

**REVIEW OF FAUNAL INVESTIGATION OF PREDATORY FLIES OF THE FAMILY  
DOLICHOPODIDAE (DIPTERA) IN IRAN**

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The data on Dolichopodidae from Iran since 1913 are reviewed. *Liancalus virens* (Scopoli, 1763) is recorded for the first time for Iran. A list of Dolichopodidae of the country includes 114 species.

*Key words: Diptera, Dolichopodidae, Palearctic Region, Iran, new record, fauna.*

**ОБЗОР ФАУНИСТИЧЕСКИХ ИСЛЕДОВАНИЙ ХИЩНЫХ МУХ  
СЕМЕЙСТВА DOLICHOPODIDAE (DIPTERA) ИРАНА**

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Приведен обзор данных по фауне мух-зеленушек Ирана, опубликованных с 1913 года. *Liancalus virens* (Scopoli, 1763) указан впервые для страны. Число известных из Ирана видов семейства достигло 114.

*Ключевые слова: Diptera, Dolichopodidae, Палеарктика, Иран, новое указание, фауна.*

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**INTRODUCTION**

The long-legged flies belong to one of the largest families (Dolichopodidae) in extant Diptera. Approximately 7600 described species and 250 genera are known in the world fauna (Grichanov, 2014). Adults and larvae of dolichopodids are mainly predacious, except for one genus (*Thrypticus*), the larvae of which are known to be phytophagous and living inside stems of cereal grasses. Some genera (*Medetera*, *Neurigona*) are known to be associated with tree trunks where their larvae are predaceous mainly on bark beetles (Coleoptera). *Medetera* flies can also feed on aphids, thrips and mites populating plants of grain, vegetable, fruit and other cultures, together with other entomophages regulating development and reproduction of dangerous pests, especially at irrigation farming (Grichanov, 2007).

**REVIEW OF FAUNAL INVESTIGATION**

The first contribution to the fauna of Dolichopodidae of Iran was made by Th. Becker and P. Stein (1913) who treated material collected by N. Zarudny (St. Petersburg, Russia) in Khorasan, Kerman and Sistan and Baluchestan provinces during 1898 and 1901 expeditions (Figure 1). The authors identified 8 mainly halophilic species of long-legged flies: *Dolichopus notatus* Staeger, 1842 (as *Dolichopus notabilis* Zetterstedt, 1843); *Tachytrechus planitarsis* Becker, 1907; *Hydrophorus praecox* (Lehmann, 1822); *Thinophilus argyropalpis* Becker, 1907; *T. indigenus* Becker, 1902; *T. quadrimaculatus* Becker, 1902; *T. spinitarsis* Becker, 1907; *Syntormon pallipes* (Fabricius, 1794).

A.A. Stackelberg (1941) mentioned *Poecilobothrus regalis* (Meigen, 1824) from northwestern Iran in the collection of the Zoological Institute (St. Petersburg). Negrobov, Stackelberg (1974) described a new species *Medetera pavlovskii* Negrobov, 1972 with the type locality “Shachrud” (probably, Shahrood, a river in northern Iran), from the collection of the same Institute, found by the Russian zoologist Yevgeny Pavlovsky (St. Petersburg) in 1942.

O.P. Negrobov & L. Matile (1974) described two new for science *Syntormon* species collected by A. Giordani Soika (Venice, Italy) in Khorramshahr and Qasr-e Shirin in 1956, i.e. *Syntormon giordanii* Negrobov, 1974 and *S. iranicus* Negrobov, 1974. The authors added also 10 species new for the country (4 species by females only) that were collected by L. Matile (Paris, France) in 1965 in Guilan mainly, in Mazandaran, Azerbaijan and Gorgan provinces: *Argyra argentina* (Meigen, 1824); *A. diaphana* (Fabricius, 1775); *Chrysotus gramineus* (Fallen,

1823); *Gymnopternus metallicus* (Stannius, 1831) (as *Hercostomus metallicus*); *Hercostomus chetifer* (Walker, 1849); *H. longiventris* (Loew, 1857); *Neurigona erichsoni* (Zetterstedt, 1843); *Rhaphium appendiculatum* Zetterstedt, 1849 (as *R. macrocerum*); *Sybstroma discipes* (Germar, 1821); *S. leptocerca* (Stackelberg, 1949) (as *Hercostomus leptocercus*). In addition, Negrobov (1991) included Iran in the area of medeterine species *Thrypticus intercedens* Negrobov, 1967 without indicating original material, and Maslova (2006) mentioned *Chrysotus angulicornis* Kowarz, 1874 for Iran, not giving original material.

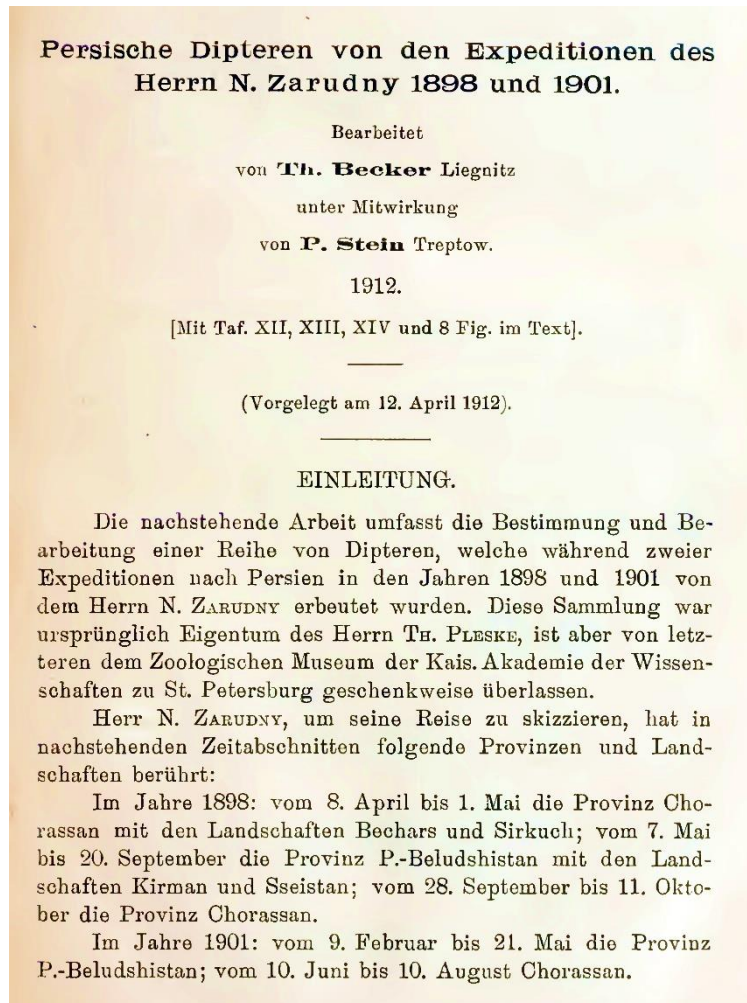


Fig. 1. First page of the work by Becker, Stein (1913).

As a result, 24 species were reported from Iran before the recent regular collecting of dolichopodids by Iranian students and researchers. The author of this paper identified also an Iranian collection of pinned dolichopodids in the Zoological Museum of Moscow State University, Moscow, Russia (Grichanov et al. 2010). The flies were collected by the Russian diplomat N.N. Filippov (under the pseudonym Zhenzhurist) in 1937-1938 at Rasht, "Jarjarud", "Shimran", "Pahlevi" [=Bandar-e Anzali] and Tehran (northern Iran). *Argyria leucocephala* (Meigen, 1824), *Dolichopus excisus* Loew, 1859, *D. griseipennis* Stannius, 1831, *D. latilimbatus* Macquart, 1827, *D. nubilus* Meigen, 1824, *D. perversus* Loew, 1871, *D. signifer* Haliday, 1832, *Tachytrechus notatus* (Stannius, 1831), *Sympycnus simplicipes* Becker, 1908 and *Syntormon zelleri* (Loew, 1850) from that collection were reported from Iran for the first time (Grichanov et al. 2010). Later *Sciapus iranicus* Grichanov, Negrobov was described from the same collection as new for science (Grichanov, Negrobov, 2014). In addition, *Liancalus virens* (Scopoli, 1763) was overlooked in Zhenzhurist's collection, being here recorded from Iran for the first time (5♂, 1♀, Iran: [Tehran,] Shimran, 5.XII.1936).

Mahmoud Alikhani (the Islamic Azad University, Arak Branch, Iran) collected dolichopodid flies during 2008-2009 from about 50 sampling sites on crop and non-crop plants in Markazi province, Arak region and suburb (Grichanov et al. 2010). The presence of *Chrysotus angulicornis* in Iran was confirmed. *Chrysotus suavis* Loew, 1857, *Dolichopus clavipes* Haliday, 1832 and *Rhaphium micans* (Meigen, 1824) were firstly found in the country.

Dr. Samad Khaghaninia and Yaser Gharajedaghi (the University of Tabriz, Tabriz, Iran) conducted a survey during 2009-2013 in order to study the family Dolichopodidae in East Azerbaijan province. The following species were recorded from Iran for the first time: *Dolichopus longitarsis* Stannius, 1831, *D. salictorum* Loew, 1871, *D. simplex* Meigen, 1824, *Hercostomus fulvicaudis* (Haliday, 1851), *Sciapus flavicinctus* (Loew, 1857) and *Sybstroma nodicornis* Meigen, 1824 (Khaghaninia et al., 2013a); *Hercostomus gracilis* (Stannius, 1831), *H. libanicola* Parent, 1933, *H. rusticus* (Meigen, 1824), *Poecilobothrus armeniorum* (Stackelberg, 1933), *P. basilicus* (Loew, 1869), *P. chrysozygos*

(Wiedemann, 1817) and *P. comitalis* (Kowarz, 1867) (Khaghaninia et al., 2013b); *Diaphorus sublautus* Negrobov, 2007, *Dolichopus austriacus* Parent, 1927, *D. campestris* Meigen, 1824, *D. immaculatus* Becker, 1909, *D. subpennatus* d'Assis Fonseca, 1976, *D. unguatus* (Linnaeus, 1758) and *Hercostomus phoebus* Parent, 1927 (Khaghaninia et al., 2014a); *Chrysotimus molliculus* (Fallén, 1823); *Hercostomus apollo* (Loew, 1869); *Hydrophorus balticus* (Meigen, 1824); *Medetera meridionalis* Negrobov, 1967; *Orthoceratium lacustre* (Scopoli, 1763) and *Poecilobothrus principalis* (Loew, 1861) (Kazerani et al., 2014a). A new species *Dolichopus malekii* Grichanov, Khaghaninia, Gharajedaghi was described from the East Azerbaijan province (Khaghaninia et al., 2014b).

So, joint efforts of Khaghaninia, Gharajedaghi, Alikhani and Grichanov in collecting and treatment of long-legged flies increased the Iranian fauna up to 66 species apart from several unidentified morphospecies.

Farzaneh Kazerani (the University of Tabriz) with the help of Drs. Khaghaninia and Grichanov identified and published a lot of new species records for the country based on material previously collected in 2010-2013 by Dr. S. Khaghaninia in East Azerbaijan, West Azerbaijan and Ardabil provinces, by Drs. A. Nadimi and M. Khayrandish (the Tarbiat Modares University, Tehran) in Mazandran and Guilan provinces. It is worth noting that this material was not checked by Igor Grichanov, but he noted (from photos sent him by Kazerani) many undescribed species of Dolichopodidae. The following 36 species were added to the Iranian fauna resulted from the Kazerani's research (some identifications must be confirmed): *Rhaphium antennatum* (Carlier, 1835), *R. auctum* Loew, 1857, *R. penicillatum* Loew, 1850 and *R. lanceolatum* Loew, 1850 (Kazerani et al., 2013); *Dolichopus siculus* Loew, 1859, *D. kiritschenkoi* Stackelberg, 1927 and *D. plumipes* (Scopoli, 1763) (Kazerani et al., 2014b); *Chrysotus cilipes* Meigen, 1824, *C. collini* Parent, 1923, *C. neglectus* (Wiedemann, 1817) and *Asyndetus latifrons* (Loew, 1857) (Kazerani et al., 2014c); *Gymnopternus assimilis* (Staeger, 1842), *G. blankaartensis* Pollet, 1991, *Hercostomus convergens* (Loew, 1857), *Medetera flavipes* Meigen, 1824, *M. micacea* Loew, 1857, *M. muralis* Meigen, 1824, *M. seguyi* Parent, 1926, *M. truncorum* Meigen, 1824 and *Rhaphium fascipes* (Meigen, 1824) (Kazerani et al., 2014d); *Campsicnemus curvipes* (Fallén, 1823), *C. umbripennis* Loew, 1856, *Sympycnus pulicarius* (Fallén, 1823) and *Syntormon pumilus* (Meigen, 1824) (Kazerani et al., 2014e); *Syntormon aulicus* (Meigen, 1824), *S. denticulatus* (Zetterstedt, 1843), *S. macula mediterraneus* Grichanov, 2013, *Teuchophorus monacanthus* Loew, 1859, *T. spinigerellus* (Zetterstedt, 1843) (Kazerani et al., 2014f); *Gymnopternus angustifrons* (Staeger, 1842), *Poecilobothrus bigoti* Mik, 1883, *Sybistroma clara* (Negrobov, Onishchenko, 1991), *S. crinipes* Staeger, 1842 (Kazerani, Talebi, 2014); *Sciapus basilicus* Meuffels, Grootaert, 1990, *S. heteropygus* Parent, 1926 and *S. medvedevi* Negrobov, Selivanova, 2009 (Kazerani et al., 2015). In addition, new species *Sciapus talebii* Kazerani, Grichanov was described from the Iran (Gulian province) (Kazerani et al., 2015), and *Sybistroma occidasiatica* Grichanov, Kazerani was described from East Azerbaijan province, Israel and Turkey (Grichanov, Kazerani, 2014).

Recently, Dr. Marc Pollet (the Research Institute for Nature and Forest, Brussels, Belgium) checked the newly collected Iranian material and added the following seven species to the Iranian fauna: *Rhaphium brevicorne* Curtis, 1835, *R. caliginosum* (Zetterstedt, 1843), *Lamprochromus speciosus* (Loew, 1871), *Syntormon silvianus* Pârvu, 1989 and *S. filiger* Verrall, 1912 (Kazerani et al., 2016); *Argyra vestita* (Wiedemann, 1817) and *Chrysotus obscuripes* Zetterstedt, 1838 (Khaghaninia et al., 2016).

As a result, the number of reported species from this country is now 111 species. Most of the species are widespread across the Palaearctic Region or across Europe; nevertheless, *Dolichopus malekii*, *Sciapus iranicus*, *S. talebii*, *Syntormon giordanii* and *S. iranicus* are at present endemics of Iran, and *Diaphorus sublautus*, *Dolichopus siculus*, *D. kiritschenkoi*, *Hercostomus libanicola*, *H. phoebus*, *Medetera pavlovskii*, *Poecilobothrus armeniorum*, *Sciapus medvedevi*, *Sybistroma clara*, *S. leptocerca* and *S. occidasiatica* are rare species in Iran and East Mediterraneans. Regarding *Syntormon silvianus* reported by Kazerani et al. (2016), I consider the species doubtful, being a possible synonym of widely distributed *Syntormon monilis* (Haliday, 1851) (see Grichanov, 2013). Key characters of the two species must be redescribed and accurately figured in order to define their true relations. I suggest that many more species will be revealed in Iran, if new districts and localities are investigated with the use of mass trapping methods. For example, the most recent survey conducted in the Markazi and Lorestan provinces has revealed 16 dolichopodid species including three species new for the country: *Medetera jacula* (Fallén, 1823), *Rhaphium albifrons* Zetterstedt, 1843 and *Thrypticus bellus* Loew, 1869 (Ahmadi et al., 2016).

## CONCLUSION

The nearest steps in the faunal investigation of predatory long-legged flies in Iran are as follows: continuation of description of Iranian fauna, including description of new species, with special attention to southern and eastern provinces of the country; molecular investigation of sibling species or phenotypes of the same species (e.g., *Medetera jacula* and *M. meridionalis*, *Syntormon pallipes* (phenotypes *pallipes* and *pseudospicatus*), *Sybistroma occidasiatica* (phenotypes A and B), etc. compiling an annotated catalog of Iranian species; studying ecology and biology of abundant species and their role in agricultural and forest ecosystems.

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