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Original article (Orijinal araştırma)

A faunistic study on the Tachinidae (Diptera) family in Mersin (Türkiye) province with new records for Türkiye[1]

Türkiye için yeni kayıtlar ile Mersin (Türkiye) ilinde Tachinidae (Diptera) familyası üzerine faunistik bir çalışma

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Abstract

This study was conducted between 2020 and 2021 to reveal the Tachinidae (Diptera) fauna of Mersin province. For this purpose, Tachinidae specimens from agriculture, forest and other areas (grassland, pasture, etc.) of 8 districts (Anamur, Çamlıyayla, Erdemli, Gülnar, Mezitli, Silifke, Toroslar, Yenişehir) selected to represent the province were collected together with the plants they visited. Additionally, insect species from different orders were reared in a laboratory to determine their status as hosts for Tachinidae species. In total, 32 species were determined and identified during the study. These species were categorized into subfamilies and genera: Exoristinae subfamily: 6 genera and 7 species; Tachininae subfamily: 5 genera and 7 species; Dexiinae subfamily: 6 genera and 8 species; Phasiinae subfamily: 4 genera and 10 species. Among them *Prosopea nigricans* (Egger, 1861), *Estheria hertingi* Cerretti & Tschorsnig, 2012 and *Stomina calvescens* Herting, 1977 were recorded for the first time in Türkiye. *P. nigricans* is the first record of the genus *Prosopea* Rondani, 1861 from Türkiye. The distribution in Türkiye, visited plants and hosts known from Türkiye of the determined species were also given. In addition, *Leucostoma crassa* (Kugler, 1966) was reared from *Spilostethus pandurus* (Scopoli, 1763) (Hemiptera: Lygaeidae), and it was determined that this host-parasitoid-couple is a new record for Türkiye. This is the first comprehensive research of the Tachinidae family in Mersin province.

Keywords: Fauna, Mersin, new records, Tachinidae, Türkiye

Öz

Bu çalışma Mersin ilinin Tachinidae (Diptera) faunasını ortaya koymak amacıyla 2020 ve 2021 yıllarında gerçekleştirilmiştir. Bu hedef doğrultusunda ili temsil edecek şekilde seçilen 8 ilçenin (Anamur, Çamlıyayla, Erdemli, Gülnar, Mezitli, Silifke, Toroslar, Yenişehir) tarım, orman ve diğer (çayır, mera vb.) alanlarından Tachinidae örnekleri, ziyaret ettikleri bitkiler ile birlikte toplanmıştır. Ayrıca, Tachinidae türlerinin konukçularını tespit etmek için farklı böcek takımlarına ait türler laboratuvar koşullarında yetiştirilmiştir. Çalışma sonucunda, Exoristinae altfamilyasından 6 cinse ait 7 tür, Tachininae altfamilyasından 5 cinse ait 7 tür, Dexiinae altfamilyasından 6 cinse ait 8 tür ve Phasiinae altfamilyasından 4 cinse ait 10 tür olmak üzere 32 tür belirlenmiştir. Bunlardan *Prosopea nigricans* (Egger, 1861), *Estheria hertingi* Cerretti & Tschorsnig, 2012 ve *Stomina calvescens* Herting, 1977 Türkiye için yeni kayıt niteliğindedir. Yine *Prosopea* Rondani, 1861 cinsi Türkiye'de ilk defa *P. nigricans* ile temsil edilmiştir. Belirlenen türlerin Türkiye'deki yayılışlar, ziyaret ettikleri bitkiler ve Türkiye'den bilinen konukçuları ile ilgili bilgiler sunulmuştur. Ayrıca *Spilostethus pandurus* (Scopoli, 1763) (Hemiptera: Lygaeidae)'dan *Leucostoma crassa* (Kugler, 1966) elde edilmiş ve bu konukçu-parazitoit çiftinin Türkiye için yeni kayıt niteliğinde olduğu belirlenmiştir. Bu çalışma Mersin ilinde Tachinidae familyasına yönelik ilk detaylı çalışma niteliğindedir.

Anahtar sözcükler: Fauna, Mersin, yeni kayıtlar, Tachinidae, Türkiye

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Introduction

The Tachinidae (Diptera) is a family which has an important biodiversity in the Diptera, with approximately 8592 species around the world, and 2112 species in the Palearctic region (O'Hara et al., 2021). In Türkiye, the number of known species belonging to the family is 341 (Kara et al., 2020). When this number is compared with the number of Tachinidae species in some neighboring countries such as Greece (Cerretti & Ziegler, 2004-334 species), Bulgaria (Hubenov, 2008-409 species) and Serbia (Hubenov, 2008-188 species) and considering the area of Türkiye, it can be seen that the tachinid fauna of Türkiye is still insufficiently investigated. All Tachinidae species are parasitoids of other arthropods, mainly insects. They attack mainly Lepidoptera larvae but also other insects such as Coleoptera (larvae and adults), Heteroptera (nymphs and adults) and Hymenoptera Symphyta (larvae). They serve a crucial role in naturally controlling the populations of major insect pests (Grenier, 1988; Stireman et al., 2009; Tschorsnig, 2017). Therefore, studies on determining species diversity and revealing host-parasitoid interactions can provide useful information for utilizing tachinids as biocontrol agents. In addition, the presence of suitable and sufficient number of plants for adult parasitoids to feed on has a positive effect on the ability of females to find hosts and parasitize, the number of eggs laid, and sex ratio (Berndt & Wratten, 2005). For this reason, studies to determine the plants visited by tachinids and to maintain the presence of the determined plants in the environment are of great importance in terms of supporting the populations of these beneficials and increasing their effectiveness.

Kara & Tachorsnig (2003) compiled all known hosts of tachinids in Türkiye and mentioned hosts of 95 tachinids. In addition, Kara et al. (2008) prepared a catalogue containing a total of 27 tachinids which are parasitoids of forest pests in Türkiye. Although there are some detailed studies conducted to reveal the species richness of the Tachinidae family in Türkiye, it is seen that the number of these studies is very low when the country is considered in general (Doğanlar, 1975; Kara, 1998; Aksu, 2005; Korkmaz, 2007; Atay & Kara, 2014; Balkan et al., 2015; Lekin et al., 2016; Atay, 2017; Uysal & Atay, 2021; Soykan & Atay, 2022). Finally, the work by Lutovinovas et al. (2018) is a significant contribution to the knowledge of Tachinidae species in southern Türkiye. Publishing a list of 139 tachinid species from this region, with 52 of them being new records for Türkiye, represents an important update to the tachinid diversity in the country.

Mersin, located in southern Türkiye, exhibits a notable variation in climate across its regions. The coastal areas of Mersin are characterized by Mediterranean climate. Inland and the more distant areas from the coast tend to have a continental climate. The variation in climate across different regions within Mersin province can contribute to an increase in insect biodiversity. The study on the Tachinidae fauna in Mersin province is of great importance, especially considering that only a limited number of tachinid species have been previously documented in the region (Yabaş & Zeren, 1987; Şimşek et al., 1994; Bystrowski, 2011; Aytar et al., 2021). This study focuses on the Tachinidae fauna of Mersin province.

Materials and Methods

Tachinid specimens were collected from various types of environments, including agricultural fields, weeds, forest trees, and ornamental plants, across multiple locations in the Mersin province (Anamur, Çamlıyayla, Erdemli, Gülnar, Mezitli, Silifke, Toroslar, Yenişehir) during 2020-2021. The random collection approach helps ensure a representative sample of the local tachinid fauna. Specimens collected with an insect net and aspirator were killed with ethyl acetate. The latitude and altitude of the site where the tachinids were collected were recorded using GPS. In addition, the plants on which the adult flies were found were photographed and herbariums were made. For host detection studies, insects belonging to different orders were collected from agricultural and forest areas. After collection, insects were taken to the laboratory and reared with the plants they fed on in separate rearing boxes. Culture boxes were maintained at 25±2°C and 60 70% and monitored periodically. For the identification of some specimens, male genital preparations were prepared. For this purpose, the last part of the abdomen was removed from the insect body with forceps, boiled in 10% KOH solution and cleaned by separating the genitalia from the other parts in pure water (Tschorsnig, 1985). Genitalia were preserved in glycerin after being used for identification.

Tachinids were identified using Mesnil (1944-1965), Herting (1977), Herting (1983), Zimin et al. (1988), Tschorsnig & Herting (1994), Tschorsnig & Richter (1998), Cerretti (2005), Cerretti & Shima (2011), Cerretti & Tschorsnig (2012) and Glisian et al. (2013). Taxonomic status of tachinids is updated based on Herting & Dely-Draskovits (1993). The current names of the species are mostly taken from Herting & Dely-Draskovits (1993). Others are from O'Hara et al. (2021). Species showing intraspecific variation were photographed. A Leica MC170 digital camera mounted on a Leica M205 C stereomicroscope was used for photographing the tachinid specimens. Leica Application Suite Software v4.13.0, including the multifocus program was used for photography. The tachinid specimens are kept in the Plant Protection Museum in Tokat Gaziosmanpaşa University, Agricultural Faculty, Tokat, Türkiye. An asterisk (*) is used to indicate species newly recorded for Türkiye. The host belonging to the suborder Heteroptera was identified by Dr. Gülten YAZICI (Plant Protection Central Research Institute, Department of Entomology, Ankara, Türkiye) and the plants visited by adult tachinids were identified by Dr. Ünal ASAV (Department of Plant Protection, Faculty of Agriculture, Tokat Gaziosmanpaşa University, Tokat, Türkiye).

Results and Discussion

A total of 32 tachinid fly species have been identified in the Mersin province of Türkiye. Among these, three species are reported as new records for the Turkish fauna: *Prosopea nigricans* (Egger, 1861), *Estheria hertingi* Cerretti & Tschorsnig, 2012 and *Stomina calvescens* Herting, 1977 (Diptera: Tachinidae).

Subfamily: Exoristinae

Tribe: Exoristini

Exorista segregata (Rondani, 1859)

Material examined. Silifke, N 36°26'10", E 34°5'43", 22.06.2021, 6m, ♂.

Distribution in Türkiye. İstanbul (Schimitschek, 1944), Trakya (Gürses, 1975), Erzurum (Doğanlar, 1975; Doğanlar, 1982a; Kılıç & Alaoğlu, 1996; Özbek & Çoruh, 2012), Ankara, Kırşehir, Niğde (Kansu et al.,1986), Tokat (Kara, 1998; Kara & Alaoğlu, 2001; Atay & Kara, 2014), Isparta (Avcı & Kara, 2002), Belen (Mückstein et al., 2007), Lakes District (Avcı, 2009), Nevşehir (Bartsch & Tschorsnig, 2010), Mersin (Akdağcık, 2010; Aytar et al., 2021), Muğla (Lutovinovas et al., 2018).

Host in Türkiye. *Thaumetopoea pityocampa* (Schimitschek, 1944), *Euproctis chrysorrhoea* (L., 1758) (Lepidoptera: Erebidae) (Gürses, 1975), *Leucoma salicis* (L., 1758), *Malacosoma castrensis* (L., 1758), *Malacosoma franconica* (Denis & Schiffermüller, 1775) (Lepidoptera: Lasiocampidae), *Simyra* sp. (Lepidoptera: Noctuidae) (Herting, 1960; Doğanlar, 1975), *Euproctis* sp., *Phalera bucephala* (L., 1758) (Lepidoptera: Notodontidae), *Simyra dentinosa* Freyer, 1838 (Lepidoptera: Noctuidae) (Doğanlar, 1982a; Atay & Kara, 2014), *Hyles centralasiae* (Staudinger, 1887) (Lepidoptera: Sphingidae) (Bartsch & Tschorsnig, 2010), *Lymantria dispar* (L., 1758) (Kara & Tschorsnig, 2003; Avcı, 2009; Aytar et al., 2021), *L. salicis* (Kansu et al., 1986; Kılıç & Alaoğlu, 1996; Kara & Alaoğlu, 2001), *Malacosoma neustria* (L., 1758) (Lepidoptera: Lasiocampidae) (Kara & Alaoğlu, 2001; Özbek & Çoruh, 2012), *Parocneria terebinthi* (Freyer, 1838) (Lepidoptera: Erebidae) (Kara & Alaoğlu, 2001), *Aporia crataegi* (L., 1758) (Lepidoptera: Pieridae) (Kansu et al., 1986; Kara & Tschorsnig, 2003), *T. ispartaensis* Doganlar & Avci, 2001 (Avcı & Kara, 2002), *Pieris* sp., *Aglais io* (L., 1758) (Lepidoptera: Nymphalidae), *Zygaena carniolica* (Scopoli, 1763) (Lepidoptera: Zygaenidae) (Kara & Tschorsnig, 2003), *Cucullia lanceolata* (Villers, 1789) (Lepidoptera: Noctuidae) (Mücksteinet al., 2007), *Pieris brassicae* (L., 1758) (Lepidoptera: Pieridae) (Akdağcık, 2010), *Hyles siehei* Püngeler, 1903 (Lepidoptera: Sphingidae) (Bartsch & Tschorsnig, 2010), *Utetheisa pulchella* (L., 1758) (Lepidoptera: Erebidae) (Aytar et al., 2021).

Tribe: Wintheminii

Nemorilla floralis (Fallén, 1820)

Material examined. Erdemli, N 36°43'37", E 34°17'54", 29.09.2021, 678m, 2♂♂, 2♀♀.

Distribution in Türkiye. Burdur (Zeki et al., 1999; Lutovinovas et al., 2018), Tokat (Kara, 1998; Kara & Alaoğlu, 2002), Edirne (Tek & Okyar, 2018).

Host in Türkiye. *Pleuroptya ruralis* Scopoli, 1763 (Lepidoptera: Sphingidae) (Kara, 1998; Kara & Alaoğlu, 2002), *Depressaria daucivorella* Ragonot, 1889 (Lepidoptera: Elachistidae) (Zeki et al., 1999), *Acleris undulana* (Walsingham, 1900) (Lepidoptera: Tortricidae) (Kara & Tschorsnig, 2003), *Archips rosana* L., 1758 (Lepidoptera: Tortricidae) (Tek & Okyar, 2018).

Tribe: Goniini

Pales pavida (Meigen, 1824)

Material examined. Toroslar, N 36°50'17", E 34°33'50", 16.04.2021, 85m, 2♂♂, collected from *Euphorbia helioscopia* L. (Euphorbiaceae); 19.09.2021, 62m, 4♂♂, 2♀♀.

Distribution in Türkiye. Ankara (Kara & Özdemir, 2000), Bolu (Robertson & Shaw, 2012), Erzurum (Doğanlar, 1975; Özbek & Çoruh, 2012), Kars (Doğanlar, 1982a; Özbek & Çalmaşur, 2010), Muğla (Lutovinovas et al., 2018), Isparta (Avcı, 2009), Sakarya (Balkan, 2014; Balkan et al., 2015), Samsun (Tuncer & Ecevit, 1996), Sivas (Robertson & Shaw, 2012), Tokat (Herting, 1983; Tschorsnig, 2005; Kara, 1998; Atay, 2011; Atay & Kara, 2014; Lekin, 2014; Lekin et al., 2016), Locality information is not provided (Cerretti, 2005), Amasya (Kara, 2001b), Muğla (Acatay, 1959).

Host in Türkiye. *Lymantria dispar* (L., 1758) (Lepidoptera: Lymantriidae) (Acatay, 1959; Avcı, 2009), *Malacosoma franconica* Esp. (Lepidoptera: Lasiocampidae) and *M. castrensis kırghisica* Stgr. (Lepidoptera: Lasiocampidae) (Doğanlar 1975, 1982a), *Hypantria cunea* (Drury, 1773) (Lepidoptera: Erebidae) (Tuncer & Ecevit, 1996; Kara & Tschorsnig, 2003), *Aglais urticae* (L., 1758) (Lepidoptera: Nymphalidae) and *Leucoma salicis* (L.) (Lepidoptera: Erebidae) (Kara, 1998), *Yponomeuta* sp. *(*Lepidoptera: Yponomeutidae) (Kara & Özdemir, 2000), *M. neustria* L. (Lepidoptera: Lasiocampidae) (Kara and Tschorsnig, 2003), *Abraxas pantaria* (L., 1767) (Lepidoptera: Geometridae) (Özbek & Çalmaşur, 2010), *Simyra dentinosa* Frr. (Lepidoptera: Noctuidae) and *Malacosoma neustria* (L.) (Lepidoptera: Lasiocampidae) (Atay, 2011; Atay & Kara, 2014).

Dolichocolon paradoxum (Brauer et Bergenstamm, 1889)

Material examined. Yenişehir, N 36°50'42", E 34°33'21", 12.04.2021, 154m, ♂.

Distribution in Türkiye. Muğla (Lutovinovas et al., 2018).

****Prosopea nigricans*** (Egger, 1861)

Material examined. Erdemli, N 36°46'31", E 34°0'1", 07.10.2021, 1395m, ♀.

Distribution in Türkiye. Recorded for the first time from Türkiye.

Remark. Tschorsnig & Herting (1994), reported that the palps completely black, the middle tibia with 3 anterodorsal setae and the r-m vein is noticeably inclined towards the m vein. In the examined materials lower half of the palps blackish brown and the upper half lighter, the middle tibia with 5 anterodorsal setae (3 big and 2 small) and the r-m vein is not very noticeably slant to the m vein (Figure 1).

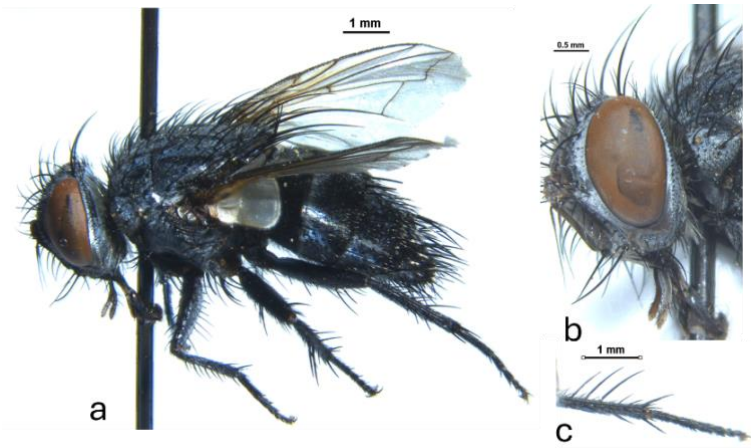

Figure 1. *Prosopea nigricans* ♀: a) General view, b) head, c) middle tibia.

Spallanzania hebes (Fallén, 1820)

Material examined. Toroslar, N 36°51'28", E 34°33'23", 04.06.2021, 154m, ♂, collected from *Teucrium* sp. (Lamiaceae).

Distribution in Türkiye. Erzurum (Doğanlar, 1982a), Sakarya (Balkan, 2014; Balkan et al., 2015), Burdur (Lutovinovas et al., 2018), Manisa (Soykan, 2021; Soykan & Atay, 2022).

Host in Türkiye. *Agrotis* sp. (Lepidoptera: Noctuidae) (Tschorsnig, 2017).

Spallanzania multisetosa (Rondani, 1859)

Material examined. Silifke, N 36°26'11", E 34°5'43", 07.04.2021, 16m, ♂.

Distribution in Türkiye. Eskişehir (Aksu, 2005).

Subfamily: Tachininae

Tribe: Tachinini

Peleteria rubescens (Robineau-Desvoidy, 1830)

Material examined. Toroslar, N 37°1'51", E 34°35'22", 04.06.2021, 953m, 2♀♀, collected from *Melissa officinalis* L. (Lamiaceae).

Distribution in Türkiye. Erzurum (Doğanlar, 1975), Tokat (Kara, 1999a; Lekin et al., 2016), Ankara (Khan & Özer, 1984; Kansu et al., 1986; Kara & Özdemir, 2000), Zonguldak (Korkmaz, 2007), Sakarya (Balkan, 2014; Balkan et al., 2015), Çorum (Uysal, 2018; Uysal & Atay, 2021), Manisa (Soykan, 2021; Soykan & Atay, 2022).

Host in Türkiye. *Malacosoma castrensis* (L., 1758) (Lepidoptera: Lasiocampidae) (Doğanlar, 1975), *Agrotis* sp. (Lepidoptera: Noctuidae) (Khan & Özer, 1984; Kansu et al., 1986; Kara & Özdemir, 2000).

Tribe: Ernestiini

Linnaemya comta (Fallén, 1810)

Material examined. Erdemli, N 36°46'31", E 34°0'1", 07.10.2021, 1395m, 4♀♀.

Distribution in Türkiye. Denizli (Kavut et al., 1974), Diyarbakır, Hakkari (Doğanlar, 1982b), Tokat (Kara, 1999a), Sakarya (Balkan, 2014; Balkan et al., 2015), Kastamonu (Atay, 2017).

Host in Türkiye. *Agrotis ipsilon* Hufnagel (Lepidoptera: Noctuidae) (Kavut et al., 1974).

Tribe: Macquartiini

Macquartia praefica (Meigen, 1824)

Material examined. Gülnar, N 36°23'26", E 33°27'7", 19.05.2020, 1207m, ♀; Toroslar, N 36°50'3", E 34°35'1", 30.03.2021, 86m, ♀, collected from *Glebionis coronaria* (L.) Cass. ex Spach (Asteraceae); Yenişehir, N 36°50'42", E 34°33'21", 12.04.2021, 154m, ♀.

Distribution in Türkiye. Tokat (Kara, 1999a).

Macquartia tenebricosa (Meigen, 1824)

Material examined. Toroslar, N 36°50'17", E 34°33'50", 16.04.2021, 85m, ♂, collected from *Euphorbia helioscopia* L. (Euphorbiaceae); 19.09.2021, ♂; N 36°50'24", E 34°33'46", 28.04.2021, 102m, ♂, ♀.

Distribution in Türkiye. Tokat (Kara, 1999a; Atay, 2018), Amasya (Kara, 2001b), Adana (Anay, 2000), Bartın (Korkmaz, 2007), Aydın and Muğla (Lutovinovas et al., 2018), Çorum (Uysal, 2018; Uysal & Atay, 2021).

Host in Türkiye. *Plebejus idas* (L., 1761) (Lepidoptera: Lycaenidae) (Anay, 2000), *Gonioctena fornicata* Brüggemann, 1873 (Coleoptera: Chrysomelidae) (Atay, 2018).

Macquartia tessellum (Meigen, 1824)

Material examined. Silifke, N 36°26'11", E 34°5'43", 7.04.2021, 16m, ♂.

Distribution in Türkiye. Erzurum (Doğanlar, 1982b), Tokat (Kara, 1999a), Muğla (Lutovinovas et al., 2018); Çorum (Uysal, 2018; Uysal & Atay, 2021).

Anthomyiopsis plagioderae (Mesnil, 1972)

Material examined. Toroslar, N 36°49'28", E 34°35'23", 02.10.2021, 78m, ♀.

Distribution in Türkiye. Sivas (Atay, 2011; Kara & Atay, 2015).

Host in Türkiye. *Phaedon cochleariae* (Fabricius, 1792) (Coleoptera: Chrysomelidae) (Atay, 2011; Kara & Atay, 2015).

Remarks. Tschorsnig & Herting (1994) reported two pairs of setae (basal and apical) on the scutellum. In the examined specimen, 3 pairs of setae (basal, lateral and apical) were observed (Figure 2).

Figure 2. *Anthomyiopsis plagioderae* ♀: a) General view, b) scutellum.

Tribe: Megaprosopini

Microphthalma europaea (Egger, 1860)

Material examined. Erdemli, N 36°43'37", E 34°17'54", 29.09.2021, 678m, ♀.

Distribution in Türkiye. Aydın, Eskişehir, Diyarbakır (Karagöz et al., 2011); Sakarya (Balkan, 2014; Balkan et al., 2015), Aydın, Muğla (Lutovinovas et al., 2018), Çorum (Uysal, 2018; Uysal & Atay, 2021).

Host in Türkiye. *Polyphylla fullo* (L., 1758) (Coleoptera: Scarabaeidae) (Karagöz et al., 2011).

Subfamily: Dexiinae

Tribe: Dexiini

Billaea adelpha (Loew, 1873)

Material examined. Toroslar, N 36°51'28", E 34°33'23", 04.06.2021, 154m, ♂, collected from *Ruta angustifolia* Pers. (Rutaceae); Yenişehir, N 36°53'48", E 34°30'22", 14.06.2021, 429m, ♂; N 36°49'50", E 34°28'19", 01.10.2021, 194m, ♂; Erdemli, N 36°41'16", E 34°19'25", 29.09.2021, 166m, ♂, collected from *Drimia maritima* (L.) Stearn (Asparagaceae); Silifke, N 36°27'6", E 34°6'10", 13.10.2021, 156m, ♂.

Distribution in Türkiye. Tokat (Kara, 2001a).

Estheria nigripes (Villeneuve, 1920)

Material examined. Toroslar, N 37°1'52", E 34°35'22", 27.09.2021, 990m, 2♀♀; N 37°2'0", E 34°34'40", 27.09.2021, 1012m, ♀; N 36°57'25", E 34°31'37", 05.10.2021, 907m, ♀.

Distribution in Türkiye. Locality information is not provided (Herting, 1984; Cerretti & Tschorsnig, 2012). İzmir (Öncüer, 1991; Herting & Dely-Draskovits, 1993), Muğla (Lutovinovas et al., 2018).

****Estheria hertingi*** Cerretti & Tschorsnig, 2012

Material examined. Silifke, N 36°26'11", E 34°5'44", 19.05.2020, 65m, ♂; N 36°26'10", E 34°5'42", 18.06.2020, 24m, ♀; N 36°26'10", E 34°5'43", 22.06.2021, 6m, 2♀♀; N 36°25'34", E 33°39'49", 22.06.2021, 223m, 2♀♀; N 36°25'33", E 33°39'49", 22.06.2021, 195m, ♂, 3♀♀; Gülnar, N 36°26'13", E 33°31'26", 22.06.2021, 419m, 3♂♂; Tarsus, N 37°5'18", E 34°38'10", 15.07.2021, 837m, 2♀♀, ♂; N 37°4'37", E 34°37'1", 15.07.2021, 1052m, 3♂♂; Çamlıyayla, N 37°5'46", E 34°42'4", 15.07.2021, 987m, 2♀♀, ♂; N 37°7'27", E 34°37'44", 15.07.2021, 877m, ♀; Toroslar, N 36°52'27", E 34°33'21", 28.07.2020, 132m, 2♂♂, 13♀♀; N 36°51'28", E 34°33'23", 4.06.2021, 154m, ♂, collected from *Ruta angustifolia* Pers. (Rutaceae); N 37°1'52", E 34°35'22", 27.09.2021, 990m, ♀; N 37°2'25", E 34°33'45", 27.09.2021, 974m, ♀; N 36°58'0", E 34°31'12", 5.10.2021, 978m, 2♀♀, collected from *Dittrichia viscosa* (L). Greuter (Asteraceae); N 36°57'25", E 34°31'37", 5.10.2021, 907m, ♀; Erdemli, N 36°43'42", E 34°17'23", 16.06.2021, 679m, ♂, collected from *Pallenis spinosa* (L.) Cass. (Asteraceae).

Distribution in Türkiye. Recorded for the first time from Türkiye.

Zeuxia tricolor (Portschinsky, 1881)

Material examined. Toroslar, N 36°52'32", E 34°33'58", 09.05.2020, 338m, ♀; N 36°53'11", E 34°34'9", 30.05.2020, 466m, 2♀♀.

Distribution in Türkiye. Konya (Herting, 1984), Tokat (Kara, 1999b; Lekin, 2014; Lekin et al., 2016) Amasya (Kara, 2001b), Eskişehir (Kara & Aksu, 2007), Manisa (Soykan, 2021; Soykan & Atay, 2022).

Tribe: Voriini

Eriothrix rufomaculatus (De Geer, 1776)

Material examined. Yenişehir, N 36°49'50", E 34°28'19", 01.10.2021, 194m, ♂; Erdemli, N 36°46'31", E 34°0'1", 07.10.2021, 1395m, 4♂♂, 3♀♀; Silifke, N 36°29'47", E 33°54'32", 13.10.2021, 826m, ♀, collected from *Eryngium campestre* L. (Apiaceae).

Distribution in Türkiye. Erzurum (Doğanlar, 1982b), Tokat (Kara, 1999b; Lekin, 2014; Lekin et al., 2016), Kastamonu, Bartın, Zonguldak (Korkmaz, 2007), Sakarya (Balkan, 2014; Balkan et al., 2015), Muğla (Lutovinovas et al., 2018), Çorum (Uysal, 2018; Uysal & Atay, 2021).

Voria ruralis (Fallén, 1810)

Material examined. Silifke, N 36°27'45", E 33°53'32", 13.10.2021, 566m, ♀, collected from *Mentha longifolia* L. (Lamiaceae).

Distribution in Türkiye. İzmir (Kavut et al., 1974), Erzurum (Avcı & Özbek, 1990), Tokat (Kara, 1999b), Adana (Anay, 2000), Niğde (Kara & Özdemir, 2000), Amasya (Kara, 2001b), Karabük (Korkmaz, 2007), Hatay (Kaya & Kornoşor, 2008), Tokat (Lekin, 2014; Lekin et al., 2016), Çorum (Uysal, 2018; Uysal & Atay, 2021), Aydın, Muğla (Lutovinovas et al., 2018), Manisa (Soykan, 2021; Soykan & Atay, 2022).

Host in Türkiye. *Spodoptera exigua* (Hübner, 1808) (Steiner, 1937), *Autographa gamma* (L., 1758) (Kavut et al., 1974; Avcı & Özbek, 1990; Anay, 2000; Kara & Özdemir, 2000), *Helicoverpa armigera* (Hübner, 1808) (Anay, 2000); Plusiinae sp. (Lepidoptera: Noctuidae) (Kaya & Kornoşor, 2008).

****Stomina calvescens*** Herting**,** 1977

Material examined. Mezitli, N 36°49'31", E 34°26'58", 01.10.2021, 524m, ♂, 2♀♀, collected from *Drimia maritima* (L.) Stearn (Asparagaceae); Toroslar, N 36°58'0", E 34°31'12", 05.10.2021, 978m, ♂; N 36°56'56", E 34°33'34", 05.10.2021, 718m, ♂; Silifke, N 36°27'45", E 33°53'32", 13.10.2021, 566m, ♀, collected from *Mentha longifolia* L. (Lamiaceae).

Distribution in Türkiye. Recorded for the first time from Türkiye.

Remarks. Herting (1977), reported the number of hairs under the last frontal seta as 1-5 in males. However, the number of hairs was more in the examined specimens (Figure 3 a,b). He also reported that the surstyli of *Stomina calvencens* similar to those of *Stomina caliendrata* (Rondani, 1862), but the basal part of the surstyli of *S. calvencens* was more developed (Figure 3 c,d).

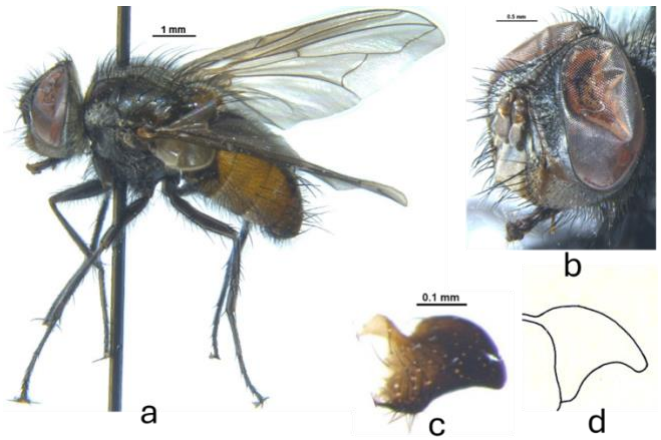

Figure 3. *Stomina calvescens* ♂:a) General view, b) head, c) surstyli, d) *Stomina caliendrata* ♂: surstyli (Herting, 1977).

Stomina tachinoides (Fallén, 1817)

Material examined. Silifke, N 36°27'45", E 33°53'32", 13.10.2021, 566m, ♀, collected from *Mentha longifolia* L. (Lamiaceae).

Distribution in Türkiye. Eskişehir (Kara, 2001a).

Subfamily: Phasiinae

Tribe: Phasiini

Gymnosoma rotundata (L., 1758)

Material examined. Toroslar, N 37°1'59", E 34°36'0", 04.06.2021, 886m, ♂, collected from *Galium odaratum* (L.) Scop. (Rubiaceae).

Distribution in Türkiye. Eastern Black Sea Region (Kurt, 1975), Tokat (Kara, 1998; Lekin, 2014; Lekin et al., 2016), Karabük, Kastamonu, Zonguldak (Korkmaz, 2007; Atay, 2017), Sakarya (Balkan, 2014; Balkan et al., 2015), Çorum (Uysal, 2018; Atay & Uysal, 2021), Manisa (Soykan, 2021; Soykan & Atay, 2022).

Host in Türkiye. *Aelia rostrata* Boheman, 1852 (Dikyar, 1981), *Palomena prasina* (L., 1761) (Hemiptera: Pentatomidae) (Kurt, 1975).

Phasia mesnili (Draber-Monko, 1965)

Material examined. Mezitli, N 36°49'31", E 34°26'58", 01.10.2021, 524m, ♀, *Drimia maritima* (L.) Stearn (Asparagaceae).

Distribution in Türkiye. Tokat (Kara, 1998; Kara & Alaoğlu, 1999), Karabük (Korkmaz, 2007; Atay, 2017), Kastamonu, Zonguldak (Korkmaz, 2007), Bolu (Atay, 2017), Aydın, Burdur and Muğla (Lutovinovas et al., 2018).

Tribe: Leucostomatini

Leucostoma crassa (Kugler, 1966)

Reared specimens. 11.10.2021, ♂; 12.10.2021, ♀, ♂; 14.10.2021, ♂ [host details. *Spilostethus pandurus* (Scopoli, 1763) (Hemiptera: Lygaeidae) specimens were collected in Erdemli, 24.09.2021, N 36°41'16", E 34°19'25", 166m, on *Drimia maritima* (L.) Stearn (Asparagaceae)]; 11.10.2021, ♂; 12.10.2021, ♀ (host details. *S. pandurus* were collected in Erdemli, 29.09.2021, N 36°43'9", E 34°20'16", 312m, on *D. maritima*).

Distribution in Türkiye. Locality information is not provided (Herting & Dely-Draskovits, 1993), Tokat (Kara, 1998).

Hosts in Türkiye. *Lygaeus equestris* (L., 1758) (Hemiptera: Lygaeidae) (Kara, 1998; Kara & Tschorsnig, 2003).

Tribe: Cylindromyiini

Cylindromyia rubida (Loew, 1854)

Material examined. Toroslar, N 36°52'55", E 34°33'0", 26.09.2021, 185m, ♂ collected from *Mentha longifolia* L. (Lamiaceae).

Remarks. Herting (1983) reported that the ratio of the apical seta on the scutellum to the subapical seta was only 0.25 times. In the examined specimen, this ratio was measured as 0.49 times (Figure 4).

Distribution in Türkiye. İzmir (Çerçi, 2017), Adana (Tarla et al., 2023).

Hosts in Türkiye. *Piezodorus lituratus* (Fabricius, 1794) (Hemiptera: Pentatomidae) (Tarla et al., 2023).

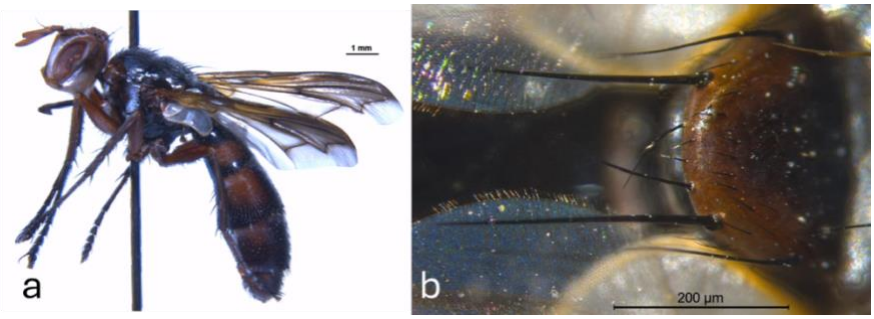

Figure 4. *Cylindromyia rubida* ♂: a) General view, b) scutellum.

Cylindromyia gemma (Richter, 1972*)*

Material examined. Toroslar, N 37°2'45", E 34°33'36", 15.07.2021, 884m, 2♂♂, collected from *Xeranthemum inapertum* (L.) Mill. (Asteraceae).

Distribution in Türkiye. Manisa (Soykan, 2021; Soykan & Atay, 2022).

Cylindromyia bicolor (Oliver, 1812)

Material examined. Toroslar, N 36°52'55", E 34°33'0", 26.09.2021, 185m, ♂, collected from *Mentha longifolia* L. (Lamiaceae); Mezitli, N 36°49'31", E 34°26'58", 05.10.2021, 526m, ♂, collected from *Drimia maritima* (L.) Stearn (Asparagaceae); Silifke, N 36°29'47", E 33°54'32", 13.10.2021, 826m, ♂, collected from *Eryngium campestre* L. (Apiaceae).

Distribution in Türkiye. Samsun (Herting, 1983), Black Sea Region (Işık et al., 1987), Tokat (Kara, 1998; Kara & Alaoğlu, 1999; Lekin, 2014; Lekin et al., 2016), Zonguldak (Korkmaz, 2007), Bartın, Karabük (Atay, 2017), Çorum (Uysal, 2018; Uysal & Atay, 2021), Aydın, Muğla (Lutovinovas et al., 2018), Manisa (Soykan, 2021; Soykan & Atay, 2022).

Host in Türkiye. *Rhaphigaster nebulosa* (Poda, 1761) (Hemiptera: Pentatomidae) (Herting, 1983).

Cylindromyia brassicaria (Fabricius, 1775)

Material examined. Toroslar, N 36°50'24", E 34°33'46", 28.04.2021, 102m, ♀.

Distribution in Türkiye. Erzurum (Doğanlar, 1982b), İzmir (Karsavuran, 1986), Tokat (Kara, 1998; Kara & Alaoğlu, 1999; Atay, 2011; Atay & Kara, 2014; Lekin, 2014; Lekin et al., 2016), Eskişehir (Aksu, 2005), Antalya, Burdur (Keçeci et al., 2007; Kastamonu (Atay, 2017); Çorum (Uysal, 2018; Uysal & Atay, 2021); Aydın, Muğla (Lutovinovas et al., 2018), Manisa (Soykan, 2021; Soykan & Atay, 2022), Adana and Uşak (Tarla et al., 2023).

Host in Türkiye. *Dolycoris baccarum* (L., 1758) (Hemiptera: Pentatomidae) (Karsavuran, 1986; Kara & Tschorsnig, 2003; Keçeci et al., 2007; Atay, 2011; Atay & Kara, 2014; Tarla et al., 2023), *Holcostethus vernalis* (Wolff, 1804) (Hemiptera: Pentatomidae) (Kara, 1998; Kara & Alaoğlu, 1999).

Cylindromyia pilipes (Loew, 1844)

Material examined. Toroslar, N 36°50'1", E 34°33'55", 26.09.2021, 73m, ♀, collected from *Symphyotrichum squamatum* (Spreng.) G.L.Nesom (Compositae).

Distribution in Türkiye. Bursa, İstanbul (Herting, 1984; Herting & Dely-Draskovits, 1993), Bartın, Kastamonu (Atay, 2017), Burdur (Lutovinovas et al., 2018), Çorum (Uysal, 2018; Uysal & Atay, 2021), Adana (Tarla et al., 2023).

Host in Türkiye. *Holcostethus vernalis* (Wolff, 1804) (Hemiptera: Pentatomidae) (Tarla, et al., 2023).

Cylindromyia pusilla (Meigen, 1824)

Material examined. Toroslar, N 36°50'1", E 34°33'55", 26.09.2021, 73m, ♂, collected from *Symphyotrichum squamatum* (Spreng.) G.L.Nesom (Compositae).

Distribution in Türkiye. Locality information is not provided (Herting & Dely-Draskovits, 1993), Antalya (Herting, 1984), Zonguldak (Korkmaz, 2007), Karabük (Atay, 2017), Muğla (Lutovinovas et al., 2018), Manisa (Soykan, 2021; Soykan & Atay, 2022).

Cylindromyia auriceps (Meigen, 1838)

Material examined. Toroslar, N 36°52'55", E 34°33'0", 26.09.2021, 185m, ♂, collected from *Mentha longifolia* L. (Lamiaceae).

Distribution in Türkiye. Tokat (Kara, 1998; Kara & Alaoğlu, 1999; Lekin, 2014; Lekin et al., 2016), Eskişehir (Aksu, 2005), Kastamonu (Korkmaz, 2007; Atay, 2017), Zonguldak (Korkmaz, 2007), Sakarya (Balkan, 2014; Balkan et al., 2015); Aydın, Muğla (Lutovinovas et al., 2018), Manisa (Soykan, 2021; Soykan & Atay, 2022).

Host in Türkiye. *Aelia acuminata* (L., 1758) (Het: Scutelleridae) (Kara & Tschorsnig, 2003).

During the study, the plants visited by the tachinids were determined and the names and families of the plants are given in Table 1.

Table 1 Plants visited by tachinids (Diptera)

Tachinids	**Visited Plants**	
	Species	**Family**
***Cylindromyia bicolor* (Olivier, 1812),** ***Eriothrix rufomaculata* (De Geer, 1776)**	*Eryngium campestre* L.	Apiaceae
***Cylindromyia pusilla* (Meigen, 1824)** ***Cylindromyia pilipes* (Loew, 1844)**	*Symphyotrichum squamatum* (Spreng.) G.L.Nesom	Compositae
***Voria ruralis* (Fallén, 1810)** ***Stomina calvescens* Herting, 1977** ***Stomina tachinoides* (Fallén, 1817)** ***Cylindromyia auriceps* (Meigen, 1838)** ***Cylindromyia bicolor* (Olivier, 1812)** ***Cylindromyia rubida* (Loew, 1854)**	*Mentha longifolia* L.	Lamiaceae
***Billaea adelpha* (Loew, 1873)** ***Stomina calvescens* Herting, 1977** ***Phasia mesnili* (Draber-Monko, 1965)** ***Cylindromyia bicolor* (Olivier, 1812)**	*Drimia maritima* (L.) Stearn	Asparagaceae
***Peleteria rubescens* (Robineau-Desvoidy, 1830)**	*Melissa officinalis* L.	Lamiaceae
***Cylindromyia gemma* (Richter, 1972)**	*Xeranthemum inapertum* (L.) Mill.	Asteraceae
***Spallanzania hebes* (Fallén, 1820)**	*Teucrium* sp.	Lamiaceae
***Gymnosoma rotundata* (L., 1758)**	*Galium odaratum* (L.) Scop.	Rubiaceae
***Macquartia tenebricosa* (Meigen, 1824),** ***Pales pavida* (Meigen, 1824)**	*Euphorbia helioscopia* L.	Euphorbiaceae
***Macquartia praefica* (Meigen, 1824)**	*Glebionis coronaria* (L.) Cass. ex Spach	Asteraceae
***Estheria hertingi* Cerretti & Tschorsnig, 2012**	*Dittrichia viscosa* (L). Greuter	Asteraceae
***Billaea adelpha* (Loew, 1873)** ***Estheria hertingi* Cerretti & Tschorsnig, 2012**	*Ruta angustifolia* Pers.	Rutaceae
***Estheria hertingi* Cerretti & Tschorsnig, 2012**	*Pallenis spinosa* (L.) Cass.	Asteraceae

The study was conducted in 8 districts in order to reveal the Tachinidae fauna of Mersin province, as a result of which a total of 32 species were determined. Of the identified species, 3 species are new records for Türkiye and 31 species for the Mersin insect fauna. Also, 7 of the determined species were the second record from Türkiye. When looking at the number of species at the subfamily level, Phasiinae had the highest number of species, followed by Dexiinae. Tachininae and Exoristinae subfamilies had an equal number of species and ranked third. The distribution of Tachinidae subfamilies in Mersin province differed from the countrywide ranking. In Türkiye, the order was Exoristinae, Tachininae, Phasiinae, and Dexiinae (Kara et al., 2020). This difference may be attributed to the host insect and plant diversity specific to the Mersin province. As a result of this study, the number of known species belonging to the Tachinidae family has reached 39 in Mersin. These findings contribute to the understanding of the Tachinidae fauna in the Mersin province and provide valuable information about the diversity and distribution of these parasitic flies in the region. Furthermore, *L. crassa* was reared from *S. pandurus*, and this host-parasitoid coupling was confirmed as a new record for Türkiye.

During the field study, it was found that tachinids visited plants from the Apiaceae, Compositae, Asparagaceae, Rubiaceae, Euphorbiaceae, and Rutaceae families, particularly Asteraceae and Lamiaceae. As a result of the identification, it was determined that 13 plant species belonging to these families were visited by tachinids (Table 1). These plants likely serve as nectar sources for the tachinid flies, which feed on nectar and pollen. In other studies, it has been revealed that tachinids frequently visit plants belonging to the Asteraceae family in a similar manner (Sathe et al., 2014; Soykan & Atay, 2022).

Tachinids parasitize a variety of hosts, the majority of which are plant pests. As natural enemies of these important phytophagous groups, tachinids have been regarded as one of the most important groups of biological control agents both in natural and managed habitats. Their effectiveness as biological control agents depend on a comprehensive understanding of their diversity, behavior, and interactions with host insects and plants. Thus, we can contribute to sustainable pest management by supporting their natural populations.

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