



Fauna of grass flies of the subfamily Chloropinae (Diptera: Chloropidae) in Shabestar region with three new records for Iran

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ABSTRACT. Grass flies of the subfamily Chloropinae were studied in the Shabestar region, East Azerbaijan province, Iran, during 2013–2014. As a result, 26 species belonging to 12 genera were identified of which one genus and three species are as new records for the insect fauna of Iran: *Phyladelphus* Becker, 1910; *Lagaroceras curtum* Sabrosky, 1961; *Neohaplegis glabra* (Duda, 1933) and *Phyladelphus thalhammeri*, Becker 1910.

Key words: Chloropidae, Chloropinae, New records, Shabestar, Iran.

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Introduction

The family Chloropidae has the most frequency, diverse species composition, and broad distribution among the other families of Diptera, therefore they can play an important role in ecosystems (Safonkin *et al.* 2013). Heretofore about 204 genera are identified from this family among in the world them 75 genera belong to the subfamily Chloropinae (Nartshuk 2012b). Adults of the subfamily Chloropinae are usually distinguished by considering the characteristics such as yellow or green body, vein costa reaching only to tip of R_{4+5} or somewhat further of it, male cerci completely fused into a narrow, rectangular or oval mesolobus and surstyli including upper, middle and lower lobes (Andersson 1977). Larvae of

most grass flies, especially those belonging to the subfamily Chloropinae, are considered to be phytophagous. Some species such as *Chlorops pumilionis*, *C. strigulus*, *C. riparius* and *Meromyza nigriventris* produce gall-like swellings on their host plants, larvae of *Thaumatomyia* are predators of root aphids and species of genus *Lasiosina* prefer shoots of monocots such as Poaceae, Cyperaceae and Juncaceae, rarely dicots, attacked by other insects (Nartshuk and Andersson 2013).

In recent years, Wheeler (2003 and 2007) described a new genera and species of this family and later Nartshuk (2012a, 2012b) described three new species from Turkey and also prepared a checklist of the world genera of the family Chloropidae, respectively.

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Nartshuk and Andersson (2013) published a book on species of this family from Fennoscandia and Denmark.

Concerning Iranian chloropids, Kubík and Barták (2008), described *Platycephala isinensis*, Modarres-Awal (2011) listed 13 species of the family Chloropidae, Rabieh *et al.* (2012) provided a checklist of grass flies of Markazi province and reported six species as new records for Iran. Khaghaninia and Gharajedaghi (2013) and Khaghaninia *et al.* (2014a, b) surveyed the fauna of Chloropidae in the East Azerbaijan province and added 24 species to the Iranian checklist of grass flies. Karimpour (2014) reported the species *Cryptonevra flavitarsis* (Meigen) and *Lipara lucens* (Meigen) for the first time from Iran. As a result of a faunistic study of the subfamily Oscinellinae from Iran by Namaki Khamneh *et al.* (2015), four species and one genus were recorded to the country. Bazyar *et al.* (2015) provided a list of the Iranian species of this family including 20 genera and 50 species and finally according to the study by Khaghaninia and Namaki Khameneh (2015) from West Azarbaijan province of Iran, two species were recorded as new for the Iranian fauna.

Since fewer studies on the family have been conducted in Iran thus faunistic study of this subfamily was subjected in the mentioned area.

Materials and Methods

Materials were collected by sweeping the poaceous plant heads using entomological net from various localities of Shabestar region in East Azerbaijan province, Iran during 2013–2014. Shabestar region is located in the northern east of East Azerbaijan province with longitudes from 45°5' to 46°9' E, latitudes from 37°5' to 38°24' N, and varying altitudes from 1,275

m to 3,195 m a.s.l. The flies were killed using potassium cyanide. The epandrium was clarified using 10% KOH. Images were achieved by an optical microscope (Nikon SMS 1000) equipped with a camera (Olympus 10μ).

The collected specimens were deposited in both the Insect Collection of Prof. Hasan Maleki Milani, University of Tabriz, Iran (ICHMM) and in the Czech University of Life Sciences Collections (CULS). The specimens were identified according to Narchuk *et al.* (1989); Nartshuk and Fedoseeva, 2011a; Nartshuk and Andersson (2013) keys.

Results

In this study 26 species belonging to 12 genera were identified of which one genus and three species are considered to be new records for the Iranian insect fauna. The genera and species are alphabetically ordered as follows.

Genus *Assuania* Becker, 1903

Assuania thalhammeri (Strobl, 1893)

Material examined: Shabestar (Til), 38°14'04.9" N, 45°25'47.9" E, 1360 m, (3♀♀), 04.vii.2014; leg. R.N.K.

Distribution: Europe; Afghanistan; North Africa; Israel; Iran (Nartshuk 1984)

Genus *Cetema* Hendel, 1907

Cetema cereris (Fallen, 1820)

Material examined: Shabestar (Shanejan), 38°13'39.3" N, 45°43'07.6" E, 1602 m, (8♂♂, 6♀♀), 05.vii.2014; (Heris), 38°11'30.0" N, 45°30'05.7" E, 1595 m, (5♂♂, 3♀♀), 15.vii.2014; leg. R.N.K.

Distribution: Kazakhstan; Siberia; Western Europe; Mongolia; Iran (Narchuk *et al.* 1989; Khaghaninia *et al.* 2014b).

Genus *Chlorops* Meigen, 1803***Chlorops calceatus* Meigen, 1830**

Material examined: Shabestar (Khameneh), 38°11'26.2" N, 45°38'08.9" E, 1501 m, (14♂♂, 8♀♀), 13.vii.2014; (Shanejan), 38°13'39.3" N, 45°43'07.6" E, 1602 m, (22♂♂, 8♀♀), 05.vii.2014; leg. R.N.K.

Distribution: Eurasia; Iran (Nartshuk and Andersson 2013; Khaghaninia and Gharajedaghi 2013).

***Chlorops figuratus* (Zetterstedt, 1848)**

Material examined: Shabestar (Shanejan), 38°13'39.3" N, 45°43'07.6" E, 1602 m, (3♂♂, 4♀♀), 05.vii.2014; (Heris), 38°11'30.0" N, 45°30'05.7" E, 1595 m, (5♂♂, 2♀♀), 15.vii.2014; leg. R.N.K.

Distribution: Eurasia; Iran (Nartshuk and Andersson 2013; Khaghaninia and Gharajedaghi 2013).

***Chlorops pannonicus* Strobl, 1893**

Material examined: Shabestar (Heris), 38°11'30.0" N, 45°30'05.7" E, 1595 m, (8♂♂, 1♀), 15.vii.2014; leg. R.N.K. (2♂ shared with CULS)

Distribution: Kazakhstan; Europe; Iran; Mongolia; (Nartshuk 1984).

***Chlorops serenus* Loew, 1866**

Material examined: Shabestar (Til), 38°15'31.7" N, 45°28'50.8" E, 1595 m, (4♂♂, 2♀♀), 04.vii.2014; (Khameneh), 38°11'47.0" N, 45°37'07.3" E, 1560 m, (3♂♂, 2♀♀), 03.vii.2014; leg. R.N.K.

Distribution: European, Mediterranean; Iran (Nartshuk and Andersson 2013; Khaghaninia and Gharajedaghi 2013).

Genus *Diplotoxa* Loew, 1863***Diplotoxa messoria* (Fallén, 1820)**

Material examined: Shabestar (Sharafkhaneh), 38°11'30.0" N, 45°30'05.7" E, 1320 m, (10♂♂, 12♀♀), 16.vii.2014; (Kuzekonan),

38°11'07.6" N, 45°33'41.8" E, 1383 m, (4♂♂, 6♀♀), 03.vi.2014; (Haftcheshmeh), 38°12'24.1" N, 45°27'29.8" E, 1313 m, (5♂♂, 7♀♀), 19.vi.2013; leg. R.N.K.

Distribution: Holarctic species in the Palearctic from the British Isles to the Far East of Russia; Iran (Nartshuk and Andersson 2013; Khaghaninia *et al.* 2014b).

Genus *Eurina* Meigen, 1830***Eurina lurida* Meigen, 1830**

Material examined: Shabestar (Shanejan), 38°14'12.3" N, 45°43'11.5" E, 1649 m, (1♂), 20.vi.2014; leg. R.N.K.

Distribution: Europe; North Africa; Israel; Iran (Nartshuk 1984).

Genus *Lagaroceras* Becker, 1903***Lagaroceras curtum* Sabrosky, 1961 (Figs. 1–3)**

Material examined: Shabestar (Kuzekonan), 38°11'07.6"N, 45°33'41.8"E, 1383 m, (1♂), 20.v.2013; leg. R.N.K.

Diagnostic characters: yellow species with black stripes on mesonotum; scutellum yellow; head with orbital setae long; ocellar triangle large, yellow and lustrous (Fig. 1); first flagellomere elongated; arista white; palpus yellow (Fig. 2); abdomen dark dorsally; epandrium as illustrated in Fig. 3.

Distribution: UAE, Afghanistan, India, Pakistan (Nartshuk 1984). **New record species for Iran.**

Genus *Lasiosina* Becker, 1910***Lasiosina cinctipes* (Meigen, 1830)**

Material examined: Shabestar (Til), 38°14'04.9" N, 45°25'47.9" E, 1360 m, (3♂♂, 3♀♀), 22.vi.2013; (Khameneh), 38°11'26.2" N, 45°38'08.9" E, 1501 m, (3♂♂, 2♀♀), 12.vi.2014; leg. R.N.K. (2♂♂, 1♀ shared with CULS).

Distribution: Europe; USSR; Israel; Afghanistan; Iran (Nartshuk 1984; Modarres-Awal 2011).

***Lasiosina paralittoralis* Dely Draskovits, 1981**

Material examined: Shabestar (Sharafkhaneh), 38°11'30.0" N, 45°30'05.7" E, 1320 m, (4♂♂, 5♀♀), 03.v.2014; (Kuzekonan), 38°11'07.6"N, 45°33'41.8"E, 1383 m, (2♂♂, 3♀♀), 11.vii.2014; (Haftch-eshmeh), 38°11'32.6" N, 45°28'14.8" E, 1306 m, (6♂♂, 2♀♀), 21.v.2013; leg. R.N.K. (2♂♂, 1♀ shared with CULS).

Distribution: Israel; Iran (Nartshuk 1984; Rabieh *et al.* 2012).

***Lasiosina subnigripes* Dely-Draskovits, 1977**

Material examined: Shabestar (Sis), 38°11'19.5" N, 45°50'10.0" E, 1409 m, (22♂♂, 28♀♀), 14.vii.2014; (Shanejan), 38°12'46.9"N, 45°42'44.6"E, 1336 m, (18♂♂, 20♀♀), 03.vi.2014; (Alibeighlu), 38°11'27.4" N, 45°30'37.3" E, 1349 m, (7♂♂, 14♀♀), 26.v.2013; (Heris), 38°12'03.1" N, 45°30'14.2" E, 1372 m, (11♂♂, 17♀♀), 11.vi.2013; (Haftcheshmeh), 38°11'32.6" N, 45°28'14.8" E, 1306 m, (16♂♂, 21♀♀), 10.vi.2014; leg. R.N.K.

Distribution: Europe; Iran (Nartshuk 1984; Khaghaninia *et al.* 2014b).

Meromyza Meigen, 1830***Meromyza curvinervis* Zetterstedt, 1848**

Material examined: Shabestar (Shanejan), 38°13'39.3" N, 45°43'07.6" E, 1602 m, (1♂), 28.vii.2014; leg. R.N.K.

Distribution: This species is widely distributed in Palaearctic region including Kazakhstan, Central Asia, Afghanistan, East Siberia and the steppes of Mongolia, Iran (Nartshuk and Fedoseeva 2011b).

***Meromyza facialis* Fedoseeva, 1962**

Material examined: Shabestar (Sharafkhaneh), 38°11'30.0" N, 45°30'05.7" E, 1320 m, (2♂♂), 10.vi.2014; leg. R.N.K. (1♂ shared with CULS).

Distribution: European Species; Iran (Rajabi *et al.* 1997; Nartshuk and Fedoseeva 2011b).

***Meromyza filippovi* Ozerov, 2008**

Material examined: Shabestar (Heris), 38°15'04.2" N, 45°31'02.3" E, 1595 m, (3♂♂), 15.vi.2014; leg. R.N.K. (1♂ shared with CULS).

Distribution: European part of Turkey; Iran (Nartshuk and Fedoseeva 2011b; Namaki Khamneh *et al.* 2016).

***Meromyza nigriventris* Macquart, 1835**

Material examined: Shabestar (Heris), 38°15'04.2" N, 45°31'02.3" E, 1595 m, (90♂♂, 81♀♀), 15.vii.2014; (Haftcheshmeh), 38°12'24.1" N, 45°27'29.8" E, 1313 m, (75♂♂, 80♀♀), 19.vi.2013; (Khameneh), 38°11'26.2" N, 45°38'08.9" E, 1501 m, (103♂♂, 96♀♀), 12.vii.2014; (Kuzekonan), 38°11'07.6" N, 45°33'41.8" E, 1383 m, (119♂♂, 103♀♀), 07.vi.2014; (Shanejan), 38°13'39.3" N, 45°43'07.6" E, 1602 m, (351♂♂, 358♀♀), 04.vi.2014; (Sharafkhaneh), 38°11'30.0" N, 45°30'05.7" E, 1320 m, (131♂♂, 120♀♀), 03.v.2014; (Til), 38°15'31.7" N, 45°28'50.8" E, 1489 m, (83♂♂, 101♀♀), 04.vii.2014; leg. R.N.K.

Distribution: This species has Holarctic distribution; in the Palaearctic Region, from Western Europe to China and Japan, also in Iran (Nartshuk and Fedoseeva 2011b; Modarres-Awal 2011).

***Meromyza ornata* (Wiedemann, 1817)**

Material examined: Shabestar (Khameneh), 38°11'26.2" N, 45°38'08.9" E, 1501 m, (2♂♂, 4♀♀), 12.vii.2014; leg. R.N.K. (1♂, 1♀ shared with CULS).

Distribution: This species is distributed in Palaearctic Region from Europe to the Russian Far East; Iran (Nartshuk and Fedoseeva 2011a; Namaki Khamneh *et al.* 2016).

***Meromyza pluriseta* Péterfi, 1961**

Material examined: Shabestar (Til), 38°15'31.7" N, 45°28'50.8" E, 1489 m, (1♂), 04.vii.2014; leg. R.N.K.

Distribution: Palaearctic: Iran, Kazakhstan, Central Asia, Afghanistan, East Siberia and Mongolia, (Nartshuk and Fedoseeva 2011b).

***Meromyza saltatrix* (Linnaeus, 1761)**

Material examined: Shabestar (Heris), 38°15'04.2" N, 45°31'02.3" E, 1595 m, (5♂♂, 8♀♀), 15.vii.2014; (Khameneh), 38°11'26.2" N, 45°38'08.9" E, 1501 m, (7♂♂, 10♀♀), 12.vii.2014; (Kuzekonan), 38°11'07.6" N, 45°33'41.8" E, 1383 m, (5♂♂, 2♀♀), 07.vi.2014; (Shanejan), 38°13'39.3" N, 45°43'07.6" E, 1602 m, (10♂♂, 12♀♀), 04.vi.2014; (Sharafkhaneh), 38°11'30.0" N, 45°30'05.7" E, 1320 m, (7♂♂, 6♀♀), 03.v.2014; (Til), 38°15'31.7" N, 45°28'50.8" E, 1489 m, (10♂♂, 8♀♀), 04.vii.2014; leg. R.N.K.

Distribution: Holarctic; In the Palaearctic region it has been reported from Europe to China, (including Iran) and in the Nearctic region, is only found in Alaska. (Behdad 1982; Nartshuk and Fedoseeva 2011b).

***Meromyza variegata* Meigen, 1830**

Material examined: Shabestar (Heris), 38°15'04.2" N, 45°31'02.3" E, 1595 m, (3♂♂, 1♀), 15.vii.2014; (Shanejan), 38°13'39.3" N, 45°43'07.6" E, 1602 m, (9♂♂, 4♀♀), 04.vi.2014; (Til), 38°15'31.7" N, 45°28'50.8" E, 1489 m, (4♂♂, 1♀), 04.vii.2014; leg. R.N.K.

Distribution: Europe, Afghanistan and Iran (Nartshuk and Fedoseeva 2011b; Khaghaninia and Gharajedghi 2013).

Genus *Neohaplegis* Beschovski, 1981***Neohaplegis glabra* (Duda, 1933) (Figs. 4–6)**

Material examined: Shabestar (Kuzekonan), 38°11'07.6"N, 45°33'41.8"E, 1383 m, (1♂),

11.vii.2014; leg. R.N.K. (1♂ shared with CULS).

Diagnostic characters: Species with entirely black body (Fig. 4); ocellar triangle large, smooth and shining (Fig. 5); gena narrower than first flagellomere; antenna and arista black; first flagellomere rounded; legs black; body length 2.0–2.5 mm; epandrium as illustrated in Fig. 6.

Distribution: Europe and Kazakhstan (Nartshuk and Andersson 2013). **New record species for Iran.**

Genus *Phyladelphus* Becker, 1910***Phyladelphus thalhammeri* Becker, 1910 (Figs. 7–9)**

Material examined: Shabestar (Sharafkhaneh), 38°11'30.0"N, 45°30'05.7"E, 1320 m, (1♂, 1♀), 18.vi.2013; leg. R.N.K.

Diagnostic characters: yellow species; stripes of mesonotum black; central stripe reaches scutellum and scutellum with black stripe (Fig. 7); palpus yellow (Fig. 8); ocellar triangle narrow (Fig. 9); abdomen brown dorsally; body length 3.0 mm.

Distribution: Mediterranean, southern Europe and Caucasus (Nartshuk 2012a). **New record genus and species for Iran.**

Genus *Platycephala* Fallen, 1820***Platycephala planifrons* (Fabricius, 1798)**

Material examined: Shabestar (Shanejan), 38°13'39.3" N, 45°43'07.6" E, 1602 m, (1♂), 03.vii.2013; leg. R.N.K.

Distribution: Eurasia; Iran (Nartshuk and Andersson 2013; Khaghaninia and Namaki Khameneh 2015).

Genus *Thaumatomyia* Zenker, 1833***Thaumatomyia glabra* (Meigen, 1830)**

Material examined: (Khameneh), 38°11'26.2" N, 45°38'08.9" E, 1501 m, (14♂♂, 9♀♀),

02.vi.2013; (Shanejan), 38°13'39.3" N, 45°43'07.6" E, 1602 m, (21♂♂, 28♀♀), 05.vii.2014; leg. R.N.K.

Distribution: Holarctic species; Iran (Nartshuk and Andersson 2013; Khaghaninia *et al.* 2014b).

***Thaumatomyia notata* (Meigen, 1830)**

Material examined: Shabestar (Heris), 38°12'03.1" N, 45°30'14.2" E, 1372 m, (27♂♂, 34♀♀), 15.vii.2014; (Alibeighlu), 38°11'27.4" N, 45°30'37.3" E, 1349 m, (27♂♂, 31♀♀), 26.v.2013; (Daryan), 38°13'38.8" N, 45°37'51.5" E, 1749 m, (56♂♂, 47♀♀), 21.v.2014; (Khameneh), 38°11'47.0" N, 45°37'07.3" E, 1560 m, (35♂♂, 36♀♀), 12.vi.2013; (Kuzekonan), 38°11'14.5" N, 45°32'50.8" E, 1378 m, (41♂♂, 38♀♀), 07.vi.2014; (Shanejan), 38°12'46.9" N, 45°42'44.6" E, 1336 m, (41♂♂, 51♀♀), 04.vi.2014; (Sharafkhaneh), 38°11'30.0" N, 45°30'05.7" E, 1320 m, (24♂♂, 31♀♀), 03.v.2014; (Til), 38°15'31.7" N, 45°28'50.8" E, 1489 m, (25♂♂, 14♀♀),

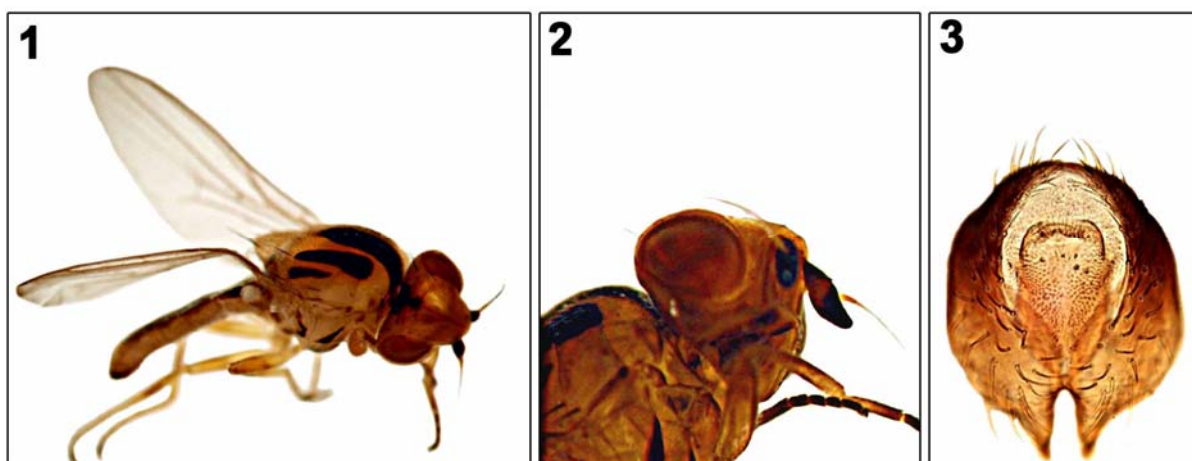
04.vii.2014; (Sis), 38°11'19.5" N, 45°50'10.0" E, 1409 m, (42♂♂, 57♀♀), 14.vii.2014; leg. R.N.K.

Distribution: Widespread species; Iran (Modarres-Awal 2011; Nartshuk and Andersson 2013).

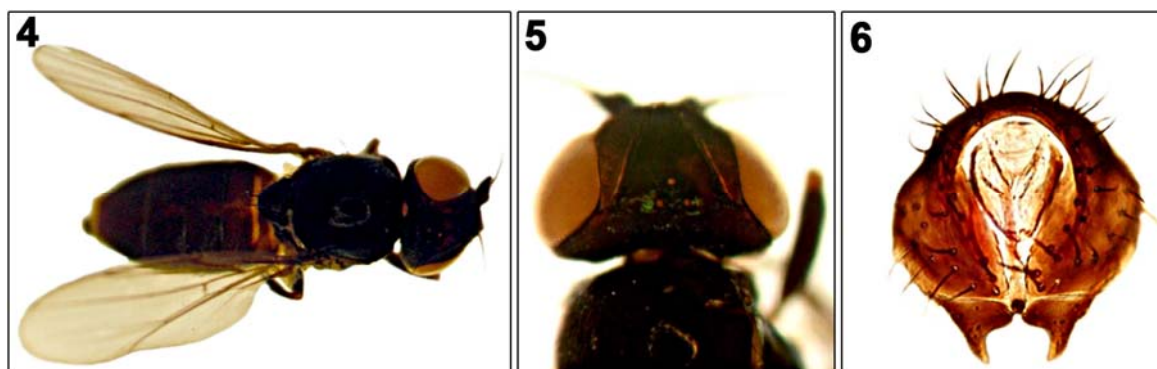
***Thaumatomyia sulcifrons* (Becker, 1907)**

Material examined: Shabestar (Heris), 38°15'04.2" N, 45°31'02.3" E, 1595 m, (16♂♂, 22♀♀), 09.vi.2014; (Daryan), 38°13'38.8" N, 45°37'51.5" E, 1749 m, (56♂♂, 47♀♀), 11.vi.2014; (Khameneh), 38°11'26.2" N, 45°38'08.9" E, 1501 m, (41♂♂, 33♀♀), 12.vi.2013; (Kuzekonan), 38°11'07.6" N, 45°33'41.8" E, 1383 m, (28♂♂, 36♀♀), 18.vii.2014; (Shanejan), 38°13'39.3" N, 45°43'07.6" E, 1602 m, (76♂♂, 62♀♀), 04.vi.2014; (Til), 38°15'31.7" N, 45°28'50.8" E, 1489 m, (27♂♂, 24♀♀), 24.v.2014; (Sis), 38°11'19.5" N, 45°50'10.0" E, 1409 m, (53♂♂, 42♀♀), 14.vii.2014; leg. R.N.K.

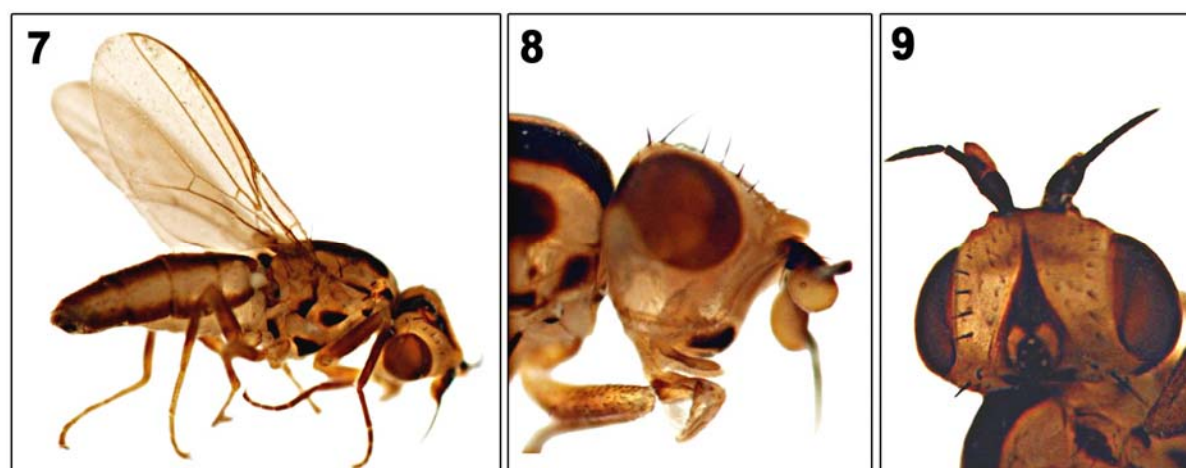
Distribution: Widespread; Iran (Narchuk *et al.* 1989; Modarres-Awal 2011).



Figures 1–3. *Lagaroceras curtum* Sabrosky, 1961 (male): 1. Lateral view, 2. Lateral view of head, 3. Caudal view of epandrium.



Figures 4-6. *Neohaplegis glabra* (Duda, 1933) (male): 4. Dorsal view, 5. Dorsal view of head, 6. Caudal view of epandrium.



Figures 7-9. *Phyladelphus thalhammeri* Becker, 1910 (male): 7. Lateral view, 8. Lateral view of head, 9. Dorsal view of head.

Discussion

Among the subfamily Chloropinae which were studied in this research, the genus *Meromyza* Meigen with eight species is the most specious genus. The species *Meromyza nigriovetris* Macqurt is the most abundant among the other species, followed by *Thaumatomyia notata* (Meigen) and *Thaumatomyia sulcifrons* (Becker). All species were collected from grasslands and lands nearby the Urmieh Lake. Shabestar region with special situation, between Urmieh salty lake in the south and the Mishow Mountain (with 3150 m

summit) in the north, has diverse environments with very rich flora and subsequently insect fauna like frit flies. The species of this subfamily are found in forests, open habitats such as grasslands, steppes, pastures, and in fields which could be found in this studying area. The scattered forests and grasslands as well pastures mostly situated around Mishow Mountain with high latitude. Since few studies about this subfamily have been taken place in Iran, therefore this case of study has great importance, which can lead to identifying more species for Iranian fauna.

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فون دوبالان زیرخانواده Chloropinae (Diptera: Chloropidae) در ناحیه شبستر به همراه سه گزارش جدید برای ایران

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چکیده: دوبالان زیرخانواده Chloropinae در منطقه شبستر واقع در استان آذربایجان شرقی در طی سال‌های ۱۳۹۳-۱۳۹۴ مورد بررسی و مطالعه قرار گرفت. بر اساس نتایج بدست آمده، ۲۶ گونه از ۱۲ جنس مورد شناسایی قرار گرفت که از بین آنها یک جنس و سه گونه شامل *Phyladelphus* Becker, 1910، *Lagaroceras curtum* Sabrosky, 1961 و *Phyladelphus thalhammeri*, Becker و *Neohaplegis glabra* (Duda, 1933) 1910 برای اولین بار از ایران گزارش می‌شوند.

واژگان کلیدی: Chloropinae، Chloropidae، گزارش جدید، شبستر، ایران