

New records of ichneumonid wasps (Hymenoptera: Ichneumonidae) from Iran

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KOLAROV J. *et al.* 2024: New records of ichneumonid wasps (Hymenoptera: Ichneumonidae) from Iran. *Acta Musei Moraviae, Scientiae biologicae* **109(1–2): 67–75**. – The present paper deals with a faunistic survey on Ichneumonidae (Hymenoptera: Ichneumonoidea) of Iran. In total, 14 species of these parasitoids in seven subfamilies are introduced as new country records: Anomaloniinae (one species), Cryptinae (two species, two genera), Ctenopelmatinae (three species, three genera), Ichneumoninae (four species, three genera), Metopiinae (one species), Pimplinae (two species, two genera) and Rhyssinae (one species).

Keywords. Faunistic survey, Ichneumonidae, new records, distribution

Introduction

Ichneumonidae is a hyperdiverse family of Hymenoptera and is considered one of the largest in Insecta, with 100,000 estimated species worldwide (GAULD 2000; GONZÁLEZ-MORENO & BORDERA 2011). The family comprises 25,300 species in 1,601 genera (YU *et al.* 2016), which is arguably the largest animal family on earth (REYNOLDS BERRY 2019). Ichneumonids are parasitoids of other holometabolous insects or spiders (very occasionally other arthropods or phytophagous species) so they play an important role in terrestrial ecosystems as regulators of host insect populations (GAULD 1991; QUICKE 2015; GHAHARI 2023).

The family Ichneumonidae is one of the least intensively studied groups of insects in Iran, which comprises more than 622 species (YU *et al.* 2016); of course still leaving several unrecorded and undescribed species, as most regions of this country have not been systematically sampled. The purpose of this paper is to introduce 14 new species records for the fauna of Iran as part of ongoing faunistic studies of Ichneumonidae in this country.

Material and methods

The paper is based on the faunistic surveys in different regions of Iran, as well as examined specimens in some insect collections of Islamic Azad University. The material

was collected with Malaise traps and sweeping net, mounted on triangular labels, and examined by a stereomicroscope (Olympus SZ61). The specimens were identified by the authors and also by J. Sawoniewicz (University of Białystok, Poland), and are preserved in the collections of the determiners. Classification, nomenclature, distributional data and host records suggested by YU *et al.* (2016) have been followed, in other cases, the related references are given.

Results

In this faunistic survey, a total of 14 species of Ichneumonidae in seven subfamilies, Anomaloniinae, Cryptinae, Ctenopelmatinae, Ichneumoninae, Metopiinae, Pimplinae and Rhyssinae are listed as new records for the fauna of Iran. The list of species is given below alphabetically, together with distributional and host data.

Subfamily Anomaloniinae Viereck, 1918

Genus *Heteropelma* Wesmael, 1849

Heteropelma amictum (Fabricius, 1775)

Material examined. Semnan province, Shahrud, Jangal-e Abr, 2♂♂, May 2011.

Distribution. Iran (new record), Armenia, Austria, Belgium, Bulgaria, China, Croatia, Czechia, Denmark, Finland, France, Germany, Hungary, India, Indonesia, Ireland, Italy, Japan, Kazakhstan, Korea, Latvia, Lithuania, Moldova, Myanmar, Nepal, Netherlands, Norway, Philippines, Poland, Romania, Russia, Spain, Sri Lanka, Sweden, Switzerland, Ukraine, United Kingdom (YU *et al.* 2016), Slovakia (HOLÝ & ZEMAN 2018).

Host records. Erebidae: *Callimorpha dominula* (Linnaeus, 1758), *Calliteara pudibunda* (Linnaeus, 1758), *Grammia quenseli* (Paykull, 1791); Geometridae: *Bupalus piniarius* (Linnaeus, 1758), *Eupithecia linariata* (Denis & Schiffermüller, 1775); Lasiocampinae: *Dendrolimus pini* (Linnaeus, 1758), *Dendrolimus sibiricus* Tschetverikov, 1908, *Dendrolimus spectabilis* (Butler, 1877), *Dendrolimus superans* (Butler, 1877), *Dendrolimus tabulaeformis* Tsai & Liu, 1999, *Macrothylacia rubi* (Linnaeus, 1758), *Pachypasa otus* (Drury, 1773); Noctuidae: *Acronicta cinerea* Hufnagel, 1766, *Agrotis ripae* (Hübner, 1823), *Allophytes oxyacanthae* (Linnaeus, 1758), *Bena prasinana* (Linnaeus, 1758), *Colocasia coryli* (Linnaeus, 1758), *Lacanobia oleracea* (Linnaeus, 1758), *Lithophane ornitopus* (Hufnagel, 1766), *Panolis flammea* (Denis & Schiffermüller, 1775), *Polia hepatica* (Clerck, 1759), *Polia nebulosa* (Hufnagel, 1766), *Shargacucullia lychnitis* (Rambur, 1833); Nolidae: *Pseudoips prasinana* (Linnaeus, 1758); Notodontidae: *Phalera bucephala* (Linnaeus, 1758), *Thaumatopoea processionea* (Linnaeus, 1758); Pieridae: *Pontia daplidice* (Linnaeus, 1758); Sphingidae: *Laothoe populi* (Linnaeus, 1758), *Sphinx pinastri* Linnaeus, 1758; Yponomeutidae: *Yponomeuta padella* (Linnaeus, 1758) (YU *et al.* 2016).

Subfamily Cryptinae Kirby, 1837

Genus *Cubocephalus* Ratzeburg, 1848

***Cubocephalus distinctor* (Thunberg, 1824)**

Material examined. Zanjan province, Mahneshan, Khandaghloo, 1♂, 6.v.2010.

Distribution. Iran (new record), Austria, Azerbaijan, Bulgaria, Finland, Germany, Lithuania, Moldova, Norway, Poland, Russia, Spain, Sweden, United Kingdom (YU *et al.* 2016), Czechia (HOLÝ & ZEMAN 2018).

Host records. Hymenoptera: Tenthredinidae: *Strongylogaster* sp. (YU *et al.* 2016).

Genus *Nematopodius* Gravenhorst, 1829

***Nematopodius formosus* Gravenhorst, 1829**

Material examined. Kordestan province, Qorveh, Soltan-Abad, 1♂, 2♀♀, 29.vii.2013. Hamadan province, Toycerkan, 1♀, August 2015.

Distribution. Iran (new record), Austria, Belarus, Bulgaria, Czechia, Denmark, Finland, France, Georgia, Germany, Hungary, Italy, Lithuania, Norway, Poland, Sweden, Switzerland, Turkey, United Kingdom, former Yugoslavia (YU *et al.* 2016), Slovakia (RINDOŠ *et al.* 2017; HOLÝ & ZEMAN 2018), Ukraine (VARGA 2017).

Host records. Coleoptera: Curculionidae: *Agrius sulcicollis* Lacordaire, 1835 (Buprestidae), *Hylesinus crenatus* (Fabricius, 1787) and *Xyleborus dispar* (Fabricius, 1792); Lepidoptera: Tortricidae: *Epinotia solandriana* (Linnaeus, 1758) (YU *et al.* 2016).

Subfamily Ctenopelmatinae Foerster, 1869

Genus *Campodorus* Foerster, 1869

***Campodorus haematodes* (Gravenhorst, 1829)**

Material examined. Mazandaran province, Ramsar, Dalkhani Forest, 2♂♂, 27.viii.2015.

Distribution. Iran (new record), Austria, Belgium, Bulgaria, Czechia, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Netherlands, Norway, Poland, Romania, Russia, Sweden, Switzerland, Ukraine, United Kingdom, former Yugoslavia (YU *et al.* 2016), Caucasus, Georgia (RIEDEL *et al.* 2018).

Host records. *Eutomostethus luteiventris* (Klug, 1816) (Hymenoptera: Tenthredinidae) (YU *et al.* 2016).

Genus *Ctenopelma* Holmgren, 1855

***Ctenopelma tomentosum* (Desvignes, 1856)**

Material examined. Mazandaran province, Savadkuh, Lajim, 3♀♀, 8.iv.2013. Mazandaran province, Babol, Nakhkola, 1♀, September 2017.

Distribution. Iran (new record), Austria, Azerbaijan, Belgium, China, Czechia, Finland, France, Georgia, Germany, Hungary, Japan, Kazakhstan, Latvia, Lithuania, Moldova, Netherlands, Norway, Poland, Russia, Sweden, Switzerland, Ukraine, United Kingdom.

Host records. Hymenoptera: Pamphiliidae: *Pamphilius hortorum* (Klug, 1808) (YU *et al.* 2016), *Neurotoma sibirica* Gussakovskij, 1935 (SUN *et al.* 2019).

Genus *Xenoschesis* Foerster, 1869

Xenoschesis fulvipes (Gravenhorst, 1829)

Material examined. Alborz province, Taleqan, Guran, 2♀♀, 10.viii.2012. Guilan province, Chaboksar, 1♀, June 2014. Qazvin province, Tekestan, Khoram-Abad, 1♀, 14.vii.2017.

Distribution. Iran (new record), Austria, Belarus, Belgium, Bulgaria, China, Czechia, Denmark, Finland, France, Germany, Hungary, Italy, Japan, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Russia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom (YU *et al.* 2016), Slovakia (HOLÝ & ZEMAN 2018).

Host records. Hymenoptera: Pamphiliidae: *Acantholyda parki* Shinohara & Byun, 1996, *Acantholyda posticalis* (Matsumura, 1912) (SHENG *et al.* 2013); *Acantholyda erythrocephala* (Linnaeus, 1758), *Acantholyda hieroglyphica* (Christ, 1791), *Cephalicia abietis* (Linnaeus, 1758), *Cephalicia alpina* (Klug, 1808), *Cephalicia arvensis* Panzer, 1805, *Pamphilius gyllenhalli* (Dahlbom, 1835), *P. hortorum* (Klug, 1808), and *P. valer* (Linnaeus, 1767) (YU *et al.* 2016).

Subfamily Ichneumoninae Latreille, 1802

Genus *Coelichneumon* Thomson, 1893

Coelichneumon impressor (Zetterstedt, 1838)

Material examined. Markazi province, Khomein, Fath-Abad, 2♀♀, 1♂, 28.v.2015.

Distribution. Iran (new record), Austria, Azerbaijan, Belgium, Bulgaria, Finland, France, Germany, Hungary, Iceland, Kazakhstan, Latvia, Norway, Poland, Romania, Spain, Sweden, Switzerland, United Kingdom.

Host records. Lepidoptera: Noctuidae: *Cerapteryx graminus* (Linnaeus, 1758), *Globia algae* (Esper, 1789), *Gortyna flavaga* (Denis and Schiffermüller, 1775), and *Staurophora celsia* (Linnaeus, 1758) (YU *et al.* 2016).

Genus *Diphyus* Kriechbaumer, 1890

Diphyus fossorius (Linnaeus, 1758)

Material examined. Tehran province, Shahriar, Qajar-Abad, 3♀♀, 2♂♂, 11.ix.2014.

Distribution. Iran (new record), Austria, Belgium, Bulgaria, Denmark, Finland, France, Germany, Hungary, Italy, Japan, Latvia, Moldova, Netherlands, Poland, Romania,

Russia, Spain, Sweden, Switzerland, Syria, Turkey, Ukraine, United Kingdom (Yu *et al.* 2016), Czechia (HOLÝ & ZEMAN 2018).

Host records. Lepidoptera: *Dicallomera fascelina* (Linnaeus, 1758) (Erebidae), *Dendrolimus* sp. (Lasiocampidae), *Agrotis segetum* (Denis and Schiffermüller, 1775), *Mniotype adusta* (Esper, 1790), and *Mythimna farrago* (Fabricius, 1787) (Noctuidae), and *Aglais urticae* (Linnaeus, 1758), and *Nymphalis antiopa* (Linnaeus, 1758) (Nymphalidae) (YU *et al.* 2016).

***Diphyus gradatorius* (Thunberg, 1822)**

Material examined. Mazandaran province, Savadkuh, Orim, 2♀, 24.viii.2018.

Distribution. Iran (new record), Austria, Azerbaijan, Belgium, Finland, France, Germany, Hungary, Italy, Japan, Poland, Romania, Russia, Slovakia, Sweden, United Kingdom (YU *et al.* 2016), Georgia (RIEDEL *et al.* 2023).

Host records. Lepidoptera: *Biston betularia* (Linnaeus, 1758) (Geometridae), and *Eurois occulta* (Linnaeus, 1758) (Noctuidae) (YU *et al.* 2016).

Genus *Syspasis* Townes, 1965

***Syspasis lineator* (Fabricius, 1781)**

Material examined. Mazandaran province, Ramsar, Dalkhani forest, 1♂, 1♀, July 2013.

Distribution. Iran (new record), Austria, Belarus, Belgium, Bulgaria, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Japan, Latvia, Lithuania, Netherlands, Norway, Poland, Romania, Russia, Spain, Sweden, Switzerland, Ukraine, United Kingdom (YU *et al.* 2016), Czechia, Slovakia (HOLÝ & ZEMAN 2018).

Host records. Lepidoptera: Bombycidae: *Theophila mandarina* (Moore, 1872); Drepanidae: *Tethea ocularis* (Linnaeus, 1767); Erebidae: *Arctia caja* (Linnaeus, 1758); Geometridae: *Abraxas grossulariata* (Linnaeus, 1758), *Biston betularia* (Linnaeus, 1758), *Eurranthis plummistaria* (Devillers, 1789), *Hydriomena furcata* (Thunberg, 1784), *Hylaea fasciaria* (Linnaeus, 1758); Noctuidae: *Acronicta aceris* (Linnaeus, 1758), *Archanara geminipuncta* (Haworth, 1809), *Cryphia muralis* (Forster, 1771), *Gortyna flavago* (Denis & Schiffermüller, 1775), *Noctua pronuba* (Linnaeus, 1758), *Panolis flammea* (Denis & Schiffermüller, 1775), *Xestia c-nigrum* (Linnaeus, 1758); Notodontidae: *Phalera bucephala* (Linnaeus, 1758); Saturniidae: *Aglia tau* (Linnaeus, 1758); Tortricidae: *Archips crataegana* (Hübner, 1796–1799) (YU *et al.* 2016).

Subfamily Metopiinae Foerster, 1869

Genus *Metopius* Panzer, 1806

***Metopius (Metopius) vespoides* (Scopoli, 1763)**

Material examined. West Azarbaijan province, Khoy, Ravian, 1♀, 14.vii.2015.

Distribution. Iran (new record), Austria, Croatia, France, Germany, Hungary, Israel-Palestine, Poland, Russia, Ukraine, former Yugoslavia.

Host records. Lepidoptera: *Lymantria lapidicola* (Herrich-Schäffer, 1852), and *Spilosoma urticae* (Esper, 1789) (Erebidae), *Dendrolimus pini* (Linnaeus, 1767), *Eriogaster catax* (Linnaeus, 1758), *Eriogaster lanestris* (Linnaeus, 1758), *Eriogaster philippsi* Bartel, 1911, *Eriogaster rimicola* (Denis and Schiffermüller, 1775), and *Malacosoma neustria* (Linnaeus, 1758) (Lasiocampidae), *Orthosia populeti* (Fabricius, 1781), and *Shargacucullia scrophulariae* (Denis and Schiffermüller, 1775) (Noctuidae); *Stauropus fagi* (Linnaeus, 1758) (Notodontidae), and *Zerynthia polyxena* (Denis and Schiffermüller, 1775) (Papilionidae) (YU *et al.* 2016).

Subfamily Pimplinae Wesmael, 1845

Genus *Perithous* Holmgren, 1859

Perithous albicinctus (Gravenhorst, 1829)

Material examined. Northern Khorasan province, Maneh, Kalateh-Chenar, 1♂, June 2010.

Distribution. Iran (new record), Austria, Azerbaijan, Belarus, Belgium, Bulgaria, Denmark, Finland, France, Germany, Hungary, Japan, Latvia, Moldova, Netherlands, Poland, Romania, Russia, Sweden, Switzerland, Ukraine, United Kingdom (YU *et al.* 2016), Czechia (HOLÝ & ZEMAN 2018).

Host records. Coleoptera: Cerambycidae: *Cerambyx cerdo* Linnaeus, 1758; Hymenoptera: Crabronidae: *Ectemnius nigritarsus* (Herrich-Schäffer, 1841), *Ectemnius ruficornis* (Zetterstedt, 1838) (YU *et al.* 2016).

Genus *Pimpla* Fabricius, 1804

Pimpla aethiops Curtis, 1828

Material examined. West Azarbaijan province, Takab, Babanazar, 1♀, 2♂♂, 10.viii.2014.

Distribution. Iran (new record), Austria, Bulgaria, China, France, Germany, Hungary, Iceland, Italy, Japan, Korea, Poland, Romania, Russia, Spain, United Kingdom (YU *et al.* 2016), Czechia (HOLÝ & ZEMAN 2018).

Host records. Lepidoptera: *Bombyx mandarina* (Moore, 1872) (Bombycidae), *Cnaphalocrosis medinalis* (Guenée, 1854), *Canoglyphus punctiferalis* (Guenée, 1854) (Crambidae), *Haplantia cunea* (Drury, 1773), *Laelia coenosa* (Hübner, 1808), *Lymantria dispar* (Linnaeus, 1758), *Orgyia thyellina* Butler, 1881 (Erebidae), *Abraxas suspecta* (Warren, 1894) (Geometridae), *Parnara guttata* (Bremer & Grey, 1852) (Hesperiidae), *Dendrolimus punctatus* Walker, 1855, *D. spectabilis* (Butler, 1877), *D. tabulaeformis* Tsai & Liu, 1962, *Malacosoma neustria* (Linnaeus, 1758) (Lasiocampidae), *Lampides boeticus* (Linnaeus, 1767) (Lycaenidae), *Ctenoplusia agnata* (Staudinger, 1892), *Lucania loreyi* (Duponchel, 1827), *Mythimna separata* Walker, 1865, *Sesamia inferens* (Walker, 1856), *Spodoptera litura* (Fabricius, 1775), *Trisuloides sericea*

Butler, 1881 (Noctuidae), *Macrochthonia fervens* Butler, 1881 (Nolidae), *Loudonta dispar* (Linnaeus, 1758) (Notodontidae), *Junonia almana* (Linnaeus, 1758), *Mycalesis gotama* Moore, 1858 (Nymphalidae), *Papilio machaon* Linnaeus, 1758 (Papilionidae), *Pieris rapae* (Linnaeus, 1758) (Pieridae), *Canephora asiatica* (Staudinger, 1761), *Cryptothelea variegata* Snellen, 1879, *Eumeta minuscula* (Butler, 1881) (Psychidae), *Diaphania pyloalis* (Hampson, 1859) (Pyralidae), *Samia cynthia* (Drury, 1773) (Saturniidae), *Archips asiaticus* Walsingham, 1900, *Homona coffearia* (Nietner, 1861), *H. magnanima* (Diakonoff, 1948), *Zeiraphera griseana* (Hübner, 1799) (Tortricidae) (YU *et al.* 2016).

Subfamily Rhyssinae Morley, 1913

Genus *Rhyssella* Rohwer, 1920

Rhyssella obliterata (Gravenhorst, 1829)

Material examined. Guilan province, Astara, Asgar-Abad, 1♀, 2♂♂, September 2010.

Distribution. Iran (new record), Armenia, Austria, Belarus, Croatia, Czechia, France, Germany, Hungary, Italy, Latvia, Montenegro, North Macedonia, Poland, Romania, Russia, Serbia, Sweden, Ukraine (YU *et al.* 2016), Bulgaria (KOLAROV 2019), Slovakia (HOLÝ & ZEMAN 2018), Switzerland (KLOPFSTEIN *et al.* 2019).

Host records. Coleoptera: Cerambycidae: *Saperda scalaris* (Linnaeus, 1758) (HAUPT 1913); Hymenoptera: Xiphidriidae: *Xiphidria picta* Konow, 1897 (KASPARYAN 1981; JOHANSSON & LARSSON 2019); *Xiphidria camelus* (Linnaeus, 1758), *X. longicollis* (Geoffroy, 1785) and *X. prolongata* (Geoffroy, 1785) are other hosts of *R. obliterata* (YU *et al.* 2016).

Discussion

In this faunistic survey, a total of 36 specimens were collected and identified, which resulted in 14 new species records in 13 genera and seven subfamilies for the fauna of Iran. The result of this research indicates that there is a diverse fauna of ichneumonid wasps in different regions of Iran which has not been studied completely. Since Iran is a large country encompassing a variety of geographical regions and climates, it is expected that several additional ichneumonid species (new country records, new distributional data, and new species) remain to be discovered by systematic sampling in all regions of the country.

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Ichneumonid wasps from Iran (Hymenoptera: Ichneumonidae)

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