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 1♀, Tokat, 18. km from Zile to Amasya, Yünlü V., 40°23'081''N/35°51'730''E, 1027 m,

19.08.2005, *Fagus orientalis*; 5♂♂, 3♀♀, Tokat, Zile, north of Sofular V., 40°21'664''N/35°44'183''E, 1250 m, 19.08.2005, *Quercus petraea* ssp. *iberica*.

#### ***Chrysopidia ciliata* (Wesmael, 1841)**

**Materials examined:** 2♂♂, 1♀, Tokat, Merkez, Musullu V., 40°32'531''N/36°38'683''E, 1018 m, 24.07.2005, *Fagus orientalis* and *Quercus petraea* ssp. *iberica*.

#### ***Cunctochrysa baetica* (Hölzel, 1972)**

**Materials examined:** 2♂♂, Tokat, Merkez, 2. km from Çamlıbel Pass to İhsaniye, 39°59'N/36°30'E, 1470 m, 15.07.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 1♀, Tokat, 8. km from Zile to Amasya, 40°21'N/35°51'E, 1300 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Başçiftlik, Hasanbeyli V., 40°31'N/37°06'E, 1200 m, 23.07.2005, *Fagus orientalis*.

#### ***Dichochrysa flavifrons* (Brauer, 1850)**

**Materials examined:** 1♂, Tokat, Merkez, 2. km from Çamlıbel Pass to İhsaniye, 39°59'N/36°30'E, 1470 m, 15.07.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, Tokat, Merkez, road Çamlıbel-Tokat, 40°11'N/36°29'E, 1110 m, 15.07.2005, *Quercus petraea* ssp. *iberica*; 1♂ 1♀, Tokat, Zile, Akkılış V., 40°10'N/35°36'E, 1180 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 1♂, Tokat, Zile, between Karakaya-Sofular V., 40°22'N/35°46'E, 1250 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Zile, north of Sofular V., 40°21'664''N/35°44'183''E, 1250 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Erbaa, Ortaköy V., Tikaç fountain, 40°52'378''N/36°37'193''E, 920 m, 23.07.2005, *Fagus orientalis*; 1♂, Tokat, Erbaa, road Erbaa-Tokat, Kartosman V., 40°34'109''N/36°32'246''E, 1024 m, 24.07.2005, *Pinus sylvestris*; 2♀♀, Tokat, Merkez, Musullu V., 40°32'531''N/36°38'683''E, 1018 m, 24.07.2005, *Fagus orientalis* and *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Merkez, Avlunlar V., 40°31'N/36°44'E, 860 m, 24.07.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, Tokat, Merkez, Çamlıbel, Aktepe V. Plateau, 40°03'565''N/36°35'190''E, 1246 m, 14.08.2005, *Quercus petraea* ssp. *iberica*; 6♀♀, Tokat, Merkez, Çamlıbel, Aktepe V. Dam, 40°04'N/36°34'E, 1180 m, 14.08.2005, *Quercus petraea* ssp. *iberica*, *Corylus avellana*, *Salix alba*; 3♂♂, Tokat, Merkez, Kızılınış site, 40°16'N/36°37'E, 1200 m, 14.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 1♂, 1♀, Tokat, Niksar, Oluklu V., 40°34'N/36°46'E, 900 m, 15.08.2005, *Quercus infectoria* ssp. *infectoria*; 5♀♀, Tokat, Niksar, Eryaba V., 40°33'568''N/36°46'081''E, 915 m, 15.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, Tokat, Niksar, north of Sulugöl V., 40°33'341''N/36°59'575''E, 800 m, 16.08.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Reşadiye, Bereketli, 40°30'N/37°17'E, 1300 m, 16.08.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Reşadiye, Yolüstü V., 40°27'N/37°18'E, 900 m, 16.08.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Reşadiye, 5. km from Reşadiye to Sazak, 40°22'978''N/37°17'144''E, 850 m, 17.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, Tokat, Turhal, Sarıçiçek V. Plateau, 40°26'N/36°21'E, 1250 m, 18.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, 1♀, Tokat, Zile, north of Sofular V., 40°21'664''N/35°44'183''E, 1250 m, 19.08.2005, *Quercus petraea* ssp. *iberica*.

#### ***Dichochrysa prasina* (Burmeister, 1839)**

**Materials examined:** 2♂♂, Tokat, Merkez, road Sivas-Tokat, Çamlıbel Pass, Highways Care House, 39°57'496''N/36°32'015''E, 1620-1690 m, 15.07.2005, *Acacia melanoxylon*, *Cornus mas*; 1♂, 3♀♀, Tokat, Merkez, 2. km from Çamlıbel Pass to İhsaniye, 39°59'N/36°30'E, 1470 m, 15.07.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 1♂, 4♀♀, Tokat, Sulusaray, Devecikargin V., 40°05'N/36°05'E, 1220 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 1♂, Tokat, Sulusaray, between Devecikargin-Arpacıkaraçay V., 40°04'N/36°05'E, 1280 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 1♂, 3♀♀, Tokat, Zile, Akkılış V., 40°10'N/35°36'E, 1180 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 1♂, 1♀, Tokat, 5. km from Zile to Amasya, 40°20'367''N/35°51'732''E, 1027 m, 16.07.2005, *Prunus cerasus* and *Quercus petraea* ssp. *iberica*; 3♂♂, 3♀♀, Tokat, 18. km from Zile to Amasya, Yünlü V., 40°23'081''N/35°51'730''E, 1027 m, 17.07.2005, *Fagus orientalis*; 1♂, 2♀♀, Tokat, Zile, between Kervansaray-Karakaya V., 40°23'N/35°46'E, 1100 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Zile, between Karakaya-Sofular V., 40°22'N/35°46'E, 1250 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 1♂, 3♀♀, Tokat, Zile, north of Sofular V., 40°21'664''N/35°44'183''E, 1250 m, 17.07.2005,

*Quercus petraea* ssp. *iberica*; 2♂♂, Tokat, Erbaa, east of Karayaka, 40°44'N/36°33'E, 400 m, 22.07.2005, *Pinus sylvestris*; 1♂, 1♀, Tokat, Erbaa, Ortaköy V., Tıkaç fountain, 40°52'378''N/36°37'193''E, 920 m, 23.07.2005, *Fagus orientalis*; 1♀, Tokat, Erbaa, Ortaköy V., Alçakbel stream, Kocadere bridge, 40°50'914''N/36°34'999''E, 1065 m, 23.07.2005, köprü altı; 1♂, Tokat, Niksar, Yerköprü V., 40°40'053''N/36°47'882''E, 500 m, 23.07.2005, *Quercus petraea* ssp. *iberica*; 1♂, 1♀, Tokat, Niksar, north of Sulugöl V., 40°33'341''N/36°58'575''E, 800 m, 23.07.2005, *Quercus petraea* ssp. *iberica*; 1♂, Tokat, Başçiftlik, Hasanbeyli V., 40°31'N/37°06'E, 1200 m, 23.07.2005, *Fagus orientalis*; 1♀, Tokat, Erbaa, road Erbaa-Tokat, Benli V., 40°36'N/36°32'E, 560 m, 24.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Merkez, Musullu V., 40°32'531''N/36°38'683''E, 1018 m, 24.07.2005, *Fagus orientalis* and *Quercus petraea* ssp. *iberica*; 3♀♀, Tokat, 2. km from Çamlıbel Pass to İhsaniye, 39°59'N/36°60'E, 1470 m, 14.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, 3♀♀, Tokat, Merkez, Çamlıbel, Aktepe V. Plateau, 40°03'565''N/36°35'190''E, 1246 m, 14.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, Tokat, Merkez, Kızılınış site, 40°16'N/36°37'E, 1200 m, 14.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 1♀, Tokat, Niksar, Oluklu V., 40°34'N/36°46'E, 900 m, 15.08.2005, *Quercus infectoria* ssp. *infectoria*; 1♂, 6♀♀, Tokat, Niksar, Eryaba V., 40°33'568''N/36°46'081''E, 915 m, 15.08.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Niksar, north of Sulugöl V., 40°33'341''N/36°59'575''E, 800 m, 16.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, Tokat, Başçiftlik, 3. km from Hasanbeyli V. to Başçiftlik, 40°31'N/37°06'E, 1200 m, 16.08.2005, *Quercus infectoria* ssp. *infectoria*; 1♂, Tokat, Reşadiye, Yolüstü V., 40°27'N/37°18'E, 900 m, 16.08.2005, *Quercus petraea* ssp. *iberica*; 2♀♀, Tokat, Reşadiye, Sazak V., 40°19'595''N/37°15'531''E, 1035 m, 17.08.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Almus, Kuruseki V., 40°23'288''N/36°57'078''E, 800 m, 17.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, 1♀, Tokat, Turhal, Sarıçiçek V. Plateau, 40°26'N/36°21'E, 1250 m, 18.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, 2♀♀, Tokat, Turhal, between Sarıçiçek-Kat V., 40°23'526''N/36°20'790''E, 1360 m, 18.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 4♀♀, Tokat, Turhal, Kat V., 40°22'240''N/36°19'424''E, 1270 m, 18.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 1♂, Tokat, Pazar, Ballica V. (Ballica Cavern), 40°13'N/36°17'E, 980 m, 18.08.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, 4♀♀, Tokat, 18. km from Zile to Amasya, Yünlü V., 40°23'081''N/35°51'730''E, 1027 m, 19.08.2005, *Fagus orientalis*; 3♂♂, 6♀♀, Tokat, Zile, north of Sofular V., 40°21'664''N/35°44'183''E, 1250 m, 19.08.2005, *Quercus petraea* ssp. *iberica*.

#### ***Dichochrysa zelleri* (Schneider, 1851)**

**Materials examined:** 1♀, Tokat, Sulusaray, between Devecikargın-Arpacıkaraçay V., 40°04'N/36°05'E, 1280 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 1♂, 1♀, Tokat, 5. km from Zile to Amasya, 40°20'367''N/35°51'732''E, 1027 m, 16.07.2005, *Prunus cerasus* and *Quercus petraea* ssp. *iberica*; 2♀♀, Tokat, Zile, between Karakaya-Sofular V., 40°22'N/35°46'E, 1250 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Merkez, road Sivas-Tokat, Çamlıbel Pass, Highways Care House 40°01'496''N/36°32'015''E, 1620-1690 m, 13.08.2005, *Cornus mas*; 1♀, Tokat, Niksar, Eryaba V. 40°33'568''N/36°46'081''E, 915 m, 15.08.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Almus, Dereköy 40°18'965''N/37°10'018''E, 827 m, 17.08.2005, *Quercus petraea* ssp. *iberica*.

#### ***Italochrysa italica* (Rossi, 1790)**

**Materials examined:** 1♂, Tokat, Niksar, Yerköprü V., 40°40'053''N/36°47'882''E, 500 m, 23.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Erbaa, road Erbaa-Tokat, Benli V., 40°36'N/36°32'E, 560 m, 24.07.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, Tokat, Başçiftlik, 3. km from Hasanbeyli V. to Başçiftlik, 40°31'N/37°06'E, 1200 m, 16.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, Tokat, Reşadiye, 5. km from Reşadiye to Sazak, 40°22'978''N/37°17'144''E, 850 m, 17.08.2005, *Quercus petraea* ssp. *iberica*.

#### ***Nineta principiae* Monserrat, [1981]**

**Materials examined:** 4♂♂, 2♀♀, Tokat, 18. km from Zile to Amasya, Yünlü V., 40°23'081''N/35°51'730''E, 1027 m, 17.07.2005, *Fagus orientalis*; 1♀, Tokat, Zile, between Karakaya-Sofular V., 40°22'N/35°46'E, 1250 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Zile, Sofular V., 40°21'N/35°45'E, 1200 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Zile, north of Sofular V., 40°21'664''N/35°44'183''E, 1250 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 4♂♂, 1♀, Tokat, Merkez, Musullu V., 40°32'531''N/36°38'683''E, 1018 m, 24.07.2005, *Fagus orientalis* and *Quercus*

*petraea* ssp. *iberica*; 2♀♀, Tokat, Merkez, Kızılınış site, 40°16'N/36°37'E, 1200 m, 14.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*.

***Peyerimhoffina gracilis* (Schneider, 1851)**

**Materials examined:** 1♂, 2♀♀, Tokat, Turhal, Kat V., 40°22'240''N/36°19'424''E, 1270 m, 18.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*.

**Family Coniopterygidae Burmeister, 1839**

***Aleuropteryx loewii* Klapálek, 1894**

**Materials examined:** 4♂♂, Tokat, Merkez, Çamlıbel, Aktepe V. Plateau, 40°03'565''N/36°35'190''E, 1246 m, 14.08.2005, *Quercus petraea* ssp. *iberica*.

***Coniopteryx (Coniopteryx) pygmaea* Enderlein, 1906**

**Materials examined:** 1♀, Tokat, Sulusaray, between Devecikargın-Arpacıkaraçay V., 40°04'N/36°05'E, 1280 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Zile, Akkılış V., 40°10'N/35°36'E, 1180 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Erbaa, east of Karayaka, 40°44'N/36°33'E, 400 m, 22.07.2005, *Pinus sylvestris*; 3♀♀, Tokat, Erbaa, south of Ortaköy V., 40°52'N/36°35'E, 1000 m, 23.07.2005, *Fagus orientalis* and *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Erbaa, road Erbaa-Tokat, Benli V., 40°36'N/36°32'E, 560 m, 24.07.2005, *Quercus petraea* ssp. *iberica*; 2♀♀, Tokat, Merkez, road Sivas-Tokat, Çamlıbel Pass, Highways Care House, 40°01'496''N/36°32'015''E, 1620-1690 m, 13.08.2005, *Crateagus monogyna*, *Pyrus communis*; 2♀♀, Tokat, Merkez, Çamlıbel, Aktepe V. Plateau, 40°03'565''N/36°35'190''E, 1246 m, 14.08.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Merkez, Şenköy forest management, 40°24'N/36°41'E, 1250 m, 14.08.2005, *Quercus petraea* ssp. *iberica*; 2♀♀, Tokat, Niksar, Teknealan V., 40°33'N/36°48'E, 980 m, 15.08.2005, *Fagus orientalis*, *Quercus petraea* ssp. *iberica*; 2♀♀, Tokat, Başçiftlik, 3. km from Hasanbeyli V. to Başçiftlik, 40°31'N/37°06'E, 1200 m, 16.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, Tokat, Reşadiye, Yolüstü V., 40°27'N/37°18'E, 900 m, 16.08.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Almus, Kuruseki V., 40°23'288''N/36°57'078''E, 800 m, 17.08.2005, *Pinus sylvestris*; 3♂♂, 2♀♀, Tokat, Turhal, Kat V., 40°22'240''N/36°19'424''E, 1270 m, 18.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 1♀, Tokat, Turhal, north of Dökmetepe V., 40°19'N/36°18'E, 950 m, 18.08.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Pazar, Ballica V. (Ballica Cavern), 40°13'N/36°17'E, 980 m, 18.08.2005, *Quercus petraea* ssp. *iberica*; 3♀♀, Tokat, 18. km from Zile to Amasya, Yünlü V., 40°23'081''N/35°51'730''E, 1027 m, 19.08.2005, *Fagus orientalis*.

***Coniopteryx (Holoconiopteryx) drammonti* Rousset, 1964**

**Materials examined:** 1♂, Tokat, Almus, Serince V., 40°23'N/36°50'E, 1000 m, 17.08.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, 1♀, Tokat, Merkez, Pınarlı V., 40°23'N/36°43'E, 850 m, 17.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*.

***Coniopteryx (Metaconiopteryx) arcuata* Kis, 1965**

**Materials examined:** 1♂, 1♀, Tokat, 8. km from Zile to Amasya, 40°21'N/35°51'E, 1300 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, 4♀♀, Tokat, Zile, Sofular V., 40°21'N/35°45'E, 1200 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 4♂♂, 5♀♀, Tokat, Merkez, Çamlıbel, Aktepe V. Dam, 40°04'N/36°34'E, 1180 m, 14.08.2005, *Quercus petraea* ssp. *iberica*, *Corylus avellana*, *Salix alba*.

***Coniopteryx (Metaconiopteryx) esbenpeterseni* Tjeder, 1930**

**Materials examined:** 1♂, Tokat, Zile, between Kervansaray-Karakaya V., 40°23'N/35°46'E, 1100 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 4♂♂, 5♀♀, Tokat, Zile, north of Sofular V., 40°21'664''N/35°44'183''E, 1250 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 1♂, 1♀, Tokat, Zile, north of Sofular V., 40°21'664''N/35°44'183''E, 1250 m, 19.08.2005, *Quercus petraea* ssp. *iberica*.



***Coniopteryx (Metaconiopteryx) lentiae* H. Aspöck & U. Aspöck, 1964**

**Materials examined:** 3 ♂♂, 7 ♀♀, Tokat, Almus, Bakımlı V., 40°22'188''N/36°47'805''E, 1100 m, 17.08.2005, *Quercus petraea* ssp. *iberica*.

***Conwentzia pineticola* Enderlein, 1905**

**Materials examined:** 3 ♂♂, 1 ♀, Tokat, Erbaa, south of Ortaköy V., 40°52'N/36°35'E, 1000 m, 23.07.2005, *Fagus orientalis* and *Quercus petraea* ssp. *iberica*; 1 ♀, Tokat, Merkez, road Sivas-Tokat, Çamlıbel Pass, Highways Care House, 40°01'496''N/36°32'015''E, 1620-1690 m, 13.08.2005, *Pyrus communis*.

***Helicoconis (Ohmopteryx) pseudolutea* Ohm, 1965**

**Materials examined:** 1 ♂, Tokat, 8. km from Zile to Amasya, 40°21'N/35°51'E, 1300 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 1 ♀, Tokat, Zile, between Kervansaray-Karakaya V., 40°23'N/35°46'E, 1100 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 1 ♀, Tokat, Zile, north of Sofular V., 40°21'664''N/35°44'183''E, 1250 m, 17.07.2005, *Quercus petraea* ssp. *iberica*.

***Semidalis aleyrodiformis* (Stephens, 1836)**

**Materials examined:** 2 ♂♂, 1 ♀, Tokat, Sulusaray, Devecikargın V., 40°05'N/36°05'E, 1220 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 3 ♂♂, 3 ♀♀, Tokat, Zile, Büyüközlü V., 40°13'N/35°37'E, 1200 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 1 ♂, 2 ♀♀, Tokat, 5. km from Zile to Amasya, 40°20'367''N/35°51'732''E, 1027 m, 16.07.2005, *Prunus cerasus* and *Quercus petraea* ssp. *iberica*; 1 ♂, Tokat, Zile, Sofular V., 40°21'N/35°45'E, 1200 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 2 ♂♂, 2 ♀♀, Tokat, Erbaa, south of Ortaköy V., 40°52'N/36°35'E, 1000 m, 23.07.2005, *Fagus orientalis* and *Quercus petraea* ssp. *iberica*; 1 ♀, Tokat, Niksar, Yerköprü V., 40°40'053''N/36°47'882''E, 500 m, 23.07.2005, *Quercus petraea* ssp. *iberica*; 1 ♂, Tokat, Niksar, north of Sulugöl V., 40°33'341''N/36°58'575''E, 800 m, 23.07.2005, *Quercus petraea* ssp. *iberica*; 1 ♂, 1 ♀, Tokat, Merkez, Şenköy forest management, 40°24'N/36°41'E, 1250 m, 14.08.2005, *Quercus petraea* ssp. *iberica*; 1 ♂, Tokat, Niksar, Eryaba V., 40°33'568''N/36°46'081''E, 915 m, 15.08.2005, *Quercus infectoria* ssp. *infectoria*; 2 ♂♂, 2 ♀♀, Tokat, Başçiftlik, 3. km from Hasanbeyli V. to Başçiftlik, 40°31'N/37°06'E, 1200 m, 16.08.2005, *Quercus petraea* ssp. *iberica*; 1 ♂, 1 ♀, Tokat, Reşadiye, Yolüstü V., 40°27'N/37°18'E, 900 m, 16.08.2005, *Quercus petraea* ssp. *iberica*; 1 ♂, 1 ♀, Tokat, Reşadiye, 5. km from Reşadiye to Sazak, 40°22'978''N/37°17'144''E, 850 m, 17.08.2005, *Quercus petraea* ssp. *iberica*; 1 ♂, 1 ♀, Tokat, Merkez, Pınarlı V., 40°23'N/36°43'E, 850 m, 17.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 1 ♂, 1 ♀, Tokat, Turhal, between Sarıçiçek-Kat V., 40°23'526''N/36°20'790''E, 1360 m, 18.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 1 ♂, 1 ♀, Tokat, Turhal, Kat V., 40°22'240''N/36°19'424''E, 1270 m, 18.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*.

**Family Hemerobiidae Latreille, 1802**

***Hemerobius (Hemerobius) handschini* Tjeder, 1957**

**Materials examined:** 2 ♂♂, Tokat, Merkez, road Sivas-Tokat, Çamlıbel Pass, Highways Care House, 39°57'496''N/36°32'015''E, 1620-1690 m, 15.07.2005, *Pinus sylvestris*, *Crateagus monogyna*; 2 ♂♂, 4 ♀♀, Tokat, Merkez, 2. km from Çamlıbel Pass to İhsaniye, 39°59'N/36°30'E, 1470 m, 15.07.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*; 2 ♀♀, Tokat, Artova, Yenice V., 40°10'N/36°15'E, 1110 m, 15.07.2005, *Pinus sylvestris* and *Quercus petraea* ssp. *iberica*; 2 ♀♀, Tokat, Artova, Ahmetkanişment V., 40°07'N/36°10'E, 1300 m, 16.07.2005, *Pinus sylvestris* and *Quercus petraea* ssp. *iberica*; 1 ♂, 1 ♀, Tokat, Erbaa, north of Çatalan V., 40°49'668''N/36°32'013''E, 1052 m, 22.07.2005, *Pinus sylvestris*; 2 ♂♂, Tokat, Çatalan, Tortepe forest recreation area, 40°48'N/36°34'E, 1250 m, 23.07.2005, *Cedrus libani*; 3 ♀♀, Tokat, Merkez, Dayılıhacı V., 40°12'893''N/36°30'491''E, 1085 m, 24.07.2005, *Pinus sylvestris*; 5 ♀♀, Tokat, Merkez, road Sivas-Tokat, Çamlıbel Pass, Highways Care House, 40°01'496''N/36°32'015''E, 1620-1690 m, 13.08.2005, *Pinus sylvestris*; 1 ♂, Tokat, 2. km from Çamlıbel Pass to İhsaniye, 39°59'N/36°60'E, 1470 m, 14.08.2005, *Quercus petraea* ssp. *iberica*; 1 ♂, 4 ♀♀, Tokat, Başçiftlik, 3. km from Hasanbeyli V. to Başçiftlik, 40°31'N/37°06'E, 1200 m, 16.08.2005, *Quercus*

*infectoria* ssp. *infectoria*; 1♂, Tokat, Başçıftlık, Büyükyayla, 40°34'836''N/37°11'882''E, 1592 m, 16.08.2005, *Fagus orientalis*; 1♂, Tokat, Almus, Kuruseki V., 40°23'288''N/36°57'078''E, 800 m, 17.08.2005, *Pinus sylvestris*; 1♀, Tokat, Turhal, between Sarıçiçek-Kat V., 40°23'526''N/36°20'790''E, 1360 m, 18.08.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Turhal, Kat V., 40°22'240''N/36°19'424''E, 1270 m, 18.08.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Turhal, north of Dökmetepe V., 40°19'N/36°18'E, 950 m, 18.08.2005, *Quercus petraea* ssp. *iberica*.

#### ***Hemerobius (Hemerobius) lutescens* Fabricius, 1793**

**Materials examined:** 1♀, Tokat, Erbaa, north of Çatalan V., 40°49'668''N/36°32'013''E, 1052 m, 22.07.2005, *Quercus petraea* ssp. *iberica*; 2♀♀, Tokat, Erbaa, Ortaköy V., Tıkaç fountain, 40°52'378''N/36°37'193''E, 920 m, 23.07.2005, *Fagus orientalis*; 2♀♀, Tokat, Erbaa, between Çatalan-Gököl V., Düden Lake shore, 40°49'728''N/36°36'089''E, 1164 m, 23.07.2005, *Fagus orientalis*.

#### ***Hemerobius (Hemerobius) micans* Olivier, 1792**

**Materials examined:** 1♀, Tokat, Erbaa, north of Çatalan V., 40°49'668''N/36°32'013''E, 1052 m, 22.07.2005, *Quercus petraea* ssp. *iberica*; 6♀♀, Tokat, Erbaa, Ortaköy V., Tıkaç fountain, 40°52'378''N/36°37'193''E, 920 m, 23.07.2005, *Fagus orientalis*; 2♂♂, 9♀♀, Tokat, Erbaa, between Çatalan-Gököl V., Düden Lake shore, 40°49'728''N/36°36'089''E, 1164 m, 23.07.2005, *Fagus orientalis*; 1♀, Tokat, Niksar, north of Sulugöl V., 40°33'341''N/36°58'575''E, 800 m, 23.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Merkez, Çamlıbel, Aktepe V. Dam, 40°04'N/36°34'E, 1180 m, 14.08.2005, *Quercus petraea* ssp. *iberica*, *Corylus avellana*, *Salix alba*; 4♂♂, 4♀♀, Tokat, Başçıftlık, Büyükyayla, 40°34'836''N/37°11'882''E, 1592 m, 16.08.2005, *Fagus orientalis*.

#### ***Hemerobius (Hemerobius) nitidulus* Fabricius, 1777**

**Materials examined:** 1♀, Tokat, Erbaa, north of Çatalan V., 40°49'668''N/36°32'013''E, 1052 m, 22.07.2005, *Pinus sylvestris*; 1♀, Tokat, Niksar, north of Sulugöl V., 40°33'341''N/36°58'575''E, 800 m, 23.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Erbaa, road Erbaa-Tokat, Kartosman V., 40°34'109''N/36°32'246''E, 1024 m, 24.07.2005, *Pinus sylvestris*; 1♂, Tokat, Merkez, Dayılıhacı V., 40°12'893''N/36°30'491''E, 1085 m, 24.07.2005, *Pinus sylvestris*; 1♂, Tokat, Merkez, road Sivas-Tokat, Çamlıbel Pass, Highways Care House, 40°01'496''N/36°32'015''E, 1620-1690 m, 13.08.2005, *Pinus sylvestris*; 1♂, Tokat, Başçıftlık, 3. km from Hasanbeyli V. to Başçıftlık, 40°31'N/37°06'E, 1200 m, 16.08.2005, *Quercus petraea* ssp. *iberica*.

#### ***Hemerobius (Hemerobius) stigma* Stephens, 1836**

**Materials examined:** 1♀, Tokat, Merkez, road Sivas-Tokat, Çamlıbel Pass, Highways Care House, 39°57'496''N/36°32'015''E, 1620-1690 m, 15.07.2005, *Cornus mas*; 1♀, Tokat, Erbaa, north of Çatalan V., 40°49'668''N/36°32'013''E, 1052 m, 22.07.2005, *Quercus petraea* ssp. *iberica*; 2♀♀, Tokat, Merkez, Dayılıhacı V., 40°12'893''N/36°30'491''E, 1085 m, 24.07.2005, *Pinus sylvestris*.

#### ***Hemerobius (Hemerobius) zernyi* Esben-Petersen, 1935**

**Materials examined:** 1♂, Tokat, Erbaa, north of Çatalan V., 40°49'668''N/36°32'013''E, 1052 m, 22.07.2005, *Pinus sylvestris*; 2♀♀, Tokat, Erbaa, between Çatalan-Gököl V., Düden Lake shore, 40°49'728''N/36°36'089''E, 1164 m, 23.07.2005, *Fagus orientalis*.

#### ***Symphorobius (Nireberge) fuscescens* (Wallengren, 1863)**

**Materials examined:** 1♀, Tokat, Niksar, north of Sulugöl V., 40°33'341''N/36°58'575''E, 800 m, 23.07.2005, *Quercus petraea* ssp. *iberica*; 1♂, 1♀, Tokat, Turhal, between Sarıçiçek-Kat V., 40°23'526''N/36°20'790''E, 1360 m, 18.08.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*.

#### ***Symphorobius (Symphorobius) elegans* (Stephens, 1836)**

**Materials examined:** 2♀♀, Tokat, Merkez, 2. km from Çamlıbel Pass to İhsaniye, 39°59'N/36°30'E, 1470 m, 15.07.2005, *Quercus petraea* ssp. *iberica* and *Pinus sylvestris*.

***Symphorobius (Sympherobius) pygmaeus (Rambur, 1842)***

**Materials examined:** 2♂♂, 3♀♀, Tokat, Artova, Ahmetkanişment V., 40°07'N/36°10'E, 1300 m, 16.07.2005, *Pinus sylvestris* and *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Sulusaray, between Devecikargın-Arpacıkaraçay V., 40°04'N/36°05'E, 1280 m, 16.07.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, Tokat, 5. km from Zile to Amasya, 40°20'367''N/35°51'732''E, 1027 m, 16.07.2005, *Prunus cerasus* and *Quercus petraea* ssp. *iberica*; 2♂♂, 3♀♀, Tokat, Niksar, north of Sulugöl V., 40°33'341''N/36°58'575''E, 800 m, 23.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Erbaa, road Erbaa-Tokat, Kartosman V., 40°34'109''N/36°32'246''E, 1024 m, 24.07.2005, *Pinus sylvestris*; 1♂, 1♀, Tokat, Niksar, Eryaba V., 40°33'568''N/36°46'081''E, 915 m, 15.08.2005, *Quercus petraea* ssp. *iberica*; 1♂, 1♀, Tokat, Niksar, Teknealan V., 40°33'N/36°48'E, 980 m, 15.08.2005, *Fagus orientalis*, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Reşadiye, Sazak V., 40°19'595''N/37°15'531''E, 1035 m, 17.08.2005, *Quercus petraea* ssp. *iberica*.

***Wesmaelius (Kimminsia) subnebulosus (Stephens, 1836)***

**Materials examined:** 1♀, Tokat, Zile, Sofular V., 40°21'N/35°45'E, 1200 m, 17.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Erbaa, between Çatalan-Gököl V., Düden Lake shore, 40°49'728''N/36°36'089''E, 1164 m, 23.07.2005, *Fagus orientalis*; 1♀, Tokat, Niksar, north of Sulugöl V., 40°33'341''N/36°58'575''E, 800 m, 23.07.2005, *Quercus petraea* ssp. *iberica*.

**Family Mantispidae Leach in Brewster, 1815**

***Mantispa aphavexelte H. Aspöck & U. Aspöck, 1994***

**Materials examined:** 2♀♀, Tokat, Niksar, Sulugöl V., 40°32'341''N/36°59'575''E, 850 m, 23.07.2005, *Quercus petraea* ssp. *iberica*.

***Mantispa perla (Pallas, 1772)***

**Materials examined:** 1♂, Tokat, Merkez, road Çamlıbel-Tokat, 40°11'N/36°29'E, 1110 m, 15.07.2005, *Quercus petraea* ssp. *iberica*; 1♂, Tokat, 18. km from Zile to Amasya, Yünlü V., 40°23'081''N/35°51'730''E, 1027 m, 17.07.2005, *Fagus orientalis*.

***Mantispa styriaca (Poda, 1761)***

**Materials examined:** 1♀, Tokat, Merkez, road Çamlıbel-Tokat, 40°11'N/36°29'E, 1110 m, 15.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Artova, Ahmetkanişment V., 40°07'N/36°10'E, 1300 m, 16.07.2005, *Pinus sylvestris*.

**Family Myrmeleontidae Latreille, 1802**

***Creoleon plumbeus (Olivier, 1811)***

**Materials examined:** 2♂♂, 4♀♀, Tokat, Erbaa, Kale V., 40°46'N/36°31'E, 280 m, 22.07.2005, *Pinus sylvestris*; 3♂♂, 2♀♀, Tokat, Reşadiye, Yolüstü V., 40°27'N/37°18'E, 900 m, 16.08.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, 5♀♀, Tokat, Almus, Gemaleönü V., 40°19'N/37°06'E, 880 m, 17.08.2005, *Quercus petraea* ssp. *iberica*; 3♂♂, 1♀, Tokat, Almus, Gemaleönü V., 40°19'N/37°06'E, 880 m, 17.08.2005, *Quercus petraea* ssp. *iberica*.

***Distoleon tetragrammicus (Fabricius, 1798)***

**Materials examined:** 1♂, Tokat, Merkez, road Çamlıbel-Tokat, 40°11'N/36°29'E, 1110 m, 15.07.2005, *Quercus petraea* ssp. *iberica*; 1♀, Tokat, Niksar, Sulugöl V., 40°32'341''N/36°59'575''E, 850 m, 23.07.2005, *Quercus petraea* ssp. *iberica*.

***Euroleon nostras (Geoffroy in Fourcroy, 1785)***

**Materials examined:** 1♀, Tokat, Almus, Bakımlı V., 40°22'188''N/36°47'805''E, 1100 m, 17.08.2005, *Quercus petraea* ssp. *iberica*.

***Myrmecaelurus trigrammus* (Pallas, 1771)**

**Materials examined:** 2♂♂, 4♀♀, Tokat, Almus, Gemaleönü V., 40°19'N/37°06'E, 880 m, 17.08.2005, *Quercus petraea* ssp. *iberica*.

***Neuroleon (Neuroleon) assimilis* (Navás, 1914)**

**Materials examined:** 2♂♂, 4♀♀, Tokat, Merkez, Çamlıbel, Aktepe V. Dam, 40°04'N/36°34'E, 1180 m, 14.08.2005, *Quercus petraea* ssp. *iberica*, *Corylus avellana*, *Salix alba*; 2♀♀, Tokat, Almus, Dereköy, 40°18'965"N/37°10'018"E, 827 m, 17.08.2005, *Quercus petraea* ssp. *iberica*.

***Palpares libelluloides* (Linnaeus, 1764)**

**Materials examined:** 2♂♂, 2♀♀, Tokat, Reşadiye, Yolüstü V., 40°27'N/37°18'E, 900 m, 16.08.2005, *Quercus petraea* ssp. *iberica*; 2♂♂, 2♀♀, Tokat, Almus, Gemaleönü V., 40°19'N/37°06'E, 880 m, 17.08.2005, *Quercus petraea* ssp. *iberica*.

**Family Osmylidae Leach in Brewster, 1815**

***Osmylus elegantissimus* Kozhantshikov, 1951**

**Materials examined:** 1♂, 1♀, Tokat, Erbaa, east of Karayaka, 40°44'N/36°33'E, 400 m, 22.07.2005, *Pinus sylvestris*; 1♂, Tokat, Erbaa, Ortaköy V., Alçakbel stream, Kocadere bridge, 40°50'914"N/36°34'999"E, 1065 m, 23.07.2005, under bridge.

#### 4. DISCUSSION

In this study, a total of 641 Neuroptera were collected between May and August 2005, in order to determine the Neuroptera fauna of the Tokat province. Collected specimens were determined to belong to 44 species, 24 genera and 6 families, which is 21 percentage of the number of neuropteroids recorded in Turkey (Table 1).

Occurrence of two species (*Chrysopa hungarica* Klapálek, 1899 and *Hemerobius (Hemerobius) gilvus* Stein, 1863) previously reported from Tokat province, has not been confirmed during the fieldwork of this study. In addition to three known species (*Chrysoperla carnea* (Stephens, 1836), *Cunctochrysa baetica* (Hölzel, 1972), *Coniopteryx (Metaconiopteryx) arcuata* Kis, 1965) have been found in this study [8, 14, 18, 29, 37].

Other 41 species, *Chrysopa dorsalis* Burmeister, 1839, *Chrysopa formosa* Brauer, 1851, *Chrysopa nigricostata* Brauer, 1851, *Chrysopa pallens* (Rambur, [1838]), *Chrysopa perla* (Linnaeus, 1758), *Chrysopa viridana* Schneider, 1845, *Chrysopidia ciliata* (Wesmael, 1841), *Dichochrysa flavifrons* (Brauer, 1850), *Dichochrysa prasina* (Burmeister, 1839), *Dichochrysa zelleri* (Schneider, 1851), *Italo-chrysa italica* (Rossi, 1790), *Nineta principiae* Monserrat, [1981], *Peyerimhoffina gracilis* (Schneider, 1851), *Aleuropteryx loewii* Klapálek, 1894, *Coniopteryx (Coniopteryx) pygmaea* Enderlein, 1906, *Coniopteryx (Holoconiopteryx) drammonti* Rousset, 1964, *Coniopteryx (Metaconiopteryx) esbenpeterseni* Tjeder, 1930, *Coniopteryx (Metaconiopteryx) lentiae* H. Aspöck & U. Aspöck, 1964, *Conwentzia pineticola* Enderlein, 1905, *Helicoconis (Ohmopteryx) pseudolutea* Ohm, 1965, *Semidalis aleyrodiformis* (Stephens, 1836), *Hemerobius (Hemerobius) handschini* Tjeder, 1957, *Hemerobius (Hemerobius) lutescens* Fabricius, 1793, *Hemerobius (Hemerobius) micans* Olivier, 1792, *Hemerobius (Hemerobius) nitidulus* Fabricius, 1777, *Hemerobius (Hemerobius) stigma* Stephens, 1836, *Hemerobius (Hemerobius) zernyi* Esben-Petersen, 1935, *Symphorobius (Niremberge) fuscescens* (Wallengren, 1863), *Symphorobius (Sympherobius) elegans* (Stephens, 1836), *Symphorobius (Sympherobius) pygmaeus* (Rambur, 1842), *Wesmaelius (Kimminsia) subnebulosus* (Stephens, 1836), *Mantispa aphavexelte* H. Aspöck & U. Aspöck, 1994, *Mantispa perla* (Pallas, 1772), *Mantispa styriaca* (Poda, 1761), *Creoleon plumbeus* (Olivier, 1811), *Distoleon tetragrammicus* (Fabricius, 1798), *Euroleon nostras* (Geoffroy in Fourcroy, 1785), *Myrmecaelurus trigrammus* (Pallas, 1771), *Neuroleon (Neuroleon) assimilis* (Navás, 1914), *Palpares libelluloides*

(Linnaeus, 1764), *Osmylus elegantissimus* Kozhantshikov, 1951 are the first records for the Neuroptera fauna of Tokat province.

*O. elegantissimus* is a purely known species spreading in the Northeastern Turkey, Crimea Peninsula, Ukraine [74] and Caucasian region (Armenia, Azerbaijan, Checheno-Ingushetia and Georgia [75]) and monocentric Ponto-Caspian faunal element [2]. In this study, *Osmylus elegantissimus* Kozhantshikov, 1951 have here their western distribution in Turkey.

Table 1 displays the neuropteran assemblages of whole region and its relative frequency per specimens. The 44 species found represented six families. Family Chrysopidae induced the majority of lacewing with 366 specimens (57.10%), while Coniopterygidae 115 (17.94%), Hemerobiidae 108 (16.85%), Myrmeleontidae 43 (6.71%), Mantispidae 6 (0.94%), Osmylidae 3 (0.47%).

The most frequently found species *Chrysoperla carnea* (136, 21.22%) are associated with coniferous trees and deciduous trees, spruce including and relatively abundant (COM). Then five species (*Dichochrysa prasina*, *Chrysopa viridana*, *Dichochrysa flavifrons*, *Semidalis aleyrodiformis*, *Hemerobius (H.) handschini*) are relatively uncommon (UNC.). Next 12 species follow in the studied material representing from 1 to 5%. Remaining 26 species were found less frequently and they are represented by less than 1%. *Euroleon nostras* species of them found only accidentally by 1 specimen [76].

The focus of this work was on survey of different neuropteran species in Tokat. As there are some rare species of Neuroptera (e. g. *Osmylus elegantissimus*) in Tokat, this part of Turkey should receive greater concern of nature-conservation organisations. As different other neuropteran species are expected in Tokat, I intend to continue our research of Neuroptera in this region.

Table 1. Species composition and dominance of lacewing species from randomly located sampling stations in the Tokat province, their representation (dominance) in percentages and comparison with families according to number of occurrence of the species in individuals (■: known data, ▲: new data).

FAMILY	SPECIES	Total (N)	Relative frequency (%)	Abundance scale	Total Family (N)	Family Relative frequency (%)	TOKAT
<b>Chrysopidae</b>							
	<i>Chrysopa dorsalis</i>	4	0.62	CAS			▲
	<i>Chrysopa formosa</i>	3	0.47	CAS			▲
	<i>Chrysopa hungarica</i>	-	0.00				■
	<i>Chrysopa nigricostata</i>	3	0.47	CAS			▲
	<i>Chrysopa pallens</i>	9	1.40	RAR			▲
	<i>Chrysopa perla</i>	5	0.78	CAS			▲
	<i>Chrysopa viridana</i>	40	6.24	UNC			▲
	<i>Chrysoperla carnea</i>	136	21.22	COM	366	57.10	■▲
	<i>Chrysopidia ciliata</i>	3	0.47	CAS			▲
	<i>Cunctochrysa baetica</i>	4	0.62	CAS			■▲
	<i>Dichochrysa flavifrons</i>	37	5.77	UNC			▲
	<i>Dichochrysa prasina</i>	90	14.04	UNC			▲
	<i>Dichochrysa zelleri</i>	8	1.25	RAR			▲
	<i>Italochrysa italic</i>	5	0.78	CAS			▲
	<i>Nineta principiae</i>	16	2.50	RAR			▲
	<i>Peyerimhoffina gracilis</i>	3	0.47	CAS			▲
<b>Coniopterygidae</b>							
	<i>Aleuropteryx loewii</i>	4	0.62	CAS			▲
	<i>Coniopteryx (Coniopteryx) pygmaea</i>	28	4.37	RAR			▲
	<i>Coniopteryx (Holoconiopteryx) drammonti</i>	4	0.62	CAS			▲
	<i>Coniopteryx (Metaconiopteryx) arcuata</i>	13	2.03	RAR			■▲
	<i>Coniopteryx (Metaconiopteryx)</i>	12	1.87	RAR	115	17.94	▲
	<i>esbenpeterseni</i>	10	1.56	RAR			▲
	<i>Coniopteryx (Metaconiopteryx) lentiae</i>	5	0.78	CAS			▲
	<i>Conwentzia pineticola</i>	3	0.47	CAS			▲
	<i>Helicoconis (Ohmopteryx) pseudolutea</i>						
	<i>Semidalis aleyrodiformis</i>	36	5.62	UNC			▲
<b>Hemerobiidae</b>							
	<i>Hemerobius (Hemerobius) gilvus</i>	-	0.00				■
	<i>Hemerobius (Hemerobius) handschini</i>	35	5.46	UNC			▲
	<i>Hemerobius (Hemerobius) lutescens</i>	5	0.78	CAS			▲
	<i>Hemerobius (Hemerobius) micans</i>	28	4.37	RAR			▲
	<i>Hemerobius (Hemerobius) nitidulus</i>	6	0.94	CAS			▲
	<i>Hemerobius (Hemerobius) stigma</i>	4	0.62	CAS	108	16.85	▲
	<i>Hemerobius (Hemerobius) zernyi</i>	3	0.47	CAS			▲
	<i>Symphorobius (Niremberge) fuscescens</i>	3	0.47	CAS			▲
	<i>Symphorobius (Sympherobius) elegans</i>	2	0.31	CAS			▲
	<i>Symphorobius (Sympherobius) pygmaeus</i>	19	2.96	RAR			▲
	<i>Wesmaelius (Kimminsia) subnebulosus</i>	3	0.47	CAS			▲
<b>Mantispidae</b>							
	<i>Mantispa aphavexelte</i>	2	0.31	CAS			▲
	<i>Mantispa perla</i>	2	0.31	CAS	6	0.94	▲
	<i>Mantispa styriaca</i>	2	0.31	CAS			▲
<b>Myrmeleontidae</b>							
	<i>Creoleon plumbeus</i>	22	3.43	RAR			▲
	<i>Distoleon tetragrammicus</i>	2	0.31	CAS			▲
	<i>Euroleon nostras</i>	1	0.16	CAS	43	6.71	▲
	<i>Myrmecaelurus trigrammus</i>	2	0.31	CAS			▲
	<i>Neuroleon (Neuroleon) assimilis</i>	8	1.25	RAR			▲
	<i>Palpares libelluloides</i>	8	1.25	RAR			▲
<b>Osmyliidae</b>							
	<i>Osmylus elegantissimus</i>	3	0.47	CAS	3	0.47	▲
<b>TOTAL</b>		<b>641</b>	<b>100</b>		<b>641</b>	<b>100</b>	<b>46</b>

The abundance scale chosen is the following: a species is considered dominant if its frequency (Q) exceeds 50% within the overall sample [76]; Very common if  $30 < Q \leq 50\%$ ; common if  $15 < Q \leq 30\%$ ; uncommon if  $5 < Q \leq 15\%$ ; rare (RAR) if  $1 < Q \leq 5\%$ ; casual (CAS) if  $0.1 < Q \leq 1\%$ ; and exceptional (EXC) if  $Q \leq 0.1\%$ .

## 5. ACKNOWLEDGEMENT

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