



Frit flies (Diptera: Chloropidae) fauna of central part of Khorasan Razavi Province, Iran

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ABSTRACT. During a study on fauna of the frit flies (Diptera: Chloropidae) in Khorasan Razavi province (Iran) in 2014 and 2015, nine species of six genera were collected and identified. *Platycephala rugosa* (Nartshuk, 1964) is recorded for the first time for Iranian fauna. Geographical distribution and biological notes are provided.

Key words: Chloropidae, Diptera, Iran, Grass flies, Khorasan Razavi

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Introduction

Chloropidae is a cosmopolitan family of flies commonly known as grass flies or frit flies. According to the Ismay and Nartshuk (2000) this family includes about 2600 described species in over 160 genera, of which 500 species are recorded from the Palaearctic region. Grass flies are as small as 0.7 to 10 mm. Mesonotum is bare or with relatively sparse setulae, usually in bright colors and sometimes black and yellow. They found in various habitats but most species are active and live in the meadows and other grasslands.

The larvae of most species are stem-borer or infests cambiums, flowers and unrip seeds of plants of the family Poaceae

and cause economical damage to agricultural crops. A few species are predators or parasitoid of different insects and can be used as potential biological control agents. A few are useful insects because of scavengerous habitat. Some species (in genus *Hippelates*) breed in rotten vegetation and animal faeces and attract to animal secretions and feed on blood, fester, smear, dead tissues and similar materials; therefore act as a vector of humans and animals diseases. Some species attract to the animals eyes (sometimes called eye gnats) and feed from tear fluid and carries yaws and pinkeye to other animals (Borror *et al.* 2005; Chansang and Mulla 2008; Matheson 2008 and Bazzyar *et al.* 2015).

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Khorasan Razavi Province is located in North East of Iran with area about 120000 km². It limited in the East to south of Republic of Turkmenistan and North West of Islamic Republic of Afghanistan. Maximum temperature reaches to 45°C during the hot summer months. The winters are cold, with a temperature plummeting to -25 °C. The average annual precipitation for province is about 210 mm. Before this study, little information was available on the frit flies of this region.

Material and methods

Materials were collected by standard sweeping net in various habitats in central part of Khorasan Razavi province during 2014-2015 seasons. Specimens were killed in a killing jar, minuten pinned on side and deposited in the following collections: IMSU: Insect Museum of Shahrood University of Technology, Shahrood, Iran; ZISP: Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia and SMNC: Personal collection of Saeed Mohamadzade Namin.

Results

In this study, nine species in six genera were collected from the central parts of Khorasan Razavi province. *Platycephala rugosa* is recorded for the first time for Iranian fauna and six species are new records for the province. The genera and species are listed in alphabetic order.

List of species

Meromyza nigriventris Macquart 1835.

Material examined: Kohsorkh, Cheshmeh Rigi, 1640m, 35°28.911N, 58°27.581E, 8.VIII.2014, 2♂, 2♀; Mashad, Meydan Bostan, 35°28.863N, 58°27.577E, 13.VIII.2014, 1♂, 3♀; Neyshabor, Rivash, 35°24.528N, 58°29.525E, 2.V.2014, 1♀, same, 8.VIII.2014, 1♂, 2♀; Neyshabor, Torogh, 19.VI.2015, 1♂, 1♀; Kashmar, 35°14.450N, 58°26.376E, 2.V.2014,

3♂, 5♀; Kohsorkh, Makki, 35°28.063N, 58°28.155E, 3.VI.2014, 1♂, 1♀; Torbat Heydarieh, Hesar, 10.VII.2015, 2♂, 4♀ (IMSU, ZISP and SMNC).

Biology: Larvae phytophagous, develop in uppermost leaf sheath of different Poaceae, including cereals (wheat, rye, oats and barley) (Nartshuk and Anderson 2013).

General distribution: Europe, East Palaearctic, Western part of Nearctic Region (Nartshuk 2013), Iran (Nartshuk 1984): Fars (Bazyar 2011), Markazi (Rabieh et al. 2012), East Azerbaijan (Khaghaninia and Namaki Khameneh 2015).

Lasiosina paralittoralis Dely-Draskovits, 1981

Material examined: Kohsorkh, 15.V.2015, 1♀ (ZISP).

Biology: Unknown

General distribution: Israel (Nartshuk 1984), Iran (Rabieh et al. 2012): Markazi (Rabieh et al. 2012), East Azerbaijan (Namaki Khameneh and Khaghaninia 2016).

Lasiosina herpini Guérin-Méneville, 1843

Material examined: Kohsorkh, Cheshmeh Rigi, 1640m, 35°28.911N, 58°27.581E, 8.VIII.2014, 2♂, 1♀; Kashmar, 2.V.2014, 3♂, 4♀; Kashmar, Kalateh, 35°24.023N, 58°27.874E, 18.VII.2014, 1♂; Neyshabor, Rivash, 35°24.528N, 58°29.525E, 8.VIII.2014, 7♂, 4♀; Neyshabor, Aria mountain, 19.VI.2015, 1♂, 1♀; Torbat Heydarieh, Hesar 10.VII.2015, 1♂, 1♀ (IMSU, ZISP and SMNC).

Biology: Larvae are secondary invaders, sapro-phytophagous, develop in shoots of Poaceae, damaged by other insects. Occur in shoots of cereals as well (Nartshuk and Anderson 2013).

General distribution: Europe, East Palaearctic, Near East, North Africa (Nartshuk 2013a), Iran (Nartshuk 1984): Khorasan Razavi, Mazandaran (Radjabin et al. 1997 as *L. cinctipes*), Markazi (Rabieh et al. 2012).

***Aphanotrigonum cinctellum* Zetterstedt, 1848**

Material examined: Kashmar, 1060m, 35°14.450N, 58°26.376E, 19.IX.2014, 2 ♂, 4♀ (IMSU, ZISP and SMNC).

Biology: larvae secondary invaders, sapro-phytophagous (Nartshuk 1970).

General distribution: Europe, East Palaearctic, Near East, North Africa, Oriental Region (Nartshuk 2013), Iran (Nartshuk 1984): Markazi (Rabieh *et al.* 2012).

***Platycephala rugosa* (Nartshuk, 1964)**

Material examined: Chaldran, Firizi, 36°28'N, 58°57'E, 1760m, 9.VIII.2011, 1♀ (ZISP).

Biology: Larvae phytophagous, develop in shoots of common reed (*Phragmites australis*) (Emilia Nartshuk, Unpublished data).

Diagnosis: Body yellowish brown and long (about 6 mm). Third antennal segment longer than second one, arista with very short pubescent; vertical triangle barely narrowed anteriorly; occupying entire frons; surface with transverse folds, without punctuation (Fig. 1). Mesonotum yellow with brown strips. Hairs on mesonotum very short. Wings hyaline, Costal vein extending to end of R4+5. Legs yellow, hind tibia not curved.

Distribution: South-Eastern part of Europe (Orenburg district), Kazakhstan, Middle Asia (Nartshuk 1984), Iran (**new record**).

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

Material examined: Kohsorkh, Makki, 1680 m, 35°28.063N, 58°28.155E, 3.VI.2014, 4♂, 7♀; Kohsorkh, Cheshmeh Rigi, 1640m, 35°28.911N, 58°27.581E, 8.VIII.2014, 2♂, 4♀; Mashad, Meydan Bostan, 1100 m, 35°28.863N, 58°27.577E, 13.VIII.2014, 1♂, 2♀; Mashad, Tabadkan, borjabad, 975m, 35°28.911N, 58°27.581E, 28.VI.2014, 1♂, 4♀ (IMSU, ZISP and SMNC).

Biology: Larvae carnivorous, live in ground among rhizome of plants and feed on root aphids.

General distribution: Southern part of the Palaearctic Region from Canary Island to Transcaucasus, Palestine, Afghanistan, Kazakhstan, Mongolia and China; North Africa: Algeria, Tunisia (Nartshuk 2013). Israel, Yemen (Deeming and Al-Dhafer 2012), Morocco (Dawah and Abdullah 2006), Iran (Becker 1913): Sistan (Becker 1913), Alburz (Radjahi *et al.* 1997), Fars (Bazyar 2011), Markazi (Alikhani *et al.* 2012), East Azerbaijan (Khaghaninia and Namaki Khameneh 2015).

***Thaumatomyia glabra* (Meigen, 1830)**

Material examined: Khalilabad road, 1060 m, 35°14.450N, 58°26.376E, 17.V.2014, 1♂, 1♀ (ZISP); Kashmar, 1660 m, 2.V.2014, 1♀ (SMNC).

Biology: Larvae carnivorous, live in ground among rhizome of plants and feed on root aphids (Nartshuk and Anderson 2013).

General distribution: Widely distributed in the Palaearctic Region, Nearctic Region (Nartshuk 2013), Iran (Rabieh *et al.* 2012): Markazi (Rabieh *et al.* 2012), East Azerbaijan (Khaghaninia *et al.* 2014).

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

Material examined: Torbat Heydarieh, Hesar, 1800 m, 10.VII.2015, 1♂, 2♀; Kohsorkh, Cheshmeh Rigi, 1640 m, 8.VIII.2014, 2♂, 3♀; Neyshabor, Rivash, 1650 m, 35°24.528N, 58°29.525E, 8.VIII.2014, 2♂, 3♀; Kashmar, 1060 m, 2.V.2014, 4♂, 2♀; Mashad, Tabadkan, Borjabad, 975 m, 35°28.911N, 58°27.581E, 28.VI.2014, 1♂, 1♀ (IMSU, ZISP and SMNC).

Biology: Larvae carnivorous, live in ground among rhizome of plants and feed on root aphids (Nartshuk 2000).

General distribution: multi-regional species, widespread in Palaearctic, Oriental and Afrotropical regions (Nartshuk 2013), Iran: Alburz, Tehran, Khorasan Razavi, Semnan (Radjahi *et al.* 1997), Fars (Bazyar 2011), Markazi (Rabieh *et al.* 2012), East Azerbaijan (Khaghaninia *et al.* 2014).



Figure 1. *Platycephala rugosa*, dorsal view.

Oscinella pusilla (Meigen, 1830)

Material examined: Neyshabor, Rivash, 1650 m, 35°24.528N, 58°29.525E, 8.VIII.2014, 1♂, 2♀; Mashad, Meydan bostan, 1120 m, 35°28.863N, 58°27.577E, 13.VIII.2014, 2♂, 3♀; Torbat Heydarieh, Hesar, 1800 m, 10.VII.2015, 1♂, 2♀; Neyshabor, Rivash, Torogh, 1690 m, 19.VI.2014, 2♂, 3♀; Kashmar, 1060m, 19.IX.2014, 3♂, 2♀; Neyshabor, Aria mountain, 2050m, 19.VI.2014, 4♂, 2♀; Kohsorkh, 1950m, 15.05.2015, 2♂, 1♀ (IMSU, ZISP and SMNC).

Biology: Larvae phytophagous, develop in shoots of different grasses (Poaceae), pest of cereals (wheat, maize, barley) (Rajabi and Behrozin 2003; Nartchuk 1970)

General distribution: Widespread in the Palaearctic Region (Nartshuk 2013), Iran (Nartshuk *et al.* 1989): Golestan, Markazi, Zanjan, East Azerbaijan (Rajabi and Behrozin 2003), Kurdistan (Modarres Awal 2011), Fars (Bazyar 2011).

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References

- Alikhani, M., Arkani, T., Rabieh, M. and Nartshuk, E. P. 2012. New records of Chloropid species from Iran (Dip., Chloropidae). *In*: Banihashemi, Z., Sarafrazi, A., Minaei, K. and Parvin, A. (Eds), *Proceedings of the 20th Iranian Plant Protection Congress*; 25–28 August 2012; Shiraz University, Shiraz, Iran, p. 104.
- Bazyar, Z. 2011. *Fauna of Chloropidae (Diptera) in central region of Fars Province*. MSc Thesis, Islamic Azad University, Jahrom Branch, Iran (in Persian).
- Bazyar, Z., Dousti, A., von Tschirnhaus, M. and Fallahzadeh, M. 2015. A first overview of the fauna of Chloropidae of Iran (Diptera, Acalyptratae). *Turkish Journal of Zoology*, 39(6): 1041–1049. Doi: 10.3906/zoo-1405-3.

- Becker, T. 1913. Persische Dipteren von den Expeditionen des Herrn N. Zarudny 1898 und 1901. *Annuaire du Musée zoologique de l'Académie impériale des sciences de St. Pétersbourg*, 17: 503–654.
- Borror, D. J., Triplehorn, C. A. and Johnson, N. F. 2005. *An introduction to the study of insects*. 6th edition. Philadelphia, Saunders College Publishing, 1989, 875 pp.
- Chansang, U. and Mulla, M. S. 2008. Field Evaluation of Repellents and Insecticidal Aerosol Compositions for Repelling and Control of *Siphunculina funicola* (Diptera: Chloropidae) on Aggregation Sites in Thailand. *Journal of the American Mosquito Control Association*, 24(2): 299–307.
- Dawah H.A. and Abdullah M.A. 2006. New records of Chloropidae (Diptera) from Southwest Saudi Arabia with some biological information, world-wide geographical distribution and taxonomic features. *Saudi Journal of Biological Science*, 13: 132–192 (in Arabic).
- Deeming, J. C. and Al-Dhafer, H. M. 2012. Chloropidae from the Arabian Peninsula (Diptera: Cyclorrhapha). *Zoology in the Middle East*, 58: 1–88. DOI: 10.1080/09397140.2012.10648977.
- Ismay, J.W. and Nartshuk, E.P. 2000. Family Chloropidae. In: Papp L, Darvas B, (Eds), *Contributions to a Manual of Palaearctic Diptera (with Special Reference to Flies of Economic Importance)*. Appendix Volume. Budapest, Hungary: Science Herald Press, pp. 387–429.
- Khaghaninia, S. and Namaki Khameneh, R. 2015. Some of the grass flies (Diptera, Chloropidae) fauna of West Azarbaijan province - Iran. *Linzer Biologische Beiträge*, 47 (2): 1573–1579.
- Khaghaninia, S., Gharejedaghi, Y. and Kubik, S. 2014. Phenotypic variation of *Thaumatomyia notata* (Meigen, 1830) (Diptera; Chloropidae) in East Azerbaijan province - Iran. *Journal of Insect Biodiversity*, 2 (22): 1–9. DOI: 10.12976/jib/2014.2.22
- Mansour Ghazi, M. and Rajabi, G.R. 2000. Identification, distribution and loss evaluation of wheat flies (*Oscinella* spp.) in Kurdistan province. In: *Proceedings of the 14th Iranian Plant Protection Congress*; 5–8 September 2000; Isfahan, Iran. Vol. I, Pests. Isfahan, Iran: University of Technology, p. 224.
- Matheson, R. 2008. *Medical Entomology*. Read Books. ISBN 1–4437–2540–4.
- Modarres-Awal, M. 2011. *List of agricultural pests and their natural enemies in Iran*. Ferdowsi University of Mashhad publication, Mashhad, third edition, 447 pp.
- Namaki Khameneh, R. and Khaghaninia, S. 2016. Fauna of grass flies of the subfamily Chloropinae (Diptera: Chloropidae) in Shabestar region with three new records for Iran. *Journal of Insect Biodiversity and Systematics*, 1(2): 101–110.
- Nartshuk, E. P., Smirnov, E. S. and Fedoseeva, L. 1989. Family Chloropidae. pp. 667–731. In: G. Y. Bei-Bienko & G. Steyskal (Eds.), *Keys to the insects of the European part of the USSR*, Volume 5, Diptera and Siphonaptera, part II: xxii + 1505 pp. Amerind Publishing, New Delhi & E. J. Brill, Leiden & Kinderkook, N.Y.
- Nartshuk, E. P. 1984. Family Chloropidae. pp. 222–297 In: Soós, Á. & Papp, L., *Catalogue of Palaearctic Diptera*, Vol. 10, Clusiidae - Chloropidae, Elsevier, Amsterdam & Akadémiai Kiado, Budapest.
- Nartshuk, E. P. 2000. Periodicity of outbreaks of predatory fly *Thaumatomyia notata* MG. (Diptera, Chloropidae) and its possible reasons. *Entomological Review*, 80: 911–918.
- Nartshuk, E. P. 2013. Fauna Europaea: Chloropidae. In: Pape, T., Beuk, P. and de Jong YSDM (Eds), *Fauna Europaea, Diptera: Brachycera. Fauna Europaea Version 2.6*. Available from: <http://www.faunaeur.org>.
- Nartshuk E. P. and Anderson, H. 2013. *The frit flies (Chloropidae: Diptera) of Fennoscandia and Denmark*. Fauna Entomologica Scandinavica, vol. 43, Brill Academic Publishers, Leiden, 277 pp.
- Rabieh, M. M., Alikhani, M., Arkani, T., Taji, M. and Nartshuk, E. P. 2012. Checklist of Grass Flies (Diptera: Chloropidae) of Markazi province, Iran. *International Journal of Dipterological Research*, 23(2): 95–101.
- Rajabi, G., Hosseini, S. M. and Mansoor-Ghazi, M. 1997. Diptera occurring on wheat and barley in Iran. *Journal of Entomological Society of Iran*, 64: 60–71.
- Rajabi, G. and Behrozin, M. 2003. *Pests and diseases of wheat in Iran*. Agricultural Education Publications, 186 page.

فون مگس‌های چمن (*Diptera: Chloropidae*) در بخش‌های مرکزی استان خراسان رضوی، ایران

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چکیده: در طی تحقیق در مورد مگس‌های چمن (*Diptera: Chloropidae*) در استان خراسان رضوی (ایران) بین سال‌های ۱۳۹۳ تا ۱۳۹۴، شامل ۹ گونه از ۶ جنس جمع‌آوری و شناسایی شدند. گونه *Platycephala rugosa* (Nartshuk, 1964) برای اولین بار از فون ایران گزارش شد. انتشار جغرافیایی و ویژگی‌های زیستی گونه‌ها ارایه شده است.

واژگان کلیدی: *Diptera*، *Chloropidae*، ایران، مگس‌های چمن، خراسان رضوی