

# A faunistic study of the Dolichopodidae (Diptera, Brachycera) in Fars Province of Iran

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We provide new data on the distribution of 14 long-legged fly species (Diptera, Brachycera, Dolichopodidae) belonging to 10 genera from the Fars Province, Southern Iran. The genera *Diaphorus* Meigen, 1824, *Dolichopus* Latreille, 1796, *Hydrophorus* Fallén, 1823, and *Syntormon* Loew, 1857 are recorded in the Fars Province for the first time. *Dolichopus lairdi* Olejnicek, Mohsen & Ouda, 1995 is newly added to the Iranian insect fauna. Four species, *Asyndetus albifrons* Loew, 1869, *Asyndetus fallahzadehi* Grichanov, 2019, *Chrysotus suavis* Loew, 1857, and *Medetera pallipes* (Zetterstedt, 1843) were the most abundant in the collected material. Available information on geographical distribution and short taxonomic comments for each species are also included.

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## Introduction

Dolichopodidae (Diptera, Brachycera) is a large, diverse and cosmopolitan family of flies commonly known as long-legged flies, including 7,600 species in 250 genera (Grichanov 2017). Until recently, only little information on long-legged flies from Iran is available, with most records coming from central and Northern provinces (e.g. Khaghaninia et al. 2014; Kazerani et al. 2015; Ahmadi et al.

2016). A comprehensive review of the work done on Iranian Dolichopodidae wasps by various researchers was by Grichanov (2016), based on all the available information and examination of some specimens. In total, this review included 114 species. Since that time several important works on Iranian long-legged flies have been published and the known number of species from the country has increased to 155.

The present study continues a series of publications dealing with the family Dolichopodidae in southern Iran (Rezaei et al. 2019; Grichanov and Rezaei 2019). The aim of the current work is to improve our knowledge of the Iranian fauna of the fly family Dolichopodidae. We provide further information on the distribution of long-legged flies in the Fars Province, southern Iran.

## Material and methods

The specimens were collected by Malaise traps in four different localities of the Fars province (South Iran). Sampling localities are briefly described below.

**Loc. A):** IRAN, Fars, Dalin, 52°07'54.7"E, 30°02'15.0"N.

Dalin is a small village in Hamaijan rural district, Sepidan County. Dalin is located in the west of Fars province, having a cold and mountainous climate with green and breezy summers and snowy winters. Diverse rivers favour the cultivation of, for example, apple (*Malus pumila* Miller), plum tree (*Prunus* spp.) and walnut (*Juglans regia* L.) orchards.

**Loc. B):** IRAN, Fars, Shiraz County, Jannat garden, 52°28'9.147"E, 29°36'52.373"N.

The climate has distinct seasons, and is overall classed as a hot semi-arid climate, though it is only a little short of a hot-summer Mediterranean climate. Shiraz contains a considerable number of gardens. Jannat garden has a large number of fruit trees and ornamental plants including walnut, pomegranate (*Punica granatum* L.), pine (*Pinus* spp.) and cypress trees (*Cupressus sempervirens* L.).

**Loc. C):** IRAN, Fars, Dasht-e Arzhan, 51°59'3.439"E, 29°39'39.047"N.

Dasht-e Arzhan is a village in Arzhan rural district, Shiraz County. This village lies in an ecologically important zone that is Arzhan and Parishan protected area. The area is included into the southern Zagros, characterized by rocky ground, predominately formed by *Quercus* spp., together with *Astragalus* spp. and herbaceous plants.

**Loc. D):** IRAN, Fars, Larestan, 54°26'1.36"E, 27°31'55.4"N.

Larestan is located in the south of Fars province and has a very hot and desert climate, with hot and dry plains, water shortages and many salt domes. The vegetation includes eucalyptus (*Eucalyptus* spp.), acacia (*Acacia* spp.), jujube (*Ziziphus* spp.) and olive (*Olea* spp.). The pastures are mostly covered with milk vetch (*Astragalus* spp.).

The general species distribution is given after Negrobov et al. (2013) and Grichanov (2017). Type localities are provided, and country lists (in zoogeographical regions) are arranged alphabetically. Photos of some species and habitat photos are provided. The specimens in ethanol have been studied with a <sup>®</sup>Zeiss Discovery V-12 stereomicroscope and <sup>®</sup>AxioCam MRc5 camera attachment. Voucher specimens are deposited in collections of the Zoological Museum of Moscow State University, Moscow, Russia (ZMUM), the Zoological Institute of the Russian Academy of Sciences, St. Petersburg (ZIN) and the Department of Entomology, Jahrom Branch, Islamic Azad University, Jahrom, Iran (JIAU).

## Results

We have collected a total of 824 specimens of Dolichopodidae in Fars province, representing 14 species. In the following, the individual species are arranged alphabetically within each genus.

### *Asyndetus* Loew, 1869

#### *Asyndetus albifrons* Loew, 1869

**MATERIAL.** Iran, Fars province, Dasht-e Arzhan (51°59'3.439"E, 29°39'39.047"N): 5♂, 4♀, 23-30.5.2017; 2♂, 6♀, 31.5.2017-6.6.2017; 16♂, 15♀, 7-13.6.2017; 3♂, 5♀, 14-20.6.2017; 2♂, 6♀, 21-27.6.2017; 5♂, 4♀, 2-9.6.2018; 4♂, 7♀, 10-17.6.2018; 2♂, 2♀, 18-24.6.2018; 3♂, 8♀, 25.6.2018-1.7.2018; 2♀, 2-9.7.2018; 5♂, 5♀, 10-17.7.2018; 3♀, 18-24.7.2018; 2♂, 2♀, 25-31.7.2018; 2♂, 4♀, 1-7.8.2018; 5♂, 8♀, 8-9.8.2018; **Larestan location1** (54°59'2.3"E, 27°32'6.7"N): 14♂, 27♀, 23-29.7.2018; 23♂, 13♀, 30.7.2018-5.8.2018; 18♂, 24♀, 6-12.8.2018; 12♂, 28♀, 13-19.8.2018; 12♂, 14♀, 20-26.8.2018; **Larestan location 2** (54°26'1.36"E, 27°31'55.4"N): 8♂, 13♀, 30.3-9.4.2018; 3♂, 9♀, 10-20.4.2018; 3♂, 8♀, 21-30.4.2018; 6♂, 12♀, 1-11.5.2018; 3♀, 12-21.5.2018; **Shiraz** (52°28'9.147"E, 29°36'52.373"N): 6♂, 2♀, 23-29.4.2017; 1♂, 1♀, 30.4-6.5.2017; 1♂, 7-13.5.2017; 1♂, 14-20.5.2017; 7♂, 6♀, 17-23.7.2018; 4♂, 2♀, 24-30.7.2018; 2♂, 2♀, 31.7-6.8.2018; 1♀, 7-13.8.2018; 1♂, 4-11.9.2018.

**REMARKS.** The species was the most abundant in all localities (see also Rezaei et al. 2019).

**DISTRIBUTION.** Type locality: Bir Abrag (South Eastern Desert). Palaearctic or Afrotropical: Egypt (close to Hala'ib Triangle); Palaearctic: Iraq, Iran.

#### *Asyndetus chaetifemoratus* Parent, 1925

**MATERIAL.** Iran, Fars province, Dasht-e Arzhan (51°59'3.439"E, 29°39'39.047"N): 1♂, 10-17.7.2018; **Shiraz** (52°28'9.147"E, 29°36'52.373"N): 2♂, 17-23.7.2018.

**REMARKS.** The species was recorded from Dalin locality of the Fars province by single male (Rezaei et al. 2019).

**DISTRIBUTION.** Type locality: Egypt: Baharia Oasis. Palaearctic: Egypt, Iran, Israel, Russia (Astrakhan).

#### *Asyndetus fallahzadehi* Grichanov, 2019

**MATERIAL.** Iran, Fars province, Dasht-e Arzhan (51°59'3.439"E, 29°39'39.047"N): 1♀, 23-30.5.2017; 1♂, 2♀, 31.5.2017-6.6.2017; 2♂♀, 14-20.6.2017; 3♂, 2♀, 10-17.6.2018; 1♀, 18-24.6.2018; 1♂, 25.6.2018-1.7.2018; 2♀, 2-9.7.2018; 1♂, 10-17.7.2018; 1♂, 18-24.7.2018; 2♂♀, 25-31.7.2018; 2♂, 2♀, 1-7.8.2018; 1♂, 8-9.8.2018; 2♂♀, 2-9.6.2018; 2♂, 1-7.8.2018; 1♂, 8-9.8.2018; **Larestan location1** (54°59'2.3"E, 27°32'6.7"N): 13♂, 8♀, 23-29.7.2018; 10♂, 6♀, 30.7.2018-5.8.2018; 10♂, 12♀, 6-12.8.2018; 4♂, 13♀, 13-19.8.2018; 5♂, 2♀, 20-26.8.2018; **Larestan location 2** (54°26'1.36"E, 27°31'55.4"N): 2♂, 2♀, 30.3-9.4.2018; 3♀, 10-20.4.2018; 1♂, 2♀, 21-30.4.2018; 6♀, 1-11.5.2018; **Shiraz** (52°28'9.147"E, 29°36'52.373"N): 1♀, 23-29.4.2017; 1♂, 17-23.7.2018; 1♀, 24-30.7.2018; 1♂, 31.7-6.8.2018; 2♀, 17-23.7.2018; 1♂, 7-13.8.2018; 1♀, 28.8-3.9.2018; 1♀, 4-11.9.2018.

**REMARKS.** The species was described by males and females collected from all studied localities of the Fars province (Rezaei & Grichanov, 2019).

**DISTRIBUTION.** Type locality: Iran: Fars Province, Larestan. Palaearctic: Iran.

***Chrysotus* Meigen , 1824*****Chrysotus* aff *obscuripes* Zetterstedt , 1838**

MATERIAL. **Iran, Fars province, Shiraz** (52°28'9.147"E, 29°36'52.373"N): 1♀, 18-19.10.2018.

REMARKS. Southern Palaearctic *Chrysotus* species are indistinguishable by females; a female collected is close to the Trans-Palaearctic *C. obscuripes* reported previously in the North West of Iran without indicating original material (Khaghaninia et al., 2016).

***Chrysotus* *suavis* Loew, 1857**

MATERIAL. **Iran, Fars province, Dasht-e Arzhan** (51°59'3.439"E, 29°39'39.047"N): 1♀, 10-17.6.2018; 1♀, 23-30.5.2017; 1♀, 31.5.2017-6.6.2017; 1♀, 7-13.6.2017; 1♀, 14-20.6.2017; **Larestan location 2** (54°26'1.36"E, 27°31'55.4"N): 1♂, 5♀, 30.3-9.4.2018; 3♂, 11♀, 10-20.4.2018; 4♂, 25♀, 21-30.4.2018; 6♂, 9♀, 1-11.5.2018; 2♂, 2♀, 12-21.5.2018; **Fars province, Shiraz** (52°28'9.147"E, 29°36'52.373"N): 1♂, 16♀, 23-29.4.2017; 6♂, 7♀, 30.4-6.5.2017; 13♂, 14♀, 7-13.5.2017; 3♂, 3♀, 14-20.5.2017; 2♂, 2♀, 21-27.5.2017; 1♂, 24-30.7.2018; 1♀, 31.7-6.8.2018; 1♀, 28.8-3.9.2018.

DISTRIBUTION. Type locality: Germany: "Coln"; Austria: "Neusiedler See in Ungarn". Palaearctic: Afghanistan, Algeria, Armenia, Austria, Azerbaijan, Belgium, Bosnia and Herzegovina, Bulgaria, N China, Croatia, Czech Republic, Egypt, Estonia, Finland, France, Georgia, Germany, Greece (North Aegean), Hungary, Iraq, Iran, Israel, Italy, Kyrgyzstan, Latvia, Lithuania, Middle Asia, Mongolia, Morocco, Netherlands, Norway, Poland, Romania, Russia (Adygea, Alania, Altai Rep., Astrakhan, Blagoveshchensk, Buryatia, Irkutsk, Kabardino-Balkaria, Kamchatka, Khabarovsk, Krasnodar, Krasnoyarsk, Kursk, Leningrad, Lipetsk, Magadan, Pskov, Rostov, Ryazan, Sakhalin, Tatarstan, Voronezh, Yakutia), Serbia, Slovakia, Spain (Canary Is), Sweden, Switzerland, Turkey (Adiyaman, Antalya, Antakya, Artvin, Gaziantep, Kizildere, Sanliurfa), UK, Ukraine (Cherkasy, Kherson, Odessa).

***Diaphorus* Meigen , 1824*****Diaphorus* aff . *parenti* Stackelberg , 1928**

MATERIAL. **Iran, Fars province, Shiraz** (52°28'9.147"E, 29°36'52.373"N): 3♀, 24-30.7.2018; 1♀, 31.7-6.8.2018.

REMARKS. Southern Palaearctic *Diaphorus* species are poorly distinguishable by females; females examined keys (Grichanov, 2007) to rather rare *D. parenti* known from Palaearctic China, from the Russian Caucasus, Siberia and the Far East.

***Dolichopus* Latreille , 1796*****Dolichopus* *lairdi* Olejnicek Ouda , 1995 (Fig. 1)**

MATERIAL. **Iran, Fars province, Larestan location1** (54°59'2.3"E, 27°32'6.7"N): 1♂, 23-29.7.2018

DISTRIBUTION. Type locality: Iraq: Baghdad, Babylon Hotel, garden. Palaearctic: Iraq. New species for Iran.

REMARKS. This is the first record of the species after description.

***Hydrophorus* Fallén , 1823**

***Hydrophorus praecox* (Lehmann, 1822)**

**MATERIAL.** Iran, Fars province, Dasht-e Arzhan (51°59'3.439"E, 29°39'39.047"N): 1♂, 10-17.7.2018.

**DISTRIBUTION.** Type locality: Germany: Hamburg. Palaearctic: Abkhazia, Austria, Belgium, Bulgaria, China, Cyprus, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Golan Heights, Greece, Hungary, Iraq, Iran, Ireland, Israel, Kazakhstan, Latvia, Mongolia, Netherlands, Norway, Poland, Portugal (Azores), Romania, Russia (Astrakhan, Chechnya, Chukotka, Crimea, Kabardino-Balkaria, Karelia, Khabarovsk, Krasnodar, Krasnoyarsk, Leningrad, Murmansk, Stavropol, Voronezh), Slovakia, South Arabia, Spain, Sweden, Switzerland, Tunisia, Turkey (Antalya, Bolu), UK, Ukraine (Kherson, Odessa); Oriental: China, India; Australian: Australia, French Polynesia, New Zealand; Afrotropical: Aldabra, Angola, Botswana, Gambia, Cape Verde Is., Ethiopia, Kenya, Mauritania, Mauritius, Namibia, Nigeria, Rodriguez, Senegal, South Africa, St Helena, Tanzania; Neotropical: Chile. New species for Fars Province.

***Medetera* Fischer von Waldheim, 1819*****Medetera media* Parent, 1925 (Fig. 2)**

**MATERIAL.** Iran, Fars province, Dasht-e Arzhan (51°59'3.439"E, 29°39'39.047"N): 1♀, 31.5.2017-6.6.2017; Iran, Larestan location 2 (54°26'1.36"E, 27°31'55.4"N): 1♀, 10-20.4.2018; 1♂, 4♀, 18-19.10.2018; 4♀, 21-30.4.2018; Shiraz (52°28'9.147"E, 29°36'52.373"N): 3♂, 4♀, 17-23.7.2018; 2♂, 24-30.7.2018; 1♂, 31.7-6.8.2018; 1♂, 7-13.8.2018.

**REMARKS.** Rezaei, Grichanov, & Fallahzadeh (2019) recorded the species from Dalin locality of the Fars province by single male. It was not appropriately illustrated in old literature; we provide here colour photos of imago for the first time.

**DISTRIBUTION.** Type locality: Tunisia. Palaearctic: Egypt, Kazakhstan, Iran, Turkmenistan, Tunisia.

***Medetera pallipes* (Zetterstedt, 1843)**

**MATERIAL.** Iran, Fars province, Larestan location 1 (54°59'2.3"E, 27°32'6.7"N): 1♂, 30.7.2018-5.8.2018; 1♂, 13-19.8.2018; Iran, Larestan location 2 (54°26'1.36"E, 27°31'55.4"N): 1♂, 1♀, 30.3-9.4.2018; 3♂, 1♀, 10-20.4.2018; 6♂, 5♀, 21-30.4.2018; 4♀, 1-11.5.2018; Shiraz (52°28'9.147"E, 29°36'52.373"N): 3♂, 30.4-6.5.2017; 2♂, 1♀, 7-13.5.2017; 1♂, 2♀, 14-20.5.2017; 2♂, 2♀, 21-27.5.2017.

**DISTRIBUTION.** Type locality: Scania, "in Ostrog ad Wadstena; Botnia orientali ad Johannis Ro prope Torneä" [Sweden; Denmark]. Palaearctic: Austria, Belgium, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Golan Heights, Greece, Hungary, Iran, Israel, Morocco, Netherlands, Norway, Poland, Romania, Russia (Adygea, Chechnya, Crimea, Kabardino-Balkaria, Karelia, Krasnodar, Leningrad, Novgorod, Pskov, Ryazan, Stavropol, Voronezh), Slovakia, Spain, Switzerland, Sweden, Turkey (Antalya, Hakkari, Kars), UK, Ukraine (Kherson). New for Fars province.





A



B

**Figure 1.** *Dolichopus lairdi* Olejnicek, Mohsen & Ouda, 1995: A-male habitus; B-wing.

***Sciapus* Zeller, 1842**

***Sciapus* aff. *adumbratus* (Becker, 1902)**

**MATERIAL.** Iran, Fars province, Dasht-e Arzhan (51°59'3.439"E, 29°39'39.047"N): 1♀, 23-30.5.2017.

**DISTRIBUTION.** Type locality: [Egypt:] "Siala". Afrotropical: Oman, United Arab Emirates; Palaearctic: Egypt, Iran, Iraq, Morocco, Tunisia, Turkmenistan. The species single male was recorded from Dalin locality of the Fars Province (Rezaei et al. 2019).

***Syntormon* Loew, 1857**

***Syntormon* aff. *pallipes* (Fabricius, 1794)**

**MATERIAL.**Iran, Fars province, Shiraz (52°28'9.147"E, 29°36'52.373"N): 1♀, 7-13.8.2018.

**REMARKS.** Palaearctic *Syntormon* species are poorly distinguishable by females. Several species of the genus are known in Iran. A female collected is close to *S. pallipes*, common species in the North West and Centre of this country (e.g. Grichanov et al. 2017), widely distributed in the Palaearctic, Afrotropical and Oriental Regions.

***Tachytrechus* Haliday, 1851**

***Tachytrechus* *planitarsis* Becker, 1907**

**MATERIAL.**Iran, Fars province, Shiraz (52°28'9.147"E, 29°36'52.373"N): 1♀, 31.7-6.8.2018.

**REMARKS.** Rezaei, Grichanov, & Fallahzadeh (2019) recorded the species from Larestan locality of the Fars province.

**DISTRIBUTION.** Type locality: Algeria: Biskra. Palaearctic: Algeria, Egypt, Iran, Israel, Saudi Arabia, Spain (Canary Is.), Tunisia, Turkmenistan; Afrotropical: Ethiopia.



A



B, C



**Figure 2.** *Medetera media* Parent, 1925: A-male habitus; B-fore leg; C-hypopygium.

***Thinophilus* Wahlberg, 1844**

***Thinophilus* sp.**

**MATERIAL.** Iran, Fars province, Dasht-e Arzhan (51°59'3.439"E, 29°39'39.047"N): 1♀, 14-20.6.2017.

**REMARKS.** *Thinophilus* species are practically indistinguishable by females. Rezaei et al. (2019) recorded a male of the genus *Thinophilus* from Larestan locality, which belongs most probably to an undescribed species.

**Discussion**

During the present study, 824 specimens have been collected, including 340 males and 484 females. Fourteen species and 10 genera are listed. Based on the current data, a following analysis can be presented. Four species, *Asyndetus albifrons* (56.31%), *Asyndetus fallahzadehi* (17.96%), *Chrysotus suavis* (16.74%) and *Medetera pallipes*(4.61%) were the most abundant in the collected material (Table 1). The comparison of the number of specimens collected in the different months of the present study shows that the highest number of individuals was collected in August (243 specimens), followed by July and April with 185 and 148 specimens, respectively.

All		October		September		August		July		June		May		April		Genus and species
♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	
265	199	0	0	0	1	96	74	72	56	46	33	17	15	34	20	<i>Asyndetus albifrons</i> Loew, 1869
0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	<i>Asyndetus chaetifemoratus</i> Parent, 1925
77	71	0	0	2	0	35	31	16	22	12	11	5	0	7	7	<i>Asyndetus fallahzadehi</i> Grichanov, 2019
1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	<i>Chrysotus aff. obscuripes</i> Zetterstedt, 1838
96	42	0	0	1	0	1	0	0	1	4	0	38	32	52	9	<i>Chrysotus suavis</i> Loew, 1857
4	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	<i>Diaph</i>

																orus aff . p arenti Stack elberg , 1928
0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	Dolic hopus lairdi Olejni cek , Mohs en & Ouda , 1995
0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	Hydr ophor us pra ecox ( Lehm ann , 1822)
14	8	4	1	0	0	0	2	7	4	1	0	0	1	2	0	Mede tera media Paren t , 192
23	15	0	0	0	0	0	2	0	0	0	0	11	8	12	5	Mede tera p allipes ( Zett ersted t , 1843)
1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	Sciap us aff . adu mbrat us ( B ecker , 1902)
1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	Synto rmon aff . p allipes ( Fabr icius , 1794)
1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	Tachy trechu s plani tarsis Becke r, 1907
1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	Thino philus sp .
484	340	5	1	3	1	134	109	98	88	64	44	73	56	107	41	All

**Table 1.** Number of males and females of collected long-legged fly species (Diptera, Brachycera, Dolichopodidae) in Fars, Iran

The genera *Diaphorus* Meigen, 1824, *Dolichopus* Latreille, 1796, *Hydrophorus* Fallén, 1823, and

*Syntormon* Loew, 1857 are recorded in the Fars province for the first time. These genera were previously recorded from the northern provinces of Iran and the records of them from southern Iran show their wider distribution in the Iranian plateau. *Dolichopus lairdi* Olejnicek, Mohsen & Ouda, 1995 is newly added to the Iranian insect fauna.

As mainly Malaise traps were used for collecting in the current study, no more conclusions on ecological and biological traits can be made. Further studies on the distribution, systematics, behavior and ecology should clearly be supported.

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