Türk. entomol. derg., 2014, 38(3): 279-290
ISSN 1010-6960

Orijinal araştırma (Original article)

Ichneumonidae (Hymenoptera) from Anatolia. II.

Anadolu'dan Ichneumonidler (Hymenoptera) II.

Saliha ÇORUH[1*] Janko KOLAROV[2] İrfan ÇORUH[1]

Summary

Faunistic data of 47 species belonging to the subfamilies Cryptinae, Metopiinae, Pimplinae and Tryphoninae (Ichneumonidae), collected from different provinces of Anatolia, including Erzurum, Giresun, Rize, Trabzon and Ordu, are reported in this study. From them 10 species - *Bathythrix linearis* (Gravenhorst), *Bathythrix pellucidator* (Gravenhorst), *Gelis cursitans* (Fabricius), *Gelis formicarius* (Linnaeus), *Gelis mutillatus* (Gmelin), *Gelis trux* (Förster), *Schreineria populnea* (Giraud), *Pimpla melanacrias* Perkins, *Ctenochira meridionator* Aubert and Kristotomus *pumilio* (Holmgren) are reported as new records for Turkey. For each species a short zoogeographical characterization isalso given.

Key words. Ichneumonidae, new records, Turkey, zoogeographical characterization.

Özet

Bu çalışmada, Anadolunun faklı bölgelerinden toplanan (Erzurum, Giresun, Rize, Trabzon ve Ordu) Cryptinae, Metopiinae, Pimplinae ve Tryphoninae (Ichneumonidae) altfamilyalarına ait 47 türün faunistik verileri değerlendirilmiştir. Bunlardan 10 tür *Bathythrix linearis* (Gravenhorst), *Bathythrix pellucidator* (Gravenhorst), *Gelis cursitans* (Fabricius), *Gelis formicarius* (Linnaeus), *Gelis mutillatus* (Gmelin), *Gelis trux* (Förster), *Schreineria populnea* (Giraud), *Pimpla melanacrias* Perkins, *Ctenochira meridionator* Aubert ve *Kristotomus pumilio* (Holmgren) Türkiye için yeni kayıt durumundadır. Her bir türe ait zoocoğrafik notlar verilmiştir.

Anahtar sözcükler. Ichneumonidae, yeni kayıt, Türkiye, zoocoğrafik karakterler.

[1] Atatürk University, Faculty of Agriculture, Department of Plant Protection, 25240 Erzurum, Turkey.
[2] University of Plovdiv, Faculty of Pedagogy, 24 Tsar Assen Str., 4000 Plovdiv, Bulgaria.
[*] Sorumlu yazar (Corresponding author): spekel@atauni.edu.tr
Alınış (Received): 16.05.2014 Kabul ediliş (Accepted): 21.07.2014

Introduction

Parasitic hymenoptera, a big insect group having a wide significance in terrestrial ecosystems (Shaw & Hochberg, 2001), constitute a specialized group of Hymenoptera, one of the mega insect orders (Stevens et al., 2007). Ichneumonidae is the biggest hymenopteran family including 1579 genera and 24,281 described species (Yu et al., 2012). The family is renowned as one of the most diverse animal group (Grissell, 1999). Townes (1969) estimated that there could be about 60,000 ichneumonid species in the world, whilst Gauld (1997) revised this figure upwards to potentially more than 100,000 species.

Common hosts are larvae and pupae of Coleoptera, Hymenoptera, and Lepidoptera. The Ichneumonidae with regards to there functions in ecosystem is considered important. In recent years they have been used successfully as biocontrol agents..There is surely a huge potential for their utilization in managed biocontrol programmes (Gupta, 1991).

However, despite of their abundance and ecological importance, the Ichneumonidae remain relatively to be poorly investigated (Shaw & Hochberg 2001). Number of species Ichneumonidae in Turkey was recorded 1056 in Taxapad (Yu et al., 2012). In term of present studies on the Ichneumonidae, we found several species so far unknown in Turkey. With the below mentioned contributions (Özgen et al., 2010; Okyar et al., 2012; Çoruh & Özbek 2013; Çoruh & Kolarov, 2013; Çoruh et al., 2013; Çoruh et al., 2014a,b; Riedel et al., 2014; Kolarov et al., 2014a,b) the numbers of Ichneumonidae fauna of Turkey reached to about 1112 species.

With our new records presented here, the total number of species recorded from Turkey are now 1122. For each species we present a zoogeographic characterization following Taglianti et al. (1999).

This study is based upon material of family Ichneumonidae collected from different localities of Anatolia in Turkey in 2013. The aim of this study was to present the complete records of preserved material in order to improve knowledge about diversity of this important group in Turkey

Material and Methods

The samples were collected by insect net on different flowering plants in the Erzurum and in East Black Sea Coast provinces Rize, Trabzon, Giresun, Ordu (Fig. 1) during June, 2013. Collected samples were transferred into a handmade aspirator and were killed with ethyl acetate. Conventional standard method was used for preparation of the samples. Materials are preserved in Collection of University of (Bulgaria) for the present. The Plant species that visited by Ichneumonid species were collected by hand, pressed and deposited in Herbarium section of Plant Protection Department (Erzurum). Plant specimens were identified according to Davis (1965-1988) and Herbaryum of Ataturk University, Faculty of Agriculture, Department of Plant Protection by third author. General distributions of the species were taken from Yu et al. (2012) and vegetation data in studied areas are given in Table 1.

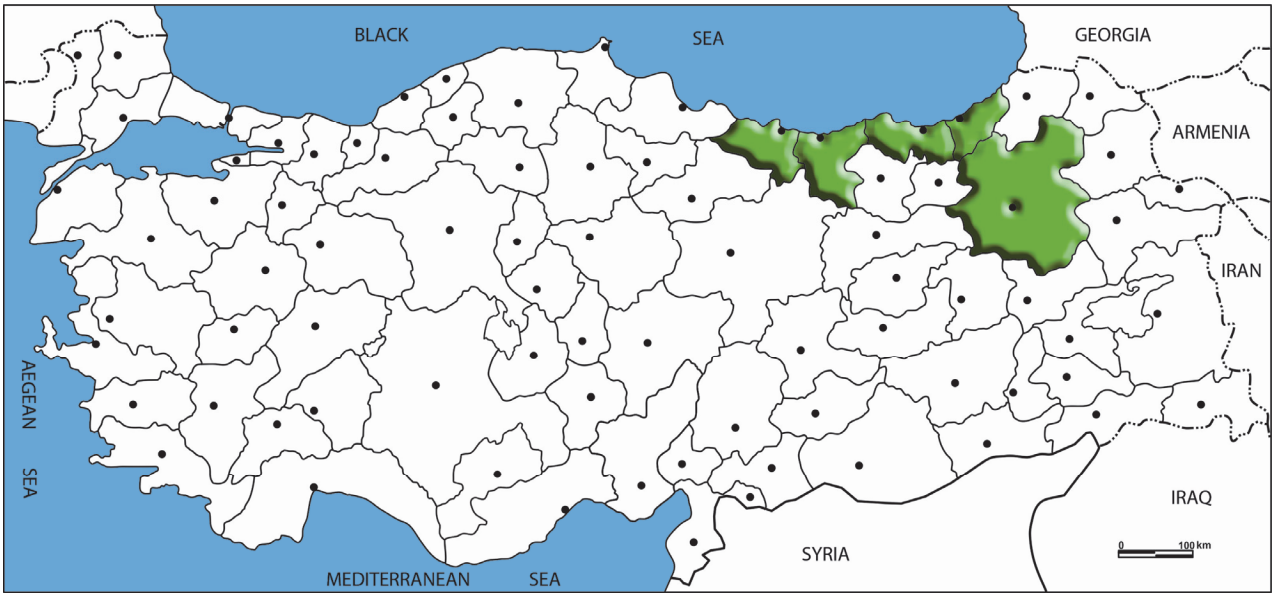

Figure 1. Map of study area.

Results and Discussion

In total 24 species in 16 genera of Cryptinae, 7 species in 4 genera of Metopiinae, 8 species in 5 genera of Pimplinae and 8 species in 6 genera of Tryphoninae from the different provinces of Anatolia were determined. The species list is given below.

Subfamily Cryptinae

Agrothereutes hospes (Tschek, 1871)

Material examined: Giresun: Eynesil, 88 m, 22.VI.2013, 1♂.

Distribution: Europe, Turkey and Iran.

Agrothereutes parvulus (Habermehl, 1926)

Material examined: Giresun: Eynesil, 88 m, 22.VI.2013, 1♂; Ordu: Gülyalı, 100 m, 22.VI.2013, 1♂.

Distribution: Spain, France, Poland, Bulgaria, Turkey and Iran.

Aritranis director (Thunberg, 1822)

Material examined: Trabzon: Çaykara, Uzungöl, 1090 m, 21.VI.2013, 1♂; Rize: İkizdere, 570 m, 24.VI.2013, 1♂.

Distribution: Europe, Azerbayjan, Turkey, Israel, Iran and North America.

Bathythrix lamina (Thomson, 1884)

Material examined: Rize: Of, 10 m, 20.VI.2013, 1♂.

Distribution: Europe and Turkey.

Bathythrix linearis (Gravenhorst, 1829)

Material examined: Rize, İkizdere, 570 m, 24.VI.2013, 1♂.

Distribution: Europe and Kamchatka oblast of Russia.

New record for Turkey.

Bathythrix pellucidator (Gravenhorst, 1829)

Material examined: Rize: İkizdere, 570 m, 24.VI.2013, 1♂, Of, 10 m, 20.VI.2013, 2♂♂; Ordu: Gülyalı, 100 m, 22.VI.2013, 1♂.

Distribution: Europe, Azerbaijan and Iran.

New record for Turkey

Buathra laborator (Thunberg, 1822)

Material examined: Trabzon: Çaykara, Uzungöl, 1090 m, , 21.VI.2013, 1♀.

Distribution: Holarctic region.

Cryptus viduatorius Fabricius, 1804

Material examined: Rize: İkizdere, 570 m, 24.VI.2013, 1♂.

Distribution: Europe, Azerbaijan, Turkey, Cyprus, Iran, Tajikistan and Siberia.

Dichrogaster liostylus (Thomson, 1885)

Material examined: Rize: İkizdere, 570 m, 24.VI.2013, 2♂♂; Of, 10 m, 20.VI.2013, 1♂.

Distribution: Palaearctic and Oriental region.

Encrateola laevigata (Ratzeburg, 1848)

Material examined: Giresun: Eynesil, 88 m, 22.VI.2013, 1♀.

Distribution: Europe, Turkey, Afghanistan, South Africa and North America.

Endasys plagiator (Gravenhorst, 1829)

Material examined: Erzurum, Gelinkaya, 1870 m, 19.VI.2013, 1♂; Rize, Ovit Mt., 2400 m, 19.VI.2013, 1♂.

Distribution: Europe and Turkey.

Gambrus incubitor (Linnaeus, 1758)

Material examined: Rize, Çat village, 1054 m, 20.VI.2013, 1♀.

Distribution: Europe, Azerbayjan, Turkey, Iran and Kenya.

Gambrus tricolor (Gravenhorst, 1829)

Material examined: Rize: İkizdere, 570 m, 24.VI.2013, 1♀.

Distribution: Europe and Turkey.

Gelis cursitans (Fabricius, 1775)

Material examined: Rize: Çayeli, Beyazsu, 10 m, 23.VI.2013, 1♂.

Distribution: Europe.

New record for Turkey.

Gelis formicarius (Linnaeus, 1758)

Material examined: Rize: İkizdere, 570 m, 24.VI.2013, 1♂.

Distribution: Europe and Azerbayjan.

New record for Turkey.

Gelis mutillatus (Gmelin, 1790)

Material examined: Erzurum, Dadaşkent, 1850 m, 19.VI.2013, 1♂.

Distribution: Europe.

New record for Turkey.

Gelis trux (Förster, 1850)

Material examined: Erzurum: Gelinkaya, 1870 m, 19.VI.2013, 2♂♂. Rize: Çayeli, Beyazsu, 10 m, 23.VI.2013, 1♂.

Distribution: Europe.

New record for Turkey.

Glyphicnemis profligator (Fabricius, 1775)

Material examined: Erzurum: Gelinkaya, 1870 m, 19.VI.2013, 1♂; Rize: İkizdere, 570 m, 24.VI.2013, 7♂♂.

Distribution: Palaearctic region.

Glyphicnemis vagabunda (Gravenhorst, 1829)

Material examined: Erzurum: Gelinkaya, 1870 m, 19.VI.2013, 42♂♂12♀♀.

Distribution: Europe, Georgia, Azerbayjan, Turkey and Iran.

Mesostenus albinotatus Gravenhorst, 1829

Material examined: Rize: İkizdere, 570 m, 24.VI.2013, 1♀.

Distribution: Holarctic region.

Hoplocryptus murarius (Börner, 1782)

Material examined: Rize: İkizdere, 570 m, 24.VI.2013, 1♂; Of, 10 m, 20.VI.2013, 1♂.

Distribution: Europe, Azerbayjan, Turkey, Iran, Kazakhstan, Kyrgyzstan and Mongolia.

Ischnus alternator (Gravenhorst, 1829)

Material examined: Giresun: Keşap, 95 m, 23.VI.2013, 1♀; Rize: Of, 10 m, 20.VI.2013, 1♂; Trabzon: Çaykara, Uzungöl, 1090 m, 21.VI.2013, 1♀.

Distribution: Europe, Azerbayjan, Turkey and Iran.

Mesoleptus laticinctus (Walker, 1874)

Material examined: Rize: Çayeli, Beyazsu, 10 m, 23.VI.2013, 1♀; İkizdere, 570 m, 24.VI.2013, 1♂.

Distribution: Palaearctic and Oriental region.

Schreineria populnea (Giraud, 1872)

Material examined: Giresun, Eynesil, 88 m, 22.VI.2013, 1♀.

Distribution: Palaearctic region.

New record for Turkey.

Subfamily Metopiinae

Colpotrochia cincta (Scopoli, 1763)

Material examined: Ordu: Gülyalı, 100 m, 22.VI.2013, 2♀♀; Rize: Çayeli, Beyazsu, 10 m, 23.VI.2013, 3♀♀.

Distribution: Palaearctic region.

Exochus flavifrons Boheman,1863

Material examined: Rize: İkizdere, 570 m, 24.VI.2013, 1♂1♀.

Distribution: Europe and Turkey.

Exochus mitratus Gravenhorst, 1829

Material examined: Giresun: Eynesil, 88 m, 22.VI.2013, 1♂; Rize: Çayeli, Beyazsu, 10 m, 23.VI.2013, 2♀♀; Of, 10 m, 20.VI.2013, 1♀.

Distribution: Holarctic region.

Exochus prosopius Gravenhorst, 1829

Material examined: Giresun: Keşap, 95 m, 23.VI.2013, 1♂; Rize: Çayeli, Beyazsu, 10 m, 23.VI.2013, 1♂.

Distribution: Palaearctic region.

Exochus suborbitalis Schmiedeknecht, 1924

Material examined: Giresun: Keşap, 95 m, 23.VI.2013, 1♀.

Distribution: Palaearctic region.

Hypsicera femoralis (Geoffroy, 1785)

Material examined: Giresun: Eynesil, 88 m, 22.VI.2013, 1♀.

Distribution: Almost all world.

Triclistus globulipes (Desvignes,1856)

Material examined: Giresun: Keşap, 95 m, 23.VI.2013, 1♀.

Distribution: Palaearctic and Oriental region.

Subfamily Pimplinae

Acrodactyla quadrisculpta (Gravenhorst, 1820)

Material examined: Rize: İkizdere, 570 m, 24.VI.2013, 1♀.

Distribution: Holarctic Oriental and Australasian region.

Apechthis compunctor (Linnaeus, 1758)

Material examined: Rize: İkizdere, 570 m, 24.VI.2013, 1♀.

Distribution: Palaearctic region, introduced into USA.

Gregopimpla inquisitor (Scopoli, 1763)

Material examined: Rize: İkizdere, 570 m, 24.VI.2013, 1♂.

Distribution: Holarctic region.

Itoplectis maculator (Fabricius, 1775)

Material examined: Erzurum: Gelinkaya, 1870 m, 19.VI.2013, 1♀; Giresun: Eynesil, 88 m, 22.VI.2013, 1♀; Trabzon: Çaykara, Uzungöl, 1090 m, 21.VI.2013, 1♀.

Distribution: Morocco, Tunisia, Europe, Azerbaijan, Turkey, Armenia, Iran, Mongolia and Siberia.

Pimpla aquilonia Cresson, 1870

Material examined: Trabzon: Çaykara, Uzungöl, 1090 m, 21.VI.2013, 1♀; Rize: İkizdere, 570 m, 24.VI.2013, 1♀.

Distribution: Holarctic region.

Pimpla insignatoria (Gravenhorst, 1807)

Material examined: Trabzon: Çaykara, Uzungöl, 1090 m, 21.VI.2013, 1♂.

Distribution: Europe, Azerbaijan, Georgia, Turkey and Armenia.

Pimpla melanacrias Perkins, 1941

Material examined: Rize: İkizdere, 570 m, 24.VI.2013, 1♂.

Distribution: Palaearctic region.

New record for Turkey.

Pimpla spuria Gravenhorst, 1829

Material examined: Giresun: Eynesil, 88 m, 22.VI.2013, 3♂♂, Keşap, 95 m, 23.VI.2013, 1♂; Rize: Çayeli, Beyazsu, 10 m, 23.VI.2013, 1♂, İkizdere, 570 m, 24.VI.2013, 2♂♂; Trabzon: Çaykara, Uzungöl, 1090 m, 21.VI.2013, 1♀.

Distribution: Palaearctic and Oriental region.

Subfamily Tryphoninae

Acrotomus succinctus (Gravenhorst, 1829)

Material examined: Rize: Çayeli, Beyazsu, 10 m, 23.VI.2013, 2♂♂.

Distribution: Holarctic and Oriental region.

Ctenochira meridionator Aubert, 1969

Material examined: Ordu: Gülyalı, 100 m, 22.VI.2013, 1♀.

Distribution: Palaearctic region.

New record for Turkey.

Cosmoconus (*Cosmoconus*) *ceratophorus* (Thomson, 1888)

Material examined: Rize, İkizdere, 570 m, 24.VI.2013, 1♂.

Distribution: Palaearctic region.

Kristotomus pumilio (Holmgren, 1857)

Material examined: Rize: Of, 10 m, 20.VI.2013, 1♂.

Distribution: Europe.

New record for Turkey.

Oedemopsis scabricula (Gravenhorst, 1829)

Material examined: Giresun: Eynesil, 88 m, 22.VI.2013, 1♀; Ordu: Gülyalı, 100 m, 22.VI.2013, 2♀♀; Rize: Çayeli, Beyazsu, 10 m, 23.VI.2013, 1♀.

Distribution: Holarctic and Oriental region.

Tryphon (*Tryphon*) *rutilator* (Linnaeus, 1761)

Material examined: Erzurum: Gelinkaya, 1870 m, 19.VI.2013, 7♂♂, 6♀♀; Rize: İkizdere, 570 m, 24.VI.2013, 2♂♂, 2♀♀; Ovit Mt., 2400 m, 19.VI.2013, 1♀.

Distribution: Europe, Azerbaijan, Georgia, Turkey, Armenia, Syria, Iran and Siberia.

Tryphon (*Tryphon*) *thomsoni* Roman, 1939

Material examined: Erzurum: Gelinkaya, 1870 m, 19.VI.2013, 2♂♂6♀♀; Rize: İkizdere, 570 m, 24.VI.2013, 2♂♂, 2♀♀.

Distribution: Europe, Azerbaijan, Georgia, Turkey, Armenia, Israel, Iran, Tajikistan and Siberia.

Tryphon (*Tryphon*) *zavreli* Gregor, 1939

Material examined: Erzurum, Gelinkaya, 1870 m, 19.VI.2013, 6♂♂.

Distribution: Europe, Azerbaijan, Georgia, Turkey, Armenia and Western Siberia.

Zoogeographical characterization

The zoogeographical characterization follows mainly the chorotype classification of the Near East fauna, proposed by Taglianti et al. (1999). After investigation of the recent geographic distribution of the species, listed above, they can be divided into the following groups:

1. Cosmopolitan range has the species *Hypsicera femoralis*.
2. With multi-regional range is the species *Acrodactyla quadrisculpta*.
3. Ranges in two zoogeographical regions have 8 species. Six species are from Holarctic/Palaearctic and Oriental region – *Dichrogaster liostylus*, *Mesoleptus laticinctus*, *Triclistus globulipes*, *Pimpla spuria*, *Acrotomus succinctus* and *Oedemopsis scabricula*. Two species are from Holarctic/Palaearctic and Afrotropical region – *Encrateola laevigata* and *Gambrus incubitor*.
4. Holarctic ranges have 7 species – *Aritranis director*, *Buathra laborator*, *Mesostenus albinotatus*, *Exochus mitratus*, *Apechthis compunctor*, *Gregopimpla inquisitor* and *Pimpla aquilonia*.

5. Palaearctic ranges have 9 species – *Bathythrix linearis*, *Glyphicnemis profligator*, *Schreineria populnea*, *Colpotrochia cincta*, *Exochus prosopius*, *E. suborbitalis*, *Pimpla melanacrias*, *Cosmoconus* (*Cosmoconus*) *ceratophorus* and *Ctenochira meridionator*.
6. Ranges in Siberoeuropean region have 5 species – *Cryptus viduatorius*, *Itoplectis maculator*, *Tryphon* (*Tryphon*) *rutilator*, *T*. (*T*) *thomsoni* and *T*. (*T*) *zavreli*.
7. *Hoplocryptus murarius* has Centralasian-European range.
8. Turanoeuropean ranges have 5 species – *Agrothereutes hospes*, *A. parvulus*, *Bathythrix pellucidator*, *Glyphicnemis vagabunda* and *Ischnus alternator*.
9. Numerous are European species – *Bathythrix lamina*, *Endasys plagiator*, *Gambrus tricolor*, *Gelis cursitans*, *G. formicarius*, *G. mutillatus*, *G. trux*, *Exochus flavifrons*, *Pimpla insignatoria* and *Kristotomus pumilio*.

In addition to all this, plant–insect relationships are of great importance to ecosystem (Petanidou and Lamborn, 2005). Pemberton and Hoover (1980) listed the records of insects (in 66 genera) associated with plants. Weeds on pastures and meadows, are good food sources for Ichneumonidae , which are important beneficial insects as parasitoids of many destructive pests of Coleoptera, Lepidoptera, and other group of insects and arachnoids.

Table 1 shows plant species that visited by Ichneumonidae species collected.

Table 1. Localities and name of collected plant species.

Name of plants	Collected localities				
	Erzurum	Rize	Trabzon	Giresun	Ordu
Apiaceae					
Carum carvi L.	+				
Daucus carota L.	+		+	+	+
Eryngium billardieri Delar	+				
Eryngium giganteum M. Bieb.		+	+	+	+
Falcaria vulgaris Bernh.	+				
Ferula communis L.	+				
Seseli libanotis (L.) W. Koch	+	+	+		
Pimpinella corymbosa Boiss.	+				
Heracleum pastinacifolium K. Koch	+	+		+	
Heracleum platytaenium Boiss.		+	+	+	
Asteraceae					
Achillea biebersteinii Afan.	+				
Achillea millefolium L.	+				+
Anthemis cretica L.	+	+		+	
Anthemis tinctoria L.	+			+	
Cirsium arvense (L.) Scop.	+	+	+	+	
Conyza canadensis (L.) Cronquist.		+			
Erigeron acer L.		+	+		+
Erigeron annuus (L.) Pers.		+			
Tanacetum balsamita L.	+	+			

Table 1. (continued)

Name of plants	Collected localities				
	Erzurum	Rize	Trabzon	Giresun	Ordu
Betulaceae					
Corylus avellana L.			+	+	+
Clusiaceae					
Hypericum hyssopifolium Chaix	+				
Hypericum perforatum L.	+	+		+	
Equisetaceae					
Equisetum palustre L.		+			
Euphorbiaceaee					
Euphorbia virgata Waldst. & Kit.	+				
Fabaceae					
Astragalus christianus L.	+				
Coronilla orientalis Mill.	+	+	+		
Trifolium pratense L.	+	+	+	+	+
Geraniaceae					
Geranium asphodeloides Burm. fil.		+	+	+	+
Geranium ibericum Cav.		+	+	+	+
Geranium sylvaticum L.		+			
Hypolepidaceae					
Pteridium aquilinum (L.) Kuhn			+		+
Lamiaceae					
Lamium purpureum L.			+		
Prunella vulgaris L.		+		+	+
Salvia forskahlei L.		+	+	+	+
Salvia verticillata L.	+	+	+	+	
Linaceae					
Linum hypericifolium Salisb.		+	+	+	
Onagraceae					
Epilobium parviflorum Schreber				+	
Papaveraceae					
Papaver dubium L.	+				
Plantaginaceae					
Plantago media L.			+		
Poaceae					
Alopecurus myosuroides Hudson	+		+		+
Cynodon dactylon (L.) Pers.	+		+		
Lolium temulentum L.			+		
Lolium perenne L.	+	+		+	
Sorghum halepense (L.) Pers.		+			
Paspalum paspalodes (Michx.) Scribner					+
Seteria glauca (L.) P. Beauv.					+
Poa annua L.	+	+	+		
Poa trivialis L.	+		+		
Festuca pratensis Hudson			+		
Phleum phyleoides (L.) Karsten		+			

Table 1. (continued)

Name of plants	Collected localities				
	Erzurum	Rize	Trabzon	Giresun	Ordu
Polygonaceae					
Polygonum persicaria L.		+			
Polygonum bistorta L.	+	+	+	+	
Primulaceae					
Anagallis arvensis L.		+			
Ranunculaceae					
Delphinium formosum Boiss. & Huet		+	+		
Ranunculus kotschyi Boiss.	+			+	
Thalictrum minus L.	+	+	+	+	
Resedaceae					
Reseda lutea L.	+	+	+		
Rosaceae					
Fragaria vesca L.			+		+
Rubus discolor Weihe & Nees			+		+
Rubus hirtus Waldst. et Kit.		+	+	+	+
Rubiaceae					
Galium incanum Sm.	+	+		+	
Galium verum L.		+			
Scrophulariaceae					
Pedicularis comosa L.	+	+			
Rhinanthus angustifolius C.C. Gmelin	+	+	+		
Veronica gentianoides Vahl.		+	+		+
Urticaceae					
Urtica dioica L.	+			+	

Acknowledgements

This research was supported by the Project Nr. BAP – 2012/234 (Atatürk Univeristy) and we are very thankful for it.

References

Çoruh, S. & J. Kolarov, 2013. New data on Turkish Acaenitinae (Hymenoptera: Ichneumonidae) with description of a new species. Zoology in the Middle East: 59 (3): 261-265.

Çoruh S. & H. Özbek, 2013. New and little known some Ichneumonidae species (Hymenoptera) from Turkey. Munis Entomology & Zoology, 8(1): 135-139.

Çoruh, S, M.F. Gürbüz, J. Kolarov, M. Yurtcan & A. Özdan, 2013. New and little known species of Ichneumonidae (Hymenoptera) for the Turkish fauna. Journal of the EntomologicalResearch Society, 15: 71–83.

Çoruh, S., J. Kolarov & I. Çoruh, 2014a. *Probles microcephalus* (Gravenhorst, 1829) a new record for the Turkish fauna (Hymenoptera: Ichneumonidae: Tersilochinae). Munis Entomology & Zoology, 9 (1): 451-456.

Çoruh, S., J. Kolarov & H. Özbek, 2014b. The fauna of Ichneumonidae (Hymenoptera) of eastern Turkey with zoogeographical remarks and host data. Journal of Insect Biodiversity, 2(16): 1-21.

Davis, P.H., 1965-1988. Flora of Turkey and the East Aegean Island. At the University Press, Edinburg, 10pp.

Gauld, I.D., 1997. The Ichneumonidae of Costa Rica, 2. Memoirs of the American Entomological Institute, 57, 485 pp.

Grissell, E.E., 1999. Hymenoptera biodiversity: some alien notions. American Entomology, 45: 235-244.

Gupta V.K., 1991. The parasitic Hymenoptera and biological control and our knowledge of the African Ichneumonidae. Insect Science and its Application, 12: 9-18.

Kolarov, J., E. Yıldırım, S. Çoruh & M. Yüksel, 2014a. Contribution to the knowledge of the Ichneumonidae (Hymenoptera) fauna of Turkey. Zoology in the Middle East, 60 (2): 154-161.

Kolarov, J., I. Çoruh & S. Çoruh, 2014b. Ichneumonidae (Hymenoptera) from Anatolia. I. Linzer Biologische Beiträge, 46 (2), (in press).

Okyar, Z., M. Yurtcan, A. Beyarslan & N. Aktaç, 2012. The parasitoid complex of White-spotted pinion Cosmia diffinis (Linnaeus, 1767) (Lepidoptera:Noctuidae) on *Ulmus minor* Miller (Ulmaceae) in Edirne province (European Turkey), Journal of The Kansas Entomological Society, 85(2): 91-96.

Özgen, I., M. Yurtcan, H. Bolu & J. Kolarov, 2010. *Listrognathus mactator* (Thunberg 1824) (Hymenoptera: Ichneumonidae) a new record parasitoid of *Cimbex quadrimaculatus* (O.F. Müller, 1766) (Hymenoptera: Cimbicidae), Entomological News: 391-392.

Pemberton, R.W. & E.M. Hoover, 1980. Insects Associated With Wild Plants in Europe and the Middle East. Biological Control of Weeds Surveys, U.S. Department of Agriculture Miscellaneous Publication No. 1382.

Petanidou, T. & E. Lamborn, E. 2005. A land for flowers and bees: studying pollination ecology in Mediterranean communities. Plant Biosystems, 139: 279-294.

Riedel, M., J. Kolarov, S. Çoruh & H. Özbek, 2014. A contribution to the Mesochorinae (Hymenoptera, Ichneumonidae) of Turkey. Zoology in the Middle East, http://dx.doi.org/10.1080/09397140.2014.939815

Shaw M.R. & M.E. Hochberg, 2001. The neglect of parasitic hymenoptera in insect conservation strategies: The British fauna as a prime example. Journal Insect Conservation 5, 253-263.

Stevens N.B, C.J., Stephens, M. Iqbal, J.T. Jennings, J. LaSalle & A.D. Austin, 2007. What Wasp is that? An Interactive Identification Guide to the Australasian Families of Hymenoptera. ABRS Identification Series, Australian Biological Resources Study/Centre for Biological Information Technology (CBIT). CD-ROM.

Taglianti, A.V., P.A. Audisio, M. Biondi, M.A. Bologna, G.M. Carpaneto, A. de Biase, S. Fattorini, E. Piattella, R. Sindaco, A. Vrnchi & M. Zapparoli, 1999. A proposal for a chorotype classification of the Near East fauna, in the framework of the Western Palearctic region. Biogeographia, XX: 31-59.

Townes, H. (1969): The genera of Ichneumonidae, Part 1. Memoirs of the American Entomological Institute, 11: 300 pp.

Yu, D.S., K. van Achterberg, & K. Horstmann, 2012. Taxapad 2012. Ichneumonoidae 2011. Database on flash drive. www.taxapad.com, Ottawa, Ontario.