

CONTRIBUTIONS TO THE KNOWLEDGE OF ASILIDAE (DIPTERA: BRACHYCERA) FROM AZARBAIJAN PROVINCES (IRAN)

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ABSTRACT: A list of 16 species of Asilidae (Insecta: Diptera) belonging to 4 subfamilies, 12 genera collected, in Azarbaijan Provinces (northwest of Iran) are given. Two species, namely *Aneomochtherus micrasiaticus*, *Erax sedulous* are new records for the fauna of Iran. Additionally 15 species are recorded for the first time from Azarbaijan provinces. Synonyms and distributional data for each species are included.

KEY WORDS: Asilidae, Iran, Fauna, Azarbaijan.

The robber flies are included in the Asilidae (Brachycera), with 7,029 species (Geller-Grimm, 2008) belonging to 518 genera (Geller-Grimm, 2003) distributed throughout the world. Records of preys taken by robber flies indicate that they are often opportunistic predators, feeding upon any insect that they can catch. The majority of the larvae live in soil but those of the Laphriinae and Laphystiinae occur in decaying logs and stumps, where they feed on larvae and pupae of other insects (Geller-Grimm, 2002). Even if many entomologists ignored their role in the past (Lehr, 1958), several recent studies have been dedicated to the predation of Asilidae (Londt 1993, 1995, 2006).

With 1107 occurrences, Asilidae, compiled in Carto Fauna Flora had a relatively good covering of the Iranian territory excepting the two large deserts, at northern *Dacht-é Kavir* (Great Salt Desert) and southeastern *Dacht-é Lut* (sandy rocky desert) (Map 1).

Investigations on Asilidae in Iran are strongly restricted and have been conducted principally by foreign researchers. Portschinsky (1873) described 2 new species, followed by Bigot (1880), Hermann (1905), Becker and Stein (1913), Engel (1930), Oldroyd (1958), Janssens (1961), Abbassian-Lintzen (1964a, b), Tsacas (1968) and Theodor (1980) that contributed to the knowledge of Iranian fauna. More recently Timon-David (1955), Geller-Grimm & Hradsky (1999), Tomasovic (1999a, 2002) have described some new species. Nowadays 237 species were described to live in Iran (Lehr et al., 2007; Ghahari et al., 2007a, b; Hayat et al., 2008; Saghaei et al. 2008).

Papers by Abbassian-Lintzen (1964a), Lehr (1988) and Hayat et al. (2008) constitute few faunistic reports on Asilidae of the Azarbaijan provinces, but none of them focused specifically on the species from this area.

MATERIALS AND METHODS

The robber flies were collected at different localities (between 35° 57' and 39° 22' N, and between 44° 37' and 48° 20' E) in the East & West Azarbaijan provinces where they are located in northwest of Iran, during 2008-2009. They were captured by sweep net in flight or when they were landing on the ground.

The specimens determined by G. Tomasovic. Data were gathered from the literature of Oldroyd (1958), Abassian-Lintzen (1965a & b), Ghahari *et al.* (2007), Lehr *et al.* (2007) and collected specimens preserved in the collections of Gembloux Agro- Bio Tech (GxABT, Belgium) and the Royal Belgian Institute of Natural Sciences (IRSNB). The general distribution of the species was made with the references to Geller-Grimm (2008). The whole material has been deposited in the insect collection of the Urmia University.

RESULTS

The list of asilidae includes 16 species belonging to 12 genera and 4 subfamilies: Apocleinae (2, genera; 2 species), Asilinae (6, genera; 8, species), Dasyopogoninae (1, genus; 1, species), Stenopogoninae (3, genera; 5, species). Of these two species *Aneomochtherus micrasiaticus* (Tsacas, 1968), *Erax sedulus* (Richter, 1963) are new records for the fauna of Iran. All the identified species are new for the fauna of Azarbaijan Provinces except *Dasyopogon irinelae* (Weinberg, 1986) which were previously reported by Hayat *et al.* (2008) from west Azarbaijan.

I-Subfamily Apocleinae Papavero 1973

***Engelopogon cingulifer* (Becker, 1913)**

Synonym: *Machimus* / *Acanthopleura*: Engel, 1927.

Material Examined: Maragheh (East Azarbaijan Province), 26♂, 27♀, 12-19.VI.2009; Urmia (West Azarbaijan Province), 13♂, 7♀, 20.VI-14.VIII. 2009.

Iranian records: Sistan & Baluchestan Province, Khorasan Province (Becker & Stein, 1913), Iran (Engel, 1930).

Distribution outside Iran: Azerbaijan, Kazakhstan (Hayat *et al.*, 2008).

Biology: The specimens were found on hills sandy soil.

***Polyphonius laevigatus* Loew, 1848**

Material Examined: Khoj (West Azarbaijan Province), 2♂, 5.VI.2009.

Iranian records: Khuzestan Province (Oldroyd, 1958).

Distribution outside Iran: Albania, Azerbaijan, Greece, Palestine, Turkey, Syria.

Biology: The specimens were found on sandy soil.

II- Subfamily Asilinae Latreille, 1802

***Aneomochtherus micrasiaticus* (Tsacas, 1968)**

Synonym: *Neomochtherus mundus micrasiaticus*.

Material Examined: Ourmia (West Azarbaijan Province), 1♂, 15.VI.2008.

Iranian records: This is a new record for the fauna of Iran.

Distribution outside Iran: Palaearctic, Afrotropical, Asia, Greece, Turkey.

Biology: Genus *Aneomochtherus* Lehr 1996. The type species was *Neomochtherus mundus micrasiaticus* Tsacas, 1968 labelled from Asia Minor. The genus contained 64 species: 57 Palaearctic, 6 Afrotropical and 1 Oriental. In Iran 6 species were actually known (Hayat *et al.*, 2008). The species is the predator of grasshoppers especially *Acridella robusta* Uvarov (Orthoptera: Acrididae).

***Didymachus picipes* (Meigen, 1820)**

Material Examined: Naqadeh (West Azarbaijan Province), 2♂, 14.V.2008, 3♀, 11.VI.2008.

Iranian records: Fars Province, Yazd Province (Lehr *et al.*, 2007).

Distribution outside Iran: Austria, Albania, Czech Republic, Switzerland, Denmark, Germany, France, Hungary, Italy, Norway, The Netherlands, Poland, Romania, former

Yugoslavia, Sweden, Finland, Georgia, Armenia, Azerbaijan, Ukraine, Russia (North, Central and South European territory, West Siberia), Kazakhstan, Turkey (Lehr, 1996).
Biology: *Silvius caucasicus* (Olsufjev, 1937) (Diptera: Tabanidae) as a prey was reported (Lehr et al., 2007).

***Dysmachus praemorsus* (Loew, 1854)**

Material Examined: Azarshar (East Azarbaijan Province), 1♂, 15.VI.2006, 3♀, 18.VI.2007.

Iranian records: Fars Province (shiraz) (Lehr et al., 2007).

Distribution outside Iran: Austria, Albania, Bulgaria, Germany, France, Hungary, Poland, Romania, former Yugoslavia, Ukraine, Turkey (Lehr et al., 2007).

Biology: *Tabanus filipjevi* Olsufjev, 1937 (Diptera: Tabanidae) as a prey was reported (Lehr et al., 2007).

***Dysmachus tricuspis* (Loew, 1848)**

Material Examined: Marand (East Azarbaijan Province), 3♂, 15.VI.2007.

Iranian records: Esfahan Province (Lehr et al., 2007).

Distribution outside Iran: Albania, Greece, Romania, Turkey, Tunisia.

Biology: *Phryxe vulgaris* (Fallén, 1810) (Diptera: Tachinidae) as a prey was reported (Lehr et al., 2007).

***Erax sedulus* Richter, 1963**

Material Examined: Ourmia (West Azarbaijan Province), Sir Mountain 4♂, 2♀, 18.IV.2008.

Iranian records: This is a new record for the fauna of Iran. But another species namely *Erax grootaerti* Tomasovic, 2002 was recorded from shiraz (Hayat et al., 2007).

Distribution outside Iran: Russia.

***Eutolmus fascialis* (Loew, 1848)**

Material Examined: Hashtrood (East Azarbaijan Province), 3♂, 12.VI.2009; 7♂, 2♀, 26.VI.2009.

Iranian records: Tehran Province (Damavand) (Lehr et al., 2007).

Distribution outside Iran: former Yugoslavia, Palestine, Turkey (Lehr et al., 2007).

Biology: *Dasyrhamphus umbrinus* (Meigen, 1820) (Diptera: Tachinidae) as a prey was reported.

***Eutolmus parricida* (Loew, 1848)**

Material Examined: Myandoab (West Azarbaijan Province) 4♂, 28.V.2007, Myaneh (East Azarbaijan Province), 8♂, 5♀, 12.VI.2009; Bonab (East Azarbaijan Province), 1♂, 3♀, 14.VI.2009; Malekan (East Azarbaijan Province) 1♂, 26.VI.2009.

Iranian records: Mazandaran Province (Ramsar, Nooshahr) (Hayat et al., 2008).

Distribution outside Iran: Afghanistan, Armenia, Azerbaijan, Georgia, Turkey.

Biology: This species was found preying on *Ramonda spathulata* (Fallén, 1820) (Diptera: Tachinidae) (Lehr et al., 2007); *Sphex oxianus* Gussakovsky (Hymenoptera: Sphecidae) (Hayat et al., 2008).

***Machimus rusticus* (Meigen, 1820)**

Synonyms: *Asilus genualis* Zeller, 1840; *A. obscures* Meigen, 1820.

Material Examined: Tabriz (East Azarbaijan Province), 8♂, 9♀, 13.VI.2009; Salmas (West Azarbaijan Province), 4♂, 4♀, 28.V.2008.

Iranian records: Mazandaran Province (Sari), Esfahan Province (Khomeini shahr) (Ghahari et al., 2007a), Khorasan, Bojnord (Hayat et al., 2008).

Distribution outside Iran: Albania, Austria, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Italy, Kazakhstan, Poland, Romania, Slovakia, Slovenia, Spain, Switzerland, The Netherlands, Turkey, United Kingdom (Hayat et al., 2008).

Biology: This species was observed preying on *Papilio demoleus demoleus* L. (Lepidoptera: Papilionidae). *Amphicoma* sp. (Coleoptera: Scarabaeoidea), *Sphaerophoria scripta*

(Linnaeus) (Diptera: Syrphidae), and *Thymelicus sylvestris* Poda (Lepidoptera: Hesperiiidae) were determined as prey in Turkey (Hayat & Alaoglu, 1996b; Hayat, 1997).

III -Subfamily Dasypogoninae Macquart, 1838

***Dasypogon irinelae* Weinberg, 1986**

Material Examined: Mahabad (West Azarbaijan Province), 2♂, 3♀, 14.VIII.2008.

Iranian records: This species has been recorded from Oshnavieh (West Azarbaijan Province), as a new for the Iranian fauna on May 1998 (Hayat et al., 2008).

Distribution outside Iran: Azerbaijan, Turkey (Hayat et al., 2008).

Biology: This species was collected with *Chalybion (Chalybion) flebile* (Lepelletier de Saint-Fargeu, 1845) (Hymenoptera: Sphecidae) as prey. Among the prey of this species, *Campptopus lateralis* (Germar) (Hemiptera: Alydidae), *Eristalis tenax* (Linnaeus) (Diptera: Syrphidae), *Systropha culvicornis* (Scopoli) (Hymenoptera: Halictidae), *Megabombus (Thoracobombus) sylvorum daghestanicus* (Radoszkowski), *Pyrobombus soroensis* (Fabricius), and *Apis mellifera* Linnaeus (Hymenoptera: Apidae) were noted (Hayat & Alaoglu, 1996a; Hayat, 1997; Ozbek & Hayat, 1999). The ethology of this species was also studied by Hayat & Caliskan (2003).

IV- Subfamily Stenopogoninae Hull, 1962

***Heteropogon nubilus* (Wiedemann, 1820)**

Material Examined: Boukan (West Azarbaijan Province), 2♂, 2♀, 5.VI.2009.

Iranian records: Fars Province (Abadeh, Eghlid), (Lehr et al. 2007).

Distribution outside Iran: Spain, Portugal, Jordan, Morocco, Algeria, Palestine, Tunisia, Turkey.

Biology: *Campylomma liebknechti* Girault, 1934 (Heteroptera: Miridae) in Abadeh and *Tetrix tartara tartara* (Bolivar, 1887) (Orthoptera: Tetrigidae) in Eghlid were recorded as preys (Lehr et al. 2007).

***Holopogon imbecillus* Loew, 1871**

Material Examined: Tekab (West Azarbaijan Province), 2♀, 14.VIII.2008.

Iranian records: Tehran Province, Ob Ali bei (Oldroyd, 1958).

Distribution outside Iran: Middle Asia including, Armenia and Azerbaijan (Hayat et al., 2008).

Biology: The specimens were found on hills sandy soil.

***Stenopogon elongatus* (Meigen, 1804)**

Synonymy: *Asilus loewi* Schiner, 1866 (nomen nudum).

Material Examined: Ourmia (West Azarbaijan Province), 1 ♀, 1.VI.2009; Pyranshahr (West Azarbaijan Province), 9 ♂, 5 ♀, 5.VI.2009; Sardasht (West Azarbaijan Province), 1 ♀ 27.VI.2008.

Iranian Records: Iran (Lehr, 1988) in Kuzestan province (Khajehzadeh, 2004).

Distribution outside Iran: Egypt, France, Greece, Hungary, Palestine, Romania, Russia, Tunisia, Turkey, West Sahara.

Biology: The species is a powerful predator of grasshoppers, *Locusta migratoria* L., and *Dociostaurus maroccanus* (Thunberg) (Orthoptera: Acrididae) in Kuzestan province (Khajehzadeh, 2004).

***Stenopogon laevigatus* (Loew, 1851)**

Synonymy: *Dasypogon bicolor* Bigot, 1878.

Material Examined: Ourmia (West Azarbaijan Province), 2♀, 22.V.2008, 2♂, 23.VI.2008; Bonab (East Azarbaijan Province), 3 ♂, 1 ♀, 5.VI.2009; Ajabshir (East Azarbaijan Province), 1♀, 20.VI.2009.

Iranian Records: Fars Province (Abbassian-Lintzen, 1964a), Golestan Province, Bandar-Torkman (Hayat et al., 2008).

Distribution outside Iran: Afghanistan, Azerbaijan, Turkey.

Biology: This species was collected with *Calliphora vomitoria* Linnaeus (Diptera: Calliphoridae) as prey. *Muscina* sp. (Diptera: Muscidae), *Chrysotoxum* sp. and *Pipizella* sp. (Diptera: Syrphidae), *Tabanus bromius* Linnaeus (Diptera: Tabanidae) and *Apis mellifera* Linnaeus (Hymenoptera: Apidae) were recorded as prey of this species by Hayat & Alaoglu (1994) and Hayat (1997). Ozbek & Hayat (1999) emphasised the importance of this species as predator of *A. mellifera* in Erzurum, Turkey.

***Stenopogon sciron superbus* (Portschinsky, 1873)**

Material Examined: Maragheh (East Azarbaijan Province), 2♂, 26.VI.2009; Ourmia (West Azarbaijan Province), 2♀, 14.VIII.2008.

Iranian Records: Sistan & Baluchestan Province (Oldroyd, 1958), Iran (Engel, 1930).

Distribution outside Iran: Afghanistan, Azerbaijan, Kazakhstan, Russia (Hayat et al., 2008).

DISCUSSION

During the course of the 2-year study period, 16 species of Asilidae were collected and identified. The total number of Asilid species recorded for Azarbaijan Provinces is 28. Both East & west Azarbaijan Provinces are large region incorporating various biogeographical areas and we expect that a large number of species remain to be discovered. As it seems that Asilid species in Iran are important predators of other insects (Lehr et al., 2007; Hayat et al., 2008), further study of their occurrence and biology, especially prey specificity, should be encouraged.

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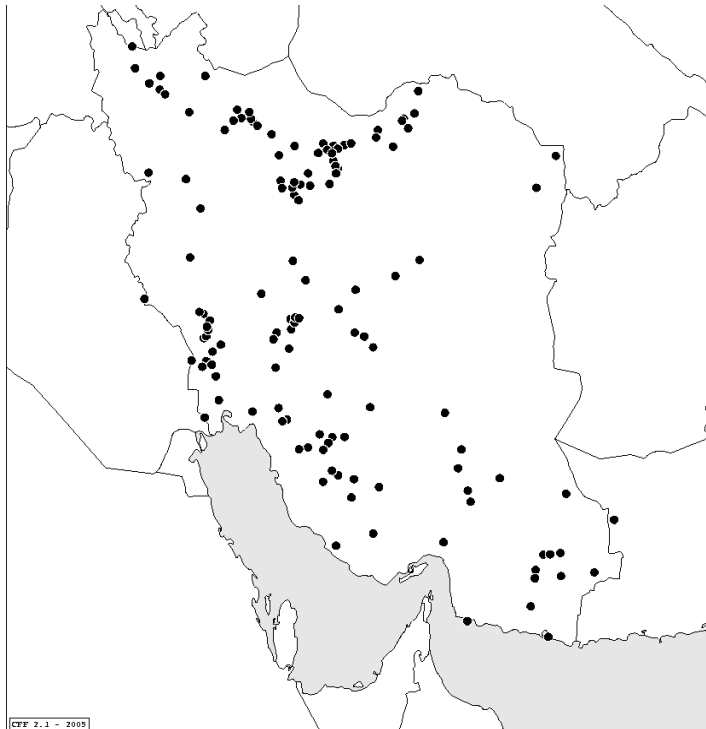
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Map 1. Distribution of Asilidae compiled in Carto Fauna Flora from Iran.