

Original article (Orijinal araştırma)

A study of Ichneumonidae (Hymenoptera) from northeastern Anatolia II, with new records

Kuzeydoğu Anadolu'dan Ichneumonidlerle ilgili bir çalışma ve yeni kayıtlar

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Summary

In total, forty five taxa belonging to Brachycyrtinae, Campopleginae, Cryptinae and Ichneumoninae subfamilies (Ichneumonidae: Hymenoptera) have been reported to occur in northeastern Anatolia. A study was conducted in July 2015 in this area and 20 ichneumonid taxa were recorded for the first time for the Turkish fauna. These species are: *Campoletis excavata* (Smits van Burgst, 1914), *Olesicampe fulviventris* (Gmelin, 1790), *Olesicampe proterva* (Brischke, 1880), *O. sternella* (Thomson, 1887), *Bathythrix collaris* (Thomson, 1896), *B. fragilis* (Gravenhorst, 1829), *Nematopodius formosus* Gravenhorst, 1829, *Rhembobius perscrutator* (Thunberg, 1822), *Thaumtogelis femoralis* (Brischke, 1881), *Apaeleticus inimicus* (Gravenhorst, 1820), *Dirophanes fulvitaris* (Wesmael, 1845), *Heterischnus excavatus* (Constantineanu, 1959), *Ichneumon deliratorius* (Linnaeus, 1758), *Nematomicrus tenellus* Wesmael, 1845, *Oronotus binotatus* (Gravenhorst, 1829), *Phaeogenes curator* (Thunberg, 1822), *P. heterogonus* Holmgren, 1890, *P. semivulpinus* (Gravenhorst, 1829), *Stenodontus biguttatus* (Gravenhorst, 1829) and *Tycherus impiger* (Wesmael, 1845). For each species discussed, new locations are added and zoogeographical characterization is given.

Key words: Fauna, Ichneumonidae, Northeastern Anatolia, zoogeographical characterization

Özet

Kuzeydoğu Anadolu'dan Brachycyrtinae, Campopleginae, Cryptinae ve Ichneumoninae (Hymenoptera: Ichneumonidae) altfamilyalarına ait 45 tür belirlenmiştir. Çalışma, 2015 yılı Temmuz ayında yapılmıştır. 20 ichneumonid türü Türkiye faunası için ilk kez kaydedilmiştir. Bu türler: *Campoletis excavata* (Smits van Burgst, 1914), *Olesicampe fulviventris* (Gmelin, 1790), *O. proterva* (Brischke, 1880), *O. sternella* (Thomson, 1887), *Bathythrix collaris* (Thomson, 1896), *B. fragilis* (Gravenhorst, 1829), *Nematopodius formosus* Gravenhorst, 1829, *Rhembobius perscrutator* (Thunberg, 1822), *Thaumtogelis femoralis* (Brischke, 1881), *Apaeleticus inimicus* (Gravenhorst, 1820), *Dirophanes fulvitaris* (Wesmael, 1845), *Heterischnus excavatus* (Constantineanu, 1959), *Ichneumon deliratorius* (Linnaeus, 1758), *Nematomicrus tenellus* Wesmael, 1845, *Oronotus binotatus* (Gravenhorst, 1829), *Phaeogenes curator* (Thunberg, 1822), *P. heterogonus* Holmgren, 1890, *P. semivulpinus* (Gravenhorst, 1829), *Stenodontus biguttatus* (Gravenhorst, 1829) ve *Tycherus impiger* (Wesmael, 1845)'dir. Bilinen türler için yeni lokaliteler eklenirken, her bir tür için de zoocoğrafik notlar verilmiştir.

Anahtar sözcükler: Fauna, Ichneumonidae, Kuzeydoğu Anadolu, zoocoğrafik notlar

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Received (Alınış): 22.04.2016 Accepted (Kabul ediliş): 02.07.2016 Published Online (Çevrimiçi Yayın Tarihi): 02.08.2016

Introduction

Ichneumonidae is the largest family within the order Hymenoptera and may be among the largest insect families on earth (Gauld, 1991). It consists of at least 24.268 described species (Yu et al., 2012). The overall distribution of Ichneumonidae is as follows: Afrotropical: 4.611; Australasian: 2.349; Eastern Palaearctic: 9.255; Europe: 10.469; Nearctic: 7.707; Neotropical: 7.413; Oceanic: 816; Oriental: 7.942; Western Palaearctic: 11.275 species (Yu et al., 2012). The established number of species from Turkey is approximately 1.200 species. Most species occurring in the tropical countries are unknown.

The ichneumonids are widely used for biological control programs against insect pests all over the world (Narendran, 1998). Therefore this family is of a great importance.

Faunistic research on the family Ichneumonidae in Turkey started in the 19th century. In the catalogue of Kolarov (1995), 383 ichneumonid species are listed. There has been a remarkable intensity of studies on this family over the last three years (Çoruh & Kolarov, 2013; Çoruh & Özbek, 2013; Çoruh et al., 2013; Çoruh et al., 2014a, 2014b, 2014c; Kolarov et al., 2014a, 2014b, Özdan, 2014; Riedel et al., 2014; Yaman, 2014; Kolarov et al., 2015; Yurtcan & Kolarov, 2015; Kolarov et al., 2016) and consequently the number of Ichneumonidae species in Turkey increased to 1181. With the 20 new records reported in this paper, the number is now 1201.

The Turkey ichneumonid fauna is rich and diverse, but very few areas have been intensively and extensively explored. Faunistic work has continued in northeastern Anatolia (Rize, Giresun, Ordu, Trabzon, Erzurum, Erzincan, Gümüşhane) for 3 years (Kolarov et al., 2014a, 2014b, Çoruh et al., 2014a, 2014b; Kolarov et al., 2015; Kolarov et al., 2016). The aim of the study is to investigate the ichneumonid biodiversity northeastern Anatolia.

Material and methods

Sampling and collection method

Insects were collected in two different regions, the East Black Sea Region (Rize, Giresun, Ordu, Trabzon) and the Eastern Anatolia Region (Erzurum, Erzincan, Gümüşhane) (Figure 1) during July 2015. The samples were collected by sweep net on different flowering plants by the first two authors. The nomenclature and general distribution follows Yu et al. (2012). Faunistic data are listed in the following order: country, locality, coordinates, date of collection, altitude, and number and sex of the specimens. The specimens are currently deposited in the Collection of University of Plovdiv (Bulgaria). The identification of the material was made by the second author.

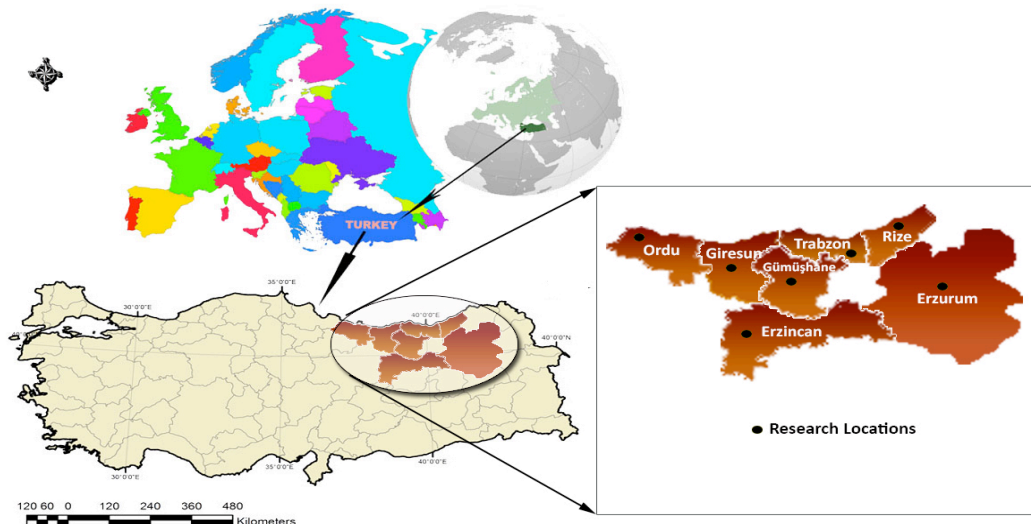


Figure 1. Map of study areas.

The plant species visited by Ichneumonid species were collected by hand, pressed and deposited in Herbarium of Plant Protection Department (Erzurum). Plant specimens were identified according to Davis (1965-1988) and Herbarium of Atatürk University, Faculty of Agriculture, Department of Plant Protection by third author.

Study area

Habitat and vegetation data for each location for collected insects are given below.

Kandilli (Erzurum):

Habitat data: roadside, meadow area near water channel, dominant plant *Medicago sativa*.

Vegetation: *Anchusa leptophylla*, *Astrodaucus orientalis*, *Bromus japonicus*, *Bupleurum rotundifolium*, *Carum carvi*, *Centaurea pseudoscabiosa*, *Cirsium arvense*, *C. echinus*, *Convolvulus arvensis*, *Cynodon dactylon*, *Dactylis glomerata*, *Eryngium billardieri*, *Festuca ovina*, *Galium verum*, *Hypericum elongatum*, *Inula oculus-christi*, *Isatis* sp., *Melampyrum arvense*, *Melilotus officinalis*, *Mentha longifolia*, *Lactuca serriola*, *Leontodon crispus*, *Linaria kurdica*, *Phlomis pungens*, *Poa bulbosa*, *Rhinanthus angustifolius*, *Rumex crispus*, *Sonchus arvensis*, *Teucrium orientale*, *Turgenia latifolia*, *Verbascum speciosum*, *Vicia cracca*, *Xeranthemum annuum*.

Gelinkaya (Erzurum):

Habitat data: roadside, dominant plants *Salix triandra*, *Populus tremula* and *Medicago sativa*.

Vegetation: *Achillea millefolium*, *Astragalus lineatus*, *Bromus arvensis*, *Campanula stevenii*, *Cephalaria procera*, *Cichorium intybus*, *Cirsium arvense*, *Coronilla varia*, *Dactylis glomerata*, *Eryngium giganteum*, *Euphorbia virgata*, *Filipendula vulgaris*, *Galium verum*, *Geranium tuberosum*, *Heracleum pastinacifolium*, *Lactuca serriola*, *Lapsana communis*, *Lathyrus pratensis*, *Lolium perenne*, *Lotus corniculatus*, *Medicago sativa*, *Phleum pratense*, *Phragmites australis*, *Populus tremula*, *Rhinanthus angustifolius*, *Rumex crispus*, *Salix triandra*, *Senecio vulgaris*, *Seseli libanotis*, *Tragopogon dubius*, *Trifolium pratense*, *Vicia cracca*.

Tepebaşı Valley (Aşkale, Erzurum):

Habitat data: roadside, dry land, pasture, dominant plant *Quercus petraea*.

Vegetation: *Acantholimon caryophyllaceum*, *Allium rotundum*, *Anthemis tinctoria*, *Astragalus lagurus*, *A. microcephalus*, *Bupleurum rotundifolium*, *Carum carvi*, *Cephalaria procera*, *Cirsium arvense*, *Coronilla varia*, *Crataegus orientalis*, *Crepis armena*, *Dactylis glomerata*, *Daucus carota*, *Delphinium cyphoplectrum*, *Eryngium billardieri*, *Euphorbia stricta*, *Festuca ovina*, *Globularia trichosanthes*, *Hypericum elongatum*, *Melampyrum arvense*, *Melilotus officinalis*, *Muscari comosum*, *Onobrychis altissima*, *Phlomis pungens*, *Potentilla argentea*, *Quercus petraea*, *Salvia candidissima*, *Sanguisorba minor*, *Scabiosa argentea*, *Seseli libanotis*, *Silene vulgaris*, *Stipa pulcherrima*, *Trifolium montanum*, *Verbascum cheiranthifolium*, *Xeranthemum annuum*.

Ahmetli (Erzincan):

Habitat data: roadside, semi-wet mown pasture.

Vegetation: *Achillea millefolium*, *Alchemilla caucasica*, *Cardaria draba*, *Carduus nutans*, *Carex panicea*, *Cephalaria procera*, *Cerinthe minor*, *Cichorium intybus*, *Cirsium arvense*, *Convolvulus arvensis*, *Crepis armena*, *Dactylis glomerata*, *Equisetum ramosissimum*, *Euphorbia petrophila*, *Festuca ovina*, *Galium verum*, *Grammosciadium daucoides*, *Hypericum elongatum*, *Marrubium parviflorum*, *Mentha longifolia*, *Ononis spinosa*, *Papaver dubium*, *Phleum pratense*, *Plantago atrata*, *Poa bulbosa*, *P. nemoralis*, *Rhinanthus angustifolius*, *Rumex acetosella*, *Sanguisorba minor*, *Senecio paucilobus*, *S. vernalis*, *Silene vulgaris*, *Tanacetum balsamita*, *Taraxacum crepidiforme*, *Verbascum oreophilum*.

Avcılar (Erzincan):

Habitat data: hillside, dominant plant *Medicago sativa*.

Vegetation: *Achillea biebersteinii*, *Asperula orientalis*, *Centaurea solstitialis*, *Cerinth minor*, *Cichorium intybus*, *Daucus carota*, *Digitaria sanguinalis*, *Echium italicum*, *Eryngium billardieri*, *E. campestre*, *Euphorbia stricta*, *Lactuca serriola*, *Medicago sativa*, *Melilotus alba*, *Poa bulbosa*, *Sanguisorba minor*, *Scabiosa argentea*, *Silene vulgaris*, *Xeranthemum annuum*.

Pöske Mountain (Erzincan):

Habitat data: roadside, oak area (red soil).

Vegetation: *Allium armenum*, *Anchusa leptophylla*, *Artemisia austriaca*, *Bromus japonicus*, *Bupleurum falcatum*, *Centaurea virgata*, *Chondrilla juncea*, *Cichorium intybus*, *Crepis armena*, *Cynanchum acutum*, *Echinops galaticus*, *Euphorbia petrophila*, *E. virgata*, *Festuca callieri*, *F. ovina*, *Galium verum*, *Gladiolus atrovioleaceus*, *Helichrysum arenarium*, *Hypericum elongatum*, *Isatis sp.*, *Koeleria cristata*, *Potentilla argentea*, *Salix pentandra*, *Salvia candidissima*, *S. sclarea*, *Sanguisorba minor*, *Scabiosa caucasica*, *Verbascum cheiranthifolium*, *V. oreophilum*, *Xeranthemum annuum*.

Kekiktepe (Eynesil, Giresun):

Habitat data: seaside, hazelnut garden on highest peak.

Vegetation: *Agrimonia eupatoria*, *Amaranthus retroflexus*, *Calystegia sepium*, *Chenopodium album*, *Cichorium intybus*, *Commelina communis*, *Conyza canadensis*, *Corylus avellana*, *Daucus carota*, *Epilobium angustifolium*, *Hypericum perforatum*, *Leontodon hispidus*, *Paspalum dilatatum*, *Plantago lanceolata*, *P. major*, *Poa longifolia*, *Prunella vulgaris*, *Pteridium aquilinum*, *Rorippa sylvestris*, *Rubus discolor*, *Solanum nigrum*, *Sonchus oleraceus*, *Trifolium pratense*, *Urtica dioica*, *Vicia cracca*.

Yolağzı (Keşap, Giresun):

Habitat data: roadside, half shade, semi-wet, hazelnut garden.

Vegetation: *Arctium minus*, *Artemisia vulgaris*, *Conyza canadensis*, *Corylus avellana*, *Epilobium angustifolium*, *Erigeron acer*, *Euphorbia peplus*, *Holcus lanatus*, *Hypericum perforatum*, *Lactuca serriola*, *Lapsana communis*, *Nasturtium officinale*, *Plantago major*, *Polygonum persicaria*, *Pteridium aquilinum*, *Rubus hirtus*, *Rumex acetosella*, *Senecio nemorensis*, *Sorghum halepense*, *Stachys sylvatica*, *Telekia speciosa*, *Vicia cracca*.

Köycük (Kelkit, Gümüşhane):

Habitat data: roadside, garden areas.

Vegetation: *Allium atrovioleaceum*, *Bupleurum rotundifolium*, *Cardaria draba*, *Centaurea solstitialis*, *Chenopodium vulvaria*, *Cirsium arvense*, *C. echinus*, *Convolvulus arvensis*, *C. galaticus*, *Coronilla varia*, *Dactylis glomerata*, *Daucus carota*, *Descurainia sophia*, *Echinops pungens*, *Echium vulgare*, *Eryngium billardieri*, *Euphorbia stricta*, *Falcaria vulgaris*, *Hypericum elongatum*, *Isatis sp.*, *Lactuca serriola*, *Lapsana communis*, *Onopordum acanthium*, *Papaver tauricola*, *Plantago lanceolata*, *Salvia verticillata*, *Verbascum cheiranthifolium*, *Xanthium strumarium*, *Xeranthemum annuum*.

Çamlık (İkizdere, Rize):

Habitat data: mown and unmown pasture, dominant plant *Ulmus glabra*.

Vegetation: *Alchemilla sintenisii*, *Arctium minus*, *Campanula rapunculoides*, *Digitalis ferruginea*, *Geranium pyrenaicum*, *G. sanguineum*, *Lapsana communis*, *Leontodon hispidus*, *Mentha longifolia*, *Origanum vulgare*, *Pilosella hoppeana*, *Plantago lanceolata*, *P. major*, *Poa pratensis*, *Prunella vulgaris*, *Pteridium aquilinum*, *Ranunculus kotschyi*, *Rhinanthus angustifolius*, *Salvia verticillata*, *Sonchus oleraceus*, *Taraxacum crepidiforme*, *Trifolium pratense*, *T. repens*, *Ulmus glabra*, *Urtica dioica*.

Turnasuyu (Ordu):

Habitat data: roadside, mown pasture, shade, hazelnut garden.

Vegetation: *Agrimonia eupatoria*, *Alyssum repens*, *Anthemis tinctoria*, *Artemisia vulgaris*, *Cerastium glomeratum*, *Cichorium intybus*, *Conyza canadensis*, *Corylus avellana*, *Crepis vesicaria*, *Epilobium angustifolium*, *Euphorbia stricta*, *Geranium asphodeloides*, *Holcus lanatus*, *Hypericum perforatum*, *Juncus acutus*, *Lolium perenne*, *Plantago major*, *Poa pratense*, *Polygonum persicaria*, *Prunella vulgaris*, *Rorippa sylvestris*, *Sambucus ebulus*, *Senecio vulgaris*, *Trifolium pratense*, *Urtica dioica*, *Xanthium strumarium*.

Yomra (Trabzon):

Habitat data: roadside, 20 m above the road, shade, hazelnut garden with cut herbs.

Vegetation: *Agrimonia eupatoria*, *Calystegia sepium*, *Corylus avellana*, *Erigeron acer*, *Holcus lanatus*, *Medicago lupulina*, *Paspalum dilatatum*, *Poa pratensis*, *Pteridium aquilinum*, *Rubus discolor*, *Tanacetum macrophyllum*, *Trifolium pratense*, *Trifolium repens*, *Vicia cracca*.

Results

In the present paper 45 species from the subfamilies Brachycyrtinae, Campopleginae, Cryptinae and Ichneumoninae are listed. Of these, 20 species (marked in the text by an asterisk) are new records for Turkish fauna.

Subfamily Brachycyrtinae Viereck, 1919

Brachycyrtus Kriechbaumer, 1880

Brachycyrtus ornatus Kriechbaumer, 1880

Material examined: Erzurum: Gelinkaya (40° 01.741' N, 40° 54.855' E), 1803 m, 26.VII.2015, 1 ♀.

Distribution in Turkey: Karabük (Kolarov & Yurtcan, 2002).

Distribution in World: Holarctic and Neotropical region.

Associated plants: *Picea* sp., *Pinus virginiana*.

Remark: this species was collected on *Medicago sativa* while feeding.

Subfamily Campopleginae Förster, 1869

Alcima Förster, 1869

Alcima orbitale (Gravenhorst, 1829)

Material examined: Erzurum: Aşkale, Tepebaşı Valley (39° 51.741' N, 40° 37.454' E) (Figure 2), 2009 m, 23.VII.2015, 1 ♀.

Distribution in Turkey: Erzurum and Tunceli (Çoruh et al., 2014c; Kolarov et al., 2014c).

Distribution in World: Palaearctic region.

Associated plants: *Angelica sylvestris*, *Heracleum sphondylium*, *Peucedanum oreoselinum*.

Campoletis Förster 1869

Campoletis crassicornis (Tschek, 1871)

Material examined: Giresun: Eynesil, Kekiktepe (41° 02.723' N, 39° 05.641' E), 4 m, 25.VII.2015, 4 ♂♂, 2 ♀♀.

Distribution in Turkey: Adana and Burdur (Kolarov & Beyarslan, 1995; Çoruh et al., 2013).

Distribution in World: Iceland, Europe, Azerbaijan and Turkey.

Associated plants: *Peucedanum oreoselinum*.

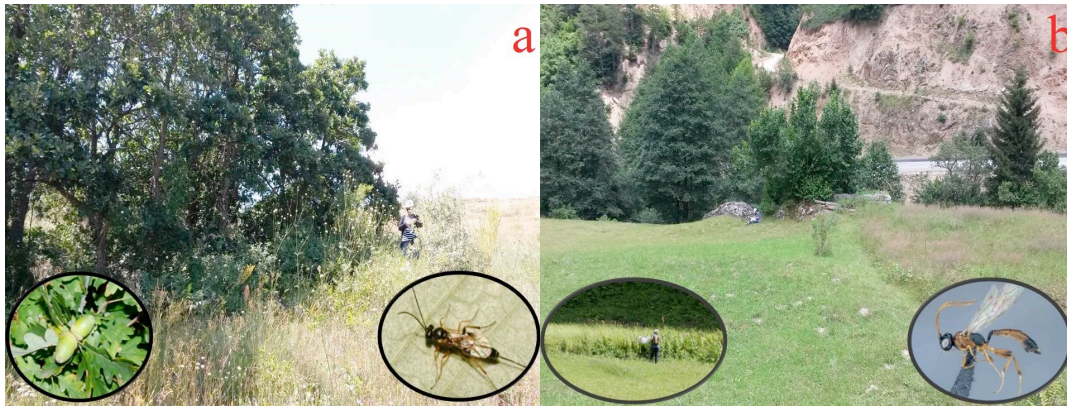


Figure 2. Same localities collect insects (a: Tepebaşı Valley; b:Çamlık).

**Campoletis excavata* (Smits van Burgst, 1914)

Material examined: Erzurum: Gelinkaya (40° 01.741' N, 40° 54.855' E), 1803 m, 26.VII.2015, 6 ♂♂.

Distribution in World: Europe and Azerbaijan.

Remark: this species was collected on *Medicago sativa* while feeding.

Campoletis latrator (Gravenhorst, 1829)

Material examined: Erzurum: Aşkale, Tepebaşı Valley (39° 51.741' N, 40° 37.454' E), 2009 m, 23.VII.2015, 4 ♀♀, 2 ♂♂, Gelinkaya (40° 01.741' N, 40° 54.855' E) 1803 m, 26.VII.2015, 8 ♀♀, 2 ♂♂; Giresun: Keşap, Yolağzı (40° 55.998' N, 38° 34.578' E), 1 m, 25.VII.2015, 1 ♂; Gümüşhane: Kelkit, Köycük (40° 08.584' N, 39° 25.354' E) 1393 m, 23.VII.2015, 1 ♂.

Distribution in Turkey: Adana, Edirne, Elazığ, Erzurum, Gaziantep, Isparta, Rize and Tunceli (Kolarov & Beyarslan, 1995; Çoruh et al., 2013; Kolarov et al., 2014c; Kolarov et al., 2016).

Distribution in World: Europe and Turkey.

Remark: this species was collected on *Medicago sativa* while feeding in Gelinkaya.

Casinaria Holmgren, 1859

Casinaria tenuiventris (Gravenhorst, 1829)

Material examined: Giresun: Eynesil, Kekiktepe (41° 02.723' N, 39° 05.641' E) 4 m, 25.VII.2015, 2 ♀♀.

Distribution in Turkey: Anatolia (Kolarov, 1995; Kolarov, 2008).

Distribution in World: Europe, Azerbaijan, Turkey, Israel, Egypt, Iran, Turkmenistan and China (Heilongjiang, Jilin and Liaoning).

Associated plants: *Chaerophyllum aromaticum*, *Daucus carota*, *Heracleum sphondylium*, *Peucedanum oreoselinum*, *Rubus fruticosus*.

Chromoplex Horstmann 1987

Chromoplex picticollis (Thomson, 1887)

Material examined: Gümüşhane: Kelkit, Köycük (40° 08.584' N, 39° 25.354' E), 1393 m, 23.VII.2015, 2 ♀♀.

Distribution in Turkey: Çanakkale, Trabzon, Isparta, İzmir, Muğla and Hatay (Kolarov et al., 1997; Özbek et al., 2000; Kolarov et al., 2002; Gürbüz, 2005; Çoruh et al., 2013).

Distribution in World: Europe, Turkey, Israel and Egypt.

Diadegma Förster, 1869

Diadegma mediterraneum (Constantineanu, 1930)

Material examined: Erzincan: Avcılar (39° 36.899' N, 39° 49.328' E), 1221 m, 23.VII.2015, 1 ♀.

Distribution in Turkey: Erzurum (Çoruh et al., 2005).

Distribution in World: Europe, Turkey and Jordan.

Remark: this species was collected on *Medicago sativa* while feeding.

Dusona Cameron, 1901

Dusona leptogaster (Holmgren, 1860)

Material examined: Rize: İkizdere, Çamlık (40° 42.979' N, 40° 37.017' E), 1099 m, 26.VII.2015, 1 ♂.

Distribution in Turkey: Anatolia (Horstmann, 2011).

Distribution in World: Palaeartic region.

Meloboris Holmgren, 1859

Meloboris collector (Thunberg, 1822)

Material examined: Gümüşhane: Kelkit, Köycük (40° 08.584' N, 39° 25.354' E) 1393 m, 23.VII.2015, 1 ♀; Rize: İkizdere, Çamlık (40° 42.979' N, 40° 37.017' E), 1099 m, 26.VII.2015, 1 ♀.

Distribution in Turkey: Adana, Ankara, Erzurum, Gaziantep, Hatay, Isparta and Trabzon (Kolarov, 1995; Kolarov & Beyarslan, 1995; Kolarov et al., 2014c; Kolarov et al., 2016).

Distribution in World: Iceland, Azores, Canary and Madeira islands, Europe, Azerbaijan, Turkey, Israel, Afghanistan, China (Qinghai) and South Africa.

Associated plants: *Angelica sylvestris*, *Peucedanum oreoselinum*, *Picea abies*.

Olesicampe Förster, 1869

**Olesicampe fulviventris* (Gmelin, 1790)

Material examined: Erzurum: Aşkale, Tepebaşı Valley (39° 51.741' N, 40° 37.454' E), 2009 m, 23.VII.2015, 1 ♂.

Distribution in World: Europe.

**Olesicampe proterva* (Brischke, 1880)

Material examined: Ordu: Turnasuyu (40° 58.572' N, 37° 58.577' E) 1 m, 24.VII.2015, 1 ♀.

Distribution in World: Europe.

**Olesicampe sternella* (Thomson, 1887)

Material examined: Erzurum: Aşkale, Tepebaşı Valley (39° 51.741' N, 40° 37.454' E), 2009 m, 23.VII.2015, 1 ♀.

Distribution in World: Europe.

Subfamily Cryptinae Kirby, 1837

Bathythrix Förster, 1869

**Bathythrix collaris* (Thomson, 1896)

Material examined: Rize: İkizdere, Çamlık (40° 42.979' N, 40° 37.017' E), 1099 m, 26.VII.2015, 4 ♂♂.

Distribution in World: Europe.

**Bathythrix fragilis* (Gravenhorst, 1829)

Material examined: Ordu: Turnasuyu (40° 58.572' N, 37° 58.577' E) 1 m, 24.VII.2015, 1 ♀.

Distribution in World: Europe and Azerbaijan.

Buathra Cameron, 1903

Buathra laborator (Thunberg, 1822)

Material examined: Erzurum: Gelinkaya (40° 01.741' N, 40° 54.855' E), 1803 m, 26.VII.2015, 1 ♀, 1 ♂.

Distribution in Turkey: Burdur, Erzurum, Isparta and Trabzon (Gürbüz & Kolarov, 2008; Çoruh & Çoruh, 2012; Çoruh et al., 2014a; Kolarov et al., 2016; Çoruh & Çalmaşur, 2016).

Distribution in World: Holarctic region.

Associated plants: *Peucedanum oreoselinum*.

Remark: this species was collected on *Medicago sativa* while feeding.

Cryptus Fabricius, 1804

Cryptus viduatorius Fabricius, 1804

Material examined: Erzurum: Gelinkaya (40° 01.741' N, 40° 54.855' E), 1803 m, 26.VII.2015, 22 ♂♂.

Distribution in Turkey: Erzurum, Kırklareli, İçel, Isparta, Istanbul and Rize (Beyarslan & Kolarov, 1994; Kolarov, 1995; Çoruh & Çoruh, 2008; Çoruh et al., 2014a; Çoruh et al., 2014c; Özdan, 2014; Kolarov et al., 2016).

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

Associated plants: *Anethum graveolens*, *Angelica sylvestris*, *Daucus carota*, *Daucus carota* subsp. *sativus*, *Euphorbia* sp., *Euphorbia nicaeensis*, *E. virgata*, *Ferula communis*, *Heracleum sphondylium*, *Medicago sativa*, *Peucedanum oreoselinum*.

Remark: this species was collected on *Medicago sativa* while feeding.

Dichrogaster Doumerc, 1855

Dichrogaster longicaudata (Thomson, 1884)

Material examined: Erzurum: Kandilli, 6 km from Aşkale (39° 57' N, 40° 52' E), 1904 m, 22.VII.2015, 1 ♂.

Distribution in Turkey: Eskişehir and Isparta (Kolarov & Gürbüz, 2007; Kırtay, 2008; Eroğlu et al., 2011).

Distribution in World: Western Palaearctic and Nearctic region.

Associated plants: *Bauhinia* sp., *Oryza sativa*.

Remark: this species was collected on *Medicago sativa* while feeding.

Encrateola Strand, 1917

Encrateola laevigata (Ratzeburg, 1848)

Material examined. Erzurum: Gelinkaya (40° 01.741' N, 40° 54.855' E), 1803 m, 26.VII.2015, 1 ♀.

Distribution in Turkey: Anatolia, Adana, Giresun and Hatay (Beyarslan & Kolarov, 1994; Kolarov, 2008; Çoruh et al., 2014a).

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

Associated plants: *Angelica sylvestris*, *Cornus* sp., *Foeniculum vulgare*, *Prunus domestica*, *Vaccinium uliginosum*.

Remark: this species was collected on *Medicago sativa* while feeding.

Gelis Thunberg, 1827

Gelis agilis (Fabricius, 1775)

Material examined: Erzincan: Ahmetli (39° 53.481' N, 39° 21.197' E), 1988 m, 23.VII.2015, 1 ♂; Giresun: Eynesil, Kekiktepe (41° 02.723' N, 39° 05.641' E) 4 m, 25.VII.2015, 1 ♂.

Distribution in Turkey: Anatolia and Trabzon (Kolarov, 2008; Kolarov et al., 2016).

Distribution in World: Iceland, Europe, Azerbaijan and Turkey.

Associated plants: *Lonicera* sp., *Mentha longifolia*, *Picea abies*, *Prunus* sp., *Quercus robur*, *Salix* sp.

Ischnus Gravenhorst, 1829

Ischnus agitator (Olivier, 1792)

Material examined: Erzurum: Gelinkaya (40° 01.741' N, 40° 54.855' E), 1803 m, 26.VII.2015, 1 ♂.

Distribution in Turkey: Isparta (Gürbüz & Kolarov, 2008).

Distribution in World: Tunisia, Europe, Azerbaijan, Turkey and Iran.

Associated plants: *Daphne gnidium*, *Juniperus* sp., *Quercus ilex*.

Remark: this species was collected on *Medicago sativa* while feeding.

Myrmeleonostenus Uchida, 1936

Myrmeleonostenus italicus (Gravenhorst, 1829)

Material examined: Erzincan: Avcılar (39° 36.899' N, 39° 49.328' E), 1221 m, 23.VII.2015, 1 ♂.

Distribution in Turkey: Antalya, Isparta, Kırklareli, Tunceli and Zonguldak (Beyarslan & Kolarov, 1994; Kolarov, 1995; Gürbüz & Kolarov, 2008; Gürbüz et al., 2009a,b; Çoruh et al., 2014c; Kolarov et al., 2014c).

Distribution in World: Algeria, Tunisia, Europe, Azerbaijan, Turkey, Iran and Tajikistan.

Associated plants: *Fraxinus* sp.

Remark: this species was collected on *Medicago sativa* while feeding.

Nematopodius Gravenhorst, 1829

**Nematopodius formosus* Gravenhorst, 1829

Material examined: Rize: İkizdere, Çamlık (40° 42.979' N, 40° 37.017' E), 1099 m, 26.VII.2015, 1 ♀.

Distribution in World: Europe and Georgia.

Associated plants: *Alnus glutinosa*, *Picea* sp., *Pteridium aquilinum*.

Rhembobius Förster, 1869

**Rhembobius perscrutator* (Thunberg, 1822)

Material examined: Erzurum: Aşkale, Tepebaşı Valley (39° 51.741' N, 40° 37.454' E), 2019 m, 23.VII.2015, 1 ♀.

Distribution in World: Palaearctic region.

Associated plants: *Armoracia rusticana*, *Carpinus betulus*.

Thaumatogelis Schwarz, 1995

**Thaumatogelis femoralis* (Brischke, 1881)

Material examined: Erzurum: Gelinkaya (40° 01.741' N, 40° 54.855' E), 1803 m, 26.VII.2015, 1 ♂; Erzincan: Ahmetli (39° 53.481' N, 39° 21.197' E), 1988 m, 23.VII.2015, 1 ♂.

Distribution in World: Europe.

Remark: in Gelinkaya this species was collected on *Medicago sativa* while feeding.

Trychosis legator (Thunberg, 1822)

Material examined: Gümüşhane: Kelkit, Köycük (40° 08.584' N, 39° 25.354' E), 1393 m, 23.VII.2015, 1 ♂; Rize: İkizdere, Çamlık (40° 42.979' N, 40° 37.017' E) 1099 m, 26.VII.2015, 2 ♂♂.

Distribution in Turkey: Adana, Burdur, Edirne, Erzurum, Gaziantep, Isparta, Kırklareli, Tekirdağ, and Tunceli (Beyarslan & Kolarov, 1994; Gürbüz & Kolarov, 2008; Kolarov et al., 2014c).

Distribution in World: Palaearctic region.

Subfamily: Ichneumoninae Latreille, 1802

Aethecerus Wesmael, 1844

Aethecerus nitidus Wesmael, 1845

Material examined: Erzurum: Gelinkaya (40° 01.741' N, 40° 54.855' E), 1803 m, 26.VII.2015, 1 ♀.

Distribution in Turkey: Anatolia (Kolarov, 1995).

Distribution in World: Europe, Turkey, Iran and Siberia.

Associated plants: *Anethum graveolens*, *Daucus carota* subsp. *sativus*, *Listera ovata*.

Remark: this species was collected on *Medicago sativa* while feeding.

Apaeleticus Wesmael, 1844

**Apaeleticus inimicus* (Gravenhorst, 1820)

Material examined: Erzurum: Gelinkaya (40° 01.741' N, 40° 54.855' E), 1803 m, 26.VII.2015, 1 ♀.

Distribution in World: Madeira islands and Europe.

Associated plants: *Angelica sylvestris*, *Chaerophyllum aromaticum*, *Daucus carota*, *Heracleum sphondylium*, *Medicago sativa*, *Peucedanum oreoselinum*, *Quercus ilex* subsp. *rotundifolia*.

Remark: this species was collected on *Medicago sativa* while feeding.

Centeterus Wesmael, 1844

Centeterus nigricornis Thomson, 1891

Material examined: Erzurum: Gelinkaya (40° 01.741' N, 40° 54.855' E), 1803 m, 26.VII.2015, 1 ♀, 1 ♂.

Distribution in Turkey: Nevşehir (Özdemir, 1996).

Distribution in World: Europe and Turkey.

Associated plants: *Angelica sylvestris*, *Rubus fruticosus*.

Remark: this species was collected on *Medicago sativa* while feeding.

Colpognathus Wesmael, 1844

Colpognathus celerator (Gravenhorst, 1807)

Material examined: Erzurum: Gelinkaya (40° 01.741' N, 40° 54.855' E), 1803 m, 26.VII.2015, 1 ♀; Giresun: Keşap, Yolağzı (40° 55.998' N, 38° 34.578' E), 1 m, 25.VII.2015, 1 ♀.

Distribution in Turkey: Giresun, Ordu and Trabzon (Kolarov et al., 2014b).

Distribution in World: Palaeartic region.

Associated plants: *Anthriscus sylvestris*, *Chaerophyllum aromaticum*, *Cornus mas*, *Corylus avellana*, *Daucus carota*, *Ferulago sylvatica*, *Fraxinus excelsior*, *Heracleum sphondylium*, *Oryza sativa*, *Peucedanum oreoselinum*, *Picea abies*.

Remark: in Gelinkaya this species was collected on *Medicago sativa* while feeding.

Phaeogenes Wesmael, 1845

**Dirophanes fulvitarsis* (Wesmael, 1845)

Material examined: Erzincan: Pöske Mt. (39° 51.160' N, 39° 21.515' E), 1838 m, 23.VII.2015, 1 ♂.

Distribution in World: Palaeartic region.

Associated plants: *Angelica sylvestris*, *Peucedanum oreoselinum*.

Dirophanes invisor (Thunberg, 1822)

Material examined: Erzincan: Ahmetli (39° 53.481' N, 39° 21.197' E), 1988 m, 23.VII.2015, 1 ♂.

Distribution in Turkey: Ankara (Özdemir, 1996).

Distribution in World: Algeria, Europe, Azerbaijan, Turkey and Iran.

Associated plants: *Dirophanes invisor*.

Diadromus Wesmael, 1845

Diadromus collaris (Gravenhorst, 1829)

Material examined: Rize: İkizdere, Çamlık (40° 42.979' N, 40° 37.017' E), 1099 m, 26.VII.2015, 2 ♂♂; Erzurum: Tepebaşı Valley, (39° 51.741' N, 40° 37.454' E), 2009 m, 23.VII.2015, 1 ♀.

Distribution in Turkey: Ankara, Erzurum, Kırşehir and Konya (Avcı & Özbek, 1990; Özdemir, 1996; Özbek et al., 2003).

Distribution in World: Palaeartic, Oriental, Australasian, Oceanic, Afrotropical and Neotropical regions.

Associated plants: *Anthriscus sylvestris*, *Chaerophyllum aromaticum*, *Chaerophyllum bulbosum*, *Daucus carota*, *Heracleum sphondylium*, *Oryza sativa*, *Peucedanum oreoselinum*.

Herpestomus Wesmael, 1845

Herpestomus brunnicornis (Gravenhorst, 1829)

Material examined: Erzincan: Avcılar (39° 36.899' N, 39° 49.328' E), 1221 m, 23.VII.2015, 1 ♂.

Distribution in Turkey: Ankara, Eskişehir, Nevşehir, Kayseri, Kırşehir and Sivas (Özdemir, 1996; Gencer, 2003).

Distribution in World: Palaeartic region, introduced into North America.

Associated plants: *Heracleum sphondylium*, *Pinus sylvestris*, *Rubus* sp., *Rubus fruticosus*.

Remark: this species was collected on *Medicago sativa* while feeding.

Heterischnus Wesmael, 1859

**Heterischnus excavatus* (Constantineanu, 1959)

Material examined: Erzurum: Aşkale, Tepebaşı Valley (39° 51.741' N, 40° 37.454' E), 2009 m, 23.VII.2015, 1 ♂.

Distribution in World: Europe.

Associated plants: *Angelica sylvestris*, *Laserpitium latifolium*.

Heterischnus truncator (Fabricius, 1798)

Material examined: Erzurum: Aşkale, Tepebaşı Valley (39° 51.741' N, 40° 37.454' E), 2009 m, 23.VII.2015, 1 ♀.

Distribution in Turkey: Erzurum, Giresun, İstanbul and Trabzon (Kolarov, 1995; Özbek et al., 2003; Çoruh et al., 2014c; Kolarov et al., 2014b).

Distribution in World: Europe, Azerbaijan, Turkey and Iran.

Associated plants: *Anethum graveolens*, *Daucus carota*, *Daucus carota* subsp. *sativus*, *Mentha* sp., *Oryza sativa*, *Rubus fruticosus*, *Rubus idaeus*, *Setaria glauca*.

Ichneumon Linnaeus, 1758

**Ichneumon deliratorius* (Linnaeus, 1758)

Material examined: Erzurum: Gelinkaya (40° 01.741' N, 40° 54.855' E), 1803 m, 26.VII.2015, 1 ♂.
Distribution in World: Holarctic region.

Associated plants: *Anthriscus sylvestris*, *Chaerophyllum aromaticum*, *Daucus carota*, *Heracleum sphondylium*, *Laserpitium latifolium*, *Oryza sativa*, *Picia abies*, *Pteridium aquilinum*, *Quercus petraea*, *Rubus fruticosus*.

Nematomicrus Wesmael, 1845

**Nematomicrus tenellus* Wesmael, 1845

Material examined: Erzurum: Aşkale, Tepebaşı Valley (39° 51.741' N, 40° 37.454' E), 2009 m, 23.VII.2015, 1 ♂.

Distribution in World: Europe.

Oronotus Wesmael, 1844

**Oronotus binotatus* (Gravenhorst, 1829)

Material examined: Ordu: Turnasuyu (40° 58.572' N, 37° 58.577' E), 1 m, 24.VII.2015, 17 ♂♂; Trabzon: Yomra (40° 56.365' N, 39° 52.131' E), 20 m, 25.VII.2015, 2 ♂♂; Giresun: Keşap, Yolağzı (40° 55.998' N, 38° 34.578' E), 1 m, 25.VII.2015, 2 ♂♂.

Distribution in World: Europe and Georgia.

Phaeogenes Wesmael, 1845

**Phaeogenes curator* (Thunberg, 1822)

Material examined: Rize: İkizdere, Çamlık (40° 42.979' N, 40° 37.017' E), 1099 m, 26.VII.2015, 1 ♂.

Distribution in World: Europe and Mongolia.

Associated plants: *Heracleum sphondylium*.

**Phaeogenes heterogonus* Holmgren, 1890

Material examined: Erzurum: Aşkale, Tepebaşı Valley (39° 51.741' N, 40° 37.454' E), 2009 m, 23.VII.2015, 2 ♂♂.

Distribution in World: Europe, Azerbaijan and Iran.

**Phaeogenes semivulpinus* (Gravenhorst, 1829)

Material examined: Erzurum: Aşkale, Tepebaşı Valley (39° 51.741' N, 40° 37.454' E), 2009 m, 23.VII.2015, 1 ♂.

Distribution: Europe and Kazakhstan.

Stenodontus Berthomieu, 1896

**Stenodontus biguttatus* (Gravenhorst, 1829)

Material examined: Erzurum: Gelinkaya (40° 01.741' N, 40° 54.855' E), 1803 m, 26.VII.2015, 1 ♂.

Distribution in World: Algeria, Europe and Israel.

Associated plants: *Chaerophyllum aromaticum*, *Daucus carota* subsp. *sativus*, *Heracleum sphondylium*.

Tycherus Förster, 1869

**Tycherus impiger* (Wesmael, 1845)

Material examined: Erzincan: Pöske Mt. (39° 51.160' N, 39° 21.515' E), 1838 m, 23.VII.2015, 1 ♂.

Distribution in World: Europe.

Associated plants: *Alnus glutinosa*, *Frangula alnus*, *Symphytum officinale*.

Vulgichneumon Heinrich, 1962

Vulgichneumon saturatorius (Linnaeus, 1758)

Material examined: Giresun: Keşap, Yolağzı (40° 55.998' N, 38° 34.578' E), 1 m, 25.VII.2015, 1 ♂.

Distribution in Turkey: Ardahan, Erzurum, Giresun, Rize (Riedel et al., 2010; Çoruh et al., 2014c; Kolarov et al., 2014b).

Distribution in World: Palaearctic and Oriental region.

Associated plants: *Acer campestre*, *Angelica sylvestris*, *Anthriscus cerefolium*, *A. trichosperma*, *Chaerophyllum aromaticum*, *Daucus carota*, *Heracleum sphondylium*, *Listera ovata*, *Pinus mugo*, *Rubus idaeus*.

Zoogeographical characterization

The zoogeographical characterization follows mainly the chorotype classification of the Near East fauna proposed by Vigna 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. Almost cosmopolitan distribution: *Diadromus collaris*.
2. Ranges in two zoogeographical regions: *Brachycyrtus ornatus*, distributed in Holarctic and Neotropical regions; *Meloboris collector* and *Encrateola laevigata*, distributed in Palaearctic/Holarctic and Afrotropical regions; *Vulgichneumon saturatorius*, distributed in Palaearctic and Oriental regions.
3. Holarctic distributions: *Buathra laborator*, *Dichrogaster longicaudata* and *Ichneumon deliratorius*.
4. With Palaearctic ranges: *Alcima orbitale*, *Dusona leptogaster*, *Rhembobius perscrutator*, *Trychosis legator*, *Colpognathus celerator*, *Dirophanes fulvitaris* and *Herpestomus brunnicornis*.
5. Sibero-European distributions: *Cryptus viduatorius* and *Aethecerus nitidus*.
6. Asiatic-European range: *Casinarina tenuiventris*.
7. Central-Asiatic-European distributions: *Phaeogenes curator* and *Ph. semivulpinus*.
8. Turano-European-Mediterranean: *Ischnus agitator*, *Dirophanes invisor* and *Myrmeleonostenus italicus*.
9. Turano-European distributions: *Heterishnus truncator*.
10. Europeo-Mediterranean ranges: *Chromoplex picticollis*, *Diadegma mediterraneum* and *Stenodontus biguttatus*.
11. Most numerous are the species with European distributions, namely *Campoletis crassicornis*, *C. excavata*, *C. latrator*, *Olesicampe fulviventris*, *O. proterva*, *O. sternella*, *Bathythrix collaris*, *B. fragilis*, *Gelis agilis*, *Nematopodius formosus*, *Thaumatogelis femoralis*, *Apaeleticus inimicus*, *Centeterus nigricornis*, *Heterishnus excavatus*, *Nematomicrus tenellus*, *Oronotus binotatus* and *Tycherus impiger*.

Acknowledgements

The preparation of this article was supported by Project Nr. BAP – 2012/234 (Atatürk University) and we are very thankful for it. We are also indebted to Halil Çoruh collecting some specimens.

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