



Original Article

New findings of Muscomorphan flies (Diptera, Brachycera) in Hungary

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ABSTRACT. Six species of Muscomorphan flies are reported from Hungary for the first time, each representing a different family: *Cheilosia* (*Neocheilosia*) *luteicornis* (Zetterstedt, 1838) (Syrphidae), *Lonchaea lateralis* MacGowan, 2016 (Lonchaeidae), *Ochthera schembrii* Rondani, 1847 (Ephydriidae), *Leptometopa rufifrons* Becker, 1903 (Milichiidae), *Phaonia kowarzii* Schnabl, 1887 (Muscidae), and *Tryphera lugubris* (Meigen, 1824) (Tachinidae). In addition, second records for Hungary are provided for *Brachydeutera meridionalis* Rondani, 1856 (Ephydriidae) and *Therobia leonidei* (Mesnil, 1965) (Tachinidae).

KEYWORDS: Ephydriidae, Lonchaeidae, Milichiidae, Muscidae, Syrphidae, Tachinidae

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INTRODUCTION

The Diptera fauna of Hungary was first summarised by Thalhammer (1900), listing approximately 2,900 species. However, this work referred to Hungary within its pre-Trianon (pre-1920) borders, thus including species recorded only from areas now within Romania, Slovakia, and other neighbouring countries. In addition, many of the species names listed are no longer valid under current taxonomy, and numerous records lack precise locality data or distributional information (e.g., noted only as “*communis*” or “*in omnibus regionibus invenitur*”).

In light of these limitations, the creation of an updated checklist became necessary. Unfortunately, Thalhammer’s collection, housed in the Hungarian Natural History Museum (HNHM), was destroyed during a Soviet bombing in 1956 (Földvári & Papp 2007), making it impossible to verify the original identifications or revise the old checklist. A completely new collection had to be built, a task undertaken primarily by László Papp, Ferenc Mihályi, Árpád Sós, and Sándor Tóth. This extensive effort eventually culminated in the publication of a new checklist in 2001 (Papp 2001), which listed approximately 5500 species. However, according to the authors, this likely represented only half of the Diptera species actually distributed in Hungary.

Since the publication of this checklist, numerous additions, corrections, and new records have been published (e.g., Papp 2003, 2005; MacGowan 2007; Tóth 2011, 2013; Kolcsár & Soltész 2018); however, a third, revised checklist has yet to be compiled. Consequently, Hungary’s Diptera fauna remains underexplored, with many species still awaiting discovery. During collecting trips in 2024 and 2025 by the first author, several species previously unrecorded in Hungary were captured. This article presents the first part of these findings, including additional specimens from private collections, with a focus on the infraorder Muscomorpha.

MATERIAL AND METHODS

Most of the specimens have been collected by sweep-netting or light-trapping (for the latter, 125 W HgLI E27 bulbs were used, combined with 25 W Sylvania UV-A compact lights). Chloroform or ethyl acetate was used as the killing agent, and all specimens were preserved dry, mounted on pins. All specimens are deposited in HNHM (Hungarian National Museum Public Collection Centre – Hungarian Natural History Museum, Budapest). For genitalia preparations, the method described in Papp (2008) was used. Photographs were taken using a Keyence® 5000 digital microscope and an Olympus® TG-6 digital camera.

RESULTS

Taxonomic hierarchy

Class Insecta Linnaeus, 1758

Order Diptera, Linnaeus, 1758

Family Syrphidae Latreille, 1802

Subfamily Eristalinae Newman, 1834

Genus *Cheilosia* Meigen, 1822

Subgenus *Neocheilosia* Barkalov, 1983

***Cheilosia (Neocheilosia) luteicornis* (Zetterstedt, 1838)**

Material examined. HUNGARY. Pest County: Göd, 23.III.2020, 1♀, leg. Lukács.

Distribution. Palearctic – Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Czechia, Finland, France, Germany, Italy, Lithuania, Montenegro, Netherlands, Norway, Poland, Serbia, Slovenia, Sweden, Switzerland, Ukraine (Bot et al. 2025). Hungary (**new record**).

Identification. The taxonomic position and identification of this species have caused considerable confusion in the past, including frequent misinterpretations with *Cheilosia morio* (Zetterstedt, 1838). Bot et al. (2025) addressed this issue by examining type material, designating a lectotype for the species, and providing a detailed redescription along with an identification key for the subgenus (the determination of the Hungarian specimen was also based on this publication).

Remarks. The subgenus *Neocheilosia* includes three described species in Europe. Of these, the presence of two species (*C. morio* and *C. luteicornis*) has been confirmed in Central Europe (Bot et al. 2025). However, neither species has previously been reported from Hungary. This study presents the first documented occurrence of *Cheilosia luteicornis* in this country, constituting a new country record for both the species and the subgenus *Neocheilosia*.

Family Lonchaeidae Loew, 1861

Subfamily Lonchaeinae Rondani, 1856

Genus *Lonchaea* Fallén, 1820

***Lonchaea lateralis* MacGowan, 2016**

Material examined. HUNGARY. Győr-Moson-Sopron County: Bakonyszentlászló, Zsidó-rét, vicinity of Cuha-völgy, 47°21'57"N 17°50'10"E (within a 50 m radius), attracted to light, 6–8.VIII.2024, 230–240 m, 1♂, leg. N. Varga et al.

Distribution. Palearctic (Central Europe) (MacGowan 2023). The type material is from Bodio, Switzerland (MacGowan & Bächli 2016), with the only other published record from Germany (Reimann & Rulik 2024). **New to Hungary.**

Identification. Within the European *Lonchaea* species, *L. lateralis* can be recognised by its bare eyes, yellow basal tarsomeres, pale calypter and characteristic male genitalia (MacGowan & Bächli 2016).

Family Ephydriidae Zetterstedt, 1837**Subfamily Gymnomyzinae Latreille, 1829****Genus *Ochthera* Latreille, 1802*****Ochthera schembrii* Rondani, 1847** (Fig. 1A–B)

Material examined. HUNGARY. Bács-Kiskun County: Fülöpszállás, Böddi-szék, 85–91 m, swept from saline mud, 46°45'55"N 19°09'03"E (within a 50 m radius), 12.X.2024, 1♀, leg. N. Varga & M. Varga.

Distribution. Afrotropical – United Arab Emirates; Palaearctic – Algeria, Azores, Bulgaria, Canary Islands, Czechia, Egypt, France, Great Britain, Greece, Iran, Italy, Malta, Morocco, Spain, Turkey, Turkmenistan (Zatwarnicki 2013; El-Hawagry et al. 2018; Keyval 2020). Hungary (**New record**).

Identification. Among the three *Ochthera* species occurring in Central Europe, *O. schembrii* can be immediately recognised by reddish fore tarsi (and partially reddish fore tibia) (Irwin 1985).

Remarks. The first report of this species in Central Europe was from Czechia (Keyval 2020); Hungary marks the second known occurrence in the region.

Subfamily Ephydrinae Zetterstedt, 1837**Genus *Brachydeutera* Loew, 1860*****Brachydeutera meridionalis* Rondani, 1856**

Material examined. HUNGARY. Bács-Kiskun County: Fülöpszállás, Böddi-szék, 46°45'55"N 19°09'03"E (within a 50 m radius), 85–91 m, swept from saline mud, 12.X.2024, 2♀, leg. N. Varga & M. Varga.

Distribution. Afrotropical – United Arab Emirates; Oceanic – Hawaiian Islands; Oriental – China, Bonin Islands, Taiwan; Palaearctic – Israel, Japan, Hungary, Madeira Islands, Russia, Spain (Papp 2003; Mathis et al. 2017).

Remarks. Interestingly, this peculiar species has so far only been reported from Hungary within Central Europe, with the sole record dating back to 1997 (see: Papp 2003 – as *Brachydeutera ibari* Ninomyia, 1929 (junior synonym)). Our findings, which include two additional specimens, in fact represent a rediscovery of the species in Hungary.

Family Milichiidae Schiner, 1862**Subfamily Madizinae Czerny, 1909****Genus *Leptometopa* Becker, 1903*****Leptometopa rufifrons* Becker, 1903** (Fig. 1C–D)

Material examined. HUNGARY. Pest County: Budaörs, Odvas-hegy, 305–310 m, attracted to light, 7.IX.2024, 1♀, leg. N. Varga et al.

Distribution. Afrotropical – Oman, Yemen; Palaearctic – Afghanistan, Algeria, Croatia, Egypt, Kazakhstan, Libya, Namibia, Romania, Saudi Arabia, South Africa, Spain, Turkey, Uzbekistan (Sabrosky 1961, 1980; Brake 2000; Dawah & Abdullah 2007). Hungary (**New record**).

Remarks. *Leptometopa rufifrons* is primarily a Mediterranean species (Hennig 1937), previously recorded no farther north than Orşova (Romania). The recent specimen probably represents the northernmost known occurrence.

Family Muscidae Latreille, 1802**Subfamily Phaoniinae Malloch, 1917****Genus *Phaonia* Robineau-Desvoidy, 1830*****Phaonia kowarzii* Schnabl, 1887** (Fig. 1E–F)

Material examined. HUNGARY. Győr-Moson-Sopron County: Bakonyszentlászló, Vinye, vicinity of Cuha-völgy, 47°21'33.4"N 17°49'26.6"E, 310–317 m, attracted to light, 2–9.VI.2024, 1♂, leg. N. Varga et al.

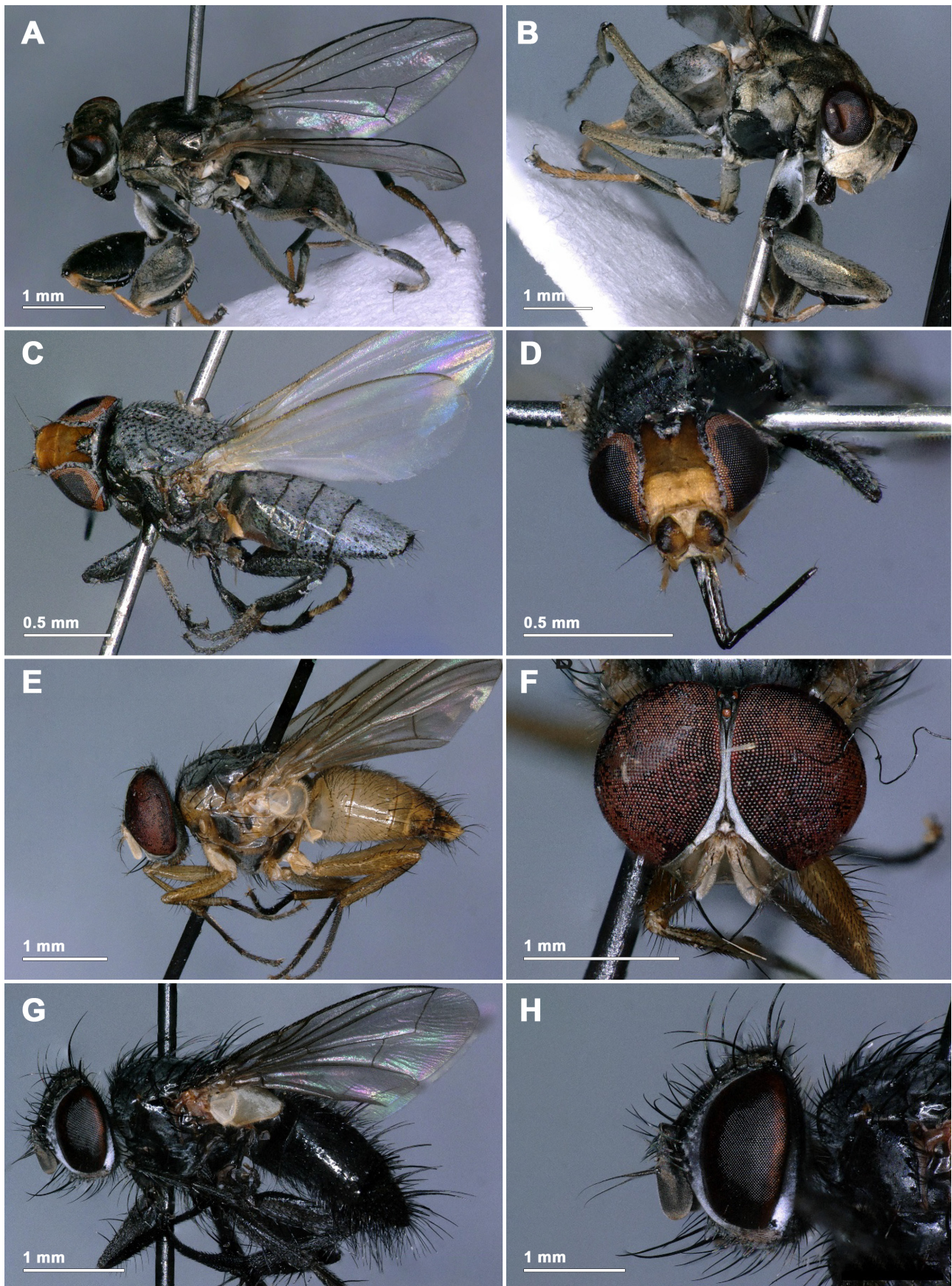


Figure 1. General habitus of the newly recorded Muscomorpha species from Hungary. **A–B.** *Ochthera schembrii* Rondani, 1847, female; **C–D.** *Leptometopa rufifrons* Becker, 1903, female; **E–F.** *Phaonia kowarzii* Schnabl, 1887, male; **G–H.** *Tryphera lugubris* (Meigen, 1824), female. (A., C., E., G. Head, lateral view; B. Habitus, fronto-lateral view; D. & F. Head, frontal view; H. Head, Lateral view).

Distribution. Palaearctic – Austria, Sweden, Finland, Belarus, Russia, Korea, China, Japan (Pont 1986; Vikhrev & Erofeeva 2018).

Remarks. The record from Austria is considered doubtful, and Gregor et al. (2016) did not mention the species as occurring in Central Europe, however, included in the key as an “Eurasian” species (postulated to occur in this region). With this first record from Hungary, the Central European distribution is also confirmed.

Family Tachinidae Robineau-Desvoidy, 1830

Subfamily Exoristinae Robineau-Desvoidy, 1863

Genus *Tryphera* Meigen, 1838

Tryphera lugubris (Meigen, 1824) (Fig. 1G–H)

Material examined. HUNGARY. Bács-Kiskun County: Kunpeszér, vicinity of Peszéri-erdő, 93–95 m, 2.V.2024, 1♀, leg. N. Varga.

Distribution. Palaearctic – Austria, Azerbaijan, Bulgaria, Denmark, France, Germany, Greece, Italy, Mongolia, Morocco, Poland, Portugal, Romania, Russia, Serbia, Spain, Switzerland, Ukraine (O'Hara et al. 2020). **New to Hungary.**

Remarks. The occurrence of this widespread species in Hungary was previously suggested by Mihályi (1986).

Subfamily Phasiinae Robineau-Desvoidy, 1830

Genus *Therobia* Brauer, 1862

Therobia leonidei (Mesnil, 1965)

Material examined. HUNGARY. Borsod-Abaúj-Zemplén County: Aggtelek, birch fen, 48°27'14"N 20°31'35"E, 358 m, attracted to light, 28–30.VIII.2024., 1♀, leg. N. Varga et al.; Komlóska, humid pine meadow, 230–250 m, attracted to light, 24.VI.2025., 1♀, leg. N. Varga et al.; Veszprém County: Gyulafirátót, 47°08'00"N 17°56'24"E, 191 m, attracted to light, 8.VIII.2025, 1♀, leg. B. Balogh.; Vas County: Szalafő, 46°52'16"N 16°18'15"E, 320 m, attracted to light, 24.VII.2025, 1♀, leg. Á. Horváth; Szőce, peat bog, 46°54'12"N 16°34'11"E, 244 m, attracted to light, 16–20.VII.2023, 2♀♀, leg. N. Varga & B. Tóth.

Distribution. Afrotropical – Yemen; Palaearctic – Azerbaijan, France, Greece, Hungary, Italy, Portugal, Spain, Switzerland, Ukraine (O'Hara et al. 2020).

Remarks. *Therobia leonidei* is the only European representative of the tribe Ormiini, a group characterised by large, protruding prosternum adapted for detecting the mating calls of host bush-crickets (Cade 1975; Lehmann 2006). In Hungary, the species was previously known from a single record dating back to 1964 (Tóth 2013). Our recent research yielded several additional specimens, primarily from fens.

DISCUSSION

The present findings again reinforce earlier suggestions (Papp 2001) that the Diptera fauna of Hungary remains far from fully documented, even regarding well-studied families such as Syrphidae and Muscidae. It is probable that besides *Cheilosia luteicornis*, the other Central European *Neocheilosia* species (*C. morio*) occurs in Hungary as well. Regarding Muscidae, *Phaonia kowarzii* is known to prefer cold, Scandinavian climates (Vikhrev & Erofeeva 2018). From Central Europe, there is only a single doubtful record (Austria), which makes the present finding rather unexpected. The rarity of this species is further highlighted by the fact that the female was only recently described (Vikhrev & Erofeeva 2018). Notably, *P. kowarzii* is not the only species with a predominantly northern distribution captured in the same valley (Bakonyszentlászló, Vinye: Cuha-völgy); *Lonchaea lateralis* and additional Tachinidae species reported by Varga (2025) show a similar pattern. This suggests that the climatic characteristics of this habitat provide suitable conditions for species that prefer colder regions.

In contrast, previously unrecorded southern or migratory species (also distributed in the Afrotropical region) were also documented during these collecting events, including *Leptometopa rufifrons* and

Ochthera schembrii. The record of *L. rufifrons* is particularly noteworthy, as Milichiidae is among the best studied Acalyptratae families in Hungary (Papp & Földvári 2008), and its occurrence had already been predicted by Papp (1978); however remained unconfirmed until now. The collecting site (southern slope of Odvas-hegy) is known as a hotspot for southern and migratory species (on the same night, over eight migrant macrolepidopteran species were attracted to light, including *Leucania loreyi* (Duponchel, 1827) and *Hecatera cappa* (Hübner, 1809)), and the record may represent a migrant specimen or evidence of a northward range expansion. Additional material is needed to confirm either of these hypotheses.

Taken together, these results demonstrate that both northern and southern faunal elements of the Hungarian Diptera are still awaiting discovery. In summary, the total number of species recorded from Hungary, even from these rather well-studied families (Ephydriidae: 150+, Lonchaeidae: 40+, Milichiidae: 30+, Muscidae: 210+, Syrphidae: 390+, Tachinidae: 430+), could be increased in the future by focusing on specific habitats such as saline lakes, peat bogs, and forested stream valleys, while making wider use of nocturnal light-trapping. Especially the latter approaches are proving highly effective for detecting rare and unexpected taxa and will be essential for documenting the true richness of the Hungarian Diptera and clarifying its biogeographical context within Central Europe.

AUTHOR'S CONTRIBUTION

The authors confirm their contribution to the paper as follows: N. Varga: Collection, preparation, and identification of specimens, as well as figure preparation; I. MacGowan: Supervision, critical revisions, and substantial input on the manuscript.

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AVAILABILITY OF DATA AND MATERIAL

The specimens listed in this study are deposited in the Hungarian Natural History Museum and are available from the curator upon request.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study only included arthropod material, and all required ethical guidelines for the treatment and use of animals were strictly adhered to in accordance with international, national, and institutional regulations. No human participants were involved in any studies conducted by the authors for this article.

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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یافته‌های جدید از دوبالان گروه مگس‌ریختان (Diptera, Brachycera) در مجارستان

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چکیده: شش گونه از دوبالان گروه مگس‌ریختان، برای اولین بار از مجارستان گزارش شدند که هر کدام نمایانگر یک خانواده متفاوت به شرح ذیل هستند: (Syrphidae) *Cheilosia (Neocheilosia) luteicornis* (Zetterstedt, 1838)، (Ephydriidae) *Ochthera schembrii* Rondani, 1847، (Lonchaeidae) *Lonchaea lateralis* MacGowan, 2016، (Muscidae) *Phaonia kowarzii* Schnabl, 1887، (Milichiidae) *Leptometopa rufifrons* Becker, 1903 و (Tachinidae) *Tryphera lugubris* (Meigen, 1824). علاوه بر این، حضور دو گونه دیگر شامل *Brachydeutera meridionalis* Rondani, 1856 (Ephydriidae) و *Therobia leonidei* (Mesnil, 1965) (Tachinidae) برای دومین بار در مجارستان ثبت شد.

ویراستار علمی

ابراهیم گیلاسیان

دریافت: ۰۵ شهریور ۱۴۰۴

ویرایش: ۱۶ مهر ۱۴۰۴

پذیرش: ۲۳ مهر ۱۴۰۴

انتشار: ۲۰ آذر ۱۴۰۴

واژگان کلیدی: Tachinidae، Syrphidae، Muscidae، Milichiidae، Lonchaeidae، Ephydriidae