

Contribution on the Knowledge of Ichneumonidae (Hymenoptera) in the Northern Part of Sistan and Baluchistan Province, Iran

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Abstract: A survey was performed during 2010-2011 to investigate the fauna of Ichneumonidae (Hymenoptera) at Sistan and Baluchistan province (Eastern Iran). Totally, 16 species belonging to 15 genera and 6 subfamilies were identified, of which three genera including *Atractodes* GRAVENHORST, 1829 (Cryptinae), *Enizemum* Förster, 1869 and *Promethes* Förster, 1869 (Diplazontinae) as well as four species including *Diadegma hispanicum* Horstmann, 1973, *Enizemum ornatum* (Gravenhorst, 1829) and *Promethes sulcator* (Gravenhorst, 1829) and *Gelis fidens* Schwarz, 2009 are newly recorded for the fauna of Iran. The general distributions of the newly recorded species are briefly discussed. The primary evidences indicate a rich fauna of Ichneumonidae at this lowland area.

Key words: Ichneumonidae, fauna, new records, Iran, Sistan and Baluchistan

Introduction

The family Ichneumonidae is an extremely large group of insect with about 60 000 estimated species and 42 subfamilies (TOWNES 1969, CORUH, ÖZBEK 2005). Due to their high diversity and difficulties in determination of the species, our knowledge of many taxa in this group remains incomplete (RIEDEL, HANSEN 2007).

The ichneumonids are parasitoids of various insect orders including Lepidoptera, Hymenoptera, Diptera, Coleoptera and even reared from spiders and other arthropod groups (CORUH, KOLAROV 2010a, b). They are believed to be more abundant and diverse in the temperate regions than in tropical areas (LASALLE, GAULD 1993).

Only ten species of different subfamilies in-

cluding Anomaloninae (KOLAROV, GHAHARI 2005), Cryptinae (KOLAROV, GHAHARI 2007), Ichneumoninae (KOLAROV, GHAHARI 2008) and Tryphoninae (KOLAROV, GHAHARI 2006) have been reported from Sistan and Baluchistan province comparing total number of 502 species recorded from Iran (BARAHOEI *et al.* 2013). In the present paper, the fauna of Ichneumonidae at the northern part of Sistan and Baluchistan province was studied.

Material and Methods

The specimens were collected using a standard sweeping net on various vegetation at different places

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in northern part of Sistan and Baluchistan province. The collected specimens were clipped from the net using an aspirator and dropped directly into ethanol 96%, then dried, pinned, labeled, mounted and put into collection boxes, subsequently. Identifications were made based on the subfamilies: Cryptinae by MARTIN SCHWARZ, Ichneumoninae by MATTHIAS RIEDEL, Anomaloninae, Campopleginae, Pimplinae and Diplazontinae by Dmitriy R. Kasparyan. A duplicated series of all specimens were deposited in the Insect Collection of H. B., at Zabol University, Iran.

Results

Sixteen species of Ichneumonidae in total are reported here of which four genera and three species are newly recorded for the fauna of Iran, indicated by an asterisk (*). The list of the taxa arranged alphabetically.

Abbreviations: F. G. – Fatemeh Golimahmoodi; H. B. – Hossein Barahoei; M. P. – Mahdyeh Poodineh; N. K. – Nahid Khajeh; Z. S. – Zahra Shahraki.

Subfamily Anomaloninae FÖRSTER, 1869

Tribe Gravenhorstiini ENDERLEIN, 1912

Barylypa amabilis (TOSQUINET, 1900)

Material examined: on *Cardaria draba* (L.) Desv., 1♂, Zahak, 09. IV. 2010, leg. H. B.; on *Medicago sativa* L., 2♀ 1♂, Dust Mohammad, 11. II. 2010, leg. N. K.

Subfamily Campopleginae FÖRSTER, 1869

Tribe Campoplegini FÖRSTER, 1869

Diadegma hispanicum HORSTMANN, 1973*

Material examined: on *Medicago sativa* L., 3♀, Zahak, 07. III. 2010, leg. N. K.

Diadegma semiclausum (HELLÉN, 1949)

Material examined: on *Medicago sativa* L., 1♀, Mohammad Abad, 03. III. 2010, leg. H. B.; 1♀, Loutak, 16. IV. 2010, leg. H. B.; 1♀ 1♂, Zabol, 10. III. 2010, leg. H. B.; 4♀, Zahak, 07. III. 2010, leg. N. K.; 1♂, Zahak, 09. IV. 2010, leg. N. K.

Sinophorus xanthostomus (GRAVENHORST, 1829)

Material examined: on *Althea* sp., 1♀, Zahak, 13. III. 2010, leg. N. K.; on *Cyperus* sp., 1♂, Jazinak, 22. IV. 2010, leg. Z. S.; on *Medicago sativa* L., 2♂, Dust Mohammad, 07. V. 2010, leg. N. K.; 1♀ 1♂, Dust Mohammad, 02. XI. 2010, leg. N. K.; 5♀ 7♂, Kooh-e-Khajeh, 07. III. 2010, leg. N. K.; 1♀, Kooh-e-Khajeh, 31. V. 2010, leg. Z. S.; 1♂, Mohammad

Abad, 23. IV. 2010, leg. H. B.; 1♀, Mohammad Abad, 05. V. 2010, leg. N. K.; 1♂, Mohammad Abad, 06. V. 2010, leg. N. K.; 1♀, Zabol, 10. III. 2010, leg. N. K.; 4♂, Zabol, 21. IV. 2010, leg. N. K.; 3♂, Zabol, 28. X. 2011, leg. F. G.; 3♀ 1♂, Zabol, 02. V. 2011, leg. N. K.; 2♂, Zahak, 07. III. 2010, leg. N. K.; 1♂, Zahak, 18. IV. 2010, leg. Z. S.; 1♂, Zahak, 20. VIII. 2010, leg. Z. S.; 4♀ 11♂, Zahak, 15. XI. 2010, leg. Z. S.

Subfamily Cryptinae KIRBY, 1837

Tribe Cryptini KIRBY, 1837

Cryptus inculcator (LINNAEUS, 1758)

Material examined: on *Cardaria draba* (L.) Desv., 1♂, Zahak, 09. IV. 2011, leg. H. B.; on *Medicago sativa* L., 2♂, Dust Mohammad, 02. XI. 2010, leg. N. K.; 2♀, Mohammad Abad, 07. V. 2010, leg. N. K.; 1♀, Zabol, 12. IV. 2011, leg. M. P.; on *Tamarix* sp., 2♀, Zabol, 10. III. 2010, leg. H. B.; 1♂, Zabol, 02. V. 2011, leg. N. K.

Hoplocryptus heliophilus (TSCHEK, 1871)

Material examined: on *Medicago sativa* L., 1♂, Mohammad Abad, 07. V. 2010, leg. N. K.

Tribe Phygadeuontini FÖRSTER, 1869

Atractodes sp.*

Material examined: on *Medicago sativa* L., 1♂, Zahak, 20. VIII. 2010, leg. N. K.

Dichrogaster saharator (AUBERT, 1964)

Material examined: on *Anthemis persica* Boiss., 1♂, Zahak, 10. III. 2011, leg. N. K.; on *Medicago sativa* L., 1♂, Jazinak, 05. V. 2010, leg. H. B.; 1♀ 1♂, Jazinak, 06. V. 2010, leg. N. K.; 1♂, Jazinak, 27. X. 2010, leg. N. K.; 1♀, Mohammad Abad, 22. III. 2011, leg. H. B.; 2♂, Mohammad Abad, 04. V. 2011, leg. H. B.; 1♂, Zahak, 15. XI. 2010, leg. Z. S.; on *Tamarix* sp., 1♀, Mohammad Abad, 22. IV. 2010, leg. H. B.; 1♀, Mohammad Abad, 02. IV. 2011, leg. H. B.

Gelis fidens SCHWARZ, 2009*

Material examined: on *Tamarix* sp., 1♀, Zahak, 29. III. 2010, leg. H. B.

Subfamily Diplazontinae VIERECK, 1918

Tribe Diplazontini VIERECK, 1918

Diplazon laetatorius (FABRICIUS, 1781)

Material examined: on *Acroptilon repens* (L.) DC., 3♀, Mohammad Abad, 09. IV. 2010, leg. H. B.; on *Alhagi persarum* Boiss. & Buhse., 1♀, Mohammad Abad, 06. IV. 2010, leg. H. B.; on *Cardaria draba* (L.) Desv., 1♀, Jazinak, 09. IV.

2011, leg. H. B.; 1♀, Mohammad Abad, 02. IV. 2010, leg. H. B.; 2♀, Zahak, 09. III. 2010, leg. N. K.; on *Brassica rapa* L., 2♀, Zabol, 06. III. 2010, leg. N. K.; 1♀, Zabol, 28. X. 2010, leg. N. K.; on *Hordeum* sp., 1♀, Loutak, 16. IV. 2010, leg. H. B.; 2♀, Mohammad Abad, 02. IV. 2010, leg. H. B.; on *Medicago sativa* L., 1♀, Adimi, 12. IV. 2011, leg. M. P.; 2♀, Bonjar, 16. X. 2010, leg. M. P.; 1♀, Bonjar, 07. IV. 2011, leg. H. B.; 8♀, Doust Mohammad, 02. XI. 2010, leg. N. K.; 3♀, Jazinak, 05. V. 2010, leg. H. B.; 4♀, Jazinak, 06. V. 2010, leg. N. K.; 3♀, Jazinak, 13. III. 2011, leg. M. P.; 3♀, Kooch-e-Khajeh, 07. III. 2010, leg. N. K.; 7♀, Mohammad Abad, 02. IV. 2010, leg. H. B.; 2♀, Mohammad Abad, 16. IV. 2010, leg. H. B.; 2♀, Mohammad Abad, 11. III. 2011, leg. H. B.; 2♀, Mohammad Abad, 13. III. 2011, leg. H. B.; 9♀, Mohammad Abad, 23. III. 2011, leg. H. B.; 5♀, Mohammad Abad, 04. IV. 2011, leg. H. B.; 3♀, Mohammad Abad, 08. IV. 2011, leg. H. B.; 2♀, Zabol, 10. III. 2010, leg. N. K.; 2♀, Zabol, 06. IV. 2010, leg. N. K.; 1♀, Zabol, 23. VII. 2010, leg. N. K.; 5♀, Zabol, 06. XI. 2010, leg. N. K.; 1♀, Zabol, 14. III. 2011, leg. N. K.; 6♀, Zahak, 07. III. 2010, leg. N. K.; 2♀, Zahak, 15. XI. 2010, leg. Z. S.; 1♀, Zahak, 16. XI. 2010, leg. N. K.; 1♀, Zahak, 22. XII. 2010, leg. N. K.; on medicinal plants, 1♀, Zahak, 09. XI. 2010, leg. N. K.; on *Melilotus* sp., 1♀, Jazinak, 11. III. 2011, leg. H. B.; in mixed fields, 1♀, Jazinak, 13. III. 2011, leg. M. P.; on *Sonchus* sp., 4♀, Mohammad Abad, 23. III. 2011, leg. H. B.; on *Triticum aestivum* L. em. Thell, 6♀, Zahak, 20. IV. 2010, leg. N. K.; Wineyard, 1♀, Zabol, 05. V. 2010, leg. N. K.

Enizemum ornatum* (GRAVENHORST, 1829)

Material examined: on *Brassica rapa* L., 1♂, Zabol, 06. III. 2010, leg. N. K.; on *Cardaria draba* (L.) Desv., 1♂, Mohammad Abad, 02. IV. 2010, leg. H. B.; on medicinal plants, 1♂, Zahak, 09-XI-2010, leg. N.K.; on *Hordeum* spp., 2♀, Mohammad Abad, 09. IV. 2010, leg. H. B.; on *Medicago sativa* L., 1♀ 1♂, Bonjar, 21. II. 2011, leg. H. B.; 5♂, Doust Mohammad, 11. II. 2010, leg. Z. S.; 6♀ 3♂, Doust Mohammad, 02. XI. 2010, leg. Z. S.; 1♂, Jazinak, 06. V. 2010, leg. N. K.; 2♂, Jazinak, 07. V. 2010, leg. Z. S.; 1♀, Jazinak, 11. III. 2011, leg. H. B.; 1♀ 1♂, Kooch-e-Khajeh, 07. III. 2010, leg. N. K.; 1♂, Loutak, 16. IV. 2010, leg. H. B.; 1♀ 1♂, Mohammad Abad, 02. IV. 2010, leg. H. B.; 1♂, Mohammad Abad, 09. IV. 2010, leg. H. B.; 2♂, Mohammad Abad, 22. IV. 2010, leg. H. B.; 1♂, Mohammad Abad, 06. V. 2010,

leg. N. K.; 1♀ 1♂, Mohammad Abad, 13. III. 2011, leg. H. B.; 2♂, Mohammad Abad, 22. III. 2011, leg. H. B.; 3♂, Mohammad Abad, 02. IV. 2011, leg. H. B.; 1♀ 2♂, Mohammad Abad, 04. IV. 2011, leg. H. B.; 1♂, Mohammad Abad, 08. IV. 2011, leg. H. B.; 1♂, Zabol, 10. III. 2010, leg. N. K.; 3♀, Zabol, 06. XI. 2010, leg. Z. S.; 2♂, Zahak, 07. III. 2010, leg. N. K.; 2♀ 2♂, Zahak, 10. XI. 2010, leg. N. K.; 1♂, Zahak, 22. XII. 2010, leg. N. K.; 1♀, Zahak, 10. III. 2011, leg. H. B.; on *Tamarix* sp., 5♂, Mohammad Abad, 22. IV. 2010, leg. H. B.; 1♂, Mohammad Abad, 02. IV. 2011, leg. H. B.

Promethes sulcator* (GRAVENHORST, 1829)

Material examined: on *Medicago sativa* L., 3♂, Zabol, 21. IV. 2010, leg. N. K.; 1♀ 1♂, Zabol, 02. V. 2011, leg. N. K.; 1♂, Zabol, 23. VII. 2011, leg. N. K.

Subfamily Ichneumoninae LATREILLE, 1802

Tribe Phaeogenini FÖRSTER, 1869

***Diadromus collaris* (GRAVENHORST, 1829)**

Material examined: on *Medicago sativa* L., 10♀, Zahak, 27. X. 2010, leg. N. K.

Subfamily Pimplinae WESMAEL, 1845

Tribe Ephialtini HELLÉN, 1915

***Liotryphon* sp.**

Material examined: on *Tamarix* sp., 1♂, Zahak, 10. IV. 2010, leg. Z. S.

Tribe Pimplini WESMAEL, 1845

***Itopectis tunetana* (SCHMIEDEKNECHT, 1914)**

Material examined: on *Medicago sativa* L., 1♀, Zahak, 01. III. 2010, leg. H. B.

***Pimpla contemplator* (MÜLLER, 1776)**

Material examined: on *Medicago sativa* L., 1♂, Zahak, 27. X. 2010, leg. N. K.

Discussion

A total of 6 subfamilies, 15 genera and 16 species were identified and recorded from Sistan region as a representative a lowland area at eastern part of Iran. We recorded three genera and two species as new records for the fauna of Iran. *D. hispanicum* from the subfamily Campopleginae is a solitary koinobiont endoparasitoids mostly attacking Lepidoptera. In Central Asia, it has previously been recorded from Turkey (ÖZBEK *et al.* 2000). The genus *Atractodes* GRAVENHORST, 1829 from the subfamily Cryptinae is reported here for first time from Iran. This ge-

Table 1. Comparison of the number of recorded species belonging to different subfamilies of Ichneumonidae in the present study with previous records from Iran.

Subfamilies	Previously recorded species	Collected species from Sistan & Baluchistan province	Newly recorded species	Total number of recorded species in Iran
Acaenitinae	8	0	0	8
Anomaloninae	11	1	0	11
Banchinae	10	0	0	10
Brachycyrtinae	1	0	0	1
Campopleginae	35	3	1	36
Collyriinae	1	0	0	1
Cre mastinae	22	0	0	22
Cryptinae	93	5	1	94
Ctenopelmatinae	9	0	0	9
Cyllocerinae	1	0	0	1
Diplazontinae	5	3	2	7
Hybrizontinae	1	0	0	1
Ichneumoninae	160	1	0	160
Mesochorinae	1	0	0	1
Metopiinae	7	0	0	7
Ophioninae	19	0	0	19
Orthocentrinae	1	0	0	1
Orthopelmatinae	1	0	0	1
Phrudinae	2	0	0	2
Pimplinae	60	3	0	60
Rhyssinae	3	0	0	3
Tersilochinae	4	0	0	4
Tryphoninae	43	0	0	43
Xoridinae	2	0	0	2
Total	498	16	4	502

nus distributed in Ethiopian and Holarctic regions (WAHL, 1993). *G. fidens* is another newly recorded species of Cryptinae that has recently been described from Eastern Palaearctic region (SCHWARZ 2009). Two newly recorded species from the subfamily Diplazontinae including *E. ornatum* and *P. sulcator* are widely distributed in Holarctic region (YU *et al.* 2005, KOLAROV 1995, 2007). Both species are representative of two newly recorded genera from Iran. First species was reared from the puparia of *Scaeva albomaculata* (MACQUART, 1842) (Diptera, Syrphidae) in the course of this studies. *P. sulcator* is

parasite of *Oscinella frit* (LINNAEUS, 1758) (Diptera, Chloropidae) (NARTSHUK 2006). Further investigations together with biological data and host associations for several years are needed to reveal the faunal complex of this large group of insects even at this isolated lowland territory as well as other part of the country with extremely different climatic and biogeographical situations.

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Atlas of the Gobies (Gobiidae) in Bulgaria

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Sofia, Ed. IBEI-BAS, 112 p. In English and Bulgarian. ISBN 978-954-9746-29-7.

The last monograph written about the Bulgarian gobies appears more than 40 years ago. In the new book the most recent data for this group are present, based on the original results of the investigations of the authors. The project was financed by MEYS-Bulgarian Science Fund.

Three new species for the Bulgarian fish gobiid fauna have been discovered and described in the book: *Neogobius eurycephalus*, *Pomatoschistus marmoratus* and *Pomatoschistus bathi*. Two other species, treated so far as extinct for the Bulgarian fauna, were re-established: *Benthophiloides brauneri* and *Chromogobius quadrivittatus*.

Description of the species is accomplished in alphabetical order according to the Latin name. The list of synonyms contains the most commonly mentioned names in the Bulgarian and foreign literature. Description of the most common and some distinguishing morphological features of every species is presented: number of vertebrae and transverse scale rows on body (squama), number of rays in different fins (D1=first dorsal, D2=second dorsal, A=anal, P=pectoral, V=ventral or pelvic disc, C=caudal), cephalic lateral line system (geni-pores), coloration and others. Description has been accomplished on own material, there have been also used for comparison the guides of Gheorghiev (1966), Miller (2004), Kotellat & Freyhof (2007) and Vasil'eva (2007). A brief species identification key is also given.

The part Biology/Ecology includes some characteristic features, such as fecundity, size, food, preferred habitats etc.

The gobiid distribution in Bulgaria has been illustrated on the applied maps according to 3 chronological periods: before 50's from 50's till 2000 and more recently from 2000.

The Distribution part includes remarks on worldwide, Black Sea and particularly distribution in Bulgaria.

The species conservation status is submitted according to the international and national legislation (IUCN, Black Sea Red Data Book, Red data Book of the Republic of Bulgaria). Some data about the exploitation of each species in Black Sea is given on the basis of estimates made by market sampling, scientific trawler, trap and gill net sampling, underwater transect censuses and fishermen's inquiries.

The monograph is illustrated with original underwater photographs of the observed species, as well as original drawings of the sensory system, which is species specific and important for determination.

The book is addressed not only to the specialists of Gobies and ichthyologists, but to the ecologists, teachers, students and all fans of the Bulgarian fish fauna.