

New records of Sarcophagidae from Turkey (Diptera)

Yury Verves¹, Miroslav Barták², Štěpán Kubík², Hasan Sungur Civelek³

1 Institute for Evolutionary Ecology, National Academy of Sciences of Ukraine, Academician Lebedev Str. 37 Kyiv, Ukraine, 03143 **2** Department of Zoology and Fisheries, Faculty of Agrobiological, Food and Natural Resources, Czech University of Life Sciences, Prague, Kamýcká 129, 165 00 Praha Suchbát, Czech Republic **3** Muğla Sıtkı Koçman University, Faculty of Science, Biology Department, Muğla, Turkey

Corresponding author: Štěpán Kubík (kubik@af.czu.cz)

Academic editor: P. Cerretti | Received 23 February 2017 | Accepted 28 July 2017 | Published 28 September 2017

<http://zoobank.org/DC91518D-5544-4CB1-9120-E08609FDCDFD>

Citation: Verves Y, Barták M, Kubík S, Civelek HS (2017) New records of Sarcophagidae from Turkey (Diptera). ZooKeys 703: 129–158. <https://doi.org/10.3897/zookeys.703.12377>

Abstract

Faunistic records of 68 flesh fly species are presented, and altogether, 22 species are recorded from Turkey for the first time. A further 46 species were recorded for the first time in at least one Turkish province. This paper presents the first locality data for four additional species, which were previously mentioned only generically in catalogues. One new synonym has been established, *Servaisia* (s. str.) *rybaltchenkoi* (Verves, 1977) = *Blaesoxipha ataturkia* Lehrer, 2008, **syn. n.** Two new combinations are proposed: *Helicophagella* (*Parabellieria*) *dreyfusi* (Lehrer, 1994), **comb. n.** and *Helicophagella* (s. str.) *bellae* (Lehrer, 2000), **comb. n.**

Keywords

distribution, flesh flies, new combinations, new records, new synonyms, Turkey

Introduction

Sarcophagidae is a large and important family of Calyptrate section of Muscomorpha comprising almost 3,000 species. Adults reach a body length of 2 mm to 22 mm and their larvae have very diverse feeding habits. Some are schizophagous or predacious (i.e., devour other necro- or coprophagous larvae in substrates). The others are obligate or facultative parasitoids of insects (orthopterans, cicadas, beetles, honeybees, etc.), myriapods, terrestrial snails, predators of earthworms, larvae of soil-inhabiting noctuid caterpillars, and pupae of dendrophilous lepidopterans, kleptoparasites of solitary

wasps, bees and, to a lesser extent, termites. Certain species are known to prey on the eggs of marine turtles and lizards, as well as spider egg cocoons and oothecae of locusts. Larvae of many species can facultatively produce wounds or occasional intestinal myiasis on various vertebrates, including humans. Obligate parasites of vertebrates include larvae of several species of *Wohlfahrtia* Brauer & Bergenstamm and some American specialized species with amphibian hosts. Certain synanthropic species are considered mechanical vectors of various intestinal diseases, including poliomyelitis, leprosy, tuberculosis, and mycosis (Rohdendorf 1937; Pape 1996; Povolný and Verves 1997; Verves 1986a; Verves and Khrokalo 2006a, b, 2015; Verves et al. 2015a).

The first reviews of Turkish Sarcophagidae were prepared by Verves (1986a, b) and Kara and Pape (2002); they listed a total of 85 and 81 species, respectively. Many authors have, through various studies, since brought the number of known Turkish species to 137 (Civelek and Tezcan 2005; Lehrer 2006; Aslan 2006; Hayat et al. 2008; Aslan and Çalişkan 2009; Gözüaçık and Mart 2009; Karaman et al. 2009; Pekbey and Hayat 2010; Xue et al. 2011, 2015; Koçak 2014; Koçak and Kemal 2009, 2012, 2013, 2015; Whitmore 2011; Pekbey and Hayat 2011, 2013a, b, c; Whitmore et al. 2013; Verves & Khrokalo 2015; Verves et al. 2015b; Kemal and Koçak 2015; Pekbey 2011; Pekbey et al. 2011 a, b). Other studies provided detailed data for the species causing obligate myiasis [*Wohlfahrtia magnifica* (Schiner)], and several facultative myiasis-causing species (Kurtpinar 1950; Dinçer 1997; Çiftçioglu et al. 1997; Şaki and Özer 1999a, b; Dinçer et al. 2001; Sevgili et al. 2004; Kökçam and Şaki 2005; Yuca et al., 2005; Ütük 2006; Büyükkurt et al. 2008; Aydenizöz and Dik 2008; Yildirim et al. 2008; Yazgi et al. 2009; İpek et al. 2009; Tuygun et al. 2009; Bayındır et al. 2010; İpek and Şaki 2010; Akduman et al. 2010; Kara and Arslan 2011; Dik et al. 2012; Övet et al. 2012; Kılınç et al. 2013; Ozsoy et al. 2013; Köse et al. 2013; Çevik et al. 2014; Özdemir et al. 2014; Gümüşsoy et al. 2015). The true number of Turkish sarcophagids may range from 175 to 250 species. The main aim of the present paper is to capitalize on the results of several expeditions to Turkey and in such a way to enrich knowledge on the flesh fly fauna of Turkey.

Materials and methods

The material examined in this study originates from southwestern Turkey, mainly from the Muğla province but also, to a minor extent, from the four adjacent provinces of Aydın, Burdur, Denizli, and Antalya and from the Samsun province. Most of the material was obtained during field expeditions of M. Barták and Š. Kubík using Malaise traps (**MT**) and yellow pan traps (**PT**), and by sweeping of vegetation (**SW**). Some specimens were collected by the senior author (**YV**) in southern Turkey in 2010–2011. Most of the specimens were originally preserved in alcohol and later dried and mounted using the method described by Barták (1997).

All specimens were identified by the senior author using numerous published keys, descriptions, and illustrations (Rohdendorf 1955, 1971, 1975, 1988; Verves 1982a, 1982b, 1985, 1989a, 1989b, 1993, 1994, Verves and Khrokalo 2006a, Whitmore

2011, Xue et al. 2011). In this paper, we included only reliably identified species. Specimens with uncertain identity and/or belonging to undescribed species will be published at a later date. We follow the classification scheme of Rohdendorf (1965, 1967) with subsequent additions of Verves (1986), Povolný and Verves (1997), Verves & Khrokalo (2006a, b, 2009, 2015), Verves et al. (2015b), Xue et al. (2011, 2015).

Distributional data of sarcophagids in Turkey were derived from the analysis of all available publications (see reference list). General species distribution was derived from Pape (1996, 2015), Povolný and Verves (1997), Verves & Khrokalo (2006a, b, 2009, 2015), Verves et al. (2015b), Xue et al. (2011, 2015) and other sources (as indicated under several species treated below). Classification of distributional ranges follows Gorodkov (1983, 1984).

Voucher specimens are deposited at **CULSP** (Czech University of Life Sciences, Prague, Czech Republic) and **IEE** (Institute for Evolutionary Ecology, National Academy of Sciences, Kyiv, Ukraine). Other abbreviations are used in text as follows: **DI** distribution, **DIT** distribution in Turkey, **TR** Turkey (species listed in catalogs without specification of locality data). Provinces are abbreviated as follows:

AD (Adana), **AF** (Afyonkarahisar), **AM** (Amasya), **AN** (Ankara), **ANT** (Antalya), **AY** (Aydın), **BT** (Batman), **BY** (Bayburt), **BO** (Bolu), **BU** (Burdur), **CA** (Çanakkale), **DE** (Denizli), **DB** (Diyabakir), **DU** (Düzce), **ED** (Edirne), **EL** (Elazığ), **ER** (Erzincan), **ERZ** (Erzurum), **ES** (Eskişehir), **GA** (Gaziantep), **HA** (Hakkari), **HT** (Hatay), **IG** (İğdir), **IZ** (İzmir), **KM** (Karaman), **KAR** (Kars), **KY** (Kayseri), **KI** (Kırıkkale), **KK** (Kırklareli), **KN** (Konya), **MN** (Manisa), **MR** (Mardin), **ME** (Mersin), **MG** (Muğla), **SA** (Samsun), **SN** (Şanlıurfa), **TO** (Tokat), **TB** (Trabzon), **VA** (Van).

Results

Species newly recorded from Turkey are marked with an asterisk (*), and from individual provinces with two asterisks (**). Localities are listed alphabetically according to province and locality names.

Subfamily Miltogramminae

Tribe Miltogrammini

Subtribe Senotainiina

Senotainia (Arrenopus) albifrons (Rondani, 1859)

Material examined. **AY:** 8 km S of Çine, river bank, SW, 68 m, 37°32'34"N, 28°03'46"E, 28.–30.vi.2015 (Barták & Kubík), 3 ♂, 3 ♀; **MG:** Akyaka, pasture, 4 m, 37°03'09"N, 28°20'17"E, 8.–14.ix.2014 (Barták & Kubík), 1 ♂; *ibid.*, salty meadow, 2 m, PT, 37°01'49"N, 28°20'01"E, 22.vi.–1.vii.2015 (Barták & Kubík), 17 ♂, 17 ♀; *ibid.*, 37°01'62"N, 28°20'00"E, 27.iv.–1.v.2016 (Barták & Kubík), 3 ♀; Dalyan, farm,

MT, 1 m, 36°48'54"N, 28°39'04"E, 8.–20.viii.2015 (Dursun), 1 ♂, 1 ♀ Muğla Univ. campus, SW+PT, 700 m, 37°09'39"N, 28°22'20"E, xi.–iii.2013 (Barták & Kubík), 1 ♀; *ibid.*, 730 m, MT, 37°09'38"N, 28°22'11"E, 5.–19.viii.2015 (H. Kavak), 1 ♂; **SA**: Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 14 ♂, 1 ♀ (CULSP).

DI: Trans-Palaeartic-Afrotropical-Oriental.

DIT: **ANT** (Koçak and Kemal 2009, 2012, 2015; Kara and Pape 2002), **AY****, **MG****, **SA****.

Subtribe *Miltogrammina*

Miltogramma aurifrons Dufour, 1850*

Material examined. **MG**: Muğla University campus, Malaise trap, 700 m, 37°09'42"N, 28°22'21"E (O.Dursun), v.2013, 1 ♂; *ibid.*, SW+PT, 37°09'42"N, 28°22'21"E, 29.iv.–10.v.2013 (Barták & Kubík), 2 ♂; *ibid.*, 730 m, 37°09'38"N, 28°22'11"E, xi.2015–iv.2016 (Barták & Kubík), 2 ♀; Muğla – 13 km NE, pine wood, 1200 m, 37°14'50"N, 28°30'00"E, 23–27.v.2016 (Barták & Kubík), 1 ♀ (CULSP).

DI: Mediterranean.

DIT: **MG****.

Miltogramma brevipila Villeneuve, 1911*

Material examined. **AY**: 8 km S of Çine, river bank, 68 m, 37°32'34"N, 28°03'46"E, 10.–12.ix.2014 (Barták & Kubík), 1 ♀ (CULSP).

DI: West-Central Palaeartic.

DIT: **AY****.

Miltogramma murina Meigen, 1824

Material examined. **MG**: Muğla University campus, MT, 730 m, 37°09'38"N, 28°22'11"E, xi.2015–iv.2016, (Barták & Kubík), 1 ♀ (CULSP).

DI: West Palaeartic.

DIT: **TR** (Povolný and Verves 1997), **MG****.

Miltogramma testaceifrons (Roser, 1840)*

Material examined. **MG**: Muğla University campus, MT, 730 m, 37°09'38"N, 28°22'11"E, xi.2015–iv.2016 (Barták & Kubík), 1 ♀ (CULSP).

DI: West Palaearctic-Oriental.

DIT: MG**.

Miltogramma turkmenora* Rohdendorf, 1930

Material examined. MG: Muğla University campus, 700 m, SW+PT, 37°09'42"N, 28°22'21"E, 29.iv.–10.v.2013 (Barták & Kubík), 4 ♂, 4 ♀ (CULSP).

DI: Western Middle East.

DIT: MG**.

Subtribe Apodacrina

Apodacra dispar* Villeneuve, 1916

Material examined. AY: 8 km S of Çine, river bank, 68 m, 37°32'34"N, 28°03'46"E, 10.–12.ix.2014 (Barták & Kubík), 1 ♂; **MG:** Muğla University campus, 710 m, MT, 37°09'39"N, 28°22'20"E, xi–iii.2013 (Barták & Kubík), 7 ♀; *ibid.*, 730 m, 37°09'38"N, 28°22'11"E, xi.2015–iv.2016 (Barták & Kubík), 6 ♀ (CULSP).

DI: West Palaearctic-Afrotropical.

DIT: AY**, MG**.

Subtribe Craticulinina

Craticulina barbifera* (Pandellé, 1895)

Material examined. MG: Akyaka, salty meadow, 2 m, 37°01'49"N, 28°20'01"E, 22.vi.–1.vii.2015 (Barták & Kubík), 1 ♀; Dalyan, salty meadow, PT, 36°47'49"N, 28°38'55"E, 28.–30.iv.2016 (Barták & Kubík), 1 ♂ 1 ♀ (CULSP).

DI: Mediterranean.

DIT: MG**.

Tribe Metopiaini

Subtribe Metopiaina

***Metopia argyrocephala* (Meigen, 1824)**

Material examined. AY: 8 km S of Çine, river bank, SW, 68 m, 37°32'34"N, 28°03'46"E, 28.–30.vi.2015 (Barták & Kubík), 1 ♂; **MG:** Muğla University campus, SW+PT, 700 m, 37°09'41"N, 28°22'21"E, 29.iv.–10.v.2013 (Barták & Kubík), 3 ♂,

1 ♀; *ibid.*, 720 m, MT, 37°09'42"N, 28°22'13"E, 26.v.–26.vi.2015 (H. Kavak), 1 ♂, 1 ♀; *ibid.*, 26–27.vi.2015 (Barták & Kubík), 1 ♀; **SA**: Samsun, University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 12 ♂, 1 ♀ (CULSP).

DI: Trans Palaearctic-Nearctic-Oriental-Neotropical.

DIT: **TR** (Kara and Pape 2002; Koçak 2014; Koçak and Kemal 2009, 2012, 2015), **AY****, **MG****, **SA****.

Metopia grandii Venturi, 1953*

Material examined. MG: Akyaka, pasture, 4 m, YPWT, 37°03'09"N, 28°20'17"E, 13.–14.ix.2014 (Barták & Kubík), 1 ♂ (CULSP).

DI: Palaearctic.

DIT: **MG****.

Subtribe Taxigrammina

Paragusia elegantula (Zetterstedt, 1844)

Material examined. MG: Muğla University campus, 720 m, MT, 37°09'42"N, 28°22'13"E, iv.2015 (H. Kavak), 1 ♀ (CULSP).

DI: European-Siberian-Mid-Asiatic.

DIT: **TR** (Kara and Pape 2002; Koçak 2014; Koçak and Kemal 2009, 2012, 2013, 2015), **MG****.

Paragusia multipunctata (Rondani, 1859)*

Material examined. MG: Muğla University campus, 710 m, MT, 37°09'39"N, 28°22'20"E, xi.–iii.2013 (Barták & Kubík), 1 ♀; *ibid.*, 720 m, 37°09'42"N, 28°22'13"E, iv.2015 (H. Kavak), 1 ♀ (CULSP).

DI: West Palaearctic-Afrotropical-Oriental.

DIT: **MG****.

Taxigramma heteroneura (Meigen, 1830)

Material examined. AY: 8 km S of Çine river bank, 68 m, 37°32'34"N, 28°03'46"E, 10.–12.ix.2014 (Barták & Kubík), 1 ♂, 1 ♀; *ibid.*, 28.–30.vi.2015 (Barták & Kubík), 2 ♂; **MG**: Muğla University campus, MT, 730 m, 37°09'38"N, 28°22'11"E, xi.2015–iv.2016 (Barták & Kubík), 3 ♂, 4 ♀ (CULSP).

DI: Trans Palaearctic-Nearctic-Oriental.

DIT: TR (Kara and Pape 2002; Koçak 2014; Koçak and Kemal 2009, 2012, 2013, 2015), **AY****, **MG****.

Subtribe Sphenometopiina

Sphenometopa (Xantharaba) steini (Schiner, 1862)

Material examined. MG: Muğla University campus, 700 m, PT, 37°09'42"N, 28°22'21"E (O. Dursun), v.2013, 2 ♀ (CULSP).

DI: Eastern Mediterranean.

DIT: TR (Koçak 2014; Koçak and Kemal 2012), **AN** (Koçak and Kemal 2009, 2013, 2015), **MG****.

Tribe Phyllotelini

Subtribe Arabiscina

Sphecapatodes ornatus Villeneuve, 1912*

Material examined. MG: Toparlar waterfall, 44 m, 36°59'73"N, 28°38'08"E, 30.v.2009 (O. Dursun), 3 ♂, 1 ♀ (CULSP).

DI: East Mediterranean-Midasiatic.

DIT: **MG****.

Subfamily Paramacronychiinae

Tribe Nyctiini

Nyctia halterata (Panzer, 1798)

Material examined. AY: 8 km S of Çine, river bank, 68 m, 37°32'34"N, 28°03'46"E, 10.–12.ix.2014 (Barták & Kubík), 1 ♂; *ibid.*, 28.–30.vi.2015 (Barták & Kubík), 1 ♂; *ibid.*, 29.iv.–1.v.2016 (Barták & Kubík), 2 ♂; **MG:** Akyaka, pasture, YPWT, 37°03'09"N, 28°20'17"E, 4 m, 13.–14.ix.2014 (Barták & Kubík), 1 ♂; *ibid.*, 4 m, 37°03'09"N, 28°20'17"E, 8.–14.ix.2014 (Barták & Kubík), 1 ♂; *ibid.*, salty meadow, 2 m, 37°01'49"N, 28°20'01"E, 22.vi.–1.vii.2015 (Barták & Kubík), 1 ♂, 1 ♀ (CULSP).

DI: West Palaearctic.

DIT: TR (Koçak 2014; Koçak and Kemal 2012), **AM** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **AY****, **MG****, **TO** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015).

***Nyctia lugubris* (Macquart, 1843)**

Material examined. MG: Kızılyaka, on flowers, 105 m, 37°01'21"N, 28°26'18"E, 27.iv.–4.v.2016 (Barták & Kubík), 1 ♂, 1 ♀; Akyaka, salty meadow, 2 m, 37°01'49"N, 28°20'01"E, 22.vi.–1.vii.2015 (Barták & Kubík), 5 ♂; *ibid.*, PT, 37°01'62"N, 28°20'00"E, 27.iv.–1.v.2016 (Barták & Kubík), 1 ♂; Dalyan, salty meadow, PT, 36°47'49"N, 28°38'55"E, 28.–30.iv.2016 (Barták & Kubík), 2 ♂ (CULSP).

DI: Mediterranean.

DIT: **TR** (Koçak 2014; Koçak and Kemal 2012), **BU** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **MG****, **SA** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015).

Tribe Paramacronychiini**Subtribe Wohlfahrtriina*****Sarcophila canaanita* Lehrer, 2007***

Material examined. ANT: Side, 36°47'38"N, 31°22'43"E, 10.–19.viii.2011 (Yu. Verves), 19 ♂♂, 14 ♀♀ (IEE); **AY:** 8 km S of Çine river bank, 68 m, 37°32'34"N, 28°03'46"E, 10.–12.ix.2014 (Barták & Kubík), 1 ♂; *ibid.*, 28.–30.vi.2015 (Barták & Kubík), 1 ♂; **MG:** Muğla University campus, 720 m, MT, 37°09'42"N, 28°22'13"E, iv.2015 (H. Kavak), 1 ♂; Akyaka, salty meadow, 2 m, PT, 37°01'62"N, 28°20'00"E, 27.iv.–1.v.2016 (Barták & Kubík), 1 ♂; 4 km N of Yatağan, flowers, 460 m, 37°22'12"N, 28°09'22"E, 30.vi.2016 (Barták & Kubík), 3 ♂ (CULSP).

DI: East Mediterranean.

DIT: **ANT****, **AY****, **MG****.

***Sarcophila latifrons* (Fallén, 1817)**

Material examined. MG: MuğlaUniv. campus, protein trap, pine wood, 700 m, 37°09'41"N, 28°22'21"E, xi–iii.2013 (Barták & Kubík), 1 ♂; Toparlar, Toparlar waterfall, 44 m, 36°59'73"N, 28°38'08"E, 30.v.2009 (O. Dursun), 1 ♂ (CULSP).

DI: West-Central Palaearctic.

DIT: **TR** (Aksoy and Bahadıroğlu 2012; Koçak 2014; Koçak and Kemal 2012), **AD** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **ADI** (Gözüaçık and Mart 2009), **BT** (Gözüaçık and Mart 2009), **MR** (Gözüaçık and Mart 2009), **MG****, **SN** (Gözüaçık and Mart 2009; Kara and Pape 2002; Koçak and Kemal 2009, 2015).

***Sarcophila meridionalis* Rohdendorf & Verves, 1982**

Material examined. MG: Akyaka, pasture, 6 m, 37°03'19"N, 28°20'07"E, 28.iv–8.v.2013 (Barták & Kubík), 1 ♂; *ibid.* 4 m, 37°03'09"N, 28°20'17"E, 8.–14.ix.2014 (Barták & Kubík), 1 ♂; Muğla University campus, Malaise trap, 700 m, 37°09'42"N, 28°22'21"E (O. Dursun), v.2013, 2 ♂ (CULSP).

DI: West-Central Palaearctic.

DIT: TR (Koçak 2014; Koçak and Kemal 2012), ER (Koçak and Kemal 2015; Pekbey 2011; Pekbey and Hayat 2013b), ERZ (Koçak and Kemal 2013, 2015; Pekbey 2011; Pekbey and Hayat 2010, 2013b), **MG****.

Subfamily Sarcophaginae**Tribe Protodexiini****Subtribe Protodexiina*****Blaesoxipha confusa* Villeneuve, 1912***

Material examined. SN: Birecik, E from Gaziantep, pastures SE from town, 37.00N/38.00E, 24.–25.iv.1997 (Vrabec V.), 1 ♂ (CULSP).

DI: West Palaearctic.

DIT: SN**.

***Blaesoxipha redempta* (Pandellé, 1896)**

Material examined. SA: Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 12 ♂, 1 ♀; **MG:** Toparlar, lowland forest, 8 m, 36°59'27"N, 28°38'50"E, 11.ix. 2014 (Barták & Kubík), 1 ♀ (CULSP).

DI: Transpalaearctic-Afrotropical-Oriental-Australasian/Oceanian (Hawaii, imported: Hardy, 1980).

DIT: TR (Kara and Pape 2002; Koçak 2014; Koçak and Kemal 2009 – as *B. lapidosa*), BY (Pekbey 2011; Pekbey and Hayat 2013c), CA (Calvert 1882), ER (Pekbey 2011; Pekbey and Hayat 2013c), ERZ (Pekbey 2011– as *B. lapidosa*; Pekbey and Hayat 2010, 2013c), **MG****, **SA****.

Comment: Analysis of Pape's (1994) description of *B. lapidosa* and redescriptions of *B. redempta* by Leonide and Leonide (1983) and Pape (1994), our opinion is such: *B. lapidosa* is a synonym of *B. redempta*, because the original descriptions and drawings of ♂ genitalia and ovipositors of both species are very detailed and essentially not differentiated from each other.

Servaisia* (s. str.) *rybaltschenkoi* (Verves, 1977)Blaesoxipha ataturkia* Lehrer, 2008a, **syn. n.****DI:** European-Anatolian-Midasiatic.**DIT:** TR (Koçak 2014 – as *Blaesoxipha ataturkia*; Koçak and Kemal 2012), **HA** (Kemal and Koçak 2015 – as *Blaesoxipha ataturkia*; Koçak and Kemal 2013– as *Blaesoxipha ataturkia*; Lehrer 2008a).**Taxonomic notes:** The original description and drawings of ♂ genitalia of male *Blaesoxipha ataturkia* are very detailed and essentially not differentiated from similar descriptions and drawings of ♂ genitalia of *Blaesoxipha rybaltschenkoi* Verves, 1977. The differences in drawings are very petty and reflected the different styles of painters; they cannot be used as reason for separation *B. ataturkia* from *S. rybaltschenkoi*.**Tribe Johnsoniini****Subtribe Sarcotachinellina*****Sarcotachinella sinuata* (Meigen 1826)****Material examined. MG:** Akyaka, pasture, 6 m, 37°03'19"N, 28°20'07"E, 28.iv.–8.v.2013, YPWT (Barták & Kubík), 5 ♂; *ibid.*, pasture, YPWT, 37°03'09"N, 28°20'17"E, 4 m, 13.–14.ix.2014 (Barták & Kubík), 1 ♂; *ibid.*, salty meadow, 2 m, PT, 37°01'62"N, 28°20'00"E, 27.iv.–1.v.2016 (Barták & Kubík), 1 ♂ (CULSP).**DI:** Transpalaeartic-Nearctic [Holarctic].**DIT:** **TR** (Koçak 2014; Koçak and Kemal 2012), **AM** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **ER** (Pekbey 2011), **ERZ** (Pekbey 2011), **KY** (Hayat et al. 2008; Koçak and Kemal 2009, 2013, 2015), **MG****, **TO** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015).**Tribe Raviniini****Subtribe Raviniina*****Ravinia pernix* (Harris, 1780)****Material examined. AY:** 8 km S of Çine, river bank, 68 m, 37°32'34"N, 28°03'46"E, 10.–12.ix.2014 (Barták & Kubík), 2 ♂; *ibid.*, 28.–30.vi.2015 (Barták & Kubík), 1 ♂; *ibid.*, 29.iv.–1.v.2016 (Barták & Kubík), 1 ♂; **MG:** Muğla Univ. campus, protein trap, pine wood, 700 m, 37°09'41"N, 28°22'21"E, xi.–iii.2013 (Barták & Kubík), 1 ♂; University campus, SW+PT, 700 m, 37°09'41"N, 28°22'21"E, 29.iv.–10.v.2013 (Barták & Kubík), 1 ♂ (CULSP).

DI: Transpalaeartic-Afrotropical-Oriental.

DIT: **TR** (Koçak 2014; Koçak and Kemal 2012), **AD** (Aslan and Çalışkan 2009; Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **AY****, **ER** (Pekbey 2011), **ERZ** (Pekbey 2011; Pekbey and Hayat 2010), **ES** (Aslan and Çalışkan 2009), **KY** (Hayat et al. 2008; Koçak and Kemal 2009, 2013, 2015), **KN** (Aslan 2006; Hayat et al. 2008; Kara and Pape 2002; Koçak and Kemal 2013, 2015), **ME** (Aslan 2006; Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **MG****, **SN** (Sevgili et al. 2004), **TO** (Aslan 2006; Hayat et al. 2008; Kara et Pape 2002; Koçak and Kemal 2009, 2013, 2015).

Tribe Sarcophagini

Subtribe Helicophagellina

Helicophagella (Parabellieria) macrura (Rohdendorf, 1937)*

Material examined. **AY:** 9 km S of Çine River bank, 70 m, 37°31'36"N, 28°04'29"E, 2.v.2013 (Barták & Kubík), 1 ♂ (CULSP).

DI: Transpalaeartic subboreal.

DIT: **AY****.

Helicophagella (Parabellieria) melanura (Meigen, 1926)

Material examined. **ANT:** Alanya, Avsallar, 36°36'54"N, 31°46'38"E, ground path in bushes, 4–7.viii.2010, (Yu. Verves), 1 ♀; Antalya, Side, clay loam waste plot of land, 36°47'38"N, 31°22'43"E, 10–19.viii.2011 (Yu. Verves), 6 ♂♂, 7 ♀♀ (IEE); **AY:** 9 km S of Çine river bank, 70 m, 37°31'36"N, 28°04'29"E, 2.v.2013 (Barták & Kubík), 2 ♂; *ibid.*, 68 m, 37°32'34"N, 28°03'46"E, 10.–12.ix.2014 (Barták & Kubík), 5 ♂; *ibid.*, 28.–30.vi.2015 (Barták & Kubík), 2 ♂; **MG:** Akyaka, pasture, 2 m, 37°03'09"N, 28°20'17"E, YPWT, 23–27.ix.2012 (Barták & Kubík), 1 ♀; *ibid.*, 6 m, YPWT, 37°03'19"N, 28°20'07"E, 28.iv.–8.v.2013 (Barták & Kubík), 3 ♂; *ibid.*, salty meadow, SW+PT, 37°02'53"N, 28°19'39"E, 28.iv.–9.v.2013 (Barták & Kubík), 1 ♂; *ibid.*, pasture, YPWT, 37°03'09"N, 28°20'17"E, 4 m, 13.–14.ix.2014 (Barták & Kubík), 3 ♂; *ibid.*, 4 m, 37°03'09"N, 28°20'17"E, 8.–14.ix.2014 (Barták & Kubík), 3 ♂; Dalyan, salty meadow, PT, 36°47'49"N, 28°38'55"E, 28.–30.iv.2016 (Barták & Kubík), 1 ♂; **SA:** Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 3 ♂ (CULSP).

DI: Transpalaeartic-Nearctic-Afrotropical-Oriental.

DIT: **TR** (Kara and Pape 2002; Koçak 2014; Koçak and Kemal 2012): **ANT****, **AY****, **BY** (Pekbey 2011), **ER** (Pekbey 2011), **ERZ** (Pekbey 2011; Pekbey and Hayat 2010), **ES** (Aslan 2006; Aslan and Çalışkan 2009; Koçak and Kemal 2009, 2015), **KY** (Hayat et al. 2008; Kara and Pape 2002; Koçak and Kemal 2009, 2015), **MG****, **SA****, **SN** (Hayat et al. 2008; Koçak and Kemal 2009, 2015), **TO** (Aslan 2006).

Helicophagella* (s. str.) *bellae* (Lehrer, 2000), comb. n.Boettcheriola bellae* Lehrer, 2000**Material examined. MG:** Muğla – 13 km NE, pine wood, 1200 m, 37°14'50"N, 28°30'00"E, 23.–27.vi.2015 (Barták & Kubík), 1 ♂ (CULSP).**DI:** East Mediterranean.**DIT: TR** (Koçak 2014; Koçak and Kemal 2012): **ANT** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **BU** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **KM** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **MG****.***Helicophagella* (s. str.) *crassimargo* (Pandellé, 1896)****Material examined. AY:** 8 km S of Çine river bank, 68 m, 37°32'34"N, 28°03'46"E, 10.–12.ix.2014 (Barták & Kubík), 2 ♂; **MG:** Akyaka, pasture, 6 m, 37°03'19"N, 28°20'07"E, 28.iv.–8.v.2013, YPWT (Barták & Kubík), 6 ♂; *ibid.*, YPWT, 37°03'09"N, 28°20'17"E, 4 m, 13.–14.ix.2014 (Barták & Kubík), 7 ♂; Toparlar, 60 m, lowland wood, SW, 36°58'39"N, 28°39'30"E, 5–7.v.2013 (Barták & Kubík), 1 ♂; *ibid.*, SW+PT, 36°58'39"N, 28°39'30"E, 28.–30.iv.2016 (Barták & Kubík), 2 ♂ (CULSP).**DI:** European-Siberian-Midasiatic.**DIT: TR** (Koçak 2014; Koçak and Kemal 2012), **AM** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **AY****, **BY** (Pekbey 2011), **ER** (Pekbey 2011), **ERZ** (Pekbey 2011; Pekbey and Hayat 2010), **KY** (Hayat et al. 2008; Koçak and Kemal 2009, 2013, 2015), **MG****, **TO** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015).***Helicophagella* (s. str.) *novella* (Baranov, 1929)*****Material examined. MG:** Akyaka, pasture, 4 m, 37°03'09"N, 28°20'17"E, 8.–14.ix.2014 (Barták & Kubík), 2 ♂; Toparlar, pasture, YPWT, 37°03'09"N, 28°20'17"E, 4 m, 13.–14.ix.2014 (Barták & Kubík), 9 ♂; **SA:** Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 14 ♂ (CULSP).**DI:** European-Anatolian.**DIT: MG****, **SA****.***Helicophagella* (s. str.) *noverca* (Rondani, 1860)****Material examined. SA:** Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 5 ♂ (CULSP).**DI:** Mediterranean.**DIT: ES** (Aslan and Çalışkan 2009), **SA****.

***Helicophagella* (s. str.) *novercoides* (Böttcher, 1913)**

Material examined. MG: Muğla University campus, SW+PT, 700 m, 37°09'41"N, 28°22'21"E, 29.iv.–10.v.2013 (Barták & Kubík), 2 ♂; Akyaka, salty meadow, 2 m, PT, 37°01'52"N, 28°20'00"E, 27.iv.–1.v.2016 (Barták & Kubík), 1 ♂; Muğla – 13 km NE, pine wood + pasture, 1100–1300 m, 37°15'N, 28°30'E, 2–3.v.2016 (Barták & Kubík), 1 ♂ (CULSP).

DI: West Palaearctic.

DIT: TR (Koçak 2014; Koçak and Kemal 2012); **ANT** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **ERZ** (Pekbey 2011), **MG****.

***Helicophagella* (*Parabellieria*) *dreyfusi* (Lehrer, 1994), comb. n.**

Ahavanella dreyfusi Lehrer, 1994

DI: West Palaearctic-Oriental.

DIT: TR (Kara and Pape 2002; Koçak 2014; Koçak and Kemal 2012, 2013, 2015).

Subtribe Phytosarcophagina***Phytosarcophaga* (s. str.) *destructor* (Malloch, 1929)**

Material examined. AY: 8 km S of Çine, river bank, 68 m, 37°32'34"N, 28°03'46"E, 28.–30.vi.2015 (Barták & Kubík), 1 ♂; *ibid.*, 29.iv.–1.v.2016 (Barták & Kubík), 1 ♂ (CULSP).

DI: West Palaearctic-Afrotropical.

DIT: TR (Koçak 2014; Koçak and Kemal 2012), **AD** (Kara and Pape 2002), **AY****, **MN** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **ME** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015).

Subtribe Heteronychiina***Heteronychia* (*Boettcherella*) *helenae* (Trofimov, 1948)**

Material examined. MG: Akyaka, pasture, YPWT, 37°03'09"N, 28°20'17"E, 4 m, 13.–14.ix.2014 (Barták & Kubík), 5 ♂ (CULSP).

DI: Central Palaearctic.

DIT: TR (Koçak 2014; Koçak and Kemal 2012); **ANT** (Verves and Khrokalo 2015), **ERZ** (Pekbey 2011; Pekbey and Hayat 2011, 2013), **IZ** (Koçak and Kemal 2015; Whitmore 2011), **MG****.

***Heteronychia (Boettcherella) setinervis* (Rondani, 1860)**

Material examined. MG: Akyaka, salty meadow, 2 m, 37°01'49"N, 28°20'01"E, 22.vi.–1.vii.2015 (Barták & Kubík), 4 ♂ (CULSP).

DI: West-Central Palaearctic.

DIT: **TR** (Kara and Pape 2002; Koçak 2014; Koçak and Kemal 2012); **ANT** (Verves and Khrokalo 2015), **DE** (Koçak and Kemal 2015; Lehrer 1977), **ERZ** (Pekbey 2011; Pekbey and Hayat 2011), **GA** (Whitmore 2010), **HT** (Koçak and Kemal 2015; Whitmore 2010), **KY** (Hayat et al. 2008; Koçak and Kemal 2009, 2015), **KN** (Verves and Khrokalo 2015), **ME** (Koçak and Kemal, 2015; Verves and Khrokalo 2015; Whitmore 2010), **MG****, **SN** (Koçak and Kemal 2015), **TO** (Koçak and Kemal 2015; Whitmore 2010).

***Heteronychia (Ctenodasypygia) minima* (Rondani, 1862)**

Leclercqiomys mouseti Lehrer, 1976a: 200.

Material examined. MG: Akyaka, pasture, YPWT, 37°03'09"N, 28°20'17"E, 4 m, 13.–14. ix.2014 (Barták & Kubík), 14 ♂; *ibid.*, salty meadow, SW+PT, 37°02'53"N, 28°19'39"E, 28.iv.–9.v.2013 (Barták & Kubík), 9 ♂; *ibid.*, pasture, 4 m, 37°03'09"N, 28°20'17"E, 8.–14.ix.2014 (Barták & Kubík), 10 ♂; *ibid.*, salty meadow, 2 m, 37°01'49"N, 28°20'01"E, 22.vi.–1.vii.2015 (Barták & Kubík), 19 ♂; *ibid.*, PT, 37°01'62"N, 28°20'00"E, 27.iv.–1.v.2016 (Barták & Kubík), 3 ♂; Dalyan, farm, 1 m, MT, 36°48'54"N, 28°39'04"E, 8.–20.viii.2015 (Dursun), 3 ♂; *ibid.*, salty meadow, PT, 36°47'49"N, 28°38'55"E, 28.–30. iv.2016 (Barták & Kubík), 4 ♂; Muğla University campus, MT, 730 m, 37°09'38"N, 28°22'11"E, 19.xiii.–17.ix.2015 (H. Kavak), 4 ♂ (CULSP).

DI: European-Western Middle East.

DIT: **TR** (Koçak 2014; Koçak and Kemal 2012), **AY** (Koçak and Kemal 2013, 2015), **GA** (Lehrer 1976a), **IZ** (Koçak and Kemal 2013, 2015), **MG****.

***Heteronychia (Ctenodasypygia) siciliensis* (Böttcher, 1913)**

Material examined. SN: Birecik, E from Gaziantep, pastures SE from town, 37.00N/38.00E, 24–25.iv.1997 (Vrabec V.), ♂ (CULSP).

DI: Mediterranean.

DIT: **TR** (Kara and Pape 2002; Koçak 2014; Koçak and Kemal 2009, 2012); **ANT** (Verves & Khrokalo 2015), **AY** (Lehrer 1976a), **IZ** (Koçak & Kemal 2015, Whitmore 2011), **SN****.

***Heteronychia (Pandelleola) boettcheri* (Villeneuve, 1911)**

Pandelleola taurica: Lehrer 2008: 1.

Material examined. **AY:** 8 km S of Çine river bank, 68 m, 37°32'34"N, 28°03'46"E, 10.–12.ix.2014 (Barták & Kubík), 3 ♂; *ibid.*, 28.–30.vi.2015 (Barták & Kubík), 10 ♂; *ibid.*, SW, 29.iv.–1.v.2016 (Barták & Kubík), 3 ♂, **MG:** Akyaka, pasture, YPWT, 37°03'09"N, 28°20'17"E, 4 m, 13.–14.ix.2014 (Barták & Kubík), 1 ♂; *ibid.*, 8.–14.ix.2014 (Barták & Kubík), 3 ♂ (CULSP).

DI: European-Mid Eastern.

DIT: **TR** (Kara and Pape 2002 – as *Sarcophaga (Heteronychia) taurica*; Koçak 2014; Koçak and Kemal 2009 – as *Sarcophaga (Heteronychia) taurica*, 2012); **AM** (Koçak and Kemal 2013, 2015; Whitmore 2011), **ANT** (Verves & Khrokalo 2015), **AY****, **BO** (Lehrer 1977 – as *Heteronychia (Pandelleola) gaspari*), **DU** (Koçak & Kemal 2015), **ER** (Pekbey 2011; Pekbey and Hayat 2011, 2013°), **ERZ** (Pekbey 2011; Pekbey and Hayat 2011, 2013°), **ME** (Koçak and Kemal 2013, 2015; Whitmore 2011), **MG****, **SA** (Koçak and Kemal 2013, 2015; Whitmore 2011), **TO** (Koçak and Kemal 2013, 2015; Whitmore 2011).

Heteronychia (Pandelleola) filia (Rondani, 1860)

Material examined. **AY:** 8 km S of Çine, river bank, 68 m, 37°32'34"N, 28°03'46"E, 10.–12.ix.2014 (Barták & Kubík), 1 ♂; *ibid.*, 28.–30.vi.2015 (Barták & Kubík), 6 ♂; *ibid.*, 29.iv.–1.v.2016 (Barták & Kubík), 3 ♂; **MG:** Akyaka, pasture, YPWT, 37°03'09"N, 28°20'17"E, 4 m, 13.–14.ix.2014 (Barták & Kubík), 6 ♂; *ibid.*, 8.–14.ix.2014 (Barták & Kubík), 1 ♂; *ibid.*, salty meadow, 2 m, PT, 37°01'49"N, 28°20'01"E, 22.vi.–1.vii.2015 (Barták & Kubík), 1 ♂; 4 km N of Yatağan, flowers, 460 m, 37°22'12"N, 28°09'22"E, 30.vi.2016 (Barták & Kubík), 1 ♂; Kızılyaka, on flowers, 105 m, 37°01'21"N, 28°26'18"E, 27.iv.–4.v.2016 (Barták & Kubík), 1 ♂; **SA:** Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 1 ♂ (CULSP).

DI: West Palaearctic.

DIT: **TR** (Koçak 2014; Koçak and Kemal 2012), **AM** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015; Whitmore 2011), **ANT** (Whitmore 2011; Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015; Verves and Khrokalo 2015; Whitmore 2011), **AY****, **BY** (Pekbey 2011; Pekbey and Hayat 2011), **ER** (Pekbey 2011; Pekbey and Hayat 2011), **ERZ** (Pekbey 2011; Pekbey and Hayat 2011), **ES** (Aslan 2006; Aslan and Çalışkan 2009; Koçak and Kemal 2009, 2013, 2015), **KY** (Hayat et al. 2008; Koçak and Kemal 2009, 2015), **MG****, **SA** (Kara and Pape 2002; Koçak and Kemal 2009, 2015), **TO** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015; Whitmore 2011), **TB** (Hayat et al. 2008; Koçak and Kemal 2009, 2013, 2015).

Heteronychia (s. str.) bulgarica (Enderlein, 1936)

Material examined. **SA:** Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 1 ♂ (CULSP).

DI: European-Mid Eastern.

DIT: **BY** (Pekbey 2011; Pekbey and Hayat 2011, 2013a), **ER** (Pekbey and Hayat 2011, 2013a), **ERZ** (Pekbey 2011; Pekbey and Hayat 2011, 2013a), **SA****.

***Heteronychia* (s. str.) *haemorrhoides* (Böttcher, 1913)**

Heteronychia wahisi Lehrer, 1976b: 264.

Material examined. **AY:** 8 km S of Çine, river bank, SW, 68 m, 37°32'34"N, 28°03'46"E, 28.–30.vi.2015 (Barták & Kubík), 1 ♂; **MG:** Akyaka, pasture, 6 m, 37°03'19"N, 28°20'07"E, YPWT, 28.iv.–8.v.2013, (Barták & Kubík), 4 ♂; *ibid.*, forest, 30 m, YPWT, 37°03'16"N, 28°19'35"E, 30.iv.–9.v.2013, (Barták & Kubík), 1 ♂; *ibid.*, pasture, YPWT, 37°03'09"N, 28°20'17"E, 4 m, 13.–14.ix.2014 (Barták & Kubík), 5 ♂; **SA:** Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 2 ♂ (CULSP).

DI: European-Middle East-Mid Asiatic.

DIT: **TR** (Kara and Pape 2002; Koçak 2014; Koçak and Kemal 2009, 2012), **AM** (Koçak and Kemal 2013, 2015; Whitmore 2010), **AY****, **ER** (Pekbey 2011; Pekbey and Hayat 2011, 2013°), **ERZ** (Pekbey 2011; Pekbey and Hayat 2011, 2013°), **HT** (Koçak and Kemal 2013, 2015; Lehrer 1976b), **MG****, **SA****, **TO** (Koçak and Kemal 2013, 2015; Whitmore 2010).

Heteronychia* (s. str.) *infixa* (Böttcher, 1913)

Material examined. **SA:** Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 1 ♂ (CULSP).

DI: European-Anatolian.

DIT: **SA****.

***Heteronychia* (s. str.) *kerteszi* (Villeneuve, 1912)**

Material examined. **MG:** Muğla University campus, 700 m, SW+PT, 37°09'41"N, 28°22'21"E, 29.iv.–10.v.2013 (Barták & Kubík), 3 ♂; *ibid.*, 700 m, 37°09'42"N, 28°22'22"E (O.Dursun), iv.–v.2014, 1 ♂; *ibid.*, 720 m, MT, 37°09'42"N, 28°22'13"E, iv.2015 (H. Kavak), 1 ♂; *ibid.*, 26–27.vi.2015 (Barták & Kubík), 2 ♂; Muğla – 13 km NE, pine wood, 1200 m, 37°14'50"N, 28°30'00"E, 23–27.vi.2015 (Barták & Kubík), 1 ♂ (CULSP).

DI: East Mediterranean.

DIT: **TR** (Koçak 2014; Koçak and Kemal 2012), **ANT** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **IZ** (Koçak and Kemal 2013, 2015; Whitmore 2011), **MG****.

***Heteronychia* (s. str.) *lacrymans* (Villeneuve, 1912)**

Material examined. **MG:** Akyaka, pasture, YPWT, 37°03'09"N, 28°20'17"E, 4 m, 13.–14.ix.2014 (Barták & Kubík), 6 ♂ (CULSP).

DI: East Mediterranean.

DIT: **TR** (Koçak 2014; Koçak and Kemal 2012), **AF** (Kara and Pape 2002 – as *Sarcophaga* (*Heteronychia*) *zhelochovtzevi*; Koçak and Kemal 2009 – as *Sarcophaga* (*Heteronychia*) *zhelochovtzevi*, 2013, 2015; Whitmore 2011), **ER** (Pekbey 2011; Pekbey and Hayat 2011, 2013°), **ERZ** (Pekbey 2011; Pekbey and Hayat 2011, 2013°), **MG****.

Heteronychia* (s. str.) *pontica* (Rohdendorf, 1937)

Material examined. **SA:** Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 13 ♂ (CULSP).

DI: East Mediterranean.

DIT: **SA****.

Heteronychia* (s. str.) *porrecta* (Böttcher, 1913)

Material examined. **SA:** Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 1 ♂ (CULSP).

DI: European-Anatolian.

DIT: **SA****.

***Heteronychia* (s. str.) *schineri* (Bezzi, 1891)**

Material examined. **SA:** Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 1 ♂.

DI: European-Mid Eastern.

DIT: **TR** (Koçak 2014), **AM** (Kara and Pape 2002; Koçak and Kemal 2009, 2012, 2013, 2015), **BY** (Pekbey 2011; Pekbey and Hayat 2011, 2013°), **SA****, **TO** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015).

Karovia* *hirticrus* (Pandellé, 1896)

Material examined. **SA:** Samsun University campus, 41°22'N, 36°11'E, 22.vi.–4.vii.2014 (Barták & Kubík), 1 ♂ (CULSP).

DI: West Palaearctic.

DIT: **SA****.

Subtribe Phallanthina***Bellieriomima subulata* (Pandellé, 1896)***

Material examined. SA: Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 4 ♂ (CULSP).

DI: European-Siberian-Central Asiatic.

DIT: SA**.

Myorhina* (s. str.) *lunigera* (Böttcher, 1914)

Material examined. SA: Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 1 ♂ (CULSP).

DI: European-Mid Eastern.

DIT: SA**.

***Myorhina* (s. str.) *nigriventris* (Meigen, 1826)**

Material examined. MG: Akyaka, forest, 30 m, 37°03'16"N, 28°19'35"E, 30.iv.–9.v.2013, YPWT (Barták & Kubík), 1 ♂; *ibid.*, pasture, 8 m, 37°03'11"N, 28°20'33"E, 27.iv.2016 (Barták & Kubík), 1 ♂; 4 km N of Yatağan, flowers, 460 m, 37°22'12"N, 28°09'22"E, 30.vi.2016 (Barták & Kubík), 2 ♂; AY: 8 km S of Çine, river bank, SW, 68 m, 37°32'34"N, 28°03'46"E, 28.–30.vi.2015 (Barták & Kubík), 1 ♂; *ibid.*, 28.–30.vi.2015 (Barták & Kubík), 3 ♂; *ibid.*, PT, 37°32'34"N, 28°03'46"E, 29.iv.–1.v.2016 (Barták & Kubík), 1 ♂; SA: Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 8 ♂ (CULSP).

DI: West Palaearctic.

DIT: TR (Koçak 2014; Koçak and Kemal 2012): AM (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), BY (Pekbey 2011), ER (Pekbey 2011), ERZ (Pekbey 2011; Pekbey and Hayat 2010), MG**, SA**, TO (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015).

Myorhina* (s. str.) *socrus* (Rondani, 1860)

Material examined. MG: Muğla – 13 km NE, pine wood, 1200 m, 37°14'50"N, 28°30'00"E, 23–27.v.i.2016 (Barták & Kubík), 2 ♂, 1 ♀; Toparlar, 8 m, lowland forest, SW+PT, 36°58'39"N, 28°39'30"E, 28.–30.iv.2016 (Barták & Kubík), 1 ♂ (CULSP).

DI: European-Mid Eastern.

DIT: MG**.

***Myorbina* (s. str.) *soror* (Rondani, 1860)**

Material examined. **AY:** 8 km S of Çine, river bank, 68 m, PT, 37°32'34"N, 28°03'46"E, 29.iv.–1.v.2016 (Barták & Kubík), 1 ♂; **MG:** Akyaka, pasture, 6 m, 37°03'19"N, 28°20'07"E, YPWT, 28.iv.–8.v.2013, (Barták & Kubík), 2 ♂; *ibid.*, YPWT, 37°03'09"N, 28°20'17"E, 4 m, 13.–14.ix.2014 (Barták & Kubík), 10 ♂; *ibid.*, 37°03'09"N, 28°20'17"E, 8.–14.ix.2014 (Barták & Kubík), 2 ♂; **SA:** Samsun University campus, 41°22'N, 36°11'E, 22.vi.–4.vii.2014 (Barták & Kubík), 13 ♂ (CULSP).

DI: Westpalaeartic.

DIT: **TR** (Koçak 2014; Koçak and Kemal 2012); **AM** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **AY****, **BY** (Pekbey 2011), **ER** (Pekbey 2011), **ERZ** (Pekbey 2011), **MG****, **SA** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015).

***Pandelleana protuberans* (Pandellé, 1896)**

Material examined. **ANT:** Güzelsu nr Akseki, 5.vi.2005 (C. Bystrowski), 1 ♂ (CULSP).

DI: European-Siberian-Centralasiatic.

DIT: **TR** (Koçak 2014; Koçak and Kemal 2012, 2013, 2015, "Anatolia": Rohdendorf 1937), **ANT****, **ERZ** (Pekbey 2011), **ES** (Aslan and Çalışkan 2009).

***Pandelleana tahtaliana* Lehrer, 2004**

Material examined. **MG:** Muğla University campus, SW+PT, 700 m, 37°09'41"N, 28°22'21"E, 29.iv.–10.v.2013 (Barták & Kubík), 1 ♂; Muğla – 13 km NE, pine wood + pasture, 1100–1300 m, 37°15'N, 28°30'E, 2–3.v.2016 (Barták & Kubík), 1 ♂ (CULSP).

DI: Anatolian.

DIT: **KY** (Lehrer 2004), **KN** (Lehrer 2004), **MG****.

***Pseudothyrsocnema spinosa* (Villeneuve, 1912)**

Material examined. **AY:** 8 km S of Çine river bank, 68 m, 37°32'34"N, 28°03'46"E, 10.–12.ix.2014 (Barták & Kubík), 1 ♂; *ibid.*, 28.–30.vi.2015 (Barták & Kubík), 3 ♂; *ibid.*, PT, 37°32'34"N, 28°03'46"E, 29.iv.–1.v.2016 (Barták & Kubík), 1 ♂; **MG:** Akyaka, pasture, 6 m, 37°03'19"N, 28°20'07"E, 28.iv.–8.v.2013, YPWT (Barták & Kubík), 4 ♂; *ibid.*, salty meadow, SW+PT, 37°02'53"N, 28°19'39"E, 28.iv.–9.v.2013 (Barták & Kubík), 1 ♂; *ibid.*, pasture, YPWT, 37°03'09"N, 28°20'17"E, 4 m, 13.–14.ix.2014 (Barták & Kubík), 4 ♂; *ibid.*, pasture, 4 m, 37°03'09"N, 28°20'17"E, 8.–14.ix.2014 (Barták & Kubík), 2 ♂; *ibid.*, salty meadow, 2 m, PT, 37°01'62"N, 28°20'00"E, 27.iv.–1.v.2016 (Barták & Kubík), 1 ♂; Dalyan, farm, MT, 1 m,

36°48'54"N, 28°39'04"E, 8.–20.viii.2015 (Dursun), 1 ♀; *ibid.*, salty meadow, PT, 36°47'49"N, 28°38'55"E, 28.–30.iv.2016 (Barták & Kubík), 3 ♂ (CULSP).

DI: European-Mid Eastern.

DIT: TR (Koçak 2014; Koçak and Kemal 2012), **AD** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **AY****, **MG****.

Sarina sexpunctata (Fabricius, 1805)

Material examined. SA: Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 1 ♂ (CULSP).

DI: Palaearctic.

DIT: TR (Koçak 2014; Koçak and Kemal 2012), **BY** (Pekbey 2011), **ERZ** (Pekbey 2011), **SA****, **TO** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015).

Thyrsocnema incisilobata (Pandellé, 1896)

Material examined. MG: Muğla – 13 km NE, pine wood, 1200 m, 37°14'50"N, 28°30'00"E, 23–27.v.i.2016 (Barták & Kubík), 1 ♂; Toparlar, 8 m, lowland wood, 36°58'27"N, 28°38'50"E, 22.–24.vi.2015 (Barták & Kubík), 1 ♂; SA: Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 3 ♂ (CULSP).

DI: Palaearctic.

DIT: TR (Koçak 2014; Koçak and Kemal 2012), **AM** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **ERZ** (Pekbey 2011), **MG****, **SA****, **TO** (Kara and Pape 2002; Koçak and Kemal, 2009, 2013, 2015).

Subtribe Parasarcophagina

Bercaea africa (Wiedemann, 1824)

Material examined. MG: Akyaka, pasture, 6 m, 37°03'19"N, 28°20'07"E, 28.iv.–8.v.2013, YPWT (Barták & Kubík), 1 ♂; *ibid.*, forest, 30 m, 37°03'16" N, 28°19'35" E, 30.iv.–9.v.2013, YPWT (Barták & Kubík), 1 ♂; Muğla, protein trap, pine wood, 700 m, 37°09'41"N, 28°22'21"E, xi.–iii.2013 (Barták & Kubík), 2 ♂ (CULSP).

DI: Cosmopolitan.

DIT: TR (Kara and Pape 2002; Koçak 2014; Koçak and Kemal 2012 – both *Sarcophaga* (*Bercaea*) *africa* & *Sarcophaga* (*Bercaea*) *cruentata*), **BT** (Koçak and Kemal 2013, 2015 – both *Sarcophaga* (*Bercaea*) *africa* & *Sarcophaga* (*Bercaea*) *cruentata*), **BY** (Pekbey 2011), **DB** (İpek et al. 2009, 2011 – as *Sarcophaga haemorrhoidalis*), **ED** (Çoban and Beyarslan 2013), **EL** (Şaki and Özer 1999a, b – as *Sarcophaga haemorrhoidalis*), **ERZ** (Pekbey 2011; Pekbey and Hayat 2010), **ES** (Aslan 2006; Aslan and

Çalışkan 2009; Koçak and Kemal 2009, 2013, 2015 – both *Sarcophaga (Bercaea) africa* & *Sarcophaga (Bercaea) cruentata*, **KAR** (Hayat et al. 2008; Koçak and Kemal 2009, 2013, 2015 – both *Sarcophaga (Bercaea) africa* & *Sarcophaga (Bercaea) cruentata*), **KI** (Dik et al. 2012 – as *Sarcophaga haemorrhoidalis*), **KN** (Dik et al. 2012 – as *Sarcophaga haemorrhoidalis*), **ME** (Aslan 2006; Kara and Pape 2002), **MG****, **SN** (Sevgili et al. 2004), **TO** (Aslan 2006; Kara and Pape 2002), **VA** (Koçak and Kemal 2015 2015 – both *Sarcophaga (Bercaea) africa* & *Sarcophaga (Bercaea) cruentata*; Özdal and Değer 2005 – as *Sarcophaga haemorrhoidalis*).

Liopygia (Engelisca) surcoufi* (Villeneuve, 1913)

Material examined. **SA:** Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 1 ♂ (CULSP).

DI: Mediterranean.

DIT: SA**.

***Liosarcophaga (Curranea) tibialis* (Macquart, 1851)**

Material examined. **AY:** 8 km S of Çine river bank, 68 m, 37°32'34"N, 28°03'06"E, 10.–12.ix.2014 (Barták & Kubík), 1 ♂; **MG:** Akyaka, pasture, 6 m, 37°03'19"N, 28°20'07"E, 28.iv.–8.v.2013, YPWT (Barták & Kubík), 3 ♂; *ibid.*, YPWT, 37°03'09"N, 28°20'17"E, 4 m, 13.–14.ix.2014 (Barták & Kubík), 3 ♂; *ibid.*, salty meadow, 2 m, 37°01'49"N, 28°20'01"E, 22.vi.–1.vii.2015 (Barták & Kubík), 1 ♂; Muğla University campus, 720 m, MT, 37°09'42"N, 28°22'13"E, 26–27.vi.2015 (Barták & Kubík), 1 ♂; *ibid.*, protein trap, pine wood, 700 m, 37°09'41"N, 28°22'21"E, xi.–iii.2013 (Barták & Kubík), 2 ♂; Dalyan, salty meadow, PT, 36°47'49"N, 28°38'55"E, 28.–30.iv.2016 (Dursun), 1 ♂; **SA:** Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 1 ♂ (CULSP).

DI: West Palaearctic-Afrotropical-Oriental-Australasian/Oceanian.

DIT: AN (Açıkgöz et al., 2011), **AY****, **MG****, **SA****, **SN** (Sevgili et al. 2004).

***Liosarcophaga (Pandelleisca) similis* (Meade, 1876)**

Material examined. **AY:** 8 km S of Çine river bank, 68 m, 37°32'34"N, 28°03'46"E, 10.–12.ix.2014 (Barták & Kubík), 1 ♂; **MG:** Akyaka, pasture, 6 m, 37°03'19"N, 28°20'07"E, 28.iv.–8.v.2013, YPWT (Barták & Kubík), 1 ♂; Toparlar, lowland wood, 8 m, 36°59'27"N, 28°38'50"E, 22.–24.vi.2015 (Barták & Kubík), 1 ♂ (CULSP).

DI: Transpalaearctic-Oriental.

DIT: **TR** (Koçak 2014; Koçak and Kemal 2012), **AY****, **MG****, **TB** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015).

***Liosarcophaga* (s. str.) *emdeni* (Rohdendorf, 1969)**

Material examined. SA: Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 9 ♂ (CULSP).

DI: European-Siberian-Central Asiatic.

DIT: **TR** (Koçak 2014; Koçak and Kemal 2012), **AM** (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), **ER** (Pekbey 2011), **ERZ** (Pekbey 2011), **SA****.

***Liosarcophaga* (s. str.) *jacobsoni* (Rohdednorf, 1937)**

Material examined. MG: Akyaka, pasture, YPWT, 37°03'19"N, 28°20'07"E, 6 m, 28.iv.–8.v.2013 (Barták & Kubík), 1 ♂; *ibid.*, salty meadow, SW+PT, 37°02'53"N, 28°19'39"E, 28.iv.–9.v.2013 (Barták & Kubík), 2 ♂; *ibid.*, pasture, YPWT, 37°03'09"N, 28°20'17"E, 4 m, 13.–14.ix.2014 (Barták & Kubík), 1 ♂; *ibid.*, salty meadow, 2 m, 37°01'49"N, 28°20'01"E, 22.vi.–1.vii.2015 (Barták & Kubík), 4 ♂; *ibid.*, PT, 37°01'52"N, 28°20'00"E, 27.iv.–1.v.2016 (Barták & Kubík), 2 ♂ (CULSP).

DI: Transpalaeartic subboreal.

DIT: **ERZ** (Pekbey 2011; Pekbey and Hayat 2010), **ES** (Aslan, 2006; Aslan and Çalışkan 2009), **MG****.

***Liosarcophaga* (s. str.) *portschinskyi* (Rohdendorf, 1937)**

Material examined. SA: Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 3 ♂ (CULSP).

Distribution: Transpalaeartic-Oriental.

DIT: **TR** (Kara and Pape 2002; Koçak 2014; Koçak and Kemal 2009, 2012, 2015), **ERZ** (Pekbey 2011), **ES** (Aslan and Çalışkan 2009), **SA****.

***Parasarcophaga* (s. str.) *albiceps* (Meigen, 1826)**

Material examined. SA: Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 1 ♂ (CULSP).

DI: Transpalaeartic- Oriental-Australasian/Oceanian.

DIT: **TR** (Kara and Pape 2002; Koçak 2014; Koçak and Kemal 2009, 2012, 2015), **ERZ** (Pekbey 2011), **SA****.

Subtribe Boettcheriscina***Rosellea aratrix* (Pandellé, 1896)**

Material examined. SA: Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 2 ♂ (CULSP).

DI: Transpalaeartic-Nearctic-Oriental.

DIT: TR (Koçak 2014; Koçak and Kemal 2012), BU (Kara and Pape 2002; Koçak and Kemal 2009, 2013, 2015), SA**.

Rosellea beckiana* Lehrer, 1996

Material examined. AY: 8 km S of Çine, river bank, SW, 68 m, 37°32'34"N, 28°03'46"E, 28.–30.vi.2015 (Barták & Kubík), 1 ♂; *ibid.*, 29.iv.–1.v.2016 (Barták & Kubík), 1 ♂; MG: Akyaka, pasture, YPWT, 37°03'09"N, 28°20'17"E, 4 m, 13.–14.ix.2014 (Barták & Kubík), 2 ♂; Muğla, protein trap, pine wood, 700 m, 37°09'41"N, 28°22'21"E, xi.–iii.2013 (Barták & Kubík), 1 ♂; Toparlar, lowland wood, 8 m, 36°59'27"N, 28°38'50"E, 22.–24.vi.2015 (Barták & Kubík), 2 ♂; *ibid.*, SW+PT, 36°58'39"N, 28°39'30"E, 28.–30.iv.2016 (Barták & Kubík), 1 ♂ (CULSP).

DI: East Mediterranean.

DIT: AY**, MG**.

Subtribe Sarcophagina***Sarcophaga lehmanni* Müller, 1922**

Material examined. AY: 8 km S of Çine, river bank, SW, 68 m, 37°32'34"N, 28°03'46"E, 28.–30.vi.2015 (Barták & Kubík), 2 ♂; HA: 25 km E of Gözeldere, 37°32'N, 43°49'E, 930 m, 22.vi.2010 (Mi. Halada), 1 ♂; MG: Akyaka, forest, 30 m, 37°03'16"N, 28°19'35"E, 30.iv.–9.v.2013, YPWT (Barták & Kubík), 1 ♂; *ibid.*, pasture, 4 m, 37°03'09"N, 28°20'17"E, 8.–14.ix.2014 (Barták & Kubík), 2 ♂; Muğla University campus, SW+PT, 700 m, 37°09'41"N, 28°22'21"E, 29.iv.–10.v.2013 (Barták & Kubík), 1 ♂; *ibid.*, 37°09'42"N, 28°22'22"E (O.Dursun), iv.–v.2014, 1 ♂; *ibid.*, MT, 730 m, 37°09'38"N, 28°22'11"E, 19.viii.–17.ix.2015 (H. Kavak), 1 ♂; Dalyan, farm, MT, 1 m, 36°48'54"N, 28°39'04"E, 8.–20.viii.2015 (Dursun), 1 ♂; *ibid.*, salty meadow, PT, 36°47'49"N, 28°38'55"E, 28.–30.iv.2016 (Barták & Kubík), 1 ♂; SA: Samsun University campus, 41°22'N, 36°11'E, 22vi.–4.vii.2014 (Barták & Kubík), 3 ♂ (CULSP).

DI: West-Central Palaearctic.

DIT: **TR** (Kara and Pape 2002; Koçak 2014; Koçak and Kemal 2012 – as *Sarcophaga* (s. str.) *lasiostyla*), **AM** (Aslan 2006), **AY****, **BY** (Pekbey 2011), **ER** (Pekbey 2011), **ERZ** (Pekbey 2011; Pekbey and Hayat 2010), **ES** (Aslan, 2006; Aslan and Çalışkan 2009; Koçak and Kemal 2009 – as *Sarcophaga* (s. str.) *lasiostyla*, 2013, 2015 – as *Sarcophaga* (s. str.) *lasiostyla*), **HA****, **IG** (Hayat et al. 2008; Koçak and Kemal 2009 – as *Sarcophaga* (s. str.) *lasiostyla*, 2013, 2015 – as *Sarcophaga* (s. str.) *lasiostyla*), **IZ** (Civelek and Tezcan 2005; Koçak and Kemal 2009 – as *Sarcophaga* (s. str.) *lasiostyla*, 2013, 2015 – as *Sarcophaga* (s. str.) *lasiostyla*), **KAR** (Hayat et al. 2008; Koçak and Kemal 2009 – as *Sarcophaga* (s. str.) *lasiostyla*, 2013, 2015 – as *Sarcophaga* (s. str.) *lasiostyla*), **KY** (Hayat et al. 2008; Koçak and Kemal 2009 – as *Sarcophaga* (s. str.) *lasiostyla*, 2013, 2015 – as *Sarcophaga* (s. str.) *lasiostyla*), **MN** (Civelek and Tezcan 2005; Koçak and Kemal 2009 – as *Sarcophaga* (s. str.) *lasiostyla*, 2013, 2015 – as *Sarcophaga* (s. str.) *lasiostyla*), **MG****, **SA****.

Discussion

This paper presents the results of an intensive collecting effort by two of the authors (MB and SK) in Turkey between 2011 and 2016. It adds new faunistic records for 68 species. The following 22 species newly recorded for Turkey are presented: *Apodacra dispar*, *Bellieriomima subulata*, *Blaesoxipha confusa*, *Craticulina barbifera*, *Helicophagella macrura*, *H. novella*, *Heteronychia infixa*, *H. pontica*, *H. porrecta*, *Karovia hirticrus*, *Liopygia surcoufi*, *Metopia grandii*, *Miltogramma aurifrons*, *M. brevipila*, *M. testaceifrons*, *M. turkmenora*, *Myorhina lunigera*, *M. socrus*, *Paragusia multipunctata*, *Rosellea beckiana*, *Sarcophila canaanita*, and *Sphecatodes ornatus*. A further 46 species are recorded for the first time from at least one Turkish province.

Previously, 132 species of Sarcophagidae were listed from Turkey (Hayat et al. 2008; Kara and Pape 2002; Koçak 2014; Koçak and Kemal 2009, 2012, 2013, 2015; Pape et al. 2015; Pekbey 2011; Pekbey and Hayat 2011; Whitmore, 2011; Whitmore et al. 2013). Our findings increase this number to 154. This relatively large number of faunistic novelties indicates that there is a low degree of faunistic research on this family in Turkey.

Acknowledgements

This paper was supported by S grant of MSMT (Ministry of Education, Sports and Youth). We thank Prof. A. Koçak (Centre for Entomological Studies, Ankara) for sending necessary publications about Turkish flies. We would also like to thank Mr. Brian Kavalir for checking English. Our special thanks are due to anonymous reviewers for improving earlier versions of this manuscript.

References

- Açıköz HN, Açıköz A, İşbaşı T (2011) Predator behavior of *Chrysomya albiceps* (Fabricius) (Diptera: Calliphoridae) on human corpses. Turkish Journal of Parasitology 35: 105–109. <https://doi.org/10.5152/tpd.2011.26>
- Akduman D, Arslan MO, Gül S (2010) A case of otomyiasis in a child with chronic otitis media. International Journal of Pediatric Otorhinolaryngology Extra 6: 116–118. <https://doi.org/10.1016/j.pedex.2010.05.001>
- Aksoy HA, Bahadıroğlu C (2012) Evaluation of some alternative control methods against Mediterranean Corn Borer, *Sesamia nonagrioides* Lefebvre (Lepidoptera: Noctuidae) and European Corn Borer, *Ostrinia nubilalis* Hübner (Lepidoptera: Crambidae). BEU Journal of Science 1: 127–136. [In Turkish with English summary]
- Aslan A (2006) Studies related with Sarcophagidae (Diptera) fauna in Eskifehir. Master of Science Thesis, Osman Gazi University, Department of Biology, 66 pp.
- Aslan A, Çalışkan H (2009) Fauna of Eskişehir Sarcophagidae (Insecta, Diptera), and new records for Turkey. Sakarya Üniversitesi Fen Edebiyat Dergisi 11: 15–27.
- Aydenizöz M, Dik B (2008) A case of gingival myiasis in a lamb caused by the *Wohlfahrtia magnifica* (Diptera: Sarcophagidae). Türkiye Parazitoloji Dergisi 32(1): 79–81.
- Barták M (1997) The biomonitoring of Diptera by means of yellow pan water traps. Folia Facultatis Scientiarum Naturalium Universitatis Masarykianae Brunensis, Biologia 95: 9–16.
- Bayındır T, Miman Ö, Miman MC, Atambay M, Şaki CE (2010) Bilateral aural myiasis (*Wohlfahrtia magnifica*): A case with chronic suppurative otitis media. Turkish Journal of Parasitology 34: 65–67. [In Turkish with English summary]
- Borah N, Hazarika M, Rehman A, Patgiri P (2015) Diversity of Dipteran insects in Jorhat district of Assam, North East India. Insect Environment 20: 109–110.
- Büyükkurt MG, Miloğlu Ö, Nalbantoğlu S, Uslu H, Yolcu Ü, Aktaş O (2008) Oral myiasis in a child due to *Wohlfahrtia magnifica*: original image. Türkiye Klinikleri Journal of Medical Sciences 28: 782–785. [In Turkish with English summary]
- Calvert F (1882) *Sarcophaga lineata* destructive to locusts in the Dardanelles. The American Naturalist 16: 410–411.
- Çevik C, Kaya ÖA, Akbay E, Özkan M, Kahraman A, Uçak M (2014) An unusual *Wohlfahrtia magnifica* myiasis case localized in cutaneous and subcutaneous tissues in a patient with head–neck cancer. Turkish Journal of Parasitology 38: 135–137. <https://doi.org/10.5152/tpd.2014.3353>
- Çiftçioglu N, Altuntaş K, Haberal M (1997) A case of human orotracheal myiasis caused by *Wohlfahrtia magnifica*. Parasitology Research 83: 34–36.
- Civelek HS, Tezcan S (2005) Some new records for Diptera fauna of Turkey and additional notes on the dipterous fauna of cherry orchards. Turkish Journal of Entomology 29(1): 11–16.
- Çoban E, Beyarslan A (2013) Identification of dipteran species of forensic entomology importance in summer season in Edirne. Bitlis Eren University Journal of Science & Technology 3: 18–21. <https://doi.org/10.17678/beuscitech.47135>

- Dik B, Uslu U, Işık N (2012) Myiasis in animals and humanbeings in Turkey. Journal of the Faculty of Veterinary Medicine, Kafkas University 18: 37–42. [In Turkish with English summary]
- Diñçer Ş (1997) İnsan ve hayvanlarda myiasis. In: Özcel MA, Daldal N (Eds) Parazitoloji de artropod hastalıkları ve vektörler. Turkish Journal of Parasitology 13: 169–233. [In Turkish]
- Diñçer Ş, Aydenizöz M, Acar A, Nalbantoğlu S (2001) Otomyiasis of humans in Turkey caused by *Wohlfahrtia magnifica* (Diptera: Sarcophagidae). Turkish Journal of Parasitology 25: 283–285. [In Turkish with English summary]
- Gorodkov KB (1983) Range types of Diptera of humid zones of Palaearctic, pp. 26–33. In: Scarlato OA, Narchuk EP (Eds) Diptera (Insecta), their systematics, geographic distribution and ecology. Zoological Institute Acad. Sci. USSR, Leningrad, 156 pp. [In Russian with English subtitle]
- Gorodkov KB (1984) Ranges types of insects of tundra and forests zones of European part of USSR. In: Scarlato OA, Gorodkov KB (Eds) Provisional atlas of the insects of the European Part of USSR. Nauka, Leningrad, 60 pp. [In Russian with English subtitle]
- Gözüaçık C, Mart C (2009) Determination of natural parasitization rates of some pests of Lepidoptera larvae in corn (*Zea mays* L.) in the Southeastern Anatolia Region. Bitki Koruma Bülteni 49: 107–116. [In Turkish with English summary]
- Gümüşsoy I, Çağlayan F, Güven E, Miloğlu Ö (2015) A rare case of palatal oral myiasis caused by *Wohlfahrtia magnifica*. Journal of Dental Faculty of Ataturk University Suppl. 11: 1–3. <https://doi.org/10.17567/dfd.60102>
- Hayat R, Richet R, Bayrak N, Pekbey G (2008) Contributions to the knowledge of flesh flies (Diptera: Sarcophagidae) from Turkey, with a new record. Turkish Journal of Zoology 32: 385–390.
- İpek DNS, Şaki CE (2010) External myiasis on cows, sheep and goats in Diyarbakır Province. Journal of the Faculty of Veterinary Medicine, Dicle University 1: 1–7.
- İpek DN S, Şaki CE, Özer E (2009) Seasonal distributions of external myiasis flies determined in Diyarbakır province. Journal of the Faculty of Veterinary Medicine, Kafkas University 17: 469–475.
- İpek DN S, Şaki CE, Özer E (2011) Seasonal distributions of external myiasis flies determined in Diyarbakır Province. Journal of the Faculty of Veterinary Medicine, Kafkas University 17 (3): 469-475.
- Kara K, Arslan ÖM (2011) Myiasis in animals and humans in northeastern Anatolia. Atatürk Üniversitesi Veteriner Bilimleri Dergisi 6: 245–250. [In Turkish with English summary]
- Kara K, Pape T (2002) Check list of Turkish Sarcophagidae (Insecta, Diptera) with new records. Deutsche Entomologische Zeitschrift 49: 291–295. <https://doi.org/10.1002/mmnd.20020490213>
- Karaman E, Samasti M, Saritzali G, Ozdemir S, Halil MC, Isildak H (2009) Otomyiasis by *Wohlfahrtia magnifica*. Journal of Craniofacial Surgery 20: 2123–2124. <https://doi.org/10.1097/SCS.0b013e3181bec66e>
- Kemal M, Koçak AÖ (2015) Preliminary list of the Pterygota of Varegöz – Yeşiltaş area (Yüksekova, Hakkari Province, SE Turkey). CESA News 103: 1–26.

- Kılınç ÖO, Oğuz B, Sona A, Biçek K, Özdal N, Değer MS (2013) Traumatic myiasis associated with *Wohlfahrtia magnifica* (Schiner, 1862; Diptera: Sarcophagidae) larvae in a dog. *Animal Health, Production and Hygiene* 2: 209–211. [In Turkish with English summary]
- Koçak AÖ (2014) List of the 23773 pterygot species in Turkey based upon the info-system of the CESA. *Priamus*, Suppl. 32: 1–877.
- Koçak AÖ, Kemal M (2009) List of the dipteran genera and species recorded in Turkey based upon the info-system of the Cesa (Report of the temporary results of the entomofauna of Turkey – 7). *CESA News* 51: 3–106.
- Koçak AÖ, Kemal M (2012) List of the hitherto recorded pterygot taxa of Turkey (Insecta) (temporary report of the Entomofauna Projekt of Turkey – 10). *CESA Memoirs* 6: 1–1649.
- Koçak AÖ, Kemal M (2013) Diptera of Turkey. *Priamus*, Suppl. 28: 1–411.
- Koçak AÖ, Kemal M (2015) Initial results of the entomofauna of SW Asia, based upon the info-system of the Cesa (excl. Lepidoptera). *Priamus* 35: 1–1186.
- Kökçam I, Şaki CE (2005) A case of cutaneous myiasis caused by *Wohlfahrtia magnifica*. *Journal of Dermatology* 32: 459–463. <https://doi.org/10.1111/j.1346-8138.2005.tb00780.x>
- Köse M, Bozkurt ME, Kartal K, Yaprakçı V (2013) Wound myiasis by *Wohlfahrtia magnifica* in a dog. *Bornova Veteriner Bilimleri Dergisi [Journal of Bornova Veterinary Science]* 35(49): 31–34. [In Turkish with English summary]
- Kurtpınar H (1950) Spesifik bir myiasis amili olan *Wohlfahrtia magnifica* (Sciner 1862) "nın Türkiye ehli hayvanlarındaki rolü. *Türk Veteriner Hekimleri Derneği Dergisi*: 20: 1–7 (in Turkish).
- Lehrer AZ (1976a) *Leclercqiomysia*: genre nouveau de sarcophagines paléarctiques (Diptera: Sarcophagidae). *Bulletin et Annales de la Royale Société Entomologique de Belgique* 112: 195–203.
- Lehrer AZ (1976b) Nouvelles sarcophagines d'Eurasie (Diptera, Sarcophagidae). *Bulletin et Annales de la Royale Société Entomologique de Belgique* 112: 259–266.
- Lehrer AZ (1977) Deux nouvelles *Heteronychia* de Turquie (Diptera: Sarcophagidae). *Bulletin et Annales de la Royale Société Entomologique de Belgique* 113: 223–228.
- Lehrer AZ (2004) Révision de l'espèce *Sarcophaga protuberans* Pandellé 1896, et description de trois espèces ouestpaléarctiques du genre *Pandelleana* Rohdendorf, 1937 (Diptera, Sarcophagidae). *Bulletin de la Société entomologique de Mulhouse* 60: 55–64.
- Lehrer AZ (2006) Liste des Sarcophaginae et Paramacronychiinae du Proche Orient, identifiés dans les collections de TAU (Diptera, Sarcophagidae). *Fragmenta dipterologica* 3: 14–22.
- Lehrer AZ (2008a) *Blaesoxipha ataturkia* n. sp. Une espèce nouvelle du genre *Blaesoxipha* Loew. *Fragmenta dipterologica* 14: 25–28.
- Lehrer AZ (2008b) A propos de l'espèce *Pandelleola taurica* Rohdendorf et description de nouveaux taxons congénériques (Diptera, Sarcophagidae). *Fragmenta dipterologica* 15: 1–6.
- Övet G, Tezer MS, Alataş N, Kocacan FN (2012) Aural myiasis in a patient with chronic otitis media. *Turkish Archives of Otolaryngology* 50: 5–7.
- Özdal N, Değer S (2005) Identification and development of several traumatic myiasis larvae recorded in Van. *Yüzüncü Yıl Üniversitesi, Veteriner Fakültesi Dergisi* 16: 81–85 (in Turkish with English summary).

- Özdemir EÇ, Fahriye Ekşi F, Şenyurt SZ, Üstün K, Karaoğlan I, Erciyas K (2014) A case of gingival myiasis caused by *Wohlfahrtia magnifica*. *Mikrobiyologii Bülteni* 48: 512–517. <https://doi.org/10.5578/mb.7563> [In Turkish with English summary]
- Özsoy İP, Dik B, Alptekin NO (2013) A case of oral myiasis due to larvae of *Wohlfahrtia magnifica*. *International Association for Dental Research, Poster Session* 132: 1.
- Pape T (1996) *Catalogue of the Sarcophagidae of the world (Insecta: Diptera)*. *Memoirs of Entomology, International* 8: 1–558. Gainesville, Florida, Associated Publishers.
- Pape T, Beuk P, Pont AC, Shatalkin AI, Ozerov AL, Woźnica AJ, Merz B, Bystrowski C, Raper C, Bergström C, Kehlmaier C, Clements DK, Greathead D, Kameneva EP, Nartshuk E, Petersen FT, Weber G, Bächli G, Geller-Grimm F, Van de Weyer G, Tschorsnig H-P, de Jong H, van Zuijlen J-W, Vaňhara J, Roháček J, Ziegler J, Majer J, Hürka K, Holston K, Rognes K, Greve-Jensen L, Munari L, de Meyer M, Pollet M, Speight MCD, Ebejer MJ, Martinez M, Carles-Tolrá M, Földvári M, Chvála M, Barták M, Evenhuis NL, Chandler PJ, Cerretti P, Meier R, Rozkosny R, Prescher S, Gaimari SD, Zatwarnicki T, Zeegers T, Dikow T, Korneyev VA, Richter VA, Michelsen V, Tanasijtshuk VN, Mathis WN, Hubenov Z, de Jong Y (2015) *Fauna Europaea: Diptera–Brachycera*. *Biodiversity Data Journal* 3: e4187. <https://doi.org/10.3897/BDJ.3.e4187>
- Pekbey G (2011) *Bayburt, Erzincan ve Erzurum İlleri Sarcophagidae (Diptera) Türleri Üzerinde Sistematik ve Faunistik Çalışmalar*. PhD thesis. Atatürk Üniversitesi, Fen Bilimleri Enstitüsü, Bitki Koruma Anabilimdalı, Erzurum 344 pp.
- Pekbey G, Hayat R (2010) *Faunistic studies on the family Sarcophagidae (Diptera) species from Erzurum province (Turkey)*. *Turkish Journal of Zoology* 34: 263–275. [In Turkish with English summary]
- Pekbey G, Hayat R (2011) *New records and distributional data on Sarcophaga (Heteronychia) (Diptera: Sarcophagidae) from Turkey*. A partial summary of Gamze Pekbey's PhD thesis (Ataturk University, Institute of Science, Department of Plant Protection), adopted on 20.06.2011 <http://online.journals.tubitak.gov.tr/open> 15 pp.
- Pekbey G, Hayat R (2013a) *New records and distributional data on Sarcophaga (Heteronychia) (Diptera: Sarcophagidae) from Turkey*. *Turkish Journal of Zoology* 37: 458–461. <https://doi.org/10.3906/zoo-1208-28>
- Pekbey G, Hayat R (2013b) *New records of Miltogramminae and Paramacronychiinae (Diptera: Sarcophagidae) from Turkey*. *Turkish Journal of Zoology* 37: 514–518. <https://doi.org/10.3906/zoo-1207-1>
- Pekbey G, Hayat R (2013c) *New records and updated distributions of Blaesoxipha Loew, 1861 (Diptera: Sarcophagidae) from Turkey*. *Journal of the Entomological Research Society* 15: 25–36.
- Pekbey G, Hayat R, Richet R (2011a) *Sarcophaga (Heteronychia) turana (Rohdendorf, 1937)*. Türkiye et sinekleri (Diptera: Sarcophagidae) faunası için yeni bir kayıt. Türkiye IV. Bitki Koruma Kongresi, 28–30 Haziran 2011, Kahramanmaraş, 194 pp.
- Pekbey G, Hayat R, Richet R, Blackith RM (2011b) *A new species of Sarcophaga (Sarcophaga) (Diptera: Sarcophagidae) from Turkey*. *Turkish Journal of Entomology* 35: 285–293.
- Povolný D, Verves Yu G (1997) *The flesh-flies of Central Europe (Insecta, Diptera, Sarcophagidae)*. *Spixiana, Suppl.* 24: 1–264.

- Rohdendorf BB (1937) Sarcophagidae. I. Sarcophaginae. Fauna SSSR. Nasekomye dvukrylye, 19, Pt 1: i–xv: 1–501. [In Russian with German summary]
- Rohdendorf BB (1955) The species of genus *Metopia* Mg. (Diptera, Sarcophagidae) from USSR and neighboring countries. Entomologicheskoe Obozrenie 34(2): 360–373.
- Rohdendorf BB (1971) 64 h. Sarcophaginae. Die Fliegen der paläarktischen Region 11(285): 129–176.
- Rohdendorf BB (1975) 64 h. Sarcophaginae. Die Fliegen der paläarktischen Region 1(311): 177–232.
- Rohdendorf BB (1988) Family Sarcophagidae pp. 1021–1096. In: Bey-Bienko GY (Ed.) Keys to the Insects of the European part of the USSR 5(2): i–xxii: 1–1505. Smithsonian Institution Libraries & National Science Foundation, Washington, D. C.
- Şaki CE, Özer E (1999a) Morphology and development of several external myiasis larvae recorded in Elazığ. Turkish Journal of Veterinary and Animal Science, 23, Suppl. 4: 723–731. [In Turkish with English summary]
- Şaki CE, Özer E (1999b) Morphology and seasonal distributions of external myiasis flies determined in Elazığ province. Turkish Journal of Veterinary and Animal Science 23: Suppl. 4: 733–746. [In Turkish with English summary]
- Sevgili M, Şaki CE, Özkutlu Z (2004) External myiasis in the Şanlıurfa Province: The distribution of flies. Turkish Journal of Parasitology 28: 150–153.
- Tuygun N, Taylan–Ozkan A, Tanir G, Mumcuoğlu KY (2009) Furuncular myiasis in a child caused by *Wohlfahrtia magnifica* (Diptera: Sarcophagidae) associated with eosinophilia. Turkish Journal of Pediatrics 51: 279–281.
- Ütük AE (2006) Traumatic myiasis in a dog. Firat Üniversitesi Sağlık Bilimleri Veteriner Dergisi 20: 97–99. [In Turkish with English summary]
- Verves Yu G (1982a) Palaeartic species of the genus *Chaetapodacra* (Diptera, Sarcophagidae). Zoologicheskii zhurnal 61(10): 1524–1530.
- Verves Yu G (1982b) Revision of the Palaeartic species of the genera *Miltogrammoides*, *Pediasiomysia* and *Rhynchapodacra* (Diptera, Sarcophagidae, Miltogrammatinae). Insects of Mongolia 8: 483–544.
- Verves Yu G (1985) 64h. Sarcophaginae. Die Fliegen der paläarktischen Region 11(330): 297–400.
- Verves Yu G (1986a) Family Sarcophagidae. In: Soós Á, Papp L (eds). Catalogue of Palaeartic Diptera. Vol. 12. Budapest- Amsterdam- New York, Calliphoridae – Sarcophagidae: 58–193.
- Verves Yu G (1986b) A present status of the knowledge of Sarcophagidae (Diptera) fauna of the world. Problems of General and Molecular Biology 5: 3–15.
- Verves Yu G (1989a) A review of the subtribes Phytosarcophagina, Erwinlindneriina, Kozloveina and Xanthopteriscina (Sarcophagini, Sarcophaginae, Sarcophagidae, Diptera). Scientific Report of High School, Biological Sciences 2: 31–37. [In Russian with English summary].
- Verves Yu G (1989b) A review of the subtribes Harpagophallina and Heteronychiina (Diptera, Sarcophagidae). Zoologicheskii Zhurnal 68: 89–97. [In Russian with English summary].
- Verves Yu G (1993) 64h. Sarcophaginae. In: Lindner E (Ed.) Die Fliegen der paläarktischen Region 11: 441–504.

- Verves Yu G (1994) A key to genera and subgenera of Palaearctic Miltogrammatinae (Diptera: Sarcophagidae) with a description of a new genus. *International Journal of Dipterological Research* 5: 239–247.
- Verves Yu G, Barták M, Kubík Š (2015a) Sarcophagidae (Diptera) of Vráž near Písek (Czech Republic). In: Kubík Š, Barták M (Eds) 7th Workshop on Biodiversity: pp. 68–79. Jevany, Česká Zemědělská Univerzita v Praze.
- Verves Yu G, Radchenko V, Khrokalo L (2015b) A review of species of subtribe Apodacrina Rohdendorf, 1967 with description of a new species of *Apodacra* Macquart, 1854 from Turkey (Insecta: Diptera: Sarcophagidae: Miltogramminae: Miltogrammini). *Turkish Journal of Zoology* 39: 263–278. <https://doi.org/10.3906/zoo-1312-14>
- Verves Yu G, Khrokalo LA (2006a) Review of Macronychiinae (Diptera, Sarcophagidae) of the world. *Vestnik zoologii* 40(3): 219–239.
- Verves Yu G, Khrokalo LA (2006b) 123. Fam. Sarcophagidae – sarcophagids. Key to the insects of Russian Far East 6(4): 64–178. Vladivostok. [In Russian].
- Verves Yu G, Khrokalo LA (2009) 14. Superfamily Oestroidea. Family Sarcophagidae. In: Gerlach J (Ed.), *The Diptera of the Seychelles islands*. Pensoft Series Faunistica 85: 270–303.
- Verves Yu G, Khrokalo LA (2015) Review of Heteronychiina (Diptera, Sarcophagidae). *Priamus*, Suppl. 36: 1–60.
- Whitmore D (2010) Systematics and phylogeny of *Sarcophaga* (*Heteronychia*) (Diptera: Sarcophagidae). Ph. D. dissertation. Dipartimento di biologia animale e ell"uomo Università di roma "la sapienza" scuola di dottorato in biologia animale, Roma 22: 257 pp.
- Whitmore D (2011) New taxonomic and nomenclatural data on *Sarcophaga* (*Heteronychia*) (Diptera: Sarcophagidae), with description of six new species. *Zootaxa* 2778: 1–57.
- Whitmore D, Pape T, Cerretti P (2013) Phylogeny of *Heteronychia*: the largest lineage of *Sarcophaga* (Diptera: Sarcophagidae). *Zoological Journal of the Linnean Society* 169: 604–639. <https://doi.org/10.1111/zoj.12070>
- Xue W, Verves Yu, Du J (2011) A review of subtribe Boettcheriscina Verves 1990 (Diptera: Sarcophagidae), with descriptions of a new species and genus from China. *Annales de la Société Entomologique de France (N.S.)* 47: 303–329.
- Xue W–Q, Verves Yu G, Wang P (2015) Review of *Senotainia* Macquart with a new species from South China (Diptera: Sarcophagidae: Miltogramminae). *Journal of Shenyang Normal University (Natural Science Edition)* 33: 447–454.
- Yazgi H, Uyanık MH, Yörük Ö, Aslan İ (2009) Aural myiasis by *Wohlfahrtia magnifica*: case report. *The Eurasian Journal of Medicine* 41: 194–196.
- Yıldırım I, Ceyhan M, Cengiz AB, Şaki CE, Özer E, Beken S, Cilsal E (2008) What's eating you? Cutaneous myiasis (*Wohlfahrtia magnifica*). *Cutis* 82: 396–398.
- Yuca K, Çaksen H, Sakin YF, Yuca SA, Kırış M, Yılmaz H, Çankaya H (2005) Aural myiasis in children and literature review. *Tohoku Journal of Experimental Medicine* 206: 125–130. <https://doi.org/10.1620/tjem.206.125>