

A CONTRIBUTION TO FAUNA OF TURKISH NEUROPTERAN INSECTS FROM ARDAHAN, İĞDIR AND KARS PROVINCES (INSECTA: NEUROPTERA)

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ABSTRACT: This study is based on 176 specimens belonging to 18 species of 11 genera of 5 families of the order Neuroptera, and these insects were collected from Ardahan, İğdir, and Kars provinces between years 2001 and 2003. Distribution of each species in Turkey and in the world has also been presented.

KEY WORDS: Distribution, fauna, Turkey, Ascalaphidae, Hemerobiidae, Mantispidae, Nemopteridae, Neuroptera.

Studies of Turkish neuropteran fauna have not yet been completed. It needs to be studied more comprehensively. It has hitherto been studied in the western parts of the country, however, the eastern parts of Turkey have rarely been studied (Hagen, 1860, 1863; Navas, 1910, 1926; Esben-Petersen, 1932; Hölzel, 1968; Gepp, 1974; Monserrat and Hölzel, 1978; Şengonca, 1979, 1980b, 1981; Makarkin, 1990; Sziraki, 1998; Kacirek, 1998; Arı and Kıyak, 2000, 2003; Aspöck, et al., 1980, 2001). It can be expected that Turkish Neuropteran species numbers can increase if it is studied in detail.

The region resolved to be studied on neuropteran insect fauna is situated in the North-Eastern parts of Turkey, and any work dealing with the fauna of neuropteran insects has not been fulfilled. The work field possesses different ecosystems such as forest, and steppe vegetations, culture plants, marshy places. Mediterranean and terrestrial climate prevails in the area of study. The topographic structure of the region is rather heterogenous. With this study, the aim is to determine the neuropteran insect fauna of the provinces Ardahan, Erzurum, İğdir and Kars. To identify the specimens, Navas, 1910; Aspöck et al., 1980; Şengonca, 1980b were followed. All specimens are stored in the Zoological Museum of Arts and Sciences Faculty of Gazi University.

In this study, a total of 176 specimens were collected from Ardahan, İğdir, and Kars provinces between years 2001 and 2003. The specimens belong to 18 species of 11 genera of five families. Nemopteridae Burmeister, 1839 with 26, Mantispidae Leach, 1815 with 61, Hemerobiidae Latreille, 1802 with 47, Osmylidae Leach in Brewster, 1815 with 10, and Ascalaphidae Lefebvre, 1842 with 32 specimens are presented. The specimens were prepared to examine according to (Şengonca, 1980a; Kıyak, 2000). Each specimen was examined to identify

what species it is. After the specimens were identified by Arı and Kiyak, they were labelled, and put in boxes as the entomological museum materials.

RESULTS

ASCALAPHIDAE Lefebvre, 1842

Bubopsis McLachlan, 1898

Bubopsis hamatus (Klug, 1834)

Materials examined: Iğdır (Aralık, near the border of Armenia), 24.6.2002, 1♀, 3♂♂, 790m.; Kars (Akçay, Kağızman), 10.8.2002, 2♂♂, 1185m.; (Kötek, Kağızman), 11.8.2002; 1♀, 1410m.; (Değirmendere, Kağızman), 13.8.2002; 1♂, 1360m. **Distribution in Turkey:** Adana, Antalya, Çanakkale, Isparta, İzmir, Mersin and Şanlıurfa (Canbulat, 1998, Canbulat and Kiyak, 2005; Şengonca, 1979). **Distribution in the world:** Anatolia, North Africa, Iraq, Israel, Iran, Caucasia, Lebanon, Egypt, Saudi Arabia, Syria, and Jordan (Aspöck et al., 2001; Mirmoayedi, 2002; Sziraki, 1998).

Libelloides Schäffer, 1763

Libelloides macaronius (Scopoli, 1763)

Materials examined: Ardahan (Posof), 8.8.2001, 2♀♀, 1685m.; (Özbaşı, Posof), 29.7.2002; 5♀♀, 1380m. - 1420m.; (Eminbey, Posof), 30.7.2002; 9♀♀, 1440m. - 1460m.; (Surroundings of Posof), 28.7.2003; 4♀♀, 1575m. - 1600m. **Distribution in Turkey:** Ankara Antalya, Burdur, Çanakkale, Isparta, Kayseri, and Niğde, (Canbulat, 2002, Canbulat and Kiyak, 2005; Kacirek, 1998). **Distribution in the world:** Anatolia, Albania, Austria, Azerbaijan, Bulgaria, Bosnia and Herzegovina, Czechoslovakia, Armenia, Georgia, Croatia, Caucasia, Kazakhstan, Cyprus, Kyrgyzstan, North Iran, Israel, Italy, Hungary, Macedonia, Moldova, Uzbekistan, Romania, Russia, Poland, Slovenia, Syria, Tajikistan, Turkmenistan, Ukraine, Yugoslavia, and Greece (Aspöck et al., 1980, 2001; Navas, 1926; Sziraki, 1998, Aspöck and Hölzel, 1996).

Deleproctophylla Lefebvre, 1842

Deleproctophylla variegata (Klug, 1834)

Materials examined: Kars (Akçay, Kağızman), 10.8.2002; 2♂♂, 1180m.; Ardahan (bank of Posof stream), 27.7.2003; 1♂, 1525m. **Distribution in Turkey:** Antalya, Burdur, Denizli, and Isparta (Canbulat and Kiyak, 2005; Sziraki, 1998). **Distribution in the world:** Anatolia, Algeria, Palestine, Caucasia, Kazakhstan, Cyprus, Small Asia, Uzbekistan, Turkmenistan and Greece (Aspöck et al., 1980, 2001; Kacirek, 1998; Aspöck and Hölzel, 1996).

OSMYLIDAE Leach in Brewster, 1815

Osmylus Latreille, 1802

Osmylus fulvicephalus (Scopoli, 1763)

Materials examined: Ardahan (Göle-Şenkaya border), 21.7.2003, 7♀♀, 3♂♂, 1525m. **Distribution in Turkey:** Antalya, Burdur, Isparta (Canbulat and Kiyak, 2005), and The West Anatolia (Aspöck et al., 1980). **Distribution in the world:** West Anatolia, Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Czechoslovakia, Denmark, Estonia, England, France, Greece, Holland,

Hungary, Italy, Ireland, Latvia, Liechtenstein, Luxembourg, Macedonia, Poland, Romania, Russia, Spain, Slovenia, Sweden, Switzerland, Ukraine, and Yugoslavia (Aspöck et al., 2001).

HEMEROBIIDAE Latreille, 1802

Wesmaelius Krüger, 1922

Wesmaelius (Kimminsia) ravus (Withycombe, 1923)

Materials examined: Ardahan (Çamlıçatak), 28.7.2001, 1♀, 1865m.; (bank of Ardahan – Göle road), 1.8.2001; 1♂, 1900m.; (Posof), 10.8.2001, 1♀, 1♂, 1580m. **Distribution in Turkey:** The middle Anatolia (Aspöck et al., 1980, 2001; Aspöck and Hölzel, 1996). **Distribution in the world:** Albania, Anatolia, Austria, Caucasus, Czechoslovakia, Denmark, Finland, France, England, Germany, Greece, Hungary, Italy, Japan, Norway, Poland, Romania, Russia, Slovenia, Spain, Sweden, and Switzerland. (Aspöck et al., 1980, 2001; Aspöck and Hölzel, 1996).

Wesmaelius (Wesmaelius) concinnus (Stephens, 1836)

Materials examined: Ardahan (bank of Ardahan–Göle road), 1.8.2001, 1♀, 1850m.; (Posof), 10.7.2001, 1♀, 1565m., Kars (Sarıkamış), 13. 8. 2001, 1♂, 2050m. **Distribution in Turkey:** Isparta (Canbulat and Kiyak, 2005), and The East Blacksea region (Aspöck et al., 1980). **Distribution in the world:** The Northeast Anatolia, Austria, Bulgaria, Czechoslovakia, Denmark, Estonia, Finland, France, Germany, England, Holland, Hungary, Latvia, Liechtenstein, Norway, Poland, Romania, Russia, Siberia, Slovenia, Sweden, Switzerland, Ukraine, and Yugoslavia (Aspöck et al., 1980, 2001; Aspöck and Hölzel, 1996).

Wesmaelius (Wesmaelius) quadrifasciatus (Reuter, 1894)

Materials examined: Ardahan (Göle), 30.7.2001, 1♂, 2040m.; (bank of Ardahan–Göle road), 1.8.2001, 1♂, 1890m.; (Surroundings of Hanak), 2.8.2001, 1♂, 2050m.; (Asmakonak, Posof), 28.7.2002, 1♂, 1660m. **Distribution in Turkey:** The Northeast Anatolia (Aspöck et al., 1980). **Distribution in the world:** Anatolia, Austria, Czechoslovakia, Denmark, England, Estonia, Finland, France, Germany, Greece, Holland, Hungary, Italy, Latvia, Liechtenstein, Mongolia, Norway, Poland, Romania, Russia, Siberia, Slovenia, Spain, Sweden Switzerland, Ukraine, White Russia, and Yugoslavia, (Aspöck et al., 1980, 2001; Aspöck and Hölzel, 1996).

Hemerobius Linnaeus, 1758

Hemerobius (Hemerobius) micans Olivier, 1792

Materials examined: Kars (Sarıkamış), 10.7.2001, 2♀♀, 2075m., (bank of Kars stream), 20.7.2001, 2♀♀, 1♂, 1765m.; Ardahan (Çamlıçatak), 28.7.2001, 1♂, 1870m.; (Banks of the Ardahan–Göle road, 30.7.2001, 1♂, 1890m.; (Surroundings of Posof), 5.8.2001, 3♀♀, 1♂, 1555m. **Distribution in Turkey:** The Northeast Anatolia (Aspöck et al., 1980), and Isparta (Canbulat and Kiyak, 2005). **Distribution in the world:** The North Anatolia, Austria, Albania, Armenia, Belgium, Bulgaria, Bosnia and Herzegovina, Croatia, Czechoslovakia, Denmark, England, Finland, France, Georgia, Germany, Greece, Holland, Hungary, Ireland, Italy, The North Iran, Latvia, Liechtenstein, Luxembourg, Macedonia, Moldova, Norway, Poland, Romania, Russia, Slovenia, Sweden, Switzerland, Ukraine, Yugoslavia (Aspöck et al., 1980, 2001; Brauer, 1876; Monserrat, 1990; Aspöck and Hölzel, 1996).

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

Materials examined: Ardahan (Çamyazı, Posof), 28.7.2002, 1♂, 1645m.; Kars (Mescitli, Sarıkamış), 20.8.2002, 1♀, 1595m. **Distribution in Turkey:** The North Anatolia (Aspöck et al., 1980). **Distribution in the world:** The United States of America, The North Anatolia, Austria, The Azorean Islands, Bulgaria, Canada, The Canarien Islands, Croatia, Cyprus, Czechoslovakia, Denmark, England, Estonia, Finland, France, Germany, Holland, Hungary, Ireland, Japan, Kazakhstan, Latvia, Liechtenstein, Luxembourg, Mongolia, Moldova, Morocco, Norway, Poland, Portugal, Romania, Russia, Siberia, Slovenia, Spain, Sweden, Switzerland, Ukraine, and Yugoslavia (Aspöck et al., 1980, 2001; Brauer, 1876; Aspöck and Hölzel, 1996).

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

Materials examined: Kars (bank of Kars stream), 20.7.2001, 2♀, 1♂, 1760m. – 1765m.; Ardahan (Çamlıçatak), 28.7.2001, 1♀, 1♂, 1865m.; (Surrounding of Göle), 30.7.2001, 1♀, 2030m.; (Banks of Ardahan–Göle road), 1.8.2001, 1♀, 1900m.; (Surroundings of Posof), 10.8.2001, 6♀♀, 1560m. – 1580m.; Kars (Mescitli, Sarıkamış), 20.8.2002, 2♀♀, 6♂♂, 1595m. – 1700m. **Distribution in Turkey:** The Northeast Anatolia (Aspöck et al., 1980), Antalya, Burdur, Denizli, and Muğla (Canbulat and Kiyak, 2005). **Distribution in the world:** Anatolia, Albania, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechoslovakia, Denmark, England, Estonia, The Fareast, Finland, France, Germany, Greece, Holland, Ireland, Latvia, Liechtenstein, Luxembourg, Hungary, Mongolia, Moldova, Norway, Poland, Romania, Russia, Siberia, Solvenia, Spain, Sweden, Switzerland, Ukraine, and Yugoslavia, (Aspöck et al., 1980, 2001; Brauer, 1876; Hagen, 1860).

Symphorobius* Banks, 1904**Symphorobius (Niremberge) fuscescens* (Wallengren, 1863)**

Materials examined: Ardahan (Çamlıçatak), 28.7.2001, 1♀, 1860m. **Distribution in Turkey:** The Northeast Anatolia (Aspöck et al., 1980). **Distribution in the world:** Anatolia, Austria, Belgium, Bulgaria, Czechoslovakia, Denmark, England, Estonia, Finland, France, Germany, Holland, Italy, Japan, Kazakhstan, Liechtenstein, Latvia, Mongolia, Norway, Poland, Romania, Russia, Siberia, Slovenia, Spain, Switzerland, Sweden, Ukraine, and Yugoslavia (Aspöck et al., 1980, 2001; Brauer, 1876; Aspöck and Hölzel, 1996; Makarkin, 1990).

Micromus* Rambur, 1842**Micromus lanosus* (Zeleny, 1962)**

Materials examined: Ardahan (Asmakonak, Posof), 28.7.2002, 1♀, 1890m.; (Sarıkayalar), 3.8.2002, 1♀, 1♂, 1645m. **Distribution in Turkey:** Ardahan, and Erzurum.(Arı and Kiyak, 2003). **Distribution in the world:** Austria, Bulgaria, Czechoslovakia, Denmark, France, Germany, Hungary, Italy, Poland, Romania, Slovenia, Spain, Switzerland, Ukraine, and Yugoslavia (Aspöck et al., 1980, 2001; Aspöck and Hölzel, 1996).

MANTISPIDAE Leach, 1815***Mantispa* Illiger in Kugelann, 1798*****Mantispa perla* Pallas, 1772**

Materials examined: Ardahan (Çamyazı, Posof), 7.8.2001, 1♀, 1560m.; (Surroundings of Göle), 3.8.2002, 2♀♀, 1610m.; (Surroundings of Göle),

21.7.2003, 1♀, 1575m.; Kars (Surroundings of Karakurt), 24.7.2002, 1♀, 1570m.
Distribution in Turkey: Denizli, Isparta, and Kütahya (Canbulat and Kiyak, 2005, Şengonca, 1979, 1980b). **Distribution in the world:** Anatolia, Armenia, Bulgaria, Caucasus, England, Greece, Italy, Kazakhstan, Macedonia, Russia, Slovenia, Spain, Turkmenistan, Ukraine, Yugoslavia (Aspöck et al., 1980, 2001; Aspöck and Hölzel, 1996; Brauer, 1876).

***Mantispa aphavexelte* Aspöck and Aspöck, 1994**

Materials examined: Kars (Mescitli, Sarıkamış), 20.8.2002, 1♀, 1595m.
Distribution in Turkey: Antalya (Canbulat and Kiyak, 2005), and Anatolia (Aspöck et al., 2001; Aspöck and Hölzel, 1996). **Distribution in the world:** Anatolia, Armenia, Bulgaria, France, Croatia, Caucasus, The North China, Greece, Italy, Kazakhstan, Mongolia, Morocco, Uzbekistan, Russia, Slovenia, Spain, Switzerland, Tajikistan, and Yugoslavia (Aspöck et al., 1980, 2001; Aspöck and Hölzel, 1996).

***Mantispa scabricollis* McLachlan, 1875**

Materials examined: Ardahan (Çamyazı, Posof), 28.7.2002, 1♀, 1705m.; (border of Göle–Şenkaya), 21.7.2003, 1♀ 1♂, 1525m; Kars (Çukurayva, Kağızman), 10.7.2003, 1♂, 1440m. **Distribution in Turkey:** Adana, Antalya, Aydın, Isparta, İzmir, Mersin, and Muğla (Arı and Kiyak, 2000; Canbulat and Kiyak, 2005, Monserrat and Hölzel, 1978; Şengonca, 1979, 1980b). **Distribution in the world:** Afghanistan, Anatolia, Armenia, Caucasus, Greece, Iraq, Iran, Kyrgyzstan, Uzbekistan, Tajikistan, Turkistan (Aspöck et al., 1980, 2001; Aspöck and Hölzel, 1996; Brauer, 1876; Şengonca, 1980b).

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

Materials examined: Ardahan (Çamlıçatak), 28.7.2001, 2♀♀, 1890m.; (Surroundings of Hanak), 29.7.2001, 1♀, 1800m.; (bank of Ardahan–Göle road), 30.7.2001, 1♀, 2010m.; (Surroundings of Hanak), 1.8.2001, 1♀, 1780m.; (Çıldır), 4.8.2001, 4♀♀, 3♂♂, 1975m.; (Posof), 5.8.2001, 1♀, 1520m.; (Eminbey, Posof), 10.8.2001, 1♀, 2♂♂, 1570m. – 1600m.; (Özbaşı, Posof), 29.7.2002; 1♀, 2♂♂, 1460m. - 1547m.; (Surroundings of Göle), 3.8.2002, 5♀♀, 2♂♂, 1535m. – 1610m., (Beyrehatun, Çıldır), 6.8.2002, 5♀♀, 7♂♂, 900m. - 1950m.; (border of Göle–Şenkaya), 21.7.2003, 2♀♀, 1♂, 1575m. – 1590m.; (Surroundings of Göle), 22.7.2003, 4♀♀, 1♂, 1840m. – 1910m., (Eminbey, Posof), 28.7.2003, 2♀♀, 2♂♂, 1550m. – 1600m. **Distribution in Turkey:** Antalya, and Kütahya (Canbulat and Kiyak, 2005, Şengonca, 1979, 1980b). **Distribution in the world:** Austria, Armenia, Bosnia and Herzegovina, Bulgaria, Croatia, Czechoslovakia, France, Germany, and Greece, Hungary, The North Iran, Italy, Mongolia, Morocco, Romania, Russia, Siberia, Slovenia, Spain, Sweden, Switzerland, Syria, Turkmenistan, Ukraine, and Yugoslavia (Aspöck et al., 1980, 2001; Aspöck and Hölzel, 1996; Brauer, 1876; Makarkin, 1990; Şengonca, 1980b).

NEMOPTERIDAE Burmeister, 1839

***Nemoptera* Latreille, 1802**

***Nemoptera sinuata* Olivier, 1811**

Materials examined: Ardahan (Göle–Şenkaya border), 3.8.2002, 8♀♀, 1540 m. – 1600 m.; (Göle – Şenkaya border), 21.7.2003; 4♀♀, 1575 m. -1585 m.
Distribution in Turkey: Adana; Amasya, Ankara, Antalya, Aydın; Burdur, Denizli, Hakkari, Isparta, İstanbul, İzmir, Kars, Kütahya, Kahramanmaraş,

Konya, Mersin, Muğla, Muş, Şanlıurfa, Tokat, and Van (Arı and Kiyak, 2000; Canbulat and Kiyak, 2005; Esben-Petersen, 1932; Gepp, 1974; Hölzel, 1968; Navas, 1910; Schneider, 1845; Şengonca, 1981). **Distribution in the world:** Armenia, Azerbaijan, Bulgaria, Georgia, Greece, The Northwest Iran, Macedonia, Syria, and Turkey (Aspöck et al., 1980, 2001; Aspöck and Hölzel, 1996; Brauer, 1876; Hagen, 1863).

Lertha Navas, 1910

***Lertha extensa* (Olivier, 1811)**

Materials examined: Iğdır (Aralık), 24.6.2002, 5♀♀, 790 m. - 820 m.; (Gaziler, Tuzluca), 1.7.2002, 8♀♀, 1045 m. - 1075 m.; Kars (Kağızman), 11.7.2003, 1♀, 1345 m. **Distribution in Turkey:** The Amanoses, Hakkari, Hatay, Kahramanmaraş, Malatya, Şanlıurfa, and The Toros Mountains (Hölzel, 1968; Kacirek, 1998; Şengonca, 1981). **Distribution in the world:** Anatolia, Small Asia, Iraq, Iran, and Jordan (Aspöck et al., 2001; Brauer, 1876; Navas, 1910, 1926).

DISCUSSION

All species, except for *Nemoptera sinuata*, are the first record for the investigated area. *Nemoptera sinuata* was recorded from Kars according to Şengonca, 1981. The other 17 species are first records for the research area. The distribution range of *Mantispa perla*, *M. aphavexelte*, *M. styriaca*, and *Osmylus fulvicephalus* found in the West Anatolia, and of *M. scabricollis*, *Deleproctophylla variegata*, *Bubopsis hamatus* known from the South and the Southwest Anatolia has been enlarged to the Northeast Anatolia. *Wesmaelius concinnus*, *Wesmaelius quadrifasciatus*, *Symphorobius fuscescens*, *Hemerobius nitidulus*, *Hemerobius stigma* had been recorded from the North and the Northeast Anatolia without marking locality (Aspöck, 1980). With this work, they were found in the localities mentioned above in Northeast Anatolia. *Wesmaelius ravus* had been known only from Central Anatolia (Aspöck, 1980), however, its distribution range has been extended to the Northeast Anatolia. *Micromus lanosus* has hitherto been recorded from Ardahan (Arı and Kiyak, 2003). *Lertha extensa* was recorded from the South, and the Southeast Anatolia (Hölzel, 1968; Şengonca, 1981), its distribution region has been enlarged to the district Kağızman with this study. With this study, number of species of the families in Turkey has not been changed, however, their distribution range in the country has been enlarged. Ascalaphidae with 10 species, and 1 subspecies, Hemerobiidae with 31, Mantispidae with 4, Nemopteridae with 9, Osmylidae with 4 species are presented in Turkey (Arı and Kiyak, 2003; Aspöck et al., 1980; 2001; Canbulat and Kiyak, 2004, 2005; Hölzel, 1968).

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