

Updated checklist of Iranian Euphorinae (Hymenoptera: Ichneumonoidea: Braconidae)

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Received: 24. August 2014 / Accepted: 06. November 2014 / Available online: 15. November 2015 / Printed: December 2015

Abstract. Euphorinae (Hymenoptera: Ichneumonoidea: Braconidae) recorded from different regions of Iran are listed. So far, 42 euphorine species belonging to 12 genera have been reported in Iran. The recorded genera are: *Allurus* Förster 1862 (two species) and *Centistes* Haliday 1835 (one species) from the tribe Centistini Capek 1970; *Dinocampus* Förster 1862 (one species) from the tribe Dinocampini Shaw 1985; *Chrysopophthorus* Goidanich 1948 (one species), *Leiophron* Nees 1819 (9 species), *Wesmaelia* Förster 1862 (one species) from the tribe Euphorini Förster 1862, *Meteorus* Haliday 1835 (12 species) and *Zele* Curtis 1832 (two species) from the tribe Meteorini Cresson 1887, *Elasmosoma* Ruthe 1858 (one species) from the tribe Neoneurini Bengtsson 1918, *Ecclitura* Kokujev 1902 (one species), *Perilitus* Nees 1819 (eight species) from the tribe Perilitini Förster 1862, and *Syntretus* Förster 1862 (three species) from the tribe Syntretini Shaw 1985. The present study provides a checklist of Euphorinae of Iran with data on species distribution in various provinces of Iran, as well as their general distribution. A map for distribution of species in various parts of Iran is provided.

Key words: checklist, Braconidae, Euphorinae, distribution, Iran.

Introduction

Members of the subfamily Euphorinae Förster 1862 are medium-sized wasps represented by 53 genera and 1198 species worldwide (Yu et al. 2012). This subfamily is a cosmopolitan lineage of the parasitoid wasps that use the adult, nymphal, and larval stages of various insects as their hosts. They are solitary, rarely gregarious, koinobiont endoparasitoids of Coleoptera, Hymenoptera, Lepidoptera, Neuroptera, Hemiptera, Psocoptera and Orthoptera (Van Achterberg 1976, Shaw & Huddleston 1991). Some species are considered as potential biological control agents against harmful insects (Shaw 2004, Yu et al. 2012). Complexity of Euphorinae taxonomy is well expressed by the variable number of recognized tribes in most recent studies. Yu et al. (2012) categorized 14 tribes (Centistini, Cosmophorini, Cryptoxilonini, Dinocampini, Euphorini, Helorimorphini, Meteorini, Myiocephalini, Neoneurini, Oncometeorini, Perilitini, Proclithrophorini, Syntretini, Tainitermini). Among them, members of seven tribes have been recorded in Iran. The first recorded species of *Leiophron* Nees, *Ecclitura* Kokujev and *Perilitus* Nees from Iran was made by Hedwig (1957). Aubert (1966) recorded species of *Meteorus* for the first time from Iran. Few other researchers have sporadically recorded some species of *Meteorus* in Iran (Herard et al. 1979, Abbasi-pour 2001, Nikdel et al. 2004). The genus *Zele* has been considered as a sister group to *Meteorus* (Van Achterberg 1979). Ghahari et al. (2009a) reported *Zele chlorophthalmus* (Spinola) from northern Iran. The genus *Allurus* was recorded by Ghahari et al. (2010a) and Farahani et al. (2013a). Bagheri (1998) recorded *Perilitus coccinellae* (Schrank), parasitoid of *Coccinella septempunctata* (Linnaeus 1758) in Isfahan for the first time. Other researchers have been studied the species of *Perilitus* from Iran (Bartlett et al. 1978, Arbab & McNeill 2001, Ghahari et al. 2010b). Recent faunistic studies on Euphorinae (Ghahari et al. 2009a, Lashkari- Bod et al. 2011, Ghahari & Fischer 2011b, Ghahari et al. 2012, Farahani et al. 2013a,b) have a great contribution in knowledge about this group. Recent published checklist of Braconidae of Iran (Fallahzadeh & Saghahi 2010) has included very few records of Euphorinae and not exactly presented the distributional data of the species. So it was necessary to prepare a complete and

updated checklist with distributional data of species in different provinces of Iran. The present study provides a checklist of Euphorinae of Iran with data on species distribution in various provinces of Iran, as well as their general distribution.

Materials and methods

The checklist contains species of the subfamily Euphorinae that have been recorded so far from Iran. It was prepared based on the reliable literatures on their biology: Davatchi & Shojai 1969, Bartlett et al. 1978, Herard et al. 1979, Haeselbarth 1983, Abbasi-pour 2001, Alizadeh & Javan Moghaddam 2004, Nikdel et al. 2004, Haeselbarth 2008, as well as the taxonomic and faunistic studies: Hedwig 1957, Aubert 1966, Van Achterberg 1980, Tobias 1986, Belokobylskij 1992, Modarres Awal 1997, Arbab & McNeill 2001, Ghahari et al. 2009a, 2010a,b, Fallahzadeh & Saghahi 2010, Ghahari et al. 2011, Ghahari & Fischer 2011a,b, Lashkari- Bod et al. 2011, Ghahari et al. 2012, Farahani & Talebi 2012, Farahani et al. 2012, 2013a, b, Sedighi et al. 2014. Nomenclature and distributional data are mainly taken from Yu et al. (2012). Species are grouped according to Tribe. Species distribution map was produced in different provinces of Iran.

Results

Among the 14 identified tribes, members of seven tribes have been recorded in Iran. Species distribution in different provinces of Iran is marked on Figure 1. Species listed in the report are as follows:

Tribe Centistini Capek 1970

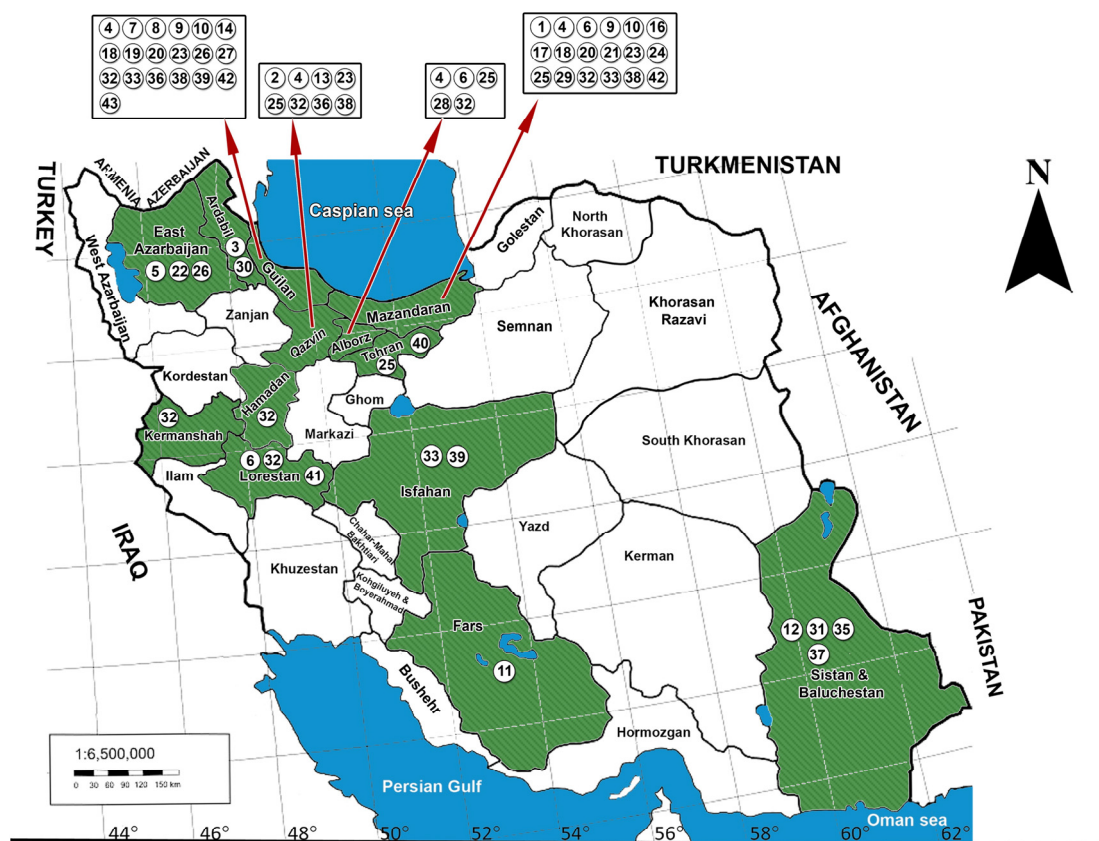
1. *Allurus lituratus* (Haliday 1835)

Distribution in Iran: Mazandaran province, Ghaemshahr, (September 2003) (Ghahari et al. 2010a).

General distribution: Eastern and Western Palaearctic, Nearctic, Oriental.

2. *Allurus muricatus* (Haliday 1833)

Distribution in Iran: Qazvin province, Zereskh Road (36°21'39.72"N, 50°03'55.26"E, 1541 m a.s.l., 24 May 2011, 08 June 2011, 21 June 2011)(Farahani et al. 2013a).



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| <ol style="list-style-type: none"> 1. <i>Allurus lituratus</i> 2. <i>Allurus muricatus</i> 3. <i>Centistes fuscipes</i> 4. <i>Dinocampus coccinellae</i> 5. <i>Chrysopophthorus hungaricus</i> 6. <i>Leiophron deficiens</i> 7. <i>Leiophron fascipennis</i> 8. <i>Leiophron heterocordylli</i> 9. <i>Leiophron pallidistigma</i> 10. <i>Leiophron palipes</i> 11. <i>Leiophron picipes</i> 12. <i>Leiophron pseudomitis</i> 13. <i>Leiophron relictus</i> 14. <i>Leiophron similis</i> | <ol style="list-style-type: none"> 15. <i>Meteorus alborossicus</i> 16. <i>Meteorus breviaentennatus</i> 17. <i>Meteorus cinctellus</i> 18. <i>Meteorus colon</i> 19. <i>Meteorus consimilis</i> 20. <i>Meteorus ictericus</i> 21. <i>Meteorus obsoletus</i> 22. <i>Meteorus pendulus</i> 23. <i>Meteorus pulchricornis</i> 24. <i>Meteorus rubens</i> 25. <i>Meteorus versicolor</i> 26. <i>Meteorus vexator</i> 27. <i>Zele albiditarsus</i> 28. <i>Zele chlorophthalmus</i> | <ol style="list-style-type: none"> 29. <i>Elasmosoma berlinense</i> 30. <i>Ecclitura primoris</i> 31. <i>Perilitus aethiops</i> 32. <i>Perilitus bicolor</i> 33. <i>Perilitus colesi</i> 34. <i>Perilitus flavobasalis</i> 35. <i>Perilitus foveolatus</i> 36. <i>Perilitus melanopus</i> 37. <i>Perilitus rutilus</i> 38. <i>Perilitus stelleri</i> 39. <i>Perilitus stenocari</i> 40. <i>Syntretus idalius</i> 41. <i>Syntretus ocellularis</i> 42. <i>Syntretus xanthocephalus</i> |
|---|--|---|

Figure 1. Distribution map for Euphorinae species in different provinces of Iran. The numbers on the map correspond to the species names which are listed.

General distribution: Western Palaearctic

3. *Centistes (Centistes) fuscipes* (Nees von Esenbeck 1834)
Distribution in Iran: Ardabil province (July 2002) (Ghahari & Fischer 2011a).

General distribution: Eastern and Western Palaearctic.

Tribe Dinocampini Shaw 1985

4. *Dinocampus coccinellae* (Schrank 1802)
Distribution in Iran: Mazandaran province (Ghahari et al. 2010a); Alborz province, Shahriar (35°40'08.01"N, 50°56'56.64"E, 1168 m a.s.l., 10 September 2010); Guilan province, Roodsar, Orkom (36°45'44.34"N, 50°18'11.88"E, 1201 m a.s.l., 24 October 2010); and Qazvin province, Zereshk Road (36°21'39.72"N, 50°03'55.26"E, 1541 m a.s.l., 09 May 2011) (Farahani et al. 2013a).

General distribution: Cosmopolitan.

Tribe Euphorini Förster 1862

5. *Chrysopophthorus hungaricus* (Kiss 1927)
Distribution in Iran: East Azarbaijan province, Arasbaran, Kaleibar, (07 September 2004) (Ghahari et al. 2009a).
General distribution: Eastern and Western Palaearctic, Oriental.

6. *Leiophron (Euphoriana) deficiens* (Ruthe 1856)
Distribution in Iran: Mazandaran province, Ghaemshahr (October 2007) (Ghahari & Fischer 2011b); Lorestan province, Borujerd (1637m, October 2009) (Ghahari et al. 2012); Alborz province, Karaj (35°46'20.16"N, 50°56'44.94"E, 1278 m.a.s.l., 14 June 2010, Shahriar, 35°40'08.01"N, 50°56'56.64"E, 1168m.a.s.l., 17 May 2010, 24 May 2010, 31 May 2010, 21 June 2010, 18 October 2010) (Farahani et al. 2013b).

General distribution: Eastern and Western Palaearctic, Oriental.

7. *Leiophron fascipennis* (Ruthe 1856)

Distribution in Iran: Guilan province, Roodsar, Ziaz, (36°52'34.44"N, 50°13'17.40"E, 537 m.a.s.l., 06 June 2010) (Farahani et al. 2013b).

General distribution: Eastern and Western Palaearctic, Nearctic, Oriental.

8. *Leiophron (Euphoriana) heterocordyli* Richards 1967

Distribution in Iran: Guilan province: Taleh (77m, 26 September 2007) (Ghahari & Fischer 2011b).

General distribution: Eastern and Western Palaearctic.

9. *Leiophron (Euphorus) pallidistigma* Curtis 1833

General distribution: Guilan provinces, Roodsar, Ziaz, (36°52'27.18"N, 50°13'24.78"E, 490 m.a.s.l., 07 June 2010, 13 June 2010; Roodsar, Orkom, 36°45'44.34"N, 50°18'11.88" E, 1201 m.a.s.l., 30 May 2010, 06 June 2010, 27 June 2010); and Mazandaran province, Noor, Tangeh-Vaz, (36°18'51.42"N, 52°07'48.00"E, 702 m.a.s.l., 21 June 2011, 27 June 2011) (Farahani et al. 2013b).

General distribution: Eastern and Western Palaearctic, Nearctic, Oriental.

10. *Leiophron (Peristenus) pallipes* Curtis 1833

Distribution in Iran: Guilan province, Roodsar, Orkom, (36°45'44.34"N, 50°18'11.88"E, 1201 m a.s.l., 16 May 2010), Ghazichak (36°45'52.62"N, 50°20'10.80"E, 1787 m a.s.l., 16 May 2010), Ziaz (36°52'27.18"N, 50°13'24.78"E, 490 m a.s.l., 30 May 2010); and Mazandaran province, Noor, Gaznasara (36°16'58.08"N, 52°10'55.62"E, 2013 m a.s.l., 28 April 2011; 09 May 2011; 25 May 2011, 06 June 2010) (Farahani et al. 2013a).

General distribution: Nearctic (Introduced), Oriental, Eastern and Western Palaearctic.

11. *Leiophron (Peristenus) picipes* (Curtis 1833)

Distribution in Iran: Fars province, Shiraz, (18 June 2007) (Lashkari- Bod et al. 2011).

General distribution: Eastern and Western Palaearctic, Oriental.

12. *Leiophron (Leiophron) pseudomitis* (Hedwig 1957)

Distribution in Iran: Sistan & Baluchestan province, (10 April 1954) (Hedwig 1957).

General distribution: Eastern Palaearctic.

13. *Leiophron (Peristenus) relictus* (Ruthe 1856)

Distribution in Iran: Qazvin province, Zereskh Road (36°25'23.88"N, 50°06'37.68"E, 1926 m a.s.l., 06 July 2011) (Farahani et al. 2013a).

General distribution: Europe, Western Palaearctic, introduced into the Nearctic.

14. *Leiophron (Euphorus) similis* Curtis 1833

Distribution in Iran: Guilan province, Roodsar, Ziaz (36°52'34.44"N, 50°13'17.40"E, 537 m.a.s.l., 06 June 2010) (Farahani et al. 2013b).

General distribution: Western Palaearctic.

15. *Wesmaelia petiolata* (Wollaston 1858)

Distribution in Iran: Recorded by Belokobylskij 1992 but the place is not clear.

General distribution: Eastern and Western Palaearctic, Nearctic, Oriental.

Tribe Meteorini Cresson 1887**16. *Meteorus alborossicus* Lobodenko 2000**

Distribution in Iran: Mazandaran province, Noor, Chamestan, Tangehvaz (36°18'51.42''N, 52°07'48.00''E, 702m a. s. l., 16 August 2011) (Farahani & Talebi 2012).

General distribution: Western Palaearctic.

17. *Meteorus brevi antennatus* Tobias 1986

Distribution in Iran: Mazandaran province, Noor, Chamestan, Tangehvaz (36°21'55.02''N, 52°06'10.74''E, 692m a. s. l., 08 June 2011, 28 June 2011) and Guilan province, Roodsar, Rahim abad, Orkom (36°45'44.34''N, 50°18'11.88''E, 1201m a. s. l., 25 July 2010, 02 August 2010, 23 August 2010, 29 August 2010, 20 September 2010) (Farahani & Talebi 2012).

General distribution: Eastern and Western Palaearctic, Oriental.

18. *Meteorus cinctellus* (Spinola 1808)

Distribution in Iran: Mazandaran province, Noor, Chamestan, Gaznasara (36°16'58.08''N, 52°10'55.62''E, 2013m a. s. l., 07 June 2011; Tangehvaz (36°21'55.02''N, 52°06'10.74''E, 692m a. s. l., 28 June 2011); and Guilan province, Roodsar, Rahim Abad, Orkom (36°45'44.34''N, 50°18'11.88''E, 1201m a. s. l., 25 October 2010) (Farahani & Talebi 2012).

General distribution: Western Palaearctic, Oriental.

19. *Meteorus colon* (Haliday 1835)

Distribution in Iran: Guilan province Astaneh Ashrafieh, Eshmankomachal (37°21'10.50''N, 49°57'56.16''E, 2m a. s. l., 01 June 2010; 27 April 2010; 18 October 2010; 25 October 2010; 01 November 2010); Guilan province, Astaneh Ashrafieh, Eshmankomachal (37°22'03.66''N, 49°57'57.84''E, -1m b. s. L., 27 September 2010) (Farahani & Talebi 2012).

General distribution: Eastern and Western Palaearctic, Oriental.

20. *Meteorus consimilis* (Nees 1834)

Distribution in Iran: Guilan province, Roodsar, Rahim abad, Ziaz (36°52'27.18''N, 50°13'24.78''E, 490 m a. s. l., 06 July 2010); and Mazandaran province, Noor, Chamestan, Tangehvaz (36°21'55.02''N, 52°06'10.74''E, 692m a. s. l., 26 July 2011) (Farahani & Talebi 2012).

General distribution: Eastern and Western Palaearctic.

21. *Meteorus ictericus* (Nees 1811)

Distribution in Iran: Mazandaran province, Noor, Chamestan, Tangehvaz (36°21'55.02''N, 52°06'10.74''E, 692m a. s. l., 16 August 2011) (Farahani & Talebi 2012).

General distribution: Australasian, Eastern and Western Palaearctic, Nearctic, Oriental.

22. *Meteorus obsoletus* (Wesmael 1835)

Distribution in Iran: East Azarbaijan province, Arasbaran forests, (1999-2003) (Nikdel et al. 2004).

General distribution: Eastern and Western Palaearctic, Oriental.

23. *Meteorus pendulus* (Muller 1776)

Distribution in Iran: Mazandaran province, Noor, Joorband (36°26'17.28''N, 52°07'13.62''E, 272m a. s. l., 26 September 2011; 10 October 2011; 05 November 2011), (36°26'15.54''N, 52°07'13.50''E, 275m a. s. l., 26 September 2011; 10 October

2011, 05 November 2011); Guilan province, Astaneh Ashrafieh, Eshmankomachal (37°22'03.66''N, 49°57'57.84''E, -1m b. s. l., 19 October 2010; 01 November 2010; 09 November 2010); Qazvin province Astaneh Ashrafieh, Eshmankomachal (37°21'10.50''N, 49°57'56.16''E, 2m a. s. l., 29 August 2010; 06 October 2010; 08 November 2010; 15 November 2010), Zereshk Road (36°21'43.02''N, 50°03'53.22''E, 1553m a. s. l., 22 June 2011) (Farahani & Talebi 2012).

General distribution: Eastern and Western Palaearctic, Nearctic, Oriental.

24. *Meteorus pulchricornis* (Wesmael 1835)

Distribution in Iran: Northern slopes of the Alborz Mountains, North Khorasan, Eastern Azarbaijan (Herard et al. 1979); Mazandaran province, Noor, Chamestan, Joorband (36°26'17.28''N, 52°07'13.62''E, 272m a. s. l., 05 November 2011) (Farahani & Talebi 2012).

General distribution: Australasian; Eastern and Western Palaearctic, Oriental.

25. *Meteorus rubens* (Nees 1811)

Distribution in Iran: Alborz province, Karaj (35°46'08.88''N, 50°56'55.20''E, 1277m a. s. l., 08 June 2010; 29 June 2010, Chalous Road, Shahrestanak (35°57'34.98''N, 51°22'20.34''E, 2305m a. s. l., 14 July 2010; 28 July 2010), Chalous Road, Arangeh (35°55'07.20''N, 51°05'09.24''E, 1891m a. s. l., 14 July 2010; 20 July 2010); Tehran province, Peykan Shahr, Botanic Gardan (35°44'19''N, 51°10'42''E, 1891m a. s. l., 18 May 2010; 08 June 2010); Mazandaran province, Noor, Chamestan, Gaznasara (36°16'56.82''N, 52°10'58.50''E, 2032m a. s. l., 28 June 2011; 13 July 2011; 16 August 2011), Chamestan, Tangehvaz (36°16'56.82''N, 52°10'58.50''E, 2032m a. s. l., 28 June 2011, 1♀; 16 August 2011), Chamestan, Joorband (36°26'15.54''N, 52°07'13.50''E, 275m a. s. l., 28 June 2011); and Qazvin province, Loshan (36°40'14.58''N, 49°25'38.52''E, 259m a. s. l., 25 May 2011; 09 June 2011), Zereshk Road (36°25'23.88''N, 50°06'37.68''E, 1926m a. s. l., 04 September 2011, 1♀; 11 October 2011), Koochin (36°22'14.22''N, 49°40'02.28''E, 1514m a. s. l., 10 May 2011) (Farahani & Talebi 2012).

General distribution: Australasian, Eastern and Western Palaearctic, Nearctic, Neotropical, Oriental.

26. *Meteorus versicolor* (Wesmael 1835)

Distribution in Iran: East Azarbaijan province, Arasbaran forests (1999-2003) (Nikdel et al. 2004); and Guilan province, Astaneh Ashrafieh, Eshmankomachal (37°21'10.50''N, 49°57'56.16''E, 2m a. s. l., 04 May 2010; 10 May 2010; 18 May 2010), (37°22'03.66''N, 49°57'57.84''E, -1m b. s. l., 18 May 2010) (Farahani & Talebi 2012).

General distribution: Australasian, Eastern and Western Palaearctic, Nearctic, Oriental.

27. *Meteorus vexator* (Haliday 1833)

Distribution in Iran: Guilan province, Roodsar, Rahim Abad, Ziaz (36°52'27.18''N, 50°13'24.78''E, 490m a. s. l., 31 May 2010), (36°52'34.44''N, 50°13'17.40''E, 537m a. s. l., 28 May 2010) (Farahani & Talebi 2012).

General distribution: Eastern and Western Palaearctic.

28. *Zelex albiditarsus* Curtis 1832

Distribution in Iran: Alborz province, Chalous Road, Shahrestanak (35°57'34.98''N, 51°22'20.34''E, 2305m a. s. l., 01 June 2010) (Farahani & Talebi 2012).

General distribution: Eastern and Western Palaearctic.

29. *Zelex chlorophthalmus* (Spinola 1808)

Distribution in Iran: Mazandaran province, Noor, Chamestan, Tangehvaz (36°21'55.02''N, 52°06'10.74''E, 692m a. s. l., 27 July 2011, 16 August 2011; 10 October 2011), Noor, Faculty of Natural Resources and Marine Sciences (36°34'52.98''N, 52°02'45.78''E, -14m b. s. l., 05 November 2011) (Farahani & Talebi 2012).

General distribution: Eastern and Western Palaearctic, Neotropical, Oriental.

Tribe Neoneurini Bengtsson 1918

30. *Elasmosoma berolinense* Ruthe 1858

Distribution in Iran: Ardabil province, Moghan (02 September 2006) (Ghahari et al. 2009b).

General distribution: Eastern and Western Palaearctic.

Tribe Perilitini Förster 1862

31. *Ecclitura primoris* Kokujev 1902

Distribution in Iran: Sistan & Baluchestan province (Hedwig 1957, Van Achterberg 1980, Haeselbarth 1983, Tobias 1986).

General distribution: Eastern and Western Palaearctic.

32. *Perilitus aethiopoidea* (Loan 1975)

Distribution in Iran: Qazvin province, Eghbali (22 April 2001); Hamadan province, Famenin (22 May 2001) (Arbab & McNeill 2001); Kermanshah province, (Wheat field, October 2003) (Ghahari et al. 2010b); Lorestan province, Chaghavandi (July 2009) (Ghahari et al. 2012); Alborz province, Chalous Road, Shahrestanak (35°58'16.26''N, 51°21'25.80''E, 2225 m a.s.l., 17 May 2010; 13 June 2010; 21 June 2010); Guilan province, Roodsar, Ghazichak (36°45'57.54''N, 50°19'35.22''E, 1803 m a.s.l., 16 May 2010; 23 May 2010; 06 June 2010; 13 June 2010; 21 June 2010; 27 June 2010; 05 July 2010; 24 July 2010; 01 August 2010; 15 August 2010; 21 August 2010; 03 October 2010; 10 October 2010; 17 October 2010; 24 October 2010), Roodsar, Orkom (36°45'44.34''N, 50°18'11.88''E, 1201 m a.s.l., 23 May 2010; 05 July 2010; 24 October 2010; 31 October 2010); Mazandaran province, Noor, Gaznasara (36°21'55.02''N, 52°06'10.74''E, 692 m a.s.l., 06 June 2011; 15 August 2011; 04 September 2011); and Qazvin province, Zereshk Road (36°21'39.72''N, 50°03'55.26''E, 1541 m a.s.l., 24 May 2011; 08 June 2011; 21 June 2011) (Farahani et al. 2013a).

General distribution: Cosmopolitan.

33. *Perilitus (Townesilitus) bicolor* (Wesmael 1835)

Distribution in Iran: Isfahan province, Ardestan (September 2005) (Ghahari et al. 2011); Guilan province, Roodsar, Ghazichak (36°45'57.54''N, 50°19'35.22''E, 1803 m a.s.l., 04 July 2010; 10 July 2010, Roodsar, Orkom (36°45'44.34''N, 50°18'11.88''E, 1201 m a.s.l., 16 May 2010); Mazandaran province, Noor, Gaznasara (36°21'55.02''N, 52°06'10.74''E, 692 m a.s.l., 09 October 2011) (Farahani et al. 2013a).

General distribution: Eastern and Western Palaearctic.

34. *Perilitus colesi* (Drea 1968)

Distribution in Iran: Recorded by Bartlett et al. 1978 but the exact locality is not clear.

General distribution: Eastern and Western Palaearctic, Nearctic.

35. *Perilitus foveolatus* Reinhard 1862

Distribution in Iran: Guilan province, Roodsar, Orkom (36°45'44.34"N, 50°18'11.88"E, 1201 m a.s.l., 03 October 2010; 17 October 2010), Roodsar, Ziaz (36°52'27.18"N, 50°13'24.78"E, 490 m a.s.l., 30 May 2010), Roodsar, Ghazichak (36°45'57.54"N, 50°19'35.22"E, 1803 m a.s.l., 17 October 2010); and Qazvin province, Zereshk Road (36°21'39.72"N, 50°03'55.26"E, 1541 m a.s.l., 24 May 2011; 08 June 2011) (Farahani et al. 2013a).

General distribution: Europe, Eastern and Western Palaearctic.

36. *Perilitus melanopus* (Ruthe 1856)

Distribution in Iran: Sistan & Baluchestan province, Zahedan, 29°23'33.2"N, 060°49'11.7"E, 1513m a.s.l.), Khash, 28°03'96.7"N, 060°56'39.4"E, 1409m a.s.l.) (Sedighi et al. 2014).

General distribution: Eastern and Western Palaearctic, Nearctic.

37. *Perilitus rutilus* (Nees 1811)

Distribution in Iran: Guilan province, Roodsar, Orkom (36°45'44.34"N, 50°18'11.88"E, 1201 m a.s.l., 06 June 2010; 13 June 2010; 21 June 2010; 05 July 2010), Roodsar, Ziaz (36°52'27.18"N, 50°13'24.78"E, 490 m a.s.l., 23 May 2010; 06 June 2010), Mazandaran province, Noor, Gaznasara (36°21'55.02"N, 52°06'10.74"E, 692 m a.s.l., 27 June 2011); and Qazvin province, Zereshk Road (36°21'39.72"N, 50°03'55.26"E, 1541 m a.s.l., 24 May 2011; 08 June 2011; 21 June 2011) (Farahani et al. 2013a).

General distribution: Europe, Nearctic (introduced), Eastern and Western Palaearctic.

38. *Perilitus (Microctonus) stelleri* (Loan 1972)

Distribution in Iran: Isfahan province, Najaf-Abad, Corn field, (August 2001) (Ghahari et al. 2010b); Guilan province, Roodsar, Orkom (36°45'44.34"N, 50°18'11.88"E, 1201 m a.s.l., 09 May 2010; 16 May 2011) (Farahani et al. 2013a).

General distribution: Eastern and Western Palaearctic.

39. *Perilitus stenocari* Haeselbarth 2008

Distribution in Iran: Tehran province (Haeselbarth 2008)

General distribution: Eastern and Western Palaearctic.

Tribe Syntretini Shaw 1985**40. *Syntretus idalius*** (Haliday 1833)

Distribution in Iran: Lorestan province, Sarab Doreh (1176m, July 2009) (Ghahari et al. 2012).

General distribution: Western Palaearctic.

41. *Syntretus (Syntretus) ocellaris* van Van Achterberg & Haeselbarth 2003

Distribution in Iran: Guilan province, Roodsar, Orkom (36°45'44.34"N, 50°18'11.88"E, 1201 m a.s.l., 17 May 2010); and Mazandaran province, Noor, Chamestan, Gaznasara (36°16'56.82"N, 52°10'58.50"E, 2032 m a.s.l., 27 June 2011) (Farahani et al. 2012).

General distribution: Eastern and Western Palaearctic.

42. *Syntretus (Syntretus) xanthocephalus* (Marshall 1887)

Distribution in Iran: Guilan province, Roodsar, Orkom (36°45'44.34"N,

50°18'11.88"E, 1201 m asl., 26 September 2010) (Farahani et al. 2012).

General distribution: Eastern and Western Palaearctic, Oriental.

Discussion

Eighteen euphorine species are reported in the Taxapad database (Yu et al. 2012) from Iran but according to the scattered faunistic studies on the subfamily Euphorinae currently 42 species belonging to this subfamily are recorded from this country. Faunistic studies have been done in neighboring countries. Comprehensive studies in Russia have been done (Belokobylskij 1993, 1996, 2000, Lobodenko 2000) and 179 species are reported (Yu et al. 2012). Fourty seven species are reported in the Taxapad database (Yu et al. 2012) from Turkey, while based on faunistic studies (Koldas et al. 2007, Çikman & Beyarslan 2009, Efil et al. 2009, Yilmaz et al. 2010, Güçlü & Özbek 2011, Koldas et al. 2013) currently there are 81 euphorine species in this country. Few studies (Shamim et al. 2007, Shamim 2013) have been carried out in India and based on Yu et al. (2012) there are 52 euphorine species in this country. After discovery of nine new species belonging to the genus *Streblocera* Westwood (Shamim 2013), the estimated number of species reaches to 61 species. No record of Eurphorinae has been documented (Yu et al., 2012) from Pakistan. On the other hand, based on few faunistic studies (Inayatullah & Karimullah 1996, Inayatullah 2002, Inayatullah & Naeem 2004, Tahira et al. 2013) there are 11 euphorine genera in Pakistan but no information is available on the number of species in this country. A few species are reported from other neighboring countries, Afghanistan (2 species), Iraq (1 species) and Saudi Arabia (1 species) (Yu et al. 2012). To date, based on recent faunistic studies there are 12 genera of Euphorinae in Iran: *Allurus* (two species), *Centistes* (one species), *Dinocampus* (one species), *Chrysopophthorus* (one species), *Leiophron* (nine species), *Wesmaelia* (one species), *Meteorus* (twelve species), *Zelee* (two species), *Elasmosoma* (one species), *Ecclitura* (one species), *Perilitus* (eight species) *Syntretus* Förster 1862 (three species). The greatest number of reported species belongs to the genus *Meteorus*, while many genera (*Centistes*, *Dinocampus*, *Chrysopophthorus*, *Elasmosoma*, *Ecclitura*, *Wesmaelia*) have only a single recorded species. Most species distributed mainly in Eastern Palaearctic and Oriental regions, while few species are cosmopolitan. They are either purposefully introduced (*Leiophron pallipes*, *Leiophron relictus*, *Perilitus rutilus*) or benefit from their opportunistic host range and/or host acceptance behavior (*Dinocampus coccinellae* (Schrank, 1802) (Loan & Holdaway 1961, Orr et al. 1992). The species of *Leiophron* have a cosmopolitan distribution (Chen & Van Achterberg 1997) and it is likely that other species of this genus occur in Iran (Farahani et al. 2013b). According to the literature, *Leiophron* and *Peristenus* are endoparasitoids of *Lygus* spp. in Europe (Loan & Shaw 1987, Hays 2004). The species of the

genus *Meteorus* are solitary or gregarious koinobiont endoparasitoids of the larvae of Lepidoptera and Coleoptera (Maeto 1990). Species of the genus *Syntretus* are small parasitoid wasps that attack adult Hymenoptera. Hosts are adult parasitoid wasps and adult bees (Hym.: Apoidea). Biology of the genus has been studied by Cole (1959) and Alford (1968). Like most other braconids, species of subfamily Euphorinae have been considered as important agents for biological control programs. There are few records of host associations for Euphorinae of Iran (Bagheri 1998, Arbab & McNeill 2001, Ghahari et al. 2010, Farahani et al. 2013), and worldwide (Clancy 1968, Loan 1980, Coulson 1987, Shaw & Huddleston 1991, Coulson 1994, Haeselbarth 1999, Haye 2004, Shaw 2004, Yu et al. 2012). Further taxonomic investigations together with host association data are necessary to increase the knowledge of diversity and applicability of this important group of braconid wasps in Iran.

Acknowledgements. This research was supported by Shahid Bahonar University of Kerman, Iran, which is greatly appreciated.

References

- Abbasipour, H. (2001): Report of endoparasitoid wasp, *Meteorus gyrtator* Thunberg (Hym.: Braconidae) on rice armyworm, *Mythimna unipuncta* Howarth from Iran. *Journal of Entomological Society of Iran* 20(2): 101-102.
- Aubert, J.F. (1966): Liste d'identification No. 6 (présentée par le service d'identification des Entomophages). *Entomophaga* 11(1): 115-134.
- Van Achterberg, C. van (1976): A preliminary key to the subfamilies of the Braconidae (Hymenoptera). *Journal of Tijdschrift Voor Entomologie* 119: 33-78.
- Van Achterberg, C. van. (1979): A revision of the subfamily Zelinae auctt. (Hym.: Braconidae). *Tijdschrift Voor Entomologie* 122: 241-479.
- Van Achterberg, C. van. (1980): Notes on some species of Braconidae (Hym.) described by Hedwig from Iran & Afghanistan. *Entomologische Berichten, Amsterdam* 40: 25-31.
- Alford, D.V. (1968): The biology and immature stages of *Syntretus splendidus* (Marshall) (Hymenoptera: Braconidae), a parasite of adult bumblebees. *Transactions of the Royal Entomological Society of London* 120: 375-393.
- Alizadeh, S., Javan Moghaddam, H. (2004): Introduction of some natural enemies of common cutworm (*Agrotis segetum* Schiff) in Miyandoab. pp. 45. In: *Proceedings of 16th Iranian Plant Protection Congress*, University of Tabriz.
- Arbab, A., McNeill, M. (2001): New report of *Microctonus aethiopoulos* (Hym., Braconidae) in Iran. *Journal of Entomological Society of Iran* 21: 111-112.
- Aubert, J.F. (1966): Liste d'identification No. 6 (présentée par le service d'identification des Entomophages). *Entomophaga* 11(1): 115-134.
- Bagheri, M.R. (1998): The first report of *Perilitus coccinellae* (Hym.: Braconidae) a parasitoid of *Coccinella septempunctata* in Isfahan. In: *Proceedings of 13th Iranian Plant Protection Congress*. Karaj: Tehran University, Iran.
- Bartlett, B.R., Clausen, C.P., Debach, P., Goeden, R.D., Legner, E.F., Mcmurtry, J.A., Oatman, E.R. (1978): *Introduced parasites and predators of arthropod pests and weeds: A world review*. Agricultural Research Service, United States Department of Agriculture. Agriculture Washington, District of Columbia, Handbook No. 480.
- Belokobylskij, S.A. (1992): *Wesmaelia & Syrrhizus* species (Hym.: Braconidae, Euphorinae) in the Far East. *Vestnik Zoologii* 3: 8-16. [in Russian]
- Belokobylskij, S.A. (1993): New taxonomic data on the braconid fauna (Hym.: Braconidae) of Vietnam. *Russian Entomological Journal* 2(2): 37-67.
- Belokobylskij, S.A. (1996): New and rare species of the subfamily Euphorinae (Hym.: Braconidae) from the Russian Far East. *Zoologische Verhandlungen* 70(20): 275-296.
- Belokobylskij, S.A. (2000): A new genus and subgenus of the subfamily Euphorinae (Hymenoptera: Braconidae) from East Asia. *Zoologische Mededelingen* 73(16): 255-267.
- Clancy, D.W. (1968): Distribution and parasitization of some *Lygus* spp. in western United States and central Mexico. *Journal of Economic Entomology* 61: 443-445.
- Çikman, E., Beyarslan, A. (2009): Four new parasitoid records of the subfamilies Euphorinae and Opiinae (Hym.: Braconidae) from the Adiyaman province of Turkey. *Turkish Journal of Zoology* 33: 367-370.
- Chen, X., Van Achterbergh, C. van (1997): Revision of the subfamily Euphorinae (excluding the tribe Meteorini Cresson) (Hym.: Braconidae) from China. *Zoologische Verhandlungen* 313(1): 1-217.
- Cole, L.R. (1959): On a new species of *Syntretus* Förster (Hym.: Braconidae) parasitic on an adult ichneumonid, with a description of the larva and notes on its life history and that of its host, *Phaeogenes invisor* (Thunberg). *Entomologist Monthly Magazine* 95: 18-21.
- Coulson, J.R. (1987): Studies on the biological control of plant bugs (Heteroptera: Miridae): an introduction and history, 1961-1983. pp. 1-12. In: Hedlund, R., Graham, H.M. (eds.), *Economic importance and biological control of Lygus and Adelphocoris in North America*; USDA-ARS-64.
- Coulson, J.R. (1994): Releases of beneficial organisms in the United States and Rerritories-1983; ARS-131. Agricultural Research Service, US Department of Agriculture, Washington, D.C.: 113 pp.
- Davatchi, A., Shojai, M. (1969): *Les hymenopteres entomophages de l'Iran (Etudes Faunistiques)*. Tehran University, Faculty of Agriculture, 107: 1-88.
- Efil, L., Güçlü, C., Belekobylskij, S.A. (2009): *Leiophron (Euphorus) deficiens* Ruthe (Hym.: Braconidae, Euphorinae), a parasitoid of *Campylomma diversicornis* (Reuter) (Heteroptera, Miridae) in Turkey. *Journal of the Entomological Research Society* 11(3):65-73.
- Fallahzadeh, M, Saghaei, N. (2010): Checklist of Braconidae (Insecta: Hymenoptera) from Iran. *Munis Entomology & Zoology* 5(1): 170-186.
- Farahani, S., Talebi, A.A. (2012): A review of the tribe Meteorini (Cresson 1887) (Hym.: Braconidae, Euphorinae) in Northern Iran, with eight new records. *Iranian Journal of Animal Biosystematics* 8(2): 133-153.
- Farahani, S., Talebi, A.A., Van Achterberg, C. van, Rakhshani, E. (2012): *Syntretus*, a genus of Euphorinae (Hym.: Braconidae) new for Iran, with first record of two species. *Journal of Crop Protection* 1: 173-179.
- Farahani, S., Talebi, A.A., Rakhshani, E. (2013a): A contribution to the knowledge of Euphorinae (Hym.: Braconidae), with six new records from Iran. *Journal of Entomological and Acarological Research* 45(e9): 43-51.
- Farahani, S., Talebi, A.A., Van Achterberg, C. van., Rakhshani, E. (2013b): Three new records of the genera *Leiophron* and *Euphorus* (Hym.: Braconidae: Euphorinae) from Iran. *Journal of Entomological Society of Iran* 33(2): 73-79.
- Ghahari, H., Fischer, M. (2011a): A contribution to the Braconidae (Hym.: Ichneumonoidea) from north-western Iran. *Calodema* 134: 1-6.
- Ghahari, H., Fischer, M. (2011b): A study on the Braconidae (Hym.: Ichneumonoidea) from some regions of Northern Iran. *Entomofauna* 32(8): 181-196.

- Ghahari, H., Fischer, M., Papp, J. (2011): A study on the braconid wasps (Hym.: Braconidae) from Isfahan province, Iran. *Entomofauna* 32(16): 261-270.
- Ghahari, H., Fischer, M., Çetin Erdoğan, Ö., Beyarslan, A., Havaskary, M. (2009a): A contribution to the knowledge of the Braconid-Fauna (Hym., Ichneumonoidea, Braconidae) of Arasbaran, Northwestern Iran. *Entomofauna* 30: 329-336.
- Ghahari, H., Gadallah, N.S., Çetin Erdoğan, Ö., Hedqvist, K.J., Fischer, M., Beyarslan, A., Ostovan, H. (2009b): Faunistic note on the Braconidae (Hym.: Ichneumonoidea) in Iranian cotton fields and surrounding grasslands. *Egyptian Journal of Biological Pest Control* 19: 115-118.
- Ghahari, H., Fischer, M., Çetin Erdoğan, Ö., Beyarslan, A., Ostovan, H. (2010a): A contribution to the braconid wasps (Hym.: Braconidae) from the forests of northern Iran. *Linzer biologische Beiträge* 42(1): 621-634.
- Ghahari, H., Fischer, M., Hedqvist, K.J., Erdoğan, Ö.Ç., Van Achterberg C. van, Beyarslan, A. (2010b): Some new records of Braconidae (Hym.) for Iran. *Linzer Biologische Beiträge* 42: 1395-1404.
- Ghahari, H., Fischer, M., Papp, J., Tobias, V.I. (2012): A contribution to the knowledge of Braconidae) from Lorestan province, Iran. *Entomofauna* 7: 65-72.
- Güçlü, C., Özbek, H. (2011): A Contribution to the Knowledge of Euphorinae (Hym., Braconidae) from Turkey. *Journal of Entomological Research Society* 13(2): 61-70.
- Haeselbarth, E. (1983): Determination list of entomophagous insects. Nr. 9. *Bulletin. Section Regionale Ouest Palaearctique, Organisation Internationale de Lutte Biologique* 6 (1): 22-23.
- Haeselbarth, E. (1999): Zur Braconiden-Gattung *Perilitus* Nees 1818. Beitrag: Die Arten mit ausgebildetem ersten Cubitus-Abschnitt (Insecta, Hym.: Braconidae). *Mitteilungen der Münchner Entomologischen Gesellschaft* 89: 11-46.
- Haeselbarth, E. (2008): Zur Braconiden-Gattung *Perilitus* Nees 1818 3. Beitrag: die Arten ohne ausgebildetem ersten Cubitus-Abschnitt (Hym.: Braconidae). *Linzer Biologische Beiträge* 40(2):1013-1152.
- Haye, T. (2004): Studies on the ecology of European *Peristenus* spp. (Hym.: Braconidae) and their potential for the biological control of *Lygus* spp. (Hemiptera: Miridae) in Canada. PhD. dissertation. University of Kiel, Kiel: 182 pp.
- Hedwig, K. (1957): Ichneumoniden und Braconiden aus dem Iran 1954 (Hym.).(Ergebnisse der entomologischen Reisen Willi RICHTER, Stuttgart, im Iran 1954 und 1956- No.10). *Jahreshefte des Vereins für vaterländische Naturkunde in Württemberg* 112: 104-117.
- Herard, F., Mercadier G., Abai, M. (1979): Situation de *Lymantria dispar* (Lep.: Lymantriidae) et son complexe parasitaire en Iran, en 1976. *Entomophaga* 24(4): 371-384.
- Inayatullah, M. (2002): The genera of the subfamily Euphorinae collected in NWFP-Pakistan. *Sarhad Journal of Agriculture* 18(2): 225-230.
- Inayatullah, M., Karimullah, (1996): A preliminary key to the subfamilies of Braconidae (Hymenoptera) of the NWFP. *Sarhad Journal of Agriculture* 12: 667-677.
- Inayatullah, M., Naeem, M. (2004): Some new records and a key to the identification of subfamilies of Braconidae (Hym.) collected in the NWFP, Pakistan. *Pakistan Journal of Zoology* 36(3): 193-200.
- Koldaş, T., Aydoğdu, M., Beyarslan, A. (2007): Euphorinae (Hym.: Braconidae) fauna from the Thrace region of Turkey. *Linzer Biologische Beiträge* 39(1):441-450.
- Koldaş, T., Aydoğdu, M., Beyarslan, A. (2013): New taxonomic and faunistic data on the subfamily Euphorinae Förster, 1862 of Turkey (Hymenoptera: Braconidae). *Journal of Entomological Research Society* 15(2): 21-35.
- Lashkari-Bod, A., Rakhshani, E., Talebi, A.A., Lozan, A., Žikić, V. (2011): A contribution to the knowledge of Braconidae (Hym.: Ichneumonoidea) of Iran. *Biharean Biologist* 5: 147-150.
- Loan, C.C. (1980): Plant bug hosts (Hym., Miridae) of some Euphorine parasites (Hym.: Braconidae) near Belleville, Ontario, Canada. *Le Naturaliste Canadien* 107: 87-93.
- Loan, C.C., Holdaway, D.C. (1961): *Microctonus aethiops* (Nees) auctt. and *Perilitus rutilus* (Nees) (Hym.: Braconidae), European parasites of *Sitona* weevils (Coleoptera: Curculionidae). *The Canadian Entomologist* 93: 1057-1079.
- Loan, C.C., Shaw, S.R. (1987): Euphorine parasites of *Lygus* and *Adelphocoris* (Hym., Braconidae and Heteroptera: Miridae). pp. 60-74. In: Hedlund, R. C., Graham, H. M. (eds.) *Economic importance and biological control of Lygus and Adelphocoris in North America*. 95 pp, United States Department of Agriculture, Agricultural Research Service, 64 (USDA-ARS-64).
- Lobodenko, Yu. S. (2000): Two new species of the genus *Meteorus* Haliday 1835 (Hym.: Braconidae: Euphorinae) from Russian Far East and Belarus. *Far Eastern Entomologist* 91: 6-9.
- Maeto, K. (1990): Systematic studies on the tribe Meteorini (Hym., Braconidae) from Japan, VII, The groups of *Meteorus ictericus* and *M. rubens*. *Japanese Journal of Entomology* 58: 81-94.
- Modarres Awal, M. (1997): Family Braconidae (Hymenoptera). pp. 265-267. In: Modarres Awal, M. (ed.), *List of agricultural pests and their natural enemies in Iran*. Ferdowsi University Press.
- Nikdel, M., Sadeghian, B., Dordaei, M. (2004): Collection and identification of brown-tail moth's natural enemies in Arasbaran forest. pp 1-5. In: *The Joint Agriculture and Natural Resources Symposium, Tabriz, Ganja*.
- Orr, C.J., Obyrcki, J.J., Flanders, R.V. (1992): Host acceptance behaviour of *Dinocampus coccinellae* (Hymenoptera: Braconidae). *Annals of the Entomological Society of America* 85: 722-730.
- Sedighi, S., Madjdzadeh, S.M., Rakhshani, E. (2014): A survey on Alysiniinae (Hym., Braconidae) associated with Alfalfa in central part of Sistan & Baluchistan province. *Third Integrated Pest Management Conference (IPMC), Kerman: Shahid Bahonar University, Kerman, Iran*.
- Shamim, M. (2013): The genus *Streblocera* Westwood (Hym.: Braconidae: Euphorinae) from India, with descriptions of 9 new species. *Turkish Journal of Zoology* 37(4): 385.
- Shamim, M., Ahmad, Z., Samiudin, A. (2007): Description of a new species of *Wesmaelia* Förster (Hym.: Braconidae) from India. *Biosystematica* 1(1): 37-40.
- Shaw, S.R. (2004): Essay on the evolution of adult-parasitism in the subfamily Euphorinae (Hym., Braconidae). *Proceedings of the Russian Entomological Society* 75(1): 82-95.
- Shaw, M.R., Huddleston, T. (1991): Classification and biology of Braconid Wasps (Hym., Braconidae). *British Museum of Natural History, London*.
- Tahira, Q.A., Ahmad, S., Inayatullah, M., Sabahatullah, M., Sarhad, J. (2013): Some new records of the genera of subfamily Euphorinae (Hym.: Braconidae) from Khyber Pakhtunkhwa a province of Pakistan. *Sarhad Journal of Agriculture* 29(4): 551- 555.
- Tobias, V.I. (1986): Subfamily Euphorinae; pp. 1- 501. In: Medvedev, G.S. (ed.), 'Opredelitel Nasekomykh Evrospeiskoi Tsasti SSSR 3, Peredpntdatokrylye 4. Opr. Faune SSSR.
- Yilmaz, T., Aydogdu, M., Beyarslan, A. (2010): The distribution of Euphorinae wasps (Hym.: Braconidae) in Turkey, with phytogeographical notes. *Turkish Journal of Zoology* 34: 181-194.
- Yu, D.S.K., Van Achterberg, C. van, Horstmann, K. (2012): *Ichneumonoidea 2011 (Biological and taxonomical information)*. Taxapad Interactive Catalogue, Ottawa. Retrieved from <www.taxapad.com>, accessed at: 2014.08.20.