

Flies of the subfamily Asilinae Latreille, 1802 (Diptera: Asilidae) in East Azerbaijan province, with three new records for Iranian Fauna

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Abstract. Based on specimens collected from East Azerbaijan province during 2010-2014, nine species belonging to seven genera of the subfamily Asilinae (Asilidae) were recognized. The following species are recorded for the first time from Iran: *Aneomochtherus illustris* (Schiner, 1867); *Neoitamus navasardiani* Richter, 1963 and *Antipalus sinuatus* (Loew, 1854). Lists of the studied species, their geographical distribution and supplementary figures of the new record species are given.

Key words: Asilinae, Asilidae, East Azerbaijan province, Iran, new records.

Introduction

Family Asilidae with over 7187 described species in eleven subfamilies and 821 genera, is a cosmopolitan and one of the large families in the order of Diptera (Geller-Grimm 2008). The members of this family are commonly named as robber flies. The adult and larvae of robber flies are predators, feeding on various arthropods, mainly insects and are important agents of biological balance in insect populations (Lehr 1988, Hayat & Özbek 1994). Asilinae Latreille, 1802 including 177 extant genera, is the most diverse subfamily of Asilidae which is distributed in all biogeographic regions except Antarctica (Geller-Grimm 2004, Londt 2005, Papavero 2009).

Morphologically it differs from the most closely related subfamilies by the following characters: marginal cell closed and petiolate; palpus one-segmented; mesopleural bristle absent; post-scutellar slopes pilose; prosternum complete or dissociated; only 2 submarginal cells; R₃ normally absent; female terminalia with or without spinous acanthophorites, or strongly modified and male genitalia variable. The genera of this subfamily were identified based mainly on male and female terminalia, since external characters are insufficient to separate them. Dikow has recently combined Apocleinae Papavero (1973) and Asilinae into a single subfamily, Asilinae, based on morphological and DNA sequence data (Dikow 2009). Prior to this study, Becker and Stein (1913), Engel (1930), Oldroyd (1958), Abbassian-Lintzen (1964), Tsacas (1968), Lehr (1988), Tomasovic (2002), Ghahari et al. (2007), Lehr et al. (2007) and Hayat et al. (2008) reported 65 species of 22 genera of the subfamily Asilinae to the Iranian insect fauna.

East Azarbaijan Province is large region with various biogeographical areas, so it is expected that further species can be found there. As the fauna of the subfamily Asilinae remain unknown, so the propose of this study is determination of the Asilidae fauna in East Azarbaijan province.

Materials and Methods

Studied specimens were collected by the sweeping net in various habitats of East Azarbaijan province, located in north-west of Iran, during 2010-2014. After killing the samples in cyanide bottle, the specimens used for identification pinned and their wings and legs set on appropriate setting mount to facilitate their morphological

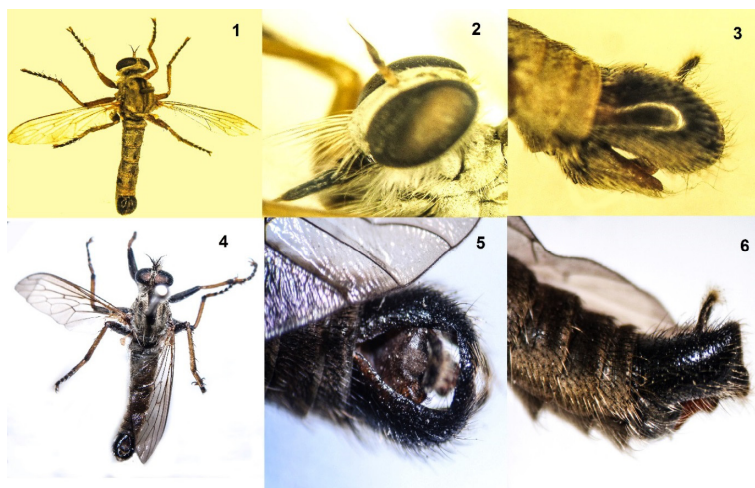
studies. On drying, they were properly labeled and preserved in collection boxes. The following references were used for identification and geographical distribution of studied species: Engel (1930), Richter (1963, 1973), Bei-Bienko G. (1988), Tomasovic (2002), Geller Grimm (2003, 2008), Lehr et al. (2007) and Hayat et al. (2008). The examined specimens were deposited in the Insect Collection of Professor Hasan Maleki Milani, Tabriz, Iran (ICHMM).

Results

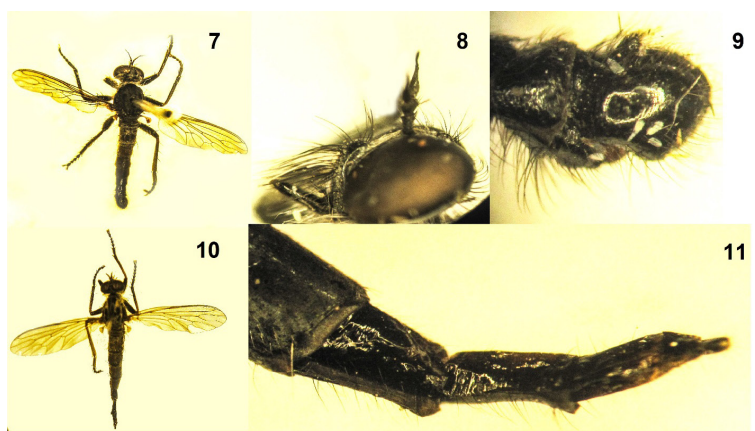
In this study, nine species belong to seven genera were collected in East Azerbaijan province. Of them, three species *Aneomochtherus illustris* (Schiner, 1867); *Neoitamus navasardiani* Richter, 1963 and *Antipalus sinuatus* (Loew, 1854) are being recorded for the Iranian fauna. All the species are recorded for the first time from the province.

Key to the studied genera of the subfamily Asilinae in East Azerbaijan province (Adopted from Bei-Bienko G. (1988), Schiner (1867), Richter (1963, 1973), Geller Grimm (2003, 2008):

1. Veins R₄ and R₅ veins ending distinctly before the wing apex.....*Satanas Jacobson*
– Veins R₄ and R₅ veins ending clearly behind the wing apex.....2
2. Basitarsi swollen and robust (especially anterior part); Superior forceps and gonopod separated from each other, ovipositor consists of 5 segments exceptionally elongated and slender; Last 3 segments compressed laterally.....*Astochia Becker*
– Basitarsi not distinctly stout; terminalia not so constructed.....3
3. Occipital bristles rectangular bent forward; Tergal bristles strong. Ovipositor very long.....*Neoitamus Loew*
– Occipital bristles at most slightly curved or straight. Ovipositor short or normal sized.....4
4. Sternites with some well-developed stout bristles; male hypopogium large broad and rounded. Ovipositor elongated and compressed laterally.....*Neomochtherus Osten-Sacken*
– Sternites with slender bristly like hairs or pile; male hypopogium simple and small. Ovipositor short and cylindrical.....5
5. Superior forceps elongated, rather slender, curving apically inward toward medial plane and leaving from dorsal



Figures 1-3. *Aneomochtherus illustris* (Male): 1. Habitus in dorsal view 2. Lateral view of head 3. Lateral view of genitalia; Fig 4-6) *Antipalus sinuatus* (Male): 4. Habitus in dorsal view 5. Dorsal view of genitalia 6. Lateral view of genitalia.



Figures 7-9. *Neoitamus navasardiani* (Male): 7. Habitus in dorsal view 8. Lateral view of head 9. Lateral view of genitalia; Fig 10-11) *Neoitamus navasardiani* (Female): 10. Habitus in dorsal view 11. lateral view of abdomen terminal.

aspect a large free but elongated enclosed space; ovipositor with an obvious terminal circllet of short stout spines

..... *Philonicus* Loew

– No dorsal curved or oval enclosed space between forceps; or if so forceps are short, exceptionally swollen. Ovipositor without terminal spines..... 6

6. Males..... 7

– Females..... 8

7. Eighth sternite with lappet or lobe-like extension ; mostly rather large species, often with reddish legs

..... *Machimus* Loew

– Eighth sternite without any extension; small middle size or large flies; Legs mostly distinct..... *Antipalus* Loew

8. Ovipositor consists of last 2 segments (ninth and tenth) and these segments short, knobbed, laterally never compressed..... *Antipalus* Loew

– Ovipositor consists of 3 or more segments; these segments not shortened, pointed, laterally compressed

..... *Machimus* Loew

The list of the studied species known from East Azerbaijan province:

Aneomochtherus hungaricus rossicus (Engel, 1927)

Material examined: (3♂♂): Kandovan: 37° 46' N, 46° 15' E, 2341m, 25.6.2010; (3♂♂): Arasbaran: 38°57' N, 4°17' E, 1444 m, 4.7.2014.

Distribution outside Iran: Azerbaijan, Armenia, China, Kazakhstan, Mongolia, Turkmenistan.

Iranian Records: Iran (Tsacas 1968).

Aneomochtherus illustris (Schiner, 1867)

Material examined: (1♂): Chichekli: 38°37' N, 46°26' E, 1534 m, 3.8.2011.

Distribution outside Iran: Israel, Jordan, Turkey, Syrien.

New record for Iran.

Antipalus sinuatus (Loew, 1854)

Material examined: (1♂, 2♀♀): Ajabshir: 37°30' N, 45°59' E, 1525 m, 9.8.2014; (2♂♂): Horand: 38° 53' N, 47° 16' E, 1367 m, 11.8.2014; (2♂♂): Chichekli: 38° 37' N, 46° 26' E, 1534 m, 11.8.2014.

Distribution outside Iran: Austria, Poland, Ukraine, Russia.

New record for Iran.

Astochia caspica (Hermann, 1917)

Material examined: (1♀): Kandovan, 37° 46' N, 46° 15' E, 2341m, 1.6.2010; (2♀♀): Chichekli: 38° 37' N, 46° 26' E, 1534 m, 5.8.2013.

Distribution outside Iran: Afghanistan, Azerbaijan, Kazakhstan, Russia, Trans Caucasus.

Iranian Records: Iran (Lehr 1988).

Machimus annulipes (Brullé, 1832)

Material examined: (2♂♂): Kandovan, 37° 46' N, 46° 15' E, 2341m, 3.8.2011; (1♂): Arasbaran, 46° 26' N, 44° 54' E, 1524m, 3.8.2011; (1♂): Arasbaran, 46° 26' N, 44° 54' E, 1753, 1.7.2013; (1♂): Hashtrud: 38°23' N, 47°09' E, 1510 m, 17.8.2014; (2♂♂): Mianeh: 37°28' N, 47°32' E, 1275 m, 4.7.2012.

Distribution outside Iran: Albania, Azerbaijan, Bosnia-

Herzegovina, Bulgaria, Croatia, Czech Republic, Greece, Hungary, Israel, Kazakstan, Poland, Romania, Slovenia, Slovak Republic, Switzerland, Transcaucasus, Turkey.

Iranian Records: Iran (Hayat 2008).

***Machimus elegans* (Loew, 1849)**

Material examined: (1♂): Mianeh: 37°28' N, 47°32' E, 1275 m, 19.8.2013; (1♂): Maragheh: 37°25' N, 46°25' E, 1787 m, 24.8.2013.

Distribution outside Iran: Spain, Turkey.

Iranian Records: Iran (Lehr 2007).

***Neoitamus navasardiani* Richter, 1963**

Material examined: (2♂♂, 1♀): Chichakli: 38°39' N, 46°31' E, 2140 m, 19.7.2013; (1♀): Ajabshir: 37°29' N, 45°52' E, 1320 m, 24.7.2013; (1♂, 1♀): Horand: 38° 53' N, 47° 16' E, 1367 m, 24.8.2014.

Distribution outside Iran: former South European territory of SSSR, Transcaucasus.

New record for Iran

***Philonicus albiceps* (Meigen, 1820)**

Material examined: (3♀♀): Qaradagh Forests: 38°55' N, 46°46' E, 1313 m, 9.6.2011; (2♀♀): Ajabshir: 37°30' N, 46°01' E, 1437 m, 19.8.2014.

Distribution outside Iran: all parts of Europe and a lot of countries of Palaearctic Asia.

Iranian Records: Enzeli, Northern Iran (Ricardo 1920 as *Philonicus domesticus* sp. n.).

***Satanas gigas* (Eversmann, 1855)**

Material examined: (2♂♂): Maragheh: 37°25' N, 46°25' E, 1787 m, 19.7.2013.

Distribution outside Iran: Algeria, China, Egypt, former Central and South European territory of SSSR, Greece, Israel, Iran, Kazakstan, Libya, Mongolia, Romania, Transcaucasus..

Iranian Record: Baluchestan, Kerman, Khorasan, Sistan (Becker & Stein 1913), Baluchestan (Oldroyd 1958), Iran (Engel 1930).

Discussion

Based on the present study, the total number of the Iranian Asilinae species has been increased to 68 species. Although regarding to the biology of the asilid flies which shows they are general predators, it seems that the predators of other harmful insects like flies and wasps are common in Iran (Lehr et al. 2007, Hayat et al. 2008), so further studies on their occurrence and biology, particularly prey specificity, are necessary.

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