



New records of the subfamily Phasiinae (Diptera: Tachinidae) from Iran

Ebrahim Gilasian^{1,2*}, Ali Asghar Talebi², Joachim Ziegler³, Shahab Manzari¹ and Mehrdad Parchami-Araghi¹

¹ Insect Taxonomy Research Department, Iranian Research Institute of Plant Protection, Agricultural Research, Education and Extension Organization (AREEO), Tehran, 19395-1454, Iran.

² Tarbiat Modares University, Faculty of Agriculture, Department of Entomology, 4115–336, Tehran, Iran.

³ Museum für Naturkunde, Leibniz Institute for Research on Evolution and Biodiversity, Invalidenstrasse 43, Berlin, 10115, Germany.

Received:
23 December 2016

Accepted:
07 February 2017

Published:
11 February 2017

Subject Editor:
Jeremy D. Blaschke

ABSTRACT. In a taxonomic study of the subfamily Phasiinae (Diptera: Tachinidae), seven species and the three genera *Opesia* Robineau-Desvoidy, *Subclytia* Pandellé and *Xysta* Meigen are recorded for the first time from Iran. The diagnostic characters, distributional data along with the photographs of species are presented. Taxonomical positions of the genera and species are discussed.

Key words: fauna, new records, taxonomy, biological control, parasitoids

Citation: Gilasian, E., Talebi, A.A., Ziegler, J., Manzari, S. and Parchami-Araghi, M. 2017. New records of the subfamily Phasiinae (Diptera: Tachinidae) from Iran. *Journal of Insect Biodiversity and Systematics*, 3(1): 7–19.

Introduction

Phasiinae with about 600 species and 100 genera described worldwide is the smallest subfamily of the family Tachinidae (Herting 1984; Tschorsnig 1985; Herting and Dely-Draskovits 1993; Tschorsnig and Richter 1998; Ziegler 1998; Richter 2004; Blaschke 2015). The most recent evolutionary survey on the subfamily proved that the elongated hypandrium should be considered as a unique synapomorphy for the phasiine taxa (Blaschke 2015). Other traits such as piercer location (in case of presence), oviposition strategy, host and hinged membranous connection between basiphallus and distiphallus share among Phasiinae and some other subfamilies (Blaschke 2015). The following external morphological characters

can be found in the subfamily Phasiinae: Eye, arista and prosternum bare; scutum with 0–2 postsutural intra-alar setae, in case of 2 setae they are widely separated from each other; middorsal depression on abdominal syntergite 1+2 not reaching posterior margin; abdominal sternites often well exposed (Tschorsnig and Richter 1998).

The subfamily Phasiinae has been a subject of taxonomic studies through the years largely for its economically important hosts and amazing parasitic strategies.

Draber-Mońko (1961, 1964) studied the subfamily Phasiinae in Poland and wrote an identification key to the species. Meanwhile, Dupuis (1963) provided a monograph on

Corresponding author: Ebrahim Gilasian, E-mail: gilasian@iripp.ir

Copyright © 2017, Gilasian et al. This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY NC 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

the subfamily Phasiinae. In line with the previous studies on Old World species of Tachinidae, Herting (1983) revised the genera *Lophosia* Meigen and *Cylindromyia* Meigen in tribe Cyndromyiini (Phasiinae) and compiled the catalogue of the family in the Palaearctic region (Herting 1984). Later, Tschorsnig (1985) classified phasiine tribes according to the structure of male terminalia leading to the exclusion of the tribe Eutherini. Tschorsnig and Herting (1994) provided a key to the species of Central Europe and defined the host ranges of species and their ecological importance. Ziegler and Shima (1996) studied the Russian Far East Tachinidae and presented 61 phasiine species with their ecological, morphological and zoogeographical data in addition to the description of the new species *Hemyda hertingi*. Ziegler (1998) investigated the morphology of puparia and cephalo-pharyngeal skeleton of mature larvae of four subfamilies of Tachinidae. In her faunistic study of the tachinid flies of the Russian Far East, Richter (2004) compiled a key to the Phasiinae species of this region. O'Hara (2013) reviewed the history of classification of Tachinidae including the subfamily Phasiinae from Meigen until now. The phylogeny of Tachinidae has been recently analyzed by using 135 morphological characters of 492 species in four subfamilies including Phasiinae (Cerretti *et al.* 2014). Their analysis supported the monophyly of the subfamily Phasiinae and its close relation to the subfamily Dexiinae. Blaschke (2013, 2015) studied the evolutionary phylogeny of the subfamily Phasiinae using molecular markers and presented a key to the species of eastern Nearctic region.

In our ongoing surveys on the Iranian fauna of Phasiinae; we studied the genera *Phania* Meigen, *Phasia* Latreille, tribe Leucostomatini and the genus *Cylindromyia* Meigen resulting in the description of the species *Phania rufomaculata* Gilasian and

Ziegler, *Cylindromyia vallicola* Ziegler and Gilasian and *C. uncinata* Gilasian, Talebi and Ziegler (Gilasian *et al.* 2013a; 2013b; 2014a; 2014b). Gheibi *et al.* (2008, 2009) recorded five species of Phasiinae from Fars province and Seyyedi Sahebari *et al.* (2016) discovered five Phasiinae species from northwestern Iran.

Material and methods

The specimens have been collected by standard insect nets and Malaise traps since 1971. The Malaise traps were set up in northern slope of central Elburz Mountains. Pinned specimens were photographed using a 650D Canon digital camera and the photos of live specimens were taken with a Canon camera EOS 500D, Canon macro lens EF 100 mm, and a Canon macro ring lite MR-14EX. The specimens are deposited in the Hayk Mirzayans Insect Museum (HMIM), Tehran, Iran; Museum of Natural History, Leibniz-Institute for Research on Evolution and Biodiversity, Berlin, Germany (ZMHB) and the Collection of Department of Entomology, Tarbiat Modares University (TMUC), Tehran, Iran. The terminology for the external morphology follows Merz and Haenni (2000), Stuckenberg (1999) and Tschorsnig and Richter (1998). The identifications were done using Draber-Moňko (1964), Zimin (1966), Kugler (1977), Zimin *et al.* (1989), Tschorsnig and Herting (1994), Tschorsnig and Richter (1998) and Richter (2004).

Results

We present here three genera (*Opesia* Robineau-Desvoidy, *Subclytia* Pandellé, *Xysta* Meigen) and seven species of Phasiinae for the first time from Iran. The species are alphabetically ordered.

Genus *Catharosia* Rondani, 1868

Type species. *Thereva pygmaea* Fallén, 1815

Remarks: The genus *Catharosia* Rondani was first recorded from Fars province in

Iran as *C. flavicornis* (Zetterstedt) by Gheibi *et al.* (2008). Although Zeegers (2007) considered *Archiphania* as a valid genus, O'Hara and Cerretti (2016) followed Crosskey (1984) and treated it as a synonym of *Catharosia*. Based on the molecular phylogenetic study of the subfamily Phasiinae, Blaschke (2013, 2015) defined *Catharosia* (Catharosiini) as a sister group to the tribe Leucostomatini.

Catharosia claripennis Kugler, 1977

Material examined: IRAN. Elburz province, Karaj, 35°46'33.6"N, 50°57'14.9"E, 1278 m, 5–15.viii.2010, Malaise trap, 1♀ [TMUC], leg. M. Khayrandish and A. Nadimi; Gilan province, Roudsar, Rahimabad, Orkom, 36°46'13.9"N, 50°18'19.8"E, 1201 m, 22–31.vi.2010, Malaise trap, 1♂ [TMUC], leg. M. Khayrandish and A. Nadimi; Tehran province, Shahryar, 35°40'51.0"N, 50°57'24.9"E, 1168 m, 1–8.x.2010, Malaise trap, 2♂ 2♀ [TMUC], leg. M. Khayrandish and A. Nadimi.

Distribution: Asia. Israel. Europe. France (Kugler 1977; Tschorsnig *et al.* 2016). New record for Iran.

Host: Unknown.

Diagnosis: Frons in male narrow and without fronto-orbital setae, at most as wide as postpedicel; palpus well developed, wing predominantly hyaline; upper calypter white to light brown; lower calypter brownish-black; petiole of wing cell R₄₊₅ 1.5–2 times as long as vein M beyond bend. Female: abdomen with a strong ventral process before sternite 5; ovipositor straight apically; cerci well developed reaching tip of ovipositor (see Fig. 9 page 9 in Kugler 1977).

Catharosia pygmaea (Fallén, 1815)

Material examined: IRAN. Elburz province, Karaj, Arangeh, 35°55'12.0"N, 51°05'15.4"E, 1891 m, 5–12.viii.2010, Malaise trap, 1♂, 1♀ [TMUC], leg. M. Khayrandish and A. Nadimi;

Shahrestanak, 35°58'27.1"N, 51°21'43.0"E, 2225 m, 14–22.vii.2010, Malaise trap, 1♂ [TMUC], leg. M. Khayrandish and A. Nadimi; Kerman Province, Basar, Keyber Mountain, south of Baft, valley, 28°45'02"N, 56°31'22"E, 2280 m, 21.iv.2006, 1♀ [ZMHB], leg. J. Ziegler.

Distribution: Asia. Israel, Mongolia, Russia (Far East) and Transcaucasia. Europe. Widely distributed in mainland Europe except for Balkan Peninsula in the south, Belarus, Estonia and Lithuania in the east (Herting and Dely-Draskovits 1993; Richter 2004; Tschorsnig *et al.* 2016). New record for Iran.

Host: *Beosus maritimus* (Scopoli, 1763) (Hemiptera: Lygaeidae) (Tschorsnig and Herting 1994; Richter 2004).

Diagnosis: This species can be separated from the similar species, *C. claripennis*, by the following characters: Wing distinctly infuscated anteriorly. Female: abdomen without a ventral strong process; ovipositor curved; cerci not exceeding half length of ovipositor.

Remarks: Although the colouration of upper calypter was used by Kugler (1977) to separate *C. pygmaea* from *C. claripennis*, we found this character unreliable and subject to intraspecific variation from white to light brown in both species. The pregonite and postgonite along with the aedeagus of *C. pygmaea* were illustrated by Tschorsnig (1985) (see Fig. 143 page 47; Fig. 229 page 66). The drawings of head and wing appeared in Richter (2004) (see Figs 180, 1–2 page 385). Draber-Moříko (1964) prepared the drawings of male and female terminalia (see Figs 123–124 page 52).

Genus *Eliozeta* Rondani, 1856

Type species: *Tachina pellucens* Fallén, 1820

Remarks: Based on the characters of male terminalia, Tschorsnig (1985) placed *Eliozeta* in the tribe Gymnosomatini and a recent phylogenetic study on the subfamily confirmed its placement (Blaschke 2015).



Figure 1. *Eliozeeta pellucens* (female).

***Eliozeeta pellucens* (Fallén, 1820)**

(Fig. 1)

Material examined: IRAN. Mazandaran province, Kandovan, Elburz Mountains, north of Tehran, 36°10'20.8"N, 51°18'55.8"E, 2570 m, 12.vii.2008, on flowers of *Achillea setacea* Waldst. and Kit. 1♂, 1♀ [ZMHB], leg. J. Ziegler; Ramsar, Eshkatechal, 1200 m, 26.v.2003, 2♂ [HMIM], leg. E. Gilasian.

Distribution: **Asia.** Russia (Far East), Transcaucasia. **Europe.** Widely spread from Central Europe northwards to Sweden and Finland and southwards to Spain and Italy (Herting and Dely-Draskovits 1993; Ziegler and Shima 1996; Richter 2004; Tschorsnig *et al.* 2016). New record for Iran.

Hosts: *Sehirus bicolor* (Linnaeus, 1758), *Cydnus aterrimus* (Forster, 1771) (Hemiptera: Cydnidae) (Tschorsnig and Herting 1994), *Homalogonia confusa* Kerzhner, 1972 (Hemiptera: Pentatomidae) (Richter 2004).

Diagnosis: Scapes nearly touch each other; postpedicel 2.1–2.5 times as long as pedicel; arista thickened in its basal 2/3.

Remarks: Draber-Mońko (1964) illustrated female terminalia and wing of *E. pellucens* (see Fig. 268 page 92, Fig. 271 page 93).

Genus *Gymnosoma* Meigen, 1803

Type Species: *Musca rotundata* Linnaeus, 1758

***Gymnosoma rungsi* (Mesnil, 1952)**

(Figs 2 A–B)

Material examined: IRAN. Chaharmahal & Bakhtiari province, Chelgerd, Goukanak, 2200 m, 2.vii.2004, 2♂ [HMIM], leg. E. Gilasian; Goukanak, northwest of Shahr-e Kord, valley, 32°33'10.8"N, 50°19'54.6"E, 2200 m, 03.vii.2004, on flowers of *Euphorbia* sp. 4♂ [ZMHB], leg. J. Ziegler; East Azarbaijan province, Mianeh, Bochoghlu, 1500 m, 24.v.2004, 1♀ [HMIM], leg. E. Gilasian; Esfahan province, Kashan, Nyasar, Aznavah, 34°05'51.9"N, 51°00'04.0"E, 2132 m, 19.v.2009, 2♂, 1♀ [HMIM], leg. E. Gilasian; Golestan province, Maraveh Tappeh, Chenaran, 950 m, 07.x.2000, 1♀ [HMIM], leg. E. Gilasian; Kerman province, Baft, Qaleh Asgar, 29°30'13.0"N, 56°38'19.4"E, 2740 m, 06.v.2007, 6♂, 3♀ [HMIM], leg. E. Gilasian; Qohroud Mountains, valley, south of Qaleh Asgar, Lalehzar Mountains, camp, 29°30'13"N, 56°38'19"E, 2740 m, 03.v.2007, on flowers of endemic *Zosima radians* Boiss. and Hohen. 4♂, 1♀ [ZMHB], leg. J. Ziegler; same data as

previous except 04.v.2007, on flowers of *Hertia intermedia* (Boiss.), 2♂, 1♀; Khorasan-e Razavi province, Mashhad, Bahreh, 36°41'07.0"N, 59°36'12.0"E, 26.v.2006, 1♂, 1♀ [HMIM], leg. E. Gilasian; Lorestan province, Doroud, Saravand, 1940 m, 26.vi.2004, 3♂, 1♀ [HMIM], leg. E. Gilasian; Aligoudarz, Tiran, 2200 m, 30.vi.2004, 1♂, 1♀ [HMIM], leg. E. Gilasian; Saravand, Oshtoran Kuh, southeast of Doroud, east of Khorramabad, slope, 33°22'33.6"N, 49°09'56.9"E, 2020 m, 26–27.vi.2004, on flowers of *Bupleurum kurdicum* Boiss. 5♂, 1♀ [ZMHB], leg. J. Ziegler; Tiran, south of Aligoudarz, east of Khorramabad, valley, 33°11'21.1"N, 49°47'50.0"E, 2350 m, 29.vi.2004, on flowers of a white Apiaceae, 1♂ [HMIM], 8♂, 2♀ [ZMHB], leg. J. Ziegler; Qazvin province, valley, south of Ab Garm, 200 km west of Tehran, 35°47'47.6"N, 49°22'46.6"E, 1500 m, 21.vi.2004, on flowers of *Euphorbia* sp. 1♂ [ZMHB], leg. J. Ziegler; Tehran province, Tehran, Evvin, 1.vii.1971, light trap 1♂ [HMIM].

Distribution: **Asia.** Central Asia, Russia (Far East), Transcaucasia. **Europe.** Eastwards to Belarus, Bulgaria and Romania. Common in Mediterranean countries. **North Africa.** Morocco. (Herting and Dely-Draskovits 1993; Tschorsnig *et al.* 2016). New record for Iran.

Hosts: *Aelia rostrata* Boheman, 1852 (Hemiptera: Pentatomidae), *Eurygaster maura* (Linnaeus, 1758) (Hemiptera: Scutelleridae) (Kara and Tschorsnig 2003).

Diagnosis: Vibrissae reduce to one on each side, sometimes entirely absent or only one on either side; fronto-orbital plate mostly bare on anterior half, rarely with a few setulae; scutellum shining black with a median longitudinal grayish microtrichosity; abdomen generally orange, tergites 3–4 in male each with a small circular macula (rarely entirely orange) and in female each with a semi-triangular black macula. Male terminalia: syncercus process triangular

(dorsal view), without an apical club-shaped thickening; surstylus 2–3 times as long as wide and digitiform (see Fig. 32 page 239 in Zimin 1966). Female terminalia: cercus triangular; ovipositor wide and short (see Fig. 59 in Zimin 1966).

Remarks: In a review of the tribe Gymnosomatini of the former Union of Soviet Socialist Republics (USSR), Zimin (1966) included *G. rungsi* in the identification key along with its diagnostic characters and illustrated male and female terminalia (see Fig. 32 page 440, Fig. 59 page 452). He also examined the specimens of *G. desertorum* from Anatolia (Turkey) which Dupuis (1961) had previously synonymized with *G. rungsi* that in point of fact was the result of Dupuis' misidentification of *G. rungsi* (Mesnil) as *G. desertorum* (Rohdendorf). Therefore, Zimin (1966) argued that the morphological characters fitted *G. rungsi* rather than *G. desertorum* and accordingly established the validity of both species *G. rungsi* and *G. desertorum*.

Genus *Opesia* Robineau-Desvoidy, 1863

Type species: *Opesia gagatea* Robineau-Desvoidy, 1863

Diagnosis: Frons in female without fronto-orbital setae; eyes nearly touch each other at frons; lower facial margin well visible in lateral view; vibrissa well developed, arising above level of lower facial margin; scutellum with three pairs of marginal setae; anatergite with a patch of minute setulae below lower calypter; wing cell R₄₊₅ closed or narrowly open at wing margin.

Remark: The genus *Opesia* is newly recorded from Iran.

Based on the male terminalia, Tschorsnig (1985) and Cerretti *et al.* (2014) treated *Opesia* in the tribe Phasiini. Recent molecular analyses found *Opesia* closely aligned with the tribe Strongygastrini rather than the Phasiini Blaschke (2013).



Figure 2. *Gymnosoma rungsi* on flowers of *Zosima radians*. **A.** Male. **B.** Female. Photo by J. Ziegler.

He also resurrected Mesnil's (1966) tribe Opeziini which was proposed on the basis of reduced abdominal sternite 8 in females.

***Opesia cana* (Meigen, 1824)
(Fig. 3A)**

Material examined: IRAN. Mazandaran province, Pole sefid, Anarum, 36°02'13.2"N, 53°09'35.4"E, 1400 m, 08.vi.2006, 1♀ [HMIM], leg. E. Gilasian.

Distribution: **Asia:** Mongolia, Russia (Far East). **Europe:** It is widely distributed in Europe (Herting and Dely Draskovits 1993; Ziegler and Shima 1996; Tschorsnig *et al.* 2016). New record for Iran.

Host: Unknown.

Diagnosis: Frontal setae extending at most to anterior margin of scape, vertical setae well differentiated from postocular row; scutum with three median black presutular stripes, central stripe in female sometimes vague; katapisternum mostly with 2 setae; basicosta blakish-brown; claws of fore leg in male nearly as long as tarsomeres 4+5 together; sternite 7 in female shiny black and shorter than sternite 6.

Remarks: The central European species of *Opesia* including *O. cana* were examined by Tschorsnig and Herting (1994) who provided an identification key to the species in this region and illustrated the head of *O. cana* (see Fig. 58 page 103). Draber-Mońko (1964) and Zimin *et al.* (1989) illustrated the terminalia as *Xysta cana* (see Figs 201, 203 page 72 in Draber-Mońko 1964; Figs 935, 2 page 1295 in Zimin *et al.* (1989).

Genus *Subclytia* Pandellé, 1894

Type species: *Tachina rotundiventris* Fallén, 1820

Diagnosis: Antenna, scutellum and legs predominantly yellow; gena at least 1/4 times as long as vertical diameter of eye; scutum with one pair of presutural dorsocentral and one pair of postsutural intra-alar setae; postpronotum with 2–3

setae; wing hyaline; wing cell R₄₊₅ open; abdomen generally yellowish orange, with or without median triangular black maculae on posterior margin, tergites 4–5 with marginal setae.

Remarks: This is the first record of the genus *Subclytia* from Iran. This genus has been treated as a member of the tribe Gymnosomatini by Blaschke (2015).

***Subclytia rotundiventris* (Fallén, 1820)
(Fig. 3B)**

Material examined: IRAN. Mazandaran province, Ramsar, Eshkatechal, 36°50'47.8"N, 50°33'28.5"E, 1500 m, 13.vii.2008, 1♂, 1♀ [HMIM], leg. E. Gilasian; Eshkatechal, Elburz Mountains, southwest of Ramsar, forest station, 36°50'46.3"N, 50°33'34.4"E, 1220 m, 13.vii.2008, on leaves, 1♀ [ZMHB], leg. J. Ziegler., same data as previous except, 36°50'32.3"N, 50°35'07.2"E, 1570 m, 14.vii.2008, 1♂.

Distribution: **Asia.** Mongolia, Russia (Far East), Transcaucasia. **Europe.** Widely distributed in mainland Europe except Iberian Peninsula in the west, Balkan Peninsula, Belarus and Lithuania in the east (Herting and Dely Draskovits 1993; Ziegler and Shima 1996; Richter 2004; Tschorsnig *et al.* 2016). New record for Iran.

Hosts: *Elasmucha grisea* (Linnaeus, 1758), *Elasmotherus interstinctus* (Linnaeus, 1758), *Cyphostethus tristriatus* (Fieber, 1860) (Hemiptera: Acanthosomatidae), *Piezodorus lituratus* (Fabricius, 1794) (Hemiptera: Pentatomidae) (Tschorsnig and Herting 1994).

Diagnosis: Monotypy of the genus *Subclytia* includes the generic diagnostic characters at the species level for *S. rotundiventris*.

Remarks: Draber-Mońko (1964) made illustrations of the wing along with male and female terminalia of *S. rotundiventris* (see Figs 208–211 page 75). Tschorsnig (1985) illustrated the male terminalia of this species (see Fig. 47 page 25).

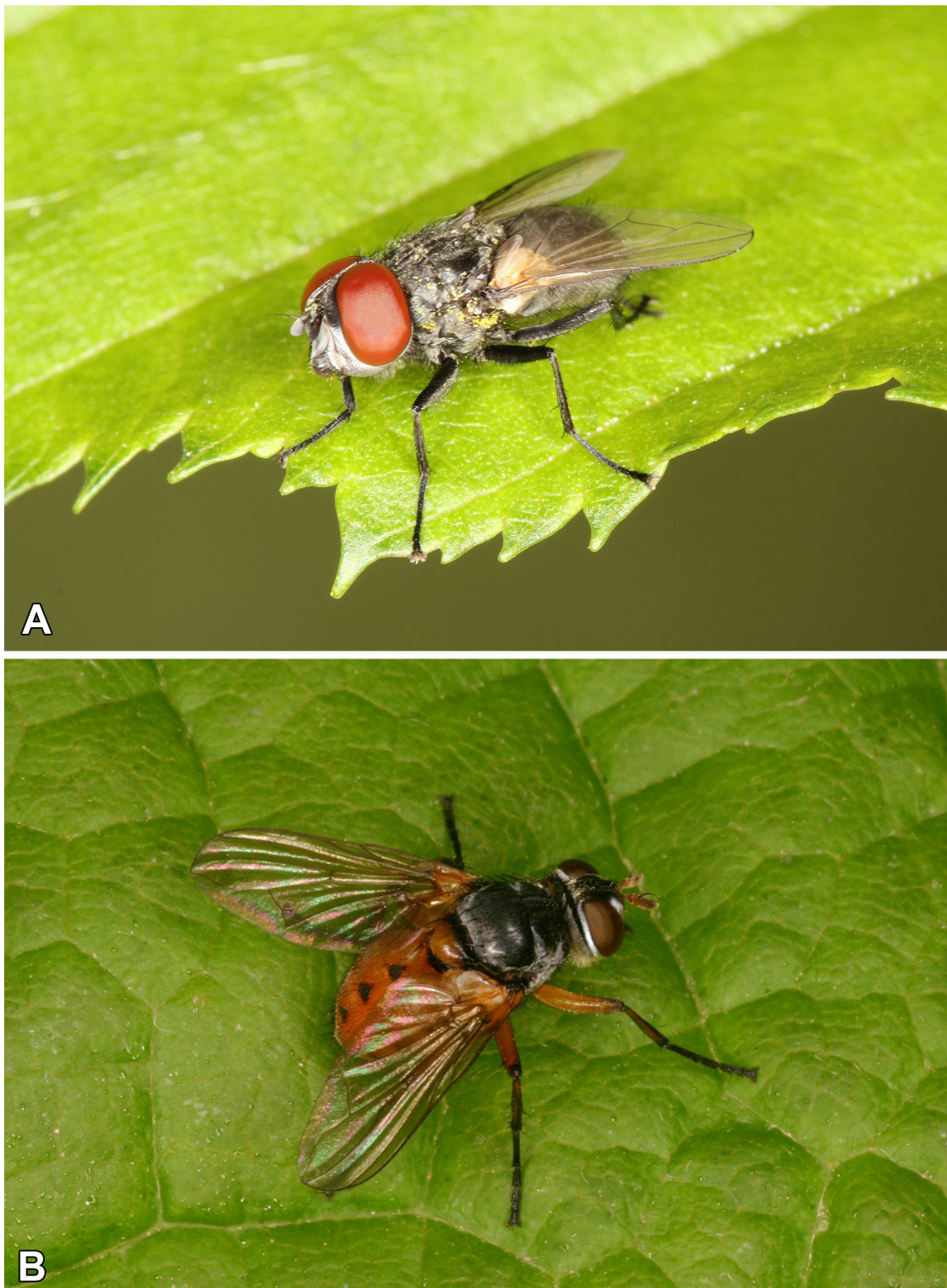


Figure 3. A. *Opesia cana* (female). B. *Subclytia rotundiventris* (female). Photo by J. Ziegler.



Figure 4. *Xysta holosericea*. A. Male. B. Female.

Genus *Xysta* Meigen, 1824

Type species: *Xysta cilipes* Meigen, 1824

Diagnosis: Scutum with one pair of postsutural dorsocentral setae, lacking postsutural intra-alar setae; postpronotum with one seta; wing cell R₄₊₅ open; male and female terminalia distinctly asymmetrical; piercer corkscrew shaped (not straight) and derives from abdominal sternite 8.

Remarks: The genus *Xysta* is recorded for the first time from Iran. Blaschke (2013, 2015) has resurrected the tribe Xystini Lioy including a single genus *Xysta*. This genus was formerly placed in the tribe Phasiini.

Xysta holosericea (Fabricius, 1805)

(Figs 4 A–B)

Diagnosis: *Xysta* is a monotypic genus and all morphological characters for the genus are referred to the species *Xysta holosericea*.

Material examined: IRAN. Chaharmahal & Bakhtiari province, Ardal, Absard, 1900 m, 21.viii.1995, 1♀ [HMIM], leg. H. Mirzayans/ M. Badii., Sabzkuh, 2500 m, 02.vii.2004, 2♂ [HMIM], leg. E. Gilasian; Kerman province, Baft, Qaleh Asgar, 29°30'13.0"N, 56°38'19.4"E, 2740 m, 03.v.2007, 1♂, 1♀ [HMIM], leg. E. Gilasian.

Distribution: Asia. Israel. Europe. Mostly occur in the Mediterranean countries eastwards to Romania (Herting and Dely Draskovits 1993; Tschorsnig *et al.* 2016). New record for Iran.

Host: Unknown.

Remarks: The illustrations for the male terminalia were provided by Tschorsnig (1985) (see Figs 8 page 10, 98 page 40). Zimin *et al.* (1989) illustrated the head, wing and terminalia of female as *Kiritshenka holosericea* (see Figs 934, 1–3 page 1294).

Acknowledgments

We thank the Iranian Research Institute of Plant Protection and Tarbiat Modares University for funding this research.

References

- Blaschke, J.D. 2013. *Molecular Systematics of the Subfamily Phasiinae (Diptera: Tachinidae)*. Master's Thesis, University of Tennessee, 114 pp.
- Blaschke, J.D. 2015. *Evolution and Phylogeny of the Parasitoid Subfamily Phasiinae (Diptera: Tachinidae)*. PhD dissertation, University of Tennessee, 168 pp.
- Cerretti, P., O'Hara, J.E., Wood, D.M., Shima, H., Inclan, D.J. and Stireman, J.O. 2014. Signal through the noise? Phylogeny of the Tachinidae (Diptera) as inferred from morphological evidence. *Systematic Entomology*, 39(2): 335–353. DOI: <https://doi.org/10.1111/syen.12062>.
- Crosskey, R.W. 1984. Annotated keys to the genera of Tachinidae (Diptera) found in tropical and southern Africa. *Annals of the Natal Museum*, 26: 189–337.
- Draber-Mońko, A. 1961. Phasiidae (Diptera) Doliny Nidy. *Fragmenta faunistica*, 8(38): 631–658.
- Draber-Mońko, A. 1964. Phasiidae. *Klucze do oznaczania owadów Polski*, 28(72): 1–100.
- Dupuis, C. 1961. Contributions a l'étude des Phasiinae cimicophages. XXIV. Les *Gymnosoma* ouest-palearctiques (a l'exclusion du groupe de costata Pz.). *Cahier des Naturalistes*, 16: 69–76.
- Dupuis, C. 1963. Essai monographique sur les Phasiinae (Diptères Tachinaires parasites d'Hétéroptères). *Mémoires du Muséum National d'Histoire Naturelle. Series A (Zoologie)*, 26: 1–461.
- Gheibi, M., Ostovan, H., Kamali, K., Ziegler, J. and Gilasian, E. 2008. Report of *Ectophasia leucoptera* (Dip.: Tachinidae) from Iran. *Journal of Entomological Society of Iran*, 27(2): 33–34 [In Persian].
- Gheibi, M., Ostovan, H., Kamali, K. and Gilasian, E. 2009. The first report of six tachinid flies from Iran (Diptera: Tachinidae). *Journal of Entomological Society of Iran*, 29(1): 53–55 [In Persian].
- Gilasian, E., Talebi, A.A., Ziegler, J. and Manzari, S. 2013a. A review of the genus *Phania* Meigen, 1824 (Diptera: Tachinidae: Phasiinae) in Iran with the description of a new species. *Zoology and Ecology*, 23(1): 13–

19. DOI: <http://dx.doi.org/10.1080/21658005.2013.765174>.
- Gilasian, E., Talebi, A.A., Ziegler, J. and Manzari, S. 2013b. A taxonomic study of the genus *Phasia* (Dip.: Tachinidae) in Iran, with two new records. *Journal of Entomological Society of Iran*, 33(2): 19–31.
- Gilasian, E., Talebi, A.A., Ziegler, J. and Manzari, S. 2014a. Taxonomic study of the tribe Leucostomatini (Dip.: Tachinidae: Phasiinae) in Iran. *Journal of Entomological Society of Iran*, 34(1): 35–58 [in Persian with English summary].
- Gilasian, E., Talebi, A.A., Ziegler, J., Manzari, S. and Parchami-Araghi, M. 2014b. A review of the genus *Cylindromyia* Meigen (Diptera: Tachinidae) in Iran, with the description of two new species and the newly discovered male of *C. persica* Tschorsnig. *Studia dipterologica*, 20(2): 299–324.
- Herting, B. 1983. 64c. Phasiinae [Lieferung 329]. pp 1–88. In: Lindner, E. (Ed.), *Die Fliegen der palaearktischen Region*, E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, 9.
- Herting, B. 1984. Catalogue of Palaearctic Tachinidae (Diptera). *Stuttgarter Beiträge zur Naturkunde, Serie A (Biologie)*, 369: 228 pp.
- Herting, B. and Dely-Draskovits, Á. 1993. Family Tachinidae. pp. 118–458. In: Soós, Á. & Papp, L. (Eds.), *Catalogue of Palaearctic Diptera. Vol. 13*. Akadémiai Kiadó, Budapest, 624 pp.
- Kara, K. and Tschorsnig, H.P. 2003. Host Catalogue for the Turkish Tachinidae (Diptera). *Journal of Applied Entomology*, 127: 465–476. DOI: <https://doi.org/10.1046/j.0931-2048.2003.00786.x>.
- Kugler, J. 1977. Neue Tachinidae aus Israel (Diptera). *Stuttgarter Beiträge zur Naturkunde. Serie A (Biologie)*, 301: 1–14.
- Merz, B. and Haenni, J.P. 2000. Morphology and terminology of adult Diptera (other than terminalia). pp. 21–51. In: Papp, L. & Darvas, B. (Eds.), *Contributions to a manual of Palaearctic Diptera (with special reference to flies of economic importance). Vol. 1. General and applied dipterology*. Science Herald, Budapest, 1: 978 pp.
- Mesnil, L.P. 1966. 64g. Larvaevorinae (Tachininae) [Lieferung 263]. pp. 881–928. In: Lindner, E. (Ed.), *Die Fliegen der Palaearktischen Region*, E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, 10: 1435 pp.
- O'Hara, J.E. 2013. History of tachinid classification (Diptera, Tachinidae). *ZooKeys*, 316: 1–34. DOI: <https://doi.org/10.3897/zookeys.316.5132>.
- O'Hara, J. and Cerretti, P. 2016. Annotated catalogue of the Tachinidae (Insecta: Diptera) of the Afrotropical region, with the description of seven new genera. *Zookeys*, 575: 1–344. DOI: <https://doi.org/10.3897/zookeys.575.6072>.
- Richter, V.A. 2004. Family Tachinidae – tachinids. pp. 148–398. In: Sidorenko V.S. (Ed.), *Key to the insects of Russian Far East. Vol. VI. Diptera and Siphonaptera. Part 3*, Dal'nauka, Vladivostok. 659 pp [In Russian].
- Seyyedi Sahebari, F., Khaghaninia, S., Ziegler, J., Gilasian, E. and Talebi, A.A. 2016. On the fauna of the subfamily Phasiinae (Diptera: Tachinidae) in northwestern Iran. *Zoology and Ecology*, 26(3): 181–190. DOI: <http://dx.doi.org/10.1080/21658005.2016.1174504>.
- Stuckenberg, B.R. 1999. Antennal evolution in the Brachycera (Diptera) with a reassessment of terminology relating to the flagellum. *Studia dipterologica*, 6: 33–48.
- Tschorsnig, H.-P. 1985. Taxonomie forstlich wichtiger Parasiten: Untersuchungen zur Struktur des männlichen Postabdomens der Raupenfliegen (Diptera, Tachinidae). *Stuttgarter Beiträge zur Naturkunde. Serie A (Biologie)*, 383: 1–137.
- Tschorsnig, H.-P. and Herting, B. 1994. Die Raupenfliegen (Diptera: Tachinidae) Mitteleuropas: Bestimmungstabellen und Angaben zur Verbreitung und Ökologie der einzelnen Arten. *Stuttgarter Beiträge zur Naturkunde, Serie A (Biologie)*, 506: 170 pp.
- Tschorsnig, H.-P. and Richter, V.A. 1998. Family Tachinidae. pp. 691–827. In: Papp, L. & Darvas, B. (Eds.), *Contributions to a Manual of Palaearctic Diptera (with special reference to flies of economic importance), Higher Brachycera*. Science Herald, Budapest, 3: 880 pp.
- Tschorsnig, H.-P., Richter, V.A., Cerretti, P., Zeegers, T., Bergström, C., Vanhara, J., van

- de Weyer, G., Bystrowsky, C., Raper, C., Ziegler, J. and Hubenov, Z. 2016. Fauna Europaea: Tachinidae. In: Pape, T. & Beuk, P. (Eds.), *Fauna Europaea: Diptera, Brachycera. Database version 2.6*, <http://www.fauna-eu.org> [downloaded 13.11.2016].
- Zeegers, T. 2007. A first account of the Tachinidae (Insecta: Diptera) of Yemen. *Fauna of Arabia*, 23: 369–419.
- Ziegler, J. 1998. Die Morphologie der Puparien und der larvalen Cephalopharyngealskelette der Raupenfliegen (Diptera, Tachinidae) und ihre phylogenetische Bewertung. *Studia dipterologica Supplement* 3, 244 pp.
- Ziegler, J. and Shima, H. 1996. Tachinid flies of the Ussuri area (Diptera, Tachinidae). Contributions to the knowledge of East Palaearctic insects, No. 5. *Beiträge zur Entomologie*, 46: 379–478.
- Zimin, L.S. 1966. A review of the tribe Gymnosomatini (Diptera, Tachinidae) of the fauna of the USSR parasitising in the phytophagous bugs. *Entomologicheskoye Obozreniye*, 45(2): 424–456.
- Zimin, L.S., Zinov'eva, K.B. and Stackelberg, A.A. 1989. Family Tachinidae (Larvaevoridae). pp. 1111–1310. In: Bei-Bienko, G.L. (Ed.), *Keys to the Insects of the European Part of the USSR V (Diptera and Siphonaptera)*, II, Leiden, New York, 1505 pp.

گزارش‌های جدید از مگس‌های زیرخانواده (Diptera: Tachinidae) Phasiinae در ایران

ابراهیم گیلasian^{۱*}، علی اصغر طالبی^۲، یواخیم زیگلر^۳، شهاب منظری^۱ و مهرداد پرچمی عراقی^۱

۱ بخش تحقیقات رده‌بندی حشرات، موسسه تحقیقات گیاه‌پزشکی کشور، سازمان تحقیقات، آموزش و ترویج کشاورزی، صندوق پستی ۱۴۵۴-۱۹۳۹۵، تهران، ایران

۲ گروه حشره‌شناسی، دانشکده کشاورزی، دانشگاه تربیت مدرس، صندوق پستی ۳۳۶-۱۴۱۱۵، تهران، ایران.

۳ موزه تاریخ طبیعی، موسسه تحقیقات تکامل و تنوع زیستی، برلین، آلمان.

* پست الکترونیکی نویسنده مسئول مکاتبه: gilasian@iripp.ir

تاریخ دریافت: ۰۳ دی ۱۳۹۵، تاریخ پذیرش: ۲۳ بهمن ۱۳۹۵، تاریخ انتشار: ۱۱ اسفند ۱۳۹۵

چکیده: طی بررسی تاکسونومیک مگس‌های زیرخانواده (Diptera: Phasiinae)

Tachinidae) هفت گونه و سه جنس *Opesia* Robineau-Desvoidy، *Subclytia*

Pandellé و *Xysta* Meigen برای اولین بار از ایران گزارش می‌شوند. صفات افتراقی،

پراکندگی گونه‌ها به همراه تصویرهای رنگی آنها ارائه می‌شوند. موقعیت تاکسونومیکی

جنس‌ها و گونه‌ها بحث شد.

واژگان کلیدی: فون، گزارش جدید، تاکسونومی، مبارزه بیولوژیک، پارازیتوئید