



New record of black fungus gnat (Diptera: Sciaroidea, Sciaridae) from Iran, with a first record for the fauna of the Middle East

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ABSTRACT. This paper presents new information on black fungus gnats (Sciaridae) based on field studies at seven localities in Iran. Five sciarid species from the genera *Bradysia* Winnertz, *Corynoptera* Winnertz and *Lycoriella* Frey were collected with Malaise traps, yellow sticky traps, sweep net and an aspirator between 2015 and 2021: *Bradysia cellarum* Frey, 1948; *B. ocellaris* (Comstock, 1882); *B. tilicola* (Loew, 1850); *Corynoptera fatigans* (Johannsen, 1912); *Lycoriella sativae* (Johannsen, 1912). All species are first records for the Sistan and Baluchestan province. *Bradysia tilicola* (Loew) is new to Iran and was recorded for the first time in the Middle East. This brings the number of known sciarid species from Iran to seven. For five species are given a short morphological diagnosis and the global distribution. A map illustrates the distribution of all identified sciarid species in Iran.

Key words: Black fungus gnats, Asia, Middle East, Iran, diversity, distribution, new record

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INTRODUCTION

The Diptera (two-winged flies) can be regarded as the most diverse order among holometabolous insects with approximately more than 169,000 described species (Pape et al., 2011). The Diptera have traditionally been divided into two suborders: "Nematocera" and Brachycera, which the latter sometimes divided further into the Orthorrhapha and Cyclorrhapha (Merritt et al., 2009). Phylogenetic studies in recent decades have shown that the former "Nematocera" (often also called nematocerous flies or lower Diptera) are not a monophyletic group. For this reason, the Diptera were temporarily divided into five accepted suborders (Wiegmann & Yeates, 2017): Bibionomorpha, Brachycera, Culicomorpha, Psychodomorpha and Tipulomorpha. The megadiverse family Sciaridae (black fungus gnats) belongs to the suborder Bibionomorpha and more narrowly to the superfamily Sciaroidea. The

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species-rich Sciaridae occurs in all zoogeographical regions and currently only a fraction of the actual species diversity is known, with more than 2,700 valid species worldwide (Menzel & Smith, 2017). The sciarid larvae are mostly phytosaprophagous or mycetophagous and the adults are usually encountered in moist, shady habitats (Steffan, 1974; Menzel & Mohrig, 2000).

Sciaridae is still one of the poorest known dipterous families in the Middle East especially Iran, while enormous progress has been made in investigating this group in the last two decades in Europe. This is supported by several studies from countries whose sciarid diversity is relatively well known: 440 species in Germany, 370 in Finland, 299 in Sweden, 261 in United Kingdom, 230 in the Czech Republic, 143 in Norway, 135 in Slovakia, 107 in Romania, and 100 in Ireland (summarized in Heller & Menzel, 2009; Heller et al., 2009; Kolcsár & Heller, 2019; Menzel, 2000, 2018; Menzel & Heller, 2007; Menzel et al., 2020b; Vilkamaa, 2014). Even in small European and North African countries, whose faunas are still poorly studied, more sciarid species have already been recorded than in Iran; e.g., Morocco (55 species), Albania (35), Estonia (28), Malta (24), Latvia and Lithuania (each with 22 species) (summarized in Ebejer & Gatt, 2021; El Ouazzani et al., 2019; Menzel, 2000; Menzel & Heller, 2007; Menzel et al., 2020a, 2020b).

In recent years, the sciarid fauna of Iran has been studied only in four papers (Talebi et al., 2003; Barzegar et al., 2014; Heidari Latibari et al., 2016a, 2016b). Thus, the full distribution and taxonomic studies of many Iranian species is still unknown due to large gaps in sampling intensity (i.e., lack of funding). Improved sampling of black fungus gnats is needed to provide a sound basis for biodiversity conservation in areas of Iran where ecosystems are undergoing rapid change due to resource extraction and climate change. This work contributes to the improvement of knowledge on the diversity of black fungus gnats in the provinces of eastern Iran. Furthermore, the study of Iranian sciarids can make an important contribution to the knowledge of the fauna of the Middle East and also help to identify distribution patterns in the south-western Palaearctic as well as invasive alien species of economic importance.

MATERIAL AND METHODS

The material was collected from 2015 to 2021 with Malaise traps, yellow sticky traps, a sweep net or with an aspirator directly from the substrate (Fig. 1), and preserved in 2 ml vials with 96% ethanol. In the laboratory, all specimens were mounted on permanent slides in Euparal. They were then observed and measured using Olympus™ BH-2 phase-contrast microscope. The nomenclature and systematics of the genera and species follows the revisions of Palaearctic and Nearctic sciarids by Menzel & Mohrig (2000) and Mohrig et al. (2013). Diagnoses of the species are generally based on the keys and descriptions in Hippa et al. (2010), Menzel and Mohrig (2000), and Mohrig et al. (2013). The distribution data of the species discussed were compiled from the following publications: Arimoto et al. (2018), Babytskiy et al. (2019), Broadley et al. (2018), Ebejer and Gatt (2021), El Ouazzani et al. (2019), Heidari Latibari et al. (2016a), Heller and Menzel (2017), Hippa et al. (2010), Katumanyane et al. (2020), Menzel & Elsayed (2013), Menzel and Satayeva (2010), Menzel and Smith (2009), Menzel and Vilkamaa (2021), Menzel et al. (2003, 2013, 2020a, 2020b), Mohrig et al. (2001, 2013, 2019), Shin et al. (2015), Sohler et al. (2012), Steffan (1969, 1974), Sueyoshi and Yoshimatsu (2019), Ye et al. (2017).

We compared high-quality photographs of a paralectotype of *Bradysia tilicola* (Loew, 1850) designated by sciarid experts (deposited in the Museum für Naturkunde, Leibniz Gesellschaft, Berlin, Germany – ZMHUB), which were sufficient to identify the Iranian material. The photographs of *B. tilicola* were taken with a Zeiss® Axiocam MRc5. Microscopic digitized photographs were stacked using Helicon Focus®. Images were processed using Adobe Photoshop® CC 2020 software. All Iranian specimens studied are kept at the Entomology Museum of Ferdowsi University of Mashhad, Iran (EMFUM). The following abbreviations and indices/ratios are used in the text: **l/w index** = length/width ratio; **R₁** = anterior branch of radius; **x** = basal part of Media (bM); **y** = Radius/Media sector (r-m) as basal part of third branch of radius (R₅).



Figure 1. Selected habitats, sampling techniques, and satellite maps of sites in the ongoing Iranian Sciaridae project. **A.** Malaise trap in Sarbaz, Sistan and Baluchestan province; **B.** Sweeping net in Rask, Sistan and Baluchestan province; **C.** Malaise trap in Zarabad, Chabahar, Sistan and Baluchestan province; **D.** Mellat Park, Mashhad province; **E.** Torqabeh, Mashhad province; **F.** Chehel Bazeh National Park, Mashhad province; **G.** Yellow sticky trap mounted over Cactus plants (Cactaceae) in a greenhouse in Sharoud, Semnan province; **H.** Insect sample in the collection bottle of a Malaise trap.

RESULTS

Following is a list of all species that were collected and could be identified to species level. This includes all collection information, as well as the current known geographic distribution and some morphological data. A total of five species are covered, including *Bradysia tilicola* (Loew, 1850), a new record for Middle East. Five new provincial distribution records viz., *Bradysia cellarum* Frey, 1948, *B. ocellaris* (Comstock, 1882), *B. tilicola* (Loew, 1850), *Corynoptera fatigans* (Johannsen, 1912), and *Lycoriella sativae* (Johannsen, 1912) are also presented.

Class Insecta Linnaeus, 1758

Order Diptera Linnaeus, 1758

Suborder Bibionomorpha Hennig, 1954

Superfamily Sciaroidea Billberg, 1820

Family Sciaridae Billberg, 1820

Genus *Bradysia* Winnertz, 1867

***Bradysia cellarum* Frey, 1948**

Original description. Frey (1948): 66, 85; plate 19, fig. 108 [as *Bradysia* (*Bradysia*)].

Synonym. = *odoriphaga* Yang & Zhang, 1985.

Material examined. IRAN, Razavi Khorasan province, Mashhad county, Mellat Park (36°19'07.96"N, 59°32'22.02"E; Fig. 1D), 22.VI.2021, 2♂♂, directly collected with an aspirator on *Robinia pseudoacacia* L. (Fabaceae), M. Heidari Latibari leg. (EMFUM); Sistan and Baluchestan province, Sarbaz county (26°30'27.143"N; 061°02'56.427"E), 16.V.2015, 2♂♂, Malaise trap in an orchard (Figs 1A, H), M. Ghafouri Moghaddam leg. (EMFUM).

Diagnosis. (male) First palpal segment with more than 2 setae and a deep sensory pit; apex of fore tibia with a comb-like row of setae, without curved margin; hypopygium unicoloured dark brown, ventral base of hypopygium without intergonocoxal lobe or groups of setae; gonocoxites longer than gonostyli, inner ventral margin of gonocoxites short and densely setose; gonostylus rounded apically, apex of gonostylus protruded and curved, with 5–8 strong spines, mesial spines missing; tegmen trapezoid.

Distribution in Iran. (Fig. 3) Razavi Khorasan province (Heidari Latibari et al., 2016a), Sistan and Baluchestan province (**new record**).

Global distribution. Palaearctic (China, Finland, Germany, Iran, Japan).

Bradysia ocellaris (Comstock, 1882)

Original description. Comstock (1882): 202–204; plate 17, figs 2–4 [as *Sciara*].

Synonyms. = *disjuncta* Yang, Zhang & Yang, 1993; = *garretti* (Shaw, 1952); = *johannseni* (Shaw, 1952); = *lafoonii* (Shaw, 1952); = *picticornis* Yang & Zhang, 1987; = *prothalliorum* (de Meijere, 1946); = *reynoldsi* (Metz, 1938); = *robusticalcar* Alam, 1988; = *rubicundula* Frey, 1948; = *tritici* (Coquillett, 1895).

Material examined. IRAN, Sistan and Baluchestan province, Rask county, 26°13'19.70"N, 61°24'31.53"E, 24.IV.2015, 3♂♂, sweep net over weeds in Date Palm (*Phoenix dactylifera* L., Arecaceae) and Mango orchards (*Mangifera indica* L., Anacardiaceae) (Fig. 1B), M. Ghafouri Moghaddam leg. (EMFUM).

Diagnosis. (male) First palpal segment with more than 2 setae and a deep sensory pit; apex of fore tibia with a comb-like row of setae, without curved margin; hypopygium conspicuously yellow to reddish-brown, with dark tips of gonostyli; inner ventral margin of gonocoxites short setose; gonostylus rounded apically, with a tooth dorsally, and 4–6 spines (2–3 subapical and 2–3 mesial spines isolated in the distal third); tegmen trapezoid.

Distribution in Iran. (Fig. 3) Kermanshah province (Barzegar et al., 2014), Razavi Khorasan province (Heidari Latibari et al., 2016a), Sistan and Baluchestan province (**new record**).

Global distribution. Afrotropical (Kenya, Seychelles, United Arab Emirates, Zimbabwe); Australasia (Australia [mainland, Tasmania], Hawaiian Islands (USA), Mariana Islands (USA), Marshall Islands, Micronesia [Kosrae Island, Pohnpei Island], New Zealand); Nearctic (Canada, United States); Neotropical (Argentina, Brazil, Chile, Costa Rica, Ecuador [Galapagos Islands], Panama); Oriental (Bangladesh, Cambodia, China, India, Indonesia, Malaysia, Taiwan, Thailand); Palearctic (Belgium, Bulgaria, China, Egypt, Finland, Germany, Iran, Ireland, Pakistan, Russia, Saudi Arabia, Spain [mainland, Canary Islands], Sweden, Switzerland, the Netherlands, Turkey, United Kingdom).

Bradysia tilicola (Loew, 1850)

Original description. Loew (1850): 18 [as *Sciara*].

Synonyms. = *amoena* (Winnertz, 1867); = *alma* (Winnertz, 1871); = *caldaria* (Lintner, 1895); = *coprophila* (Lintner, 1895); = *domestica* Frey, 1948; = *incomta* (Winnertz, 1867); = *marcilla* (Hutton, 1902); = *nanella* (Frey, 1936); = *selecta* (Winnertz, 1871); = *setigera* (Winnertz, 1867); = *silvatica* (Meigen, 1818); = *sexdentata* (Petty, 1918); = *triseriata* (Winnertz, 1867); = *turbida* (Winnertz, 1867); = *vana* (Winnertz, 1871); = *vividula* (Winnertz, 1867); = *volucris* (Winnertz, 1867); = *wendalinae* (van Bruggen, 1954).

Material examined. **PARALECTOTYPE**, male (Fig. 2C), **GERMANY**: “Thuringia, Liebenstein” (Menzel & Heller, 2007); specimen mounted on slide in Canada balsam, with labels “*tilicola* Lw./ 189/ 8518/ Coll. H. Loew/ ♂/ Paralectotypus/ *Bradysia/tilicola*/ (Loew, 1850)/ det. F. Menzel 2002/ Quick Response (QR) Barcode: <http://coll.mfn-berlin.de/u/c2e421>” (©ZMHUB). **IRAN**: Semnan province, Shahroud county, Salehabad village (36°15'35.56"N, 54°48'13.52"E), 1.VII.2018, 1♂, yellow sticky trap, in a greenhouse over Cactus plants (Cactaceae) (Fig. 1G), B. Gharaei leg. (EMFUM); Razavi Khorasan province, Mashhad county, Torqabeh (36°18'22.17"N, 59°22'21.10"E) (Fig. 1E), 1.VII.2021, 1♂, sweep net over weeds, M. Heidari Latibari leg. (EMFUM); Sistan and Baluchestan province, Sarbaz county (26°30'27.143"N, 61°02'56.427"E), 16.V.2015, 1♂, Malaise trap in orchard (Figs 1A, H), M. Ghafouri Moghaddam leg. (EMFUM).

Diagnosis. (male) (Figs 2A–B) First palpal segment with more than 2 setae and with a deep sensory pit; apex of fore tibia with a comb-like row of setae, without curved margin; macrotrichia on the wing vein sections x and y present; 4th flagellomere with l/w index of 2.5; apex of fore tibia with a comb-like row of setae; R₁ rather long; hypopygium unicoloured dark brown, ventrally without an intergonocoxal differentiation; inner ventral margin of gonocoxites short and setose; gonostylus rounded apically, protruded and curved, apex of gonostylus with a short tooth dorsally and with a dense group of 8–12 longer, apical/subapical spines; tegmen trapezoid.

Distribution in Iran. (Fig. 3) Razavi Khorasan province, Sistan and Baluchestan province (**new records**).

Global distribution. Afrotropical (South Africa, Tristan da Cunha archipelago); Australasia (New Zealand); Nearctic (Canada, United States); Neotropical (Chile); Palearctic (Austria, Belgium, Bulgaria, China, Czech Republic, Estonia, Finland, Greece, Germany, Hungary, Iran [**new record**], Ireland, Italy, Lithuania, Morocco, the Netherlands, Nepal, Poland, Portugal [Azores Islands], Russia, Slovakia, Spain [mainland, Canary Islands], Sweden, the Netherlands, Turkey, United Kingdom).

Note. This species is recorded for the first time from the Middle East.

Genus *Corynoptera* Winnertz, 1867

Corynoptera fatigans (Johannsen, 1912)

Original description. Johannsen (1912): 121, 132–133; plate 3, fig. 135; plate 6, fig. 241 [as *Sciara*].

Synonym. = *perpusilla* Winnertz, 1867 (preocc.).

Material examined. **IRAN**, Sistan and Baluchestan province, Chahbahar county, Zarabad (25°39'06.700"N, 59°20'01.396"E), 15.VI.2015, 3♂♂, Malaise trap on agricultural land surrounded by Date Palm (*Phoenix dactylifera* L., Arecaceae) (Fig. 1C), M. Ghafouri Moghaddam leg. (EMFUM).

Diagnosis. (male) First palpal segment with one long seta only, without deep sensory pit; fore tibia with an irregular row of setae, mostly with weakly developed, curved margin; hypopygium light yellow-brown, ventral base of hypopygium without intergonocoxal differentiation; inner ventral margin of gonocoxites longer and more densely setose; gonostylus slender, with a l/w index of 2.5, gonostylus tapered and pointed, with a dark tooth and 3 light hyaline spines which do not reach the end of the tooth; mesial, long whiplash seta missing; tegmen rounded.

Distribution in Iran. (Fig. 3) Kermanshah province (Barzegar et al., 2014), Razavi Khorasan province (Heidari Latibari et al., 2016a), Sistan and Baluchestan province (**new record**).

Global distribution. Nearctic (USA); Palearctic (Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Greece, Iran, Ireland, Italy, Morocco, Norway, Poland, Portugal [Azores Islands, Madeira Islands], Romania, Russia, Slovakia, Slovenia, Spain [mainland, Balearic Islands, Canary Islands], Sweden, Switzerland, the Netherlands, Ukraine, United Kingdom).

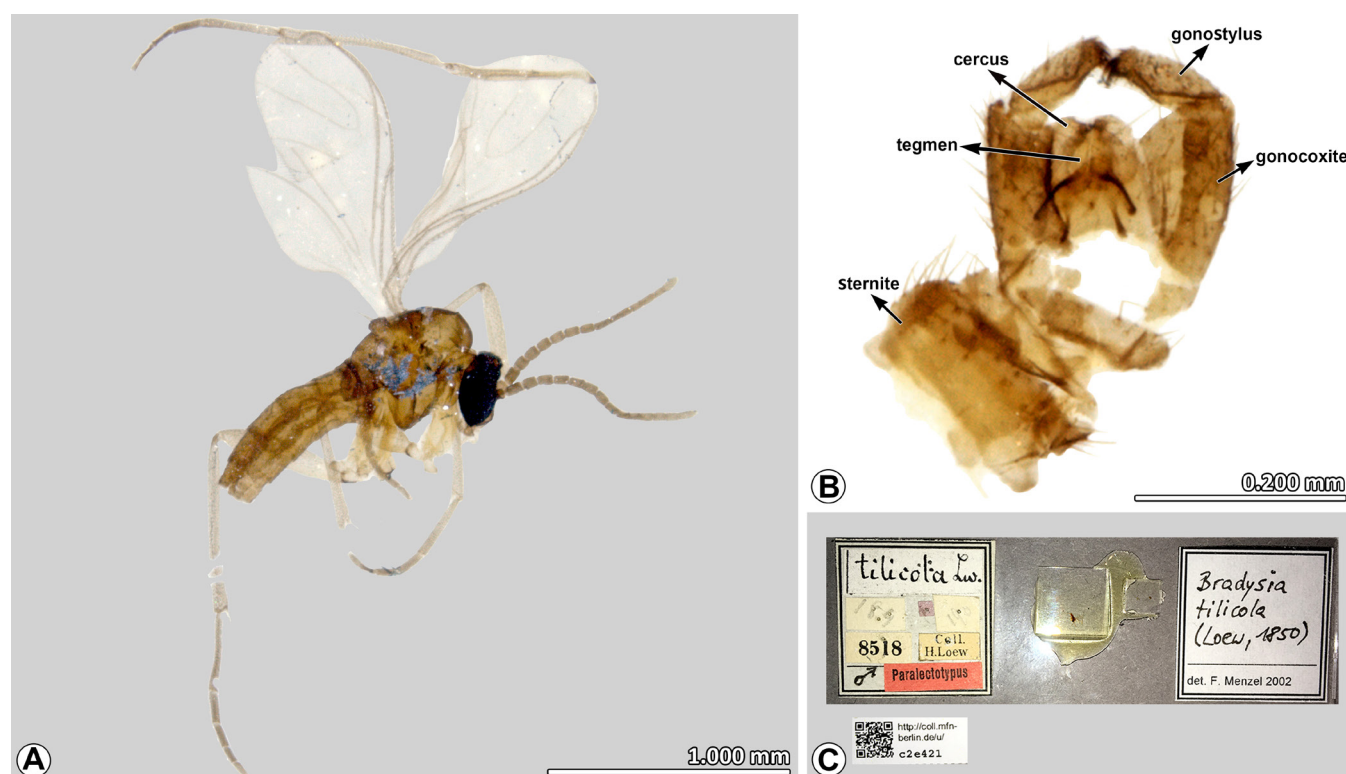


Figure 2. *Bradysia tilicola* (Loew, 1850), paralectotype male (©ZMHUB). **A.** Habitus without hypopygium, lateral view; **B.** Hypopygium, ventral view; **C.** Permanent slide with paralectotype labels.

Genus *Lycoriella* Frey, 1942

Lycoriella sativae (Johannsen, 1912)

Original description. Johannsen (1912): 121, 133; plate 3, fig. 120; plate 6, fig. 240 [as *Sciara*].

Synonyms. = *agarici* Loudon, 1978; = *auberti* (Séguy, 1940); = *brevipetiolata* (Shaw, 1941); = *castanescens* (Lengersdorf, 1940); = *difficilis* (Frey, 1948) (preocc.); = *fucorum* (Frey, 1948); = *jeanneli* (Séguy, 1940), = *kaiseri* (Shaw, 1941); = *kaiseri* (Shaw, 1941); = *paucisetulosa* (Frey, 1948); = *rufotincta* Tuomikoski, 1959; = *similans* (Johannsen, 1925); = *solispina* (Hardy, 1956); = *trifolii* (Pettey, 1918).

Material examined. IRAN, Mashhad, Razavi Khorasan, Chehel Bazeh National Park (36°20'41.53"N, 59°28'04.77"E; Fig. 1F), 1.VI.2020, 1♂, directly collected with aspirator on *Pinus mugo* Turra (Pinaceae), M. Heidari Latibari leg (EMFUM); Sistan and Baluchestan province, Sarbaz county (26°30'27.143"N, 61°02'56.427"E), 16.V.2015, 2♂♂, Malaise trap in an orchard (Figs 1A, H), M. Ghafouri Moghaddam leg. (EMFUM).

Diagnosis. (male) First palpal segment with some setae and a deep sensory pit; apex of fore tibia with a depressed area of dense setae, with closed and clear curved margin; hypopygium brown; ventral base of hypopygium with a small group of 4–8 isolated setae on the intergonocoxal membrane; inner ventral margin of gonocoxites short and sparsely setose; gonostylus tapered and pointed, with apical tooth; distal half of gonostylus with 4–6 mesial spines above a long whiplash seta; tegmen rounded.

Distribution in Iran. (Fig. 3) Razavi Khorasan province (Heidari Latibari et al., 2016a), Sistan and Baluchestan province (**new record**).

Global distribution. Afrotropical (South Africa, Tristan da Cunha archipelago); Australasia (Australia [mainland, Tasmania, Norfolk Island], Hawaiian Islands (USA), New Zealand); Nearctic (Canada, United States); Palearctic (Afghanistan, Austria, Belarus, Belgium, Bulgaria, China, Czech Republic,

Denmark, Egypt, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Iran, Ireland, Italy, Japan, Malta, Mongolia, Morocco, Norway, ?Pakistan, Poland, Portugal [Azores Islands], Romania, Russia, Slovakia, South Korea, Spain [mainland, Balearic Islands, Canary Islands], Sweden, Switzerland, the Netherlands, Turkey, Turkmenistan, United Kingdom); Subantarctic (French Southern and Antarctic Lands [Kerguelen Island]).

DISCUSSION

Five sciarid species are presented in this study, belonging to the genera *Bradysia* Winnertz (3 species), *Corynoptera* Winnertz (1 species) and *Lycoriella* Frey (1 species). Only one species, *Bradysia tilicola* (Loew), is new to Iran and the Middle East. This data shows that the Sciaridae fauna in Iran, as in the whole Middle East, is poorly studied. The insufficient data situation and our limited knowledge about this megadiverse dipteran family in Iran is mainly attributed to few, localised studies, through which only few adults have been captured in very short periods and unrepresentative habitats. Most sampling to date has been limited to Kermanshah, Razavi Khorasan and Alborz provinces (Talebi et al., 2003; Barzegar et al., 2014; Heidari Latibari et al., 2016a, 2016b), while other provinces have remained unexplored (e.g., Semnan and Sistan and Baluchestan in this study). Based on unpublished data and current fieldwork, we believe that the sciarid fauna is exceptionally rich and more species can easily be added to the Iranian checklist.

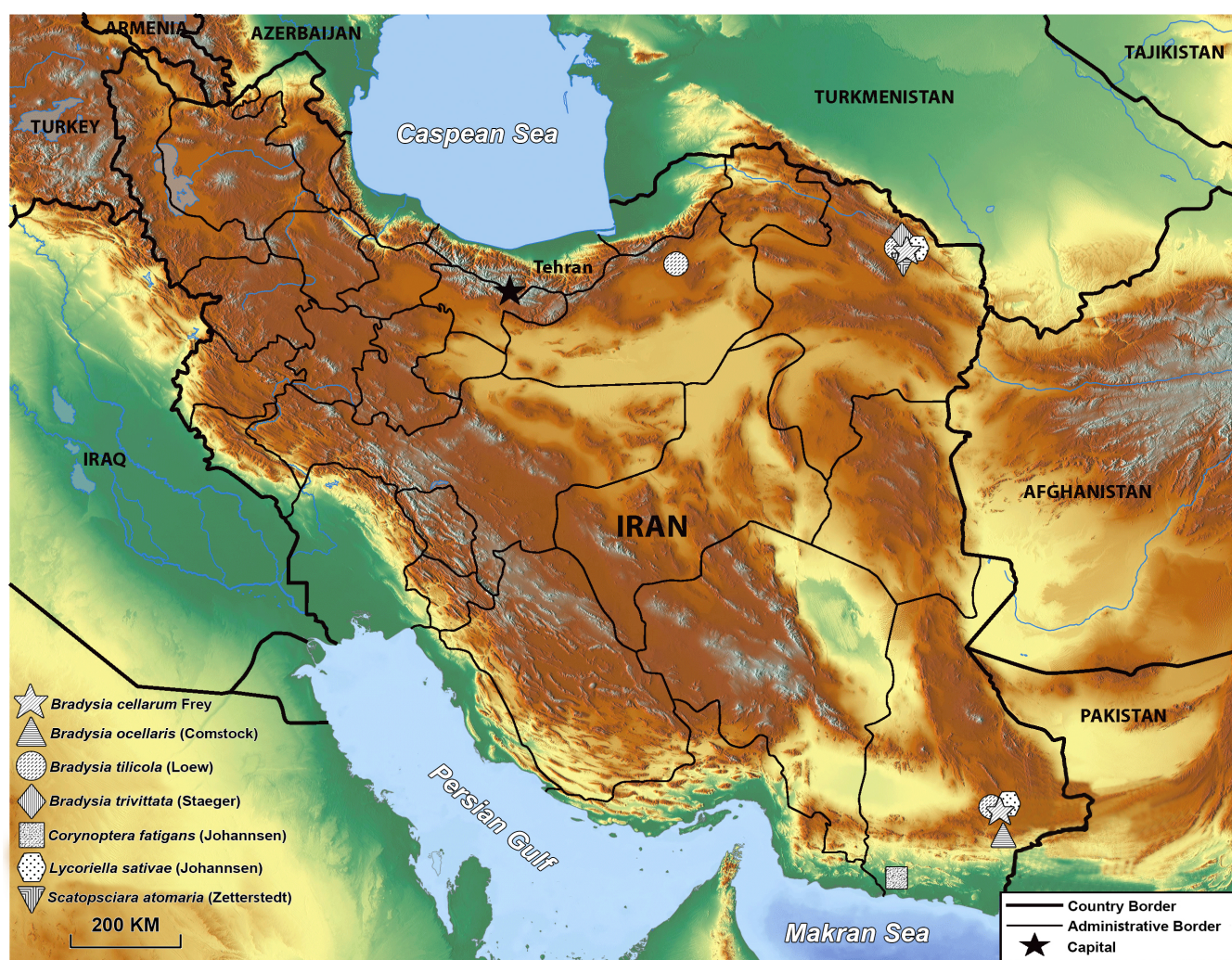
All the sciarid species in Iran listed in Table 1, which two species *Corynoptera perpusilla* (Det. Pekka Vilkamaa - University of Helsinki, Helsinki, Finland) and *Bradysia odoriphaga* (Det. Kai Heller - Heikendorf, Germany) removed from the list as they were synonymized to *Corynoptera fatigans* and *Bradysia cellarum*, respectively. *Corynoptera perpusilla* Winnertz is a valid synonym of *C. fatigans*, and is not identical with *Corynoptera perpusilla* (Walker, 1848) (further details in Mohrig et al. (2013): pp. 181, 183). The sciarid specialists have studied paratypes of *B. odoriphaga* in China, and Ye et al. (2017) have been collected fresh material from the type locality of *odoriphaga*. They have confirmed *B. odoriphaga* as a synonymy of *B. cellarum* both morphologically and genetically, while Sueyoshi and Yoshimatsu (2019) did not accept the genetic studies done so far -*B. cellarum* and *B. odoriphaga* have the same Barcode Index Number (BIN)- and ignored in their article. On the other hand, Sueyoshi and Yoshimatsu (2019) used minute morphological deformations as "distinguishing characters", whereas all the type specimens of taxa discussed in that article were in very poor condition (as the published figures show) because the dry and pinned specimens have been transferred to permanent slides (pers. comm. F. Menzel). *Lycoriella auripila* (Winnertz, 1867) has already been recorded by Talebi et al. (2003; Det. Dr. Klaus Hövemeyer - University of Göttingen, Göttingen, Germany), which was a misidentification and reidentified as *Lycoriella sativae* (Heidari Latibari et al., 2016a). Accordingly, *L. auripila* has never been recorded from Iran.

As depicted in the distribution map (Fig. 3), sciarids presented in this study were mostly collected in the North-East (Razavi Khorasan) and South-East (Sistan and Baluchestan). To fill the knowledge gaps to the sciarid fauna of Iran the field work must be intensified in these provinces and extended to other Iranian regions. A significantly higher number of sciarid species can be detected in natural habitats during the entire vegetation period with the same (Malaise traps, pit fall traps, sweep net) and additional collecting methods (automatic light traps, photoeclectors). All species identified in this study were caught in anthropogenically influenced habitats (agricultural areas, greenhouses, orchards, fallow land with weeds and palms) or detected on non-native trees (*Mangifera indica*, *Phoenix dactylifera*, *Pinus mugo*, *Robinia pseudoacacia*). For this reason, mostly were collected agricultural pests that are very common and widespread in the Holarctic region (*Bradysia ocellaris*, *B. tilicola*, *Lycoriella sativae*). Therefore, the results of this study may also be useful for Middle Eastern countries from the point of view of biological control. We hope that this paper will stimulate local interest in the study of Iranian sciarids and draw more attention of researchers to this dipteran family and its host associations.

Table 1. List all of Sciaridae Species in Iran.

Species name	Provincial distribution in Iran	Depository	Reference
<i>Bradysia cellarum</i> Frey, 1948	Razavi Khorasan	ZFMK	Heidari Latibari et al. (2016a)
	Sistan and Baluchestan	EMFUM	Current study
<i>Bradysia ocellaris</i> (Comstock, 1882)	Kermanshah	Unknown	Barzegar et al. (2014)
	Razavi Khorasan	ZFMK	Heidari Latibari et al. (2016a)
	Sistan and Baluchestan	EMFUM	Current study
<i>Bradysia tilicola</i> (Loew, 1850)	Razavi Khorasan	EMFUM	Current study
<i>Bradysia trivittata</i> (Staeger, 1840)	Razavi Khorasan	ZFMK	Heidari Latibari et al. (2016b)
	Kermanshah	Unknown	Barzegar et al. (2014)
<i>Corynoptera fatigans</i> (Johannsen, 1912)	Razavi Khorasan	ZFMK	Heidari Latibari et al. (2016a)
	Sistan and Baluchestan	EMFUM	Current study
	Alborz province	Unknown	Talebi et al. (2003)
<i>Lycoriella sativae</i> (Johannsen, 1912)	Razavi Khorasan	ZFMK	Heidari Latibari et al. (2016a)
	Sistan and Baluchestan	EMFUM	Current study
<i>Scatopsciara atomaria</i> (Zetterstedt, 1851)	Razavi Khorasan	ZFMK	Heidari Latibari et al. (2016b)

ZFMK: Zoologisches Forschungsmuseum Alexander Koenig' in Bonn, Germany.

**Figure 3.** Distribution map of all sciarid species in Iran.

AUTHOR'S CONTRIBUTION

The authors confirm contribution to the paper as follows: MHL devised the project. MHL and MGM performed the field works. GHM and MGM supervised the findings of this work through MHL. MHL wrote the draft manuscript with support from MGM. MGM provided critical feedback and helped shape the research, and manuscript. All authors discussed the results and contributed to the final manuscript.

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AVAILABILITY OF DATA AND MATERIAL

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this paper.

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گزارش جدید پشه سیاه‌بال قارچ‌زی (Diptera: Sciarioidea, Sciaridae) از ایران با اولین گزارش برای فون خاورمیانه

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چکیده: این مقاله براساس مطالعات میدانی در هفت منطقه در ایران، اطلاعات جدیدی در مورد پشه‌های سیاه‌بال قارچ‌زی (Sciaridae) ارائه می‌کند. پنج گونه سیارید از جنس‌های *Bradysia* Winnertz، *Corynoptera* Winnertz و *Lycoriella* Frey با تله مالایز، تله‌های چسبنده زرد، تور جارو و یک دستگاه آسپیراتور بین سال‌های ۲۰۱۵ و ۲۰۲۱ جمع‌آوری شدند: *B. ocellaris*، *Bradysia cellarum* Frey, 1948 و *Corynoptera fatigans*، *B. tilicola* (Loew, 1850)، (Comstock, 1882) و (Johannsen, 1912) و *Lycoriella sativae* (Johannsen, 1912). همه گونه‌ها اولین گزارش برای استان سیستان و بلوچستان هستند. گونه *Bradysia tilicola* (Loew) برای ایران جدید می‌باشد و برای اولین بار از خاورمیانه گزارش می‌شود. بدین ترتیب تعداد گونه‌های پشه‌های سیاه‌بال قارچ‌زی شناخته شده از ایران به هفت گونه رسید. برای پنج گونه یک تشخیص ریخت‌شناسی کوتاه و پراکنش جهانی داده شده است. یک نقشه از پراکنش همه گونه‌های پشه‌های سیاه‌بال قارچ‌زی شناسایی شده در ایران ارائه شد.

واژگان کلیدی: پشه سیاه‌بال قارچ‌زی، آسیا، خاورمیانه، ایران، تنوع، پراکنش، گزارش جدید