

A faunistic study of Ichneumonidae (Hymenoptera: Ichneumonoidea) of Iran

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Abstract: In this faunistic paper, totally 49 species of Ichneumonidae (Hymenoptera) under 13 subfamilies (Agriotypinae, Anomaloninae, Banchinae, Campopleginae, Cryptinae, Ctenopelmatinae, Ichneumoninae, Ophioninae, Pimplinae, Poemeniinae, Tersilochinae, Tryphoninae and Xoridae) is represented after examining of insect collections, as well as collecting of some specimens during faunistic surveys. Nine species are newly recorded from Iran: *Aphanistes bellicosus* (Wesmael, 1849) (Anomaloninae), *Dusona leptogaster* (Holmgren, 1860), *Hyposoter virginalis* (Gravenhorst, 1829) (Campopleginae), *Aptesis improba* (Gravenhorst, 1829) (Cryptinae), *Sympherta obligator* (Thunberg, 1824) (Ctenopelmatinae), *Schizopyga circulator* (Panzer, 1800) (Pimplinae), *Poemenia brachyura* Holmgren, 1860 (Poemeniinae), *Xorides gracilicornis* (Gravenhorst, 1829) and *Xorides irrigator* (Fabricius, 1793) (Xoridae).

Key words: Ichneumonidae, biological control, species diversity, new records, Iran.

Estudio faunístico de Ichneumonidae (Hymenoptera: Ichneumonoidea) de Irán

Resumen: En este trabajo sobre faunística se presentan las citas de un total de 49 especies de Ichneumonidae (Hymenoptera) de 13 subfamilias (Agriotypinae, Anomaloninae, Banchinae, Campopleginae, Cryptinae, Ctenopelmatinae, Ichneumoninae, Ophioninae, Pimplinae, Poemeniinae, Tersilochinae, Tryphoninae and Xoridae) despues de la revisión de ejemplares en conección así como la captura de individuos durante varias campañas de muestreos. Como resultado, nueve especies son citadas por primera vez para Irán: *Aphanistes bellicosus* (Wesmael, 1849) (Anomaloninae), *Dusona leptogaster* (Holmgren, 1860), *Hyposoter virginalis* (Gravenhorst, 1829) (Campopleginae), *Aptesis improba* (Gravenhorst, 1829) (Cryptinae), *Sympherta obligator* (Thunberg, 1824) (Ctenopelmatinae), *Schizopyga circulator* (Panzer, 1800) (Pimplinae), *Poemenia brachyura* Holmgren, 1860 (Poemeniinae), *Xorides gracilicornis* (Gravenhorst, 1829) y *Xorides irrigator* (Fabricius, 1793) (Xoridae).

Palabras clave: Ichneumonidae, control biológico, diversidad de especies, nuevas citas, Irán.

INTRODUCTION

Hymenoptera are one of the four largest orders of insects, with over 152,677 described recent species around the world (Zhang, 2013). The Ichneumonidae is the largest hymenopteran family with 1,601 genera and 25,285 described species (Yu *et al.*, 2016). These wasps are powerful parasitoids of several agricultural and forest pests and have efficient role in decreasing of their population density (Gupta, 1987; Wahl & Sharkey, 1993; Broad *et al.*, 2018).

The catalogue of Iranian Ichneumonidae has been published by Kolarov and Ghahari (2005), they recorded 144 species belonging to 65 genera and 14 subfamilies. After that Barahoei *et al.* (2012) published the checklist comprises 502 species belonging to 189 genera and 24 subfamilies. Latter, other authors (Mohammadi-Khoramabadi *et al.*, 2013; Ghahari & Jussila, 2014a, 2014b, 2015a, 2015b, 2016a, 2016b; Barahoei *et al.*, 2014a, 2014b, 2015; Ghahari, 2015, 2016; Ghahari and Gadallah, 2017; Riedel & Aghadokht, 2017; Mohammadi-Khoramabadi & Talebi, 2018, etc.) have made contributions to the Iranian fauna.

Due to the great diversity and difficulties in identification of many species in this taxon, our knowledge of the Iranian fauna remains insufficient. The purpose of this paper is to record the species of Ichneumonidae of some regions of Iran as part of ongoing faunistic studies of Ichneumonidae in Iran. In the present study, totally 49 Ichneumonid species were collected, of which nine species are recorded for the first time from Iran.

MATERIAL AND METHODS

The specimens of the present study were collected from different areas of Iran by Malaise traps and sweeping net. Additionally, some materials of different insect collections of some universities and private collections were examined. The specimens of this research are preserved

in the collections of the second and third authors, and insect collection of Qaemshahr Islamic Azad University. Here we follow Yu *et al.* (2016) for nomenclature, classification and distributional data.

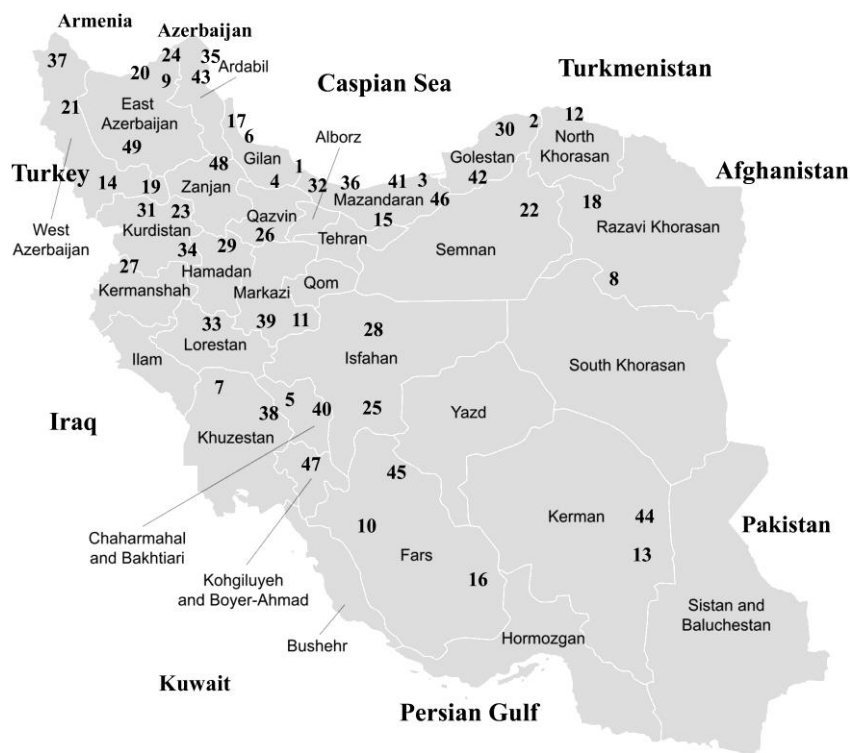


Figure 1.- Map of Iran with provincial boundaries, and distribution of Iranian Ichneumonidae. Numbers refer to species number in the text. **Figura 1.-** Mapa de Irán con las provincias y la distribución de las especies de Ichneumonidae citadas. Los números hacen referencia al orden asignado en el texto.

RESULTS

In total, 49 Ichneumonidae species in 37 genera have been identified for the fauna of Iran, comprising nine new records for Iran. The list of species is given below alphabetically, with distributional data.

Subfamily Agriotypinae Haliday, 1838

Genus *Agriotypus* Curtis, 1832

1. *Agriotypus armatus* Curtis, 1832

Material examined: Gilan province, Roodsar, 2♀, May 2014.

General distribution: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Italy, Japan, Korea, Norway, Poland, Romania, Spain, Sweden, Switzerland, Turkey, United Kingdom.

Subfamily Anomaloninae Viereck, 1918

Genus *Agrypon* Förster, 1860

2. *Agrypon delarvatum* (Gravenhorst, 1829)

Material examined: Golestan province, Golestan National Park, 3♀, June 2010.

General distribution: Austria, Azerbaijan, Bulgaria, former Czechoslovakia, Finland, France, Germany, Hungary, Italy, Kazakhstan, Lithuania, Moldova, Mongolia, Poland, Russia, Spain, Switzerland, United Kingdom.

3. *Agrypon hilare* (Tosquinet, 1889)

Material examined: Mazandaran province, Tonekabon (Jangal-e 2000), 3♀, July 2013.

General distribution: Bulgaria, former Czechoslovakia, France, Hungary, Kazakhstan, Moldova, Romania, Russia, Turkmenistan, Ukraine, Uzbekistan.

Genus *Aphanistes* Förster, 1869

4. *Aphanistes bellicosus* (Wesmael, 1849)

Material examined: Gilan province, Talesh (Subatan), 2♀, 1♂, June 2013. *New record for Iran.*

General distribution: Austria, Belgium, Czech Republic, Finland, France, Germany, Hungary, Japan, Norway, Poland, Russia, Spain, Sweden, Turkey, United Kingdom.

Subfamily Banchinae Wesmael, 1845

Genus *Banchus* Fabricius, 1798

5. *Banchus volutatorius* (Linnaeus, 1758)

Material examined: Chaharmahal and Bakhtiari province, Shahrekord, 2050 m, 1♀, 2♂, September 2010.

General distribution: Eastern and Western Palearctic, Europe, Nearctic, Oriental.

Genus *Lissonota* Gravenhorst, 1829

6. *Lissonota picticoxis* Schmiedeknecht, 1900

Material examined: Gilan province, Masal, 70 m, 1♀, August 2012.

General distribution: Former Czechoslovakia, Finland, France, Germany, Hungary, Moldova, Poland, Russia, Spain, Switzerland.

7. *Lissonota quadrinotata* Gravenhorst, 1829

Material examined: Khuzestan province, Andimeshk, 1♀, April 2016.

General distribution: Austria, Belgium, former Czechoslovakia, Finland, France, Germany, Poland, Sweden, Switzerland, Turkey, Ukraine, United Kingdom.

Subfamily Campopleginae Förster, 1869

Genus *Campoletis* Förster, 1869

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

Material examined: Razavi Khorasan province, Ferdos, 1♂, May 2013.

General distribution: Azerbaijan, Bulgaria, Germany, Greece, Italy.

9. *Campoletis femoralis* (Gravenhorst, 1829)

Material examined: East Azerbaijan province, Horand, 1113 m, 2♀, July 2009.

General distribution: Austria, Belarus, Belgium, Bulgaria, Finland, France, Germany, Hungary, Latvia, Norway, Poland, Romania, Russia, Sweden, Switzerland, United Kingdom, former Yugoslavia.

Genus *Cymodusa* Holmgren, 1859

10. *Cymodusa cruentata* (Gravenhorst, 1829)

Material examined: Fars province, Kazeroon, 2♀, 1♂, June 2009.

General distribution: Austria, Azerbaijan, Belgium, Bulgaria, Canada, former Czechoslovakia, Denmark, Finland, France, Germany, Hungary, Ireland, Kazakhstan, Moldova, Norway, Poland, Romania, Russia, Spain, Sweden, USA, Ukraine, United Kingdom.

Genus *Diadegma* Förster, 1869

11. *Diadegma gracile* (Gravenhorst, 1829)

Material examined: Markazi province, Komijan (Emamzadeh Abbas), 1♀, 1♂, October 2009.

General distribution: France, Germany, Hungary, Italy, Latvia, Netherlands, Poland, Romania, Russia, Tajikistan, United Kingdom.

Genus *Dusona* Cameron, 1900

12. *Dusona leptogaster* (Holmgren, 1860)

Material examined: North Khorasan province, Jajarm, 993 m, 2♀, June 2011. *New record for Iran.*

General distribution: Austria, Azerbaijan, Belgium, Bulgaria, former Czechoslovakia, Finland, France, Germany, Ireland, Japan, Latvia, Moldova, Netherlands, Poland, Romania, Russia, Sweden, United Kingdom.

13. *Dusona nidulator* (Fabricius, 1804)

Material examined: Kerman province, Jiroft, 3♀, April 2014.

General distribution: Austria, Azerbaijan, Belarus, Belgium, Bulgaria, former Czechoslovakia, Finland, France, Germany, Hungary, Ireland, Italy, Kazakhstan, Latvia, Moldova, Netherlands, Norway, Poland, Romania, Russia, Spain, Sweden, Switzerland, Ukraine, United Kingdom.

Genus *Hyposoter* Förster, 1869

14. *Hyposoter seniculus* (Gravenhorst, 1829)

Material examined: West Azerbaijan province, Bookan, 1379 m, 1♀, June 2008.

General distribution: Austria, Belgium, Finland, France, Germany, Netherlands, Norway, Poland, Romania, United Kingdom.

15. *Hyposoter virginalis* (Gravenhorst, 1829)

Material examined: Mazandaran province, Amol, 1♀, June 2004. *New record for Iran.*

General distribution: Azerbaijan, Bulgaria, former Czechoslovakia, France, Germany, Latvia, Netherlands, Sweden, Ukraine, United Kingdom.

Subfamily Cryptinae Kirby, 1837

Genus *Acrolyta* Förster, 1869

16. *Acrolyta rufocincta* (Gravenhorst, 1829)

Material examined: Fars province, Fasa (Mahmood-Abad Olya), 1♀, 1♂, October 2014.

General distribution: Austria, Azerbaijan, Belgium, Bulgaria, former Czechoslovakia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Moldova, Netherlands, Norway, Poland, Romania, Spain, Sweden, Switzerland, Turkey, United Kingdom.

Genus *Aptesis* Förster, 1850

17. *Aptesis assimilis* (Gravenhorst, 1829)

Material examined: Gilan province, Lahijan (Nobijar), 1♂, May 2014.

General distribution: Austria, Bulgaria, Denmark, Finland, France, Germany, Hungary, Isle of Man, Lithuania, Norway, Poland, Russia, Spain, Sweden, Switzerland, United Kingdom.

18. *Aptesis improba* (Gravenhorst, 1829)

Material examined: Razavi Khorasan province, Sabzevar, 1024 m, 2♀, June 2011. *New record for Iran.*

General distribution: Austria, Belgium, Bulgaria, former Czechoslovakia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Poland, Russia, Spain, Sweden, Switzerland, United Kingdom.

Genus *Javra* Cameron, 1903**19. *Javra opaca* (Thomson, 1873)**

Material examined: West Azerbaijan province, Takab, 1♀, July 2014.

General distribution: Austria, former Czechoslovakia, Denmark, Finland, France, Germany, Hungary, Italy, Lithuania, Poland, Romania, Sweden, Switzerland, United Kingdom.

Genus *Schenkia* Förster, 1869**20. *Schenkia spinolae* (Gravenhorst, 1829)**

Material examined: East Azerbaijan province, Arasbaran forest, 1♀, August 2011.

General distribution: Bulgaria, Finland, France, Germany, Italy, Latvia, Lithuania, Norway, Poland, Spain, Switzerland, United Kingdom.

Genus *Zoophthorus* Förster, 1869**21. *Zoophthorus punctiventris* (Thomson, 1884)**

Material examined: West Azerbaijan province, Khoy (1153 m), 1♀, September 2009.

General distribution: Azerbaijan, Bulgaria, former Czechoslovakia, Finland, Hungary, Sweden.

Subfamily Ctenopelmatinae Förster, 1869**Genus *Alexeter* Foester, 1869****22. *Alexeter segmentarius* (Fabricius, 1787)**

Material examined: Semnan province, Shahrood (Jangal-e Abr), 1♀, 2♂, April 2009.

General distribution: Austria, Belarus, Belgium, Bulgaria, China, former Czechoslovakia, Estonia, Finland, France, Georgia, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Mongolia, Montenegro, Netherlands, Norway, Poland, Romania, Russia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, former Yugoslavia.

Genus *Euryproctus* Holmgren, 1855**23. *Euryproctus alpinus* Holmgren, 1857**

Material examined: Kurdistan province, Saqez, 1♀, June 2011.

General distribution: Austria, Belgium, Bulgaria, former Czechoslovakia, Finland, France, Germany, Latvia, Netherlands, Norway, Poland, Russia, Sweden, Switzerland, United Kingdom.

Genus *Sympherta* Förster, 1869**24. *Sympherta canaliculata* (Thomson, 1893)**

Material examined: East Azerbaijan province, Arasbaran forest, 1♀, August 2011.

General distribution: Bulgaria, France, Germany, Hungary, Lithuania, Poland, Romania, Spain, Switzerland, United Kingdom.

25. *Sympherta obligator* (Thunberg, 1824)

Material examined: Isfahan province, Samirom, 1♀, 1♂, September 2012. *New record for Iran.*

General distribution: Austria, Azerbaijan, Belarus, Belgium, Bulgaria, former Czechoslovakia, Finland, France, Georgia, Germany, Hungary, Latvia, Lithuania, Moldova, Mongolia, Netherlands, Norway, Poland, Romania, Russia, Spain, Sweden, Switzerland, Turkey, United Kingdom.

Subfamily Ichneumoninae Latreille, 1802

Genus *Aethecerus* Wesmael, 1845

26. *Aethecerus placidus* Wesmael, 1845

Material examined: Qazvin province, Takestan (Jafar-Abad), 2♀, May 2010.

General distribution: Austria, Belgium, former Czechoslovakia, Finland, France, Germany, Hungary, Lithuania, Netherlands, Norway, Poland, Romania, Russia, Spain, Sweden, United Kingdom.

Genus *Anisopygus* Kriechbaumer, 1888

27. *Anisopygus pseudonymus* (Wesmael, 1845)

Material examined: Kermanshah province, Javanrood, 1♀, October 2015.

General distribution: Austria, Belarus, Belgium, Canada, former Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Poland, Romania, Russia, Sweden, USA.

Genus *Aoplus* Tischbein, 1874

28. *Aoplus castaneus* (Gravenhorst, 1820)

Material examined: Isfahan province, Najaf-Abad (Goldarreh), 1♀, 1♂, June 2009.

General distribution: Austria, Belarus, Belgium, Bulgaria, former Czechoslovakia, Finland, France, Germany, Hungary, Iceland, Italy, Latvia, Netherlands, Norway, Poland, Romania, Russia, Sweden, Switzerland, Tunisia, Ukraine, United Kingdom.

29. *Aoplus defraudator* (Wesmael, 1845)

Material examined: Hamadan province, Razan (Nodeh), 1♀, July 2008.

General distribution: Austria, Belarus, Belgium, Bulgaria, former Czechoslovakia, Finland, France, Germany, Hungary, Italy, Netherlands, Norway, Poland, Romania, Spain, United Kingdom.

Genus *Apaeleticus* Wesmael, 1845

30. *Apaeleticus mesostictus* (Gravenhorst, 1829)

Material examined: Golestan province, Golestan National Park, 1♀, 2♂, May 2015.

General distribution: Austria, Belarus, Belgium, Bulgaria, Finland, France, Germany, Hungary, Kazakhstan, Netherlands, Norway, Poland, Romania, Russia, Spain, Sweden, Ukraine.

Genus *Barichneumon* Thomson, 1893

31. *Barichneumon gemellus* (Gravenhorst, 1829)

Material examined: Kurdistan province, Bijar, 1♀, June 2011.

General distribution: Austria, Belarus, Belgium, Bulgaria, Croatia, former Czechoslovakia, Finland, France, Germany, Hungary, Ireland, Netherlands, Poland, Romania, Russia, Spain, Sweden, Ukraine, United Kingdom.

32. *Barichneumon microcerus* (Gravenhorst, 1829)

Material examined: Mazandaran province, Marzan-Abad, 2♀, July 2011.

General distribution: Former Czechoslovakia, France, Hungary, Latvia, Netherlands, Poland, Romania, United Kingdom.

Genus *Coelichneumon* Thomson, 1893

33. *Coelichneumon bilineatus* (Gmelin, 1790)

Material examined: Lorestan province, Noor-Abad, 2♀, August 2017.

General distribution: Austria, Belgium, Bulgaria, former Czechoslovakia, Finland, France, Germany, Hungary, Ireland, Japan, Netherlands, Poland, Portugal, Romania, Russia, Spain, Sweden, Switzerland, Ukraine, United Kingdom, former Yugoslavia.

Genus *Crypteffigies* Heinrich, 1961

34. *Crypteffigies pseudocryptus* (Wesmael, 1857)

Material examined: Kurdistan province, Bijar, 1♀, June 2011.

General distribution: Austria, Belgium, Finland, France, Germany, Italy, Korea, Poland, United Kingdom, former Yugoslavia.

Genus *Ctenichneumon* Thomson, 1894

35. *Ctenichneumon aterrimus* (Tischbein, 1879)

Material examined: Ardabil province, Bilehsavar (Anjirloo), 1♂, September 2010.

General distribution: Germany, Greece, Hungary, Poland, Romania, Russia.

Genus *Eupalamus* Wesmael, 1845

36. *Eupalamus oscillator* Wesmael, 1845

Material examined: Mazandaran province, Ramsar (Dalkhani forest), 1♀, May 2010.

General distribution: Austria, Azerbaijan, Belarus, Belgium, former Czechoslovakia, Finland, France, Germany, Hungary, Italy, Latvia, Netherlands, Poland, Romania, Russia, Sweden, Ukraine, United Kingdom.

Genus *Virgichneumon* Heinrich, 1977

37. *Virgichneumon tenuipes* (Berthoumieu, 1896)

Material examined: West Azerbaijan province, Makoo, 1♀, June 2006.

General distribution: Algeria, France, Germany, Hungary, Morocco, Portugal, Romania.

Subfamily Ophioninae Shuckard, 1840

Genus *Ophion* Fabricius, 1798

38. *Ophion similis* (Szépligeti, 1905)

Material examined: Khuzestan province, Gotvand, 214 m, 1♀, 1♂, April 2009.

General distribution: Egypt, Iraq, Israel, Libya, Tunisia, Turkey.

Subfamily Pimplinae Wesmael, 1845**Genus *Schizopyga* Gravenhorst, 1829****39. *Schizopyga circulator* (Panzer, 1800)**

Material examined: Markazi province, Shazand (Haji-Abad), 2♀, May 2016. *New record for Iran.*

General distribution: Austria, Belarus, Bulgaria, Canada, former Czechoslovakia, Finland, France, Germany, Hungary, Ireland, Japan, Lithuania, Moldova, Netherlands, Norway, Poland, Romania, Russia, Spain, Sweden, Turkey, USA, United Kingdom.

Subfamily Poemeniinae Narayanan and Lal, 1953**Genus *Neoxorides* Clement, 1938****40. *Neoxorides collaris* (Gravenhorst, 1829)**

Material examined: Chaharmahal and Bakhtiari province, Lordegan, 1♀, September 2010.

General distribution: Austria, Belarus, Belgium, China, Czech Republic, Finland, France, Germany, Hungary, Italy, Japan, Netherlands, Norway, Poland, Romania, Russia, Sweden, Switzerland.

Genus *Poemenia* Holmgren, 1859**41. *Poemenia brachyura* Holmgren, 1860**

Material examined: Mazandaran province, Savadkooh (Alasht), 1♀, May 2008. *New record for Iran.*

General distribution: Austria, Belarus, Belgium, former Czechoslovakia, Finland, France, Germany, Latvia, Mongolia, Netherlands, Norway, Poland, Romania, Russia, Sweden, Switzerland.

Subfamily Tersilochinae Schmiedeknecht, 1910**Genus *Barycnemis* Förster, 1869****42. *Barycnemis claviventris* (Gravenhorst, 1829)**

Material examined: Golestan province, Gorgan (Naharkhoran), 2♀, June 2016.

General distribution: Austria, Belgium, Czech Republic, Finland, France, Germany, Greenland, Hungary, Iceland, Kazakhstan, Latvia, Lithuania, Netherlands, Norway, Poland, Romania, Russia, Sweden, Ukraine, United Kingdom.

Subfamily Tryphoninae Shuckard, 1840**Genus *Eridolius* Förster, 1869****43. *Eridolius aurifluus* (Haliday, 1838)**

Material examined: Ardabil province, Bilehsavar (Anjirloo), 1♀, September 2010.

General distribution: Belarus, Belgium, Denmark, Finland, France, Germany, Hungary, Ireland, Kazakhstan, Mongolia, Netherlands, Poland, Russia, Sweden, Ukraine, United Kingdom.

Genus *Kristotomus* Mason, 1962

44. *Kristotomus pumilio* (Holmgren, 1857)

Material examined: Kerman province, Jiroft, 1♀, April 2014

General distribution: Austria, Belarus, Bulgaria, former Czechoslovakia, Finland, Germany, Italy, Latvia, Netherlands, Poland, Russia, Sweden, United Kingdom.

45. *Kristotomus ridibundus* (Gravenhorst, 1829)

Material examined: Fars province, Abadeh, 2♀, May 2011.

General distribution: Austria, Belarus, Belgium, China, former Czechoslovakia, Finland, France, Germany, Japan, Kazakhstan, Korea, Lithuania, Netherlands, Poland, Romania, Russia, Switzerland, Taiwan, United Kingdom.

Subfamily Xoridinae Shuckard, 1840

Genus *Odontocolon* Cushman, 1942

46. *Odontocolon spinipes* (Gravenhorst, 1829)

Material examined: Mazandaran province, Sari, (Pahneh-Kola), 1♀, October 2008.

General distribution: Austria, Belarus, former Czechoslovakia, Finland, France, Germany, Hungary, Latvia, Norway, Poland, Romania, Russia, Sweden, Switzerland.

Genus *Xorides* Latreille, 1809

47. *Xorides gracilicornis* (Gravenhorst, 1829)

Material examined: Kuhgiloyeh and Boyerahmad province, Dogonbadan, 750 m, 1♀, August 2006. *New record for Iran.*

General distribution: Belarus, Belgium, Bulgaria, Czech Republic, Finland, France, Germany, Hungary, Italy, Japan, Poland, Romania, Russia, Spain, Sweden, Turkey, Ukraine.

48. *Xorides irrigator* (Fabricius, 1793)

Material examined: Zanjan province, Abhar (Kabood-Cheshmeh), 2♀, August 2016. *New record for Iran.*

General distribution: Austria, Belarus, Belgium, Bulgaria, Czech Republic, Finland, France, Germany, Hungary, Italy, Moldova, Norway, Poland, Romania, Russia, Spain, Sweden, Switzerland, United Kingdom, former Yugoslavia.

49. *Xorides sepulchralis* (Holmgren, 1860)

Material examined: East Azerbaijan province, Azarshahr, 1♀, June 2017.

General distribution: Belarus, Bulgaria, China, former Czechoslovakia, Finland, France, Germany, Hungary, Italy, Japan, Poland, Romania, Russia, Sweden, former Yugoslavia.

DISCUSSION

The results of this faunistic paper and also other works on Iranian fauna indicate that the fauna of Iranian Ichneumonidae is very diverse and on the other hand unknown. In the faunistic survey, most specimens were collected from north and northwestern areas of Iran (Fig. 1). Totally, the fauna of Ichneumonidae was poorly studied in east and southern regions of Iran. Since ichneumonid wasps have efficient role in biocontrol programs in various ecosystems (Gupta, 1987, Quicke, 2015), conservation of these beneficial insects will result to suppression of agricultural pests' populations (Croft, 1990, De Bach & Rosen, 1991, Barbosa, 1998). Host species of most Iranian Ichneumonidae are unknown because nearly all the faunistic researches have been done upon collecting of adult wasps by traps not rearing of hosts. So investigations on parasitoid-host relationships of Iranian Ichneumonidae can be necessary research projects in order to determining of powerful parasitoids of destructive agricultural pests.

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