



## Research Article

# A contribution to the knowledge of robber flies (Diptera: Asilidae) from Tehran province and vicinity, Iran

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**ABSTRACT:** Robber flies (Diptera: Asilidae) are one of the important groups of predators in controlling numerous insect groups. A total of 30 asilid species representing 22 genera are listed in this paper from Tehran province. Of these, *Neoitamus senectus* Richter, *Stenopogon rufipilus ruficauda* Engel and *Rhadinus unguinus* Loew are new records for the fauna of Iran. Additionally, prey records and distributional data are provided for asilid species.

**KEY WORDS:** Asilidae, fauna, prey, Tehran province, Iran

(Article chronicle – Received: 23.11.2009; Sent for revision: 25.12.2009; Accepted: 05.01.2010)

## INTRODUCTION

Robber flies (Insecta: Diptera: Asilidae) are an abundant and diverse family known for their predatory behavior. As their common name implies, robber flies have voracious appetites and feed on a vast array of other arthropods, which may help to maintain a healthy balance among insect populations in various habitats (Joern and Rudd 1982, Shurovnekov 1962). Asilid adults attack wasps, bees, dragonflies, grasshoppers, other flies, and some spiders. Robber flies are particularly abundant in arid and semi-arid habitats.

Asilidae is one of the important groups of predators controlling numerous insect groups (Hull, 1962; Theodor, 1980). Robber flies are opportunistic predators, their diets often reflecting prey availability in a particular habitat. Shelly (1986) reported that of the nine Neotropical Asilid species he studied, 85% of the diet were composed of insects from the orders Diptera, Coleoptera, Hymenoptera, Homoptera, and Lepidoptera. Furthermore, larger species tended to consume a greater diversity of prey taxa. Robber flies generally establish a perching zone in which to locate potential prey. Perching height varies by species, but generally occurs in open, sunny locations. Asilids seize their prey in flight and inject their victims with saliva containing neurotoxic and proteolytic enzymes. These injections, inflicted by their modified mouthparts (hypopharynx), rapidly immobilize the prey and digest bodily contents. The robber fly soon has access to a liquid

meal, which is generally consumed upon returning to a perch (Lavigne, 2003; Ghahari *et al.*, 2007b).

There are 1634 species of Asilidae recorded from the Palearctic region (Geller Grimm, 2005). The Iranian fauna has been studied recently very well and a total of 8 papers have been published from Iran so far (Oldroyd, 1958; Abbasian-Lintzen, R. 1964a, b; Lehr *et al.*, 2007; Ghahari *et al.*, 2007a, c; Hayat *et al.*, 2008; Saghaei *et al.*, 2009). This paper documents additions to the known fauna.

## MATERIALS AND METHODS

Collections were made from various locations in Tehran province. Additional material was located in collections including those of Islamic Azad University (Tehran Science & Research and Ghaemshahr Branches). Identifications by the authors were based on comparisons with material identified by Engel (1930), Oldroyd (1958), Abbasian-Lintzen (1964a, b), Tsacas (1968), Theodor (1980) and Lehr (1988). The taxonomic arrangement and distributional data for regions outside Iran are those of Lehr (1988, 1996), Geller-Grimm (2005) and Bosák and Hradský (2001).

## RESULTS AND DISCUSSION

A total of 30 asilid species representing 22 genera were collected from different regions of Tehran province.

The list of species, their distributional data and prey are given below.

***Ancylorhynchus glaucius* (Rossi)**

Material: Tehran province: km 25 Tehran-Qom road, 2 female, 1 male, June 2007.

Prey record: *Polistes nimpha* (Christ) (Hymenoptera: Vespidae).

Distribution: Austria, Albania, France, Greece, Israel, Italy, Palestine, Romania, Russia and adjacent regions (South European territory, Kazakh, Soviet Middle Asia), Syria, Turkey, former Yugoslavia.

***Aneomochtherus aerifacies* (Tsacas)**

Material: Tehran province: Firoozkooh, 1 male, May 2004.

Distribution: Turkey.

***Asilus crabroniformis* Linnaeus**

Material: Tehran province: Damavand, 5 female, September 2005.

Prey record: *Eristalinus quinquelineatus* (Fabricius) and *Helophilus parallelus* (Harris) (Diptera: Syrphidae).

Distribution: Algeria, Austria, Azerbaijan, Belgium, Bosnia-Herzegovina, Croatia, Czech Republic, France, Denmark, Finland, Germany, Hungary, Italy, Morocco, Norway, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, The Netherlands, Turkey, United Kingdom.

***Choerades fuliginosa* (Panzer)**

Material: Tehran province: Darband, 1 male, June 2002.

Distribution: Austria, Albania, Bulgaria, Czech Republic, Finland, France, Germany, Greece, Spain, Poland, Romania, Russia and adjacent regions (Armenia, East Siberia, North European territory, Transcaucasus, West Siberia), Sweden, Turkey, former Yugoslavia.

***Erax barbatus* Scopoli**

Material: Tehran province: Jajrood, 1 male, 3 female, July 2003.

Prey record: *Macrophya duodecimpunctata* (Linnaeus) and *Messa wuestneii* (Konow) (Hymenoptera: Tenthredinidae).

Distribution: Bulgaria, Czech Republic, France, Germany, Greece, Poland, Romania, Sweden, Russia (South European territory, Transcaucasus), Turkey, former Yugoslavia.

***Habropogon spissipes* Hermann**

Material: Tehran province: Shahre Rey, 1 male, 1 female, September 2003.

Prey record: *Taxonus agrorum* (Fallen) (Hymenoptera: Tenthredinidae).

Distribution: Egypt, Morocco, North Africa, Turkey.

***Heteropogon lugubris mesasiaticus* Lehr**

Material: Tehran province: Robat-Karim, 1 female, July 2004.

Distribution: Azerbaijan, Kazakhstan.

***Holopogon albosetosus* Schiner**

Material: Tehran province: Damavand, 1 female, June 2003.

Distribution: Russia and adjacent regions (Kazakh, South European territory, Soviet Middle Asia, Transcaucasus), Turkey.

***Jothopogon leucomallus* (Loew)**

Material: Tehran province: Varamin, 3 female, August 2005.

Prey record: *Dolichovespula media* (Retzius) (Hymenoptera: Vespidae).

Distribution: Israel, Jordan, Turkey.

***Leptogaster pubicornis* Loew, 1847**

Material: Tehran province: Karaj, 4 female, September 2005.

Prey record: *Cerceris rybyensis* (L.) (Hymenoptera: Sphecidae) and *Vespula vulgaris* (L.) (Hymenoptera: Vespidae).

Distribution: Bulgaria, Czech Republic, France, Germany, Greece, Hungary, Italy, Russia, Switzerland, Turkey.

***Loewinella virescens* (Loew)**

Material: Tehran province: Robat-Karim, 1 male, April 2005.

Distribution: China, Russia.

***Machimus rusticus* (Meigen)**

Material: Tehran province: Kahrizak, 4 male, 3 female, September 2008.

Prey record: *Conophorus glaucescens* and *Usia (Usia) calva* (Diptera: Bombyliidae).

Distribution: 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.

***Molobratia teutonius* (Linnaeus)**

Material: Tehran province: Shahreyar, 2 female, 1 male, June 2005.

Prey record: *Dolichovespula saxonica* (Fabricius) (Hymenoptera: Vespidae).

Distribution: Albania, Austria, Belgium, Bulgaria, Czech Republic, Denmark, France, Germany, Greece, Hungary,

Italy, Poland, Romania, Russia, Spain, Sweden, The Netherlands, Switzerland, Turkey.

***Neoitamus cyanurus* (Loew)**

Material: Tehran province: Damavand, 1 female, June 2007.

Distribution: Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Poland, Romania, Russia, Sweden, Switzerland, Taiwan, The Netherlands, Turkey.

***Neoitamus senectus* Richter**

Material: Tehran province: Saveh, 1 male, 3 female, June 2006. **New record for Iran.**

Prey record: *Anastoechus miscens* Walker (Diptera: Bombyliidae).

Distribution: Russia, Ukraine, Moldavia, Georgia, Azerbaijan, Armenia.

***Philonicus albiceps* (Meigen)**

Material: Tehran province: Firoozkooh, 2 male, August 2006.

Prey record: *Mellinus crabroneus* (Thunberg) (Hymenoptera: Sphecidae).

Distribution: Albania, Austria, Azerbaijan, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, East Siberia and Far East of Russia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Liechtenstein, Luxembourg, Malta, Mongolia, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, The Netherlands, Turkey, United Kingdom.

***Promachus canus leontochlaenus* Loew**

Material: Tehran province: Damavand, 1 female, June 2007.

Distribution: outside Iran; Kazakhstan, Turkey.

***Promachus leoninus* Loew**

Material: Tehran province: Firoozkooh, 1 female, August 2006.

Distribution: Azerbaijan, Bosnia-Herzegovina, Croatia, Greece, India, Israel, Myanmar (Burma), Romania, Russia, Slovenia, Turkey.

***Promachus mustela* Loew**

Material: Material: Tehran province: km 25 Tehran-Qom road, 1 male, June 2007.

Distribution: Israel, Lebanon, Palestine, Syria, Turkey.

***Rhadinus unguinus* Loew**

Material: Tehran province: Roodehen, 1 male, 1 female, July 2008. **New record for Iran.**

Prey record: *Cephus cultratus* Eversmann (Hymenoptera: Cephidae).

Distribution: Egypt, Israel, North Africa, Palestine, Tunisia, Yemen.

***Saropogon dasynotus* Loew**

Material examined: Tehran province: Saveh, 1 male, September 2006.

Distribution: Russia and adjacent regions (Kazakh, Soviet Middle Asia), Turkey.

***Saropogon longicornis* (Macquart)**

Material: Tehran province: Karaj, 1 male, July 2007.

Distribution: Egypt, Israel.

***Stenopogon avus* (Loew)**

Material: Tehran province: Varamin, 1 male, 2 female, September 2004.

Prey record: *Polistes bischoffi* Weyrauch (Hymenoptera: Vespidae).

Distribution: Kazakhstan.

***Stenopogon laevigatus* (Loew)**

Material: Tehran province: Shahryar, 1 male, June 2007.

Distribution: Afghanistan, Azerbaijan, Turkey.

***Stenopogon sciron* (Loew)**

Material: Tehran province: Jajrood, 1 female, September 2007.

Distribution: Afghanistan, Azerbaijan, China, Egypt, Turkey.

***Stenopogon rufipilus ruficauda* Engel**

Material: Tehran province: Karaj, 1 male, 1 female, June 2004. **New record for Iran.**

Prey record: *Chrysotoxum parvulum* Virolovitsh (Diptera: Syrphidae).

Distribution: Russia and adjacent regions (Armenia, Transcaucasus).

***Stichopogon albellus* Loew**

Material: Tehran province: Varamin, 1 female, July 2006.

Distribution: Egypt, Israel.

***Stichopogon scaliger* Loew**

Material: Tehran province: Roodehen, 1 male, 1 female, August 2006.

Prey record: *Tachysphex pompiliformis* (Panzer) (Hymenoptera: Sphecidae).

Distribution: Bulgaria, Czech Republic, Egypt, France, Greece, Italy, Kazakhstan, Romania, Slovakia, Turkey.

***Tolmerus cingulatus* (Fabricius)**

Material: Tehran province: Damavand, 1 male, May 2008.  
 Distribution: Austria, Azerbaijan, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Norway, Poland, Romania, Russia, Slovakia, Slovenia, Sweden, Switzerland, The Netherlands, Turkey, United Kingdom.

***Trichomachimus pubescens* (Ricardo)**

Material: Tehran province: Varamin, 2 male, 2 female, July 2005.

Prey record: *Chrysotoxum cautum* (Harris) and *Eupeodes nuba* (Wiedemann) (Diptera: Syrphidae).

Distribution: Afghanistan, China, India, Tibet.

The result of this research and also that of many other researchers, which were conducted on the fauna of Iranian Asilidae, indicate that there is a diverse fauna of robber flies in Iran. With attention to the prior papers and 3 new records of this paper, the total number of Iranian asilids reaches to 235 species. This paper is a part of a huge project “Iranian Asilidae” which was established by Hassan Ghahari and Pavel A. Lehr of Russia in 2000. Upon the mentioned project, several asilid specimens were collected and studied from different regions of Iran, many insect collections of different universities and also from some museums of the world. Lehr died in 2005 and therefore the project was continued by H. Ghahari and two other specialists including, Rüstem Hayat of Turkey and Robert J. Lavigne of Australia until 2008. However, Iran is a large country and although 235 asilid species have been identified from Iran so far, many other species are expected to be discovered in future. We estimate that the total number of Iranian asilids is about 350 species. The preys of robber flies were studied in this paper too. A total of 19 prey were collected of which 9 species are from Diptera (5 species from Syrphidae and 4 species from Bombyliidae), and 11 species from Hymenoptera (3, 3, 4 and 1 species from the families Tenthredinidae, Sphecidae, Vespidae and Cephidae, respectively). The members of Hymenoptera are one of the most important prey for robber flies (Londt, 2006; Dennis and Lavigne, 2007).

**ACKNOWLEDGEMENTS**

The research was supported by Tehran Islamic Azad University (Science & Research Branch), Ghaemshahr Islamic Azad University and Young Researchers Club of Islamic Azad University.

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