

Contributions to the Knowledge of Flesh Flies (Diptera: Sarcophagidae) from Turkey, with a New Record

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Abstract: A total of 13 species of Sarcophagidae (Diptera) belonging to 2 subfamilies collected from different localities in Turkey between 1994 and 2006 were examined. *Wohlfahrtia meigeni* (Schiner, 1862) is recorded for the first time from Turkey. This new record increases the number of flesh flies known from Turkey to 86. New locality records are given for all 13 species.

Key Words: Flesh flies, Sarcophagidae, Diptera, Turkey

Yeni Bir Kayıtlarla Birlikte Türkiye Et Sinekleri (Diptera: Sarcophagidae) Faunasına Katkıları

Özet: 1994-2006 yılları arasında Türkiye'nin değişik yerlerinden toplanan 13 Sarcophagidae (Diptera) türü değerlendirilmiş, bunlardan *Wohlfahrtia meigeni* (Schiner, 1862) Türkiye faunası için yeni kayıt olarak belirlenmiştir. Ayrıca, tüm türler için yeni lokalite kayıtları verilmiştir.

Anahtar Sözcükler: Et sinekleri, Sarcophagidae, Diptera, Türkiye

Introduction

Sarcophagidae (flesh flies) is a medium-sized family of Diptera with some 2600 known species worldwide, which includes specialists ranging from inhabitants of pitcher plants to bat coprophages, crab saprophages, wasp nest inquilines, and insect parasitoids (Pape et al., 2006). Additionally, one species, *Sarcophaga protuberans*, also develops on lizard eggs (Pape and Arribas, 1999).

The studies on Turkish Sarcophagidae are very limited. Some studies on general taxonomy, biology, and faunistics were performed by Süreyya (1931), Rohdendorf (1937), Nizamlioğlu (1954), Collart (1962), Merdivenci (1966), and Ebejer (2000). Additionally, some new Turkish records were given in the checklist and catalogue of Palaearctic and world species by Verves (1986) and Pape (1996), respectively. Kara and Pape (2002) listed 81 Turkish sarcophagid species with 43 new records. After that, Aslan (2006) carried out a faunistic and systematic study and added another 4 species to the Turkish fauna.

The aim of this study was to provide an update of the current knowledge on the sarcophagid fly fauna of Turkey. The number of species of Sarcophagidae known from Turkey is 85 (Kara and Pape, 2002; Aslan, 2006), and with this study the number is increased to 86. Turkey is a large country having various geographical regions and climates, and the true number of sarcophagid species should be expected to be substantially more than this. More studies should be conducted on this important group.

Materials and Methods

The specimens were collected from different localities mainly within Kayseri province in Turkey, in 1994-2006, and were deposited in the Entomology Museum, Erzurum, Turkey (EMET). All material was obtained by sweeping. The species were determined by the second author.

The newly recorded species was described and photographs of important body parts showing diagnostic

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taxonomic characters were taken. The following information is given for the material listed: Administrative district (province): number of ♂, ♀ (town, village or specific locality, altitude, date, collector).

The classification reported by Pape (1996) is followed in this paper.

Results

Totally, 13 species belonging to 2 subfamilies were determined in this study from Turkey.

Subfamily: Paramacronychiinae

***Wohlfahrtia meigeni* (Schiner, 1862)**

Material: Kayseri: 1♂ (Hörmetçi, 1054 m, 05.VIII.2004, leg. N. Karabiyik-Bayrak).

Distribution: Austria, Belgium, Bulgaria, former Czechoslovakia, Denmark, France, Germany, Hungary, Italy, Mongolia, North China, North America, Poland, Romania, Spain, Switzerland, former USSR (Azerbaijan, Byelorussian SSR, East and West Siberia, Far East, Kazakhstan, Latvia, Lithuania, Moldavia, Russian SFSR, Ukraine) and former Yugoslavia (Verves, 1986).

Remark: The distribution is that proposed by Verves, who distinguishes *Wohlfahrtia meigeni* (Schiner, 1862) from *Wohlfahrtia vigil* (Walker, 1849); we do not accept the synonymy of these 2 species reported by Pape (1996). We can separate these species using the following key:

- Extremity of the distiphallus rounded; ventral expansion of the distiphallus without microscopic teeth on the ventral margin and with a dorsal margin straight *W. meigeni*
- Extremity of the distiphallus not rounded with an angle; ventral expansion with microscopic teeth on the ventral margin and with a dorsal margin curved in the middle *W. vigil*

Turkish Records: New record for the Turkish fauna

Description: *Wohlfahrtia meigeni* is a medium-sized fly with dark spots on the dorsal surface of the abdomen (Figures 1.1, 2 and 2.1, 2), and its male and female genitalia display important taxonomic characters for

distinguishing this species from other closely related species.

Male genitalia (Figure 1.3-11): Cerci slender in profile, wider at the base and with numerous long setae on the dorsal margin and a few setae on the ventral margin (Figure 1.3), united dorsally in the upper part, separated distally by a long indentation less wide than a cercus in dorsal view (Figure 1.4). Surstylus with a long dorsal margin with a few setae and a short, bare ventral margin (Figure 1.5). Phallus in profile rounded at its extremity and with a long, triangular paired appendage almost perpendicular to the phallus (Figure 1.6). Gonopod in profile slightly but clearly curved, with 2 small apical teeth and a rather big blade-like structure at its base (Figure 1.8). Paramere in profile with a distal hook, with a wider base that has a seta ventrally (not visible on the photograph but clearly visible in the preparation) (Figure 1.9). Fifth sternite about 3.5 times wider than long in the middle part, with some setae in 2 groups near the posterior margin. Sclerite of the ejaculatory duct is a triangular blade with a darker base (Figure 1.11).

Female genitalia (Figures 2.3-10): Spermathecae short and oval (Figure 2.3). First genital tergite (TG1) about 4.33 times wider than long in the middle (tergite flattened between slides), with a row of 12-13 long bristles at its posterior margin (Figure 2.4). Second genital tergite (TG2) divided into 2 small trapezoidal pieces, each with 2 setae at the posterior margin (Figure 2.5). Third genital tergite divided into 2 small parts with a very few setulae and observable between them is the epiproct, a very small area with longer setae (Figure 2.6). Cerci small, with long setae but without particular features, observable between them is the hypoproct, a triangular group of short setae situated ventrally just after the vulva (Figure 2.7). Eighth sternite (ST8) about 2.75 times wider than long in the middle part, with a few rather long setae in the posterior half part (Figure 2.8). Seventh sternite (ST7) about 2.58 times wider than long in the middle part, with about 4 long setae on its slightly curved posterior margin and some setulae (Figure 2.9). Sixth sternite (ST6) about 2.88 times wider than long in the middle part, with about 8 long setae in its rectilinear posterior margin and some setulae in the posterior half (Figure 2.10).

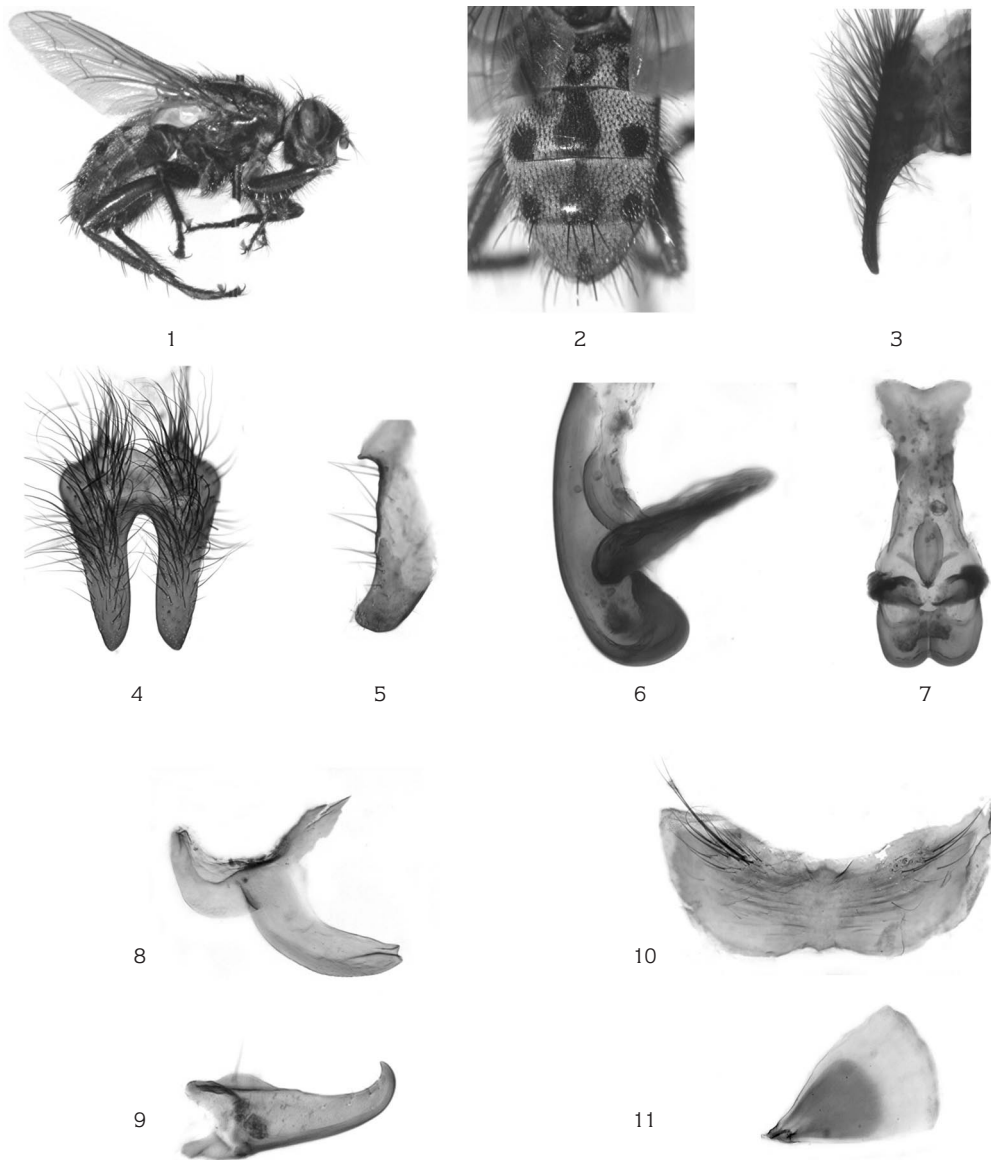


Figure 1. Male of *Wohlfahrtia meigeni* (Schiner): 1. Habitus in profile; 2. Spots on the abdomen; 3. Right cercus in profile, 4. Cerci in dorsal view, 5. Right surstylus in profile, 6. Distiphallus in profile, 7. Phallus in ventral view, 8. Right gonopod in profile, 9. Right paramere in profile, 10. Fifth sternite, 11. Sclerite of the ejaculatory duct.

Subfamily: Sarcophaginae

***Ravinia pernix* (Harris, 1780)**

Kayseri: 1♀ (Cırgalan, 1054 m, 21.VII.2004, leg. N. Karabıyık-Bayrak), 1♀ (Yahyalı, Ova Çiftliği, 1054 m, 10.VIII. 2004, leg. N. Karabıyık-Bayrak).

Distribution: Albania, Andorra, Austria, Belarus, Belgium, Britain I., Bulgaria, Canary Is., Corsica, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania,

Malta, Moldova, Norway, Poland, Portugal, Romania, Sardinia, Sicily, Slovakia, Spain, Sweden, Switzerland, The Netherlands, Turkey, Ukraine, and Yugoslavia (Kara and Pape, 2002; Pape, 2004).

Turkish Records: Adana, Eskişehir, Konya, Mersin, and Tokat (Kara and Pape, 2002; Aslan, 2006).

***Sarcophaga (Bercaea) africa* (Wiedemann, 1824)**

Kars: 1♂ (Kümbetli, 1200 m, 27.VII.1994, leg. M. Kardaş).

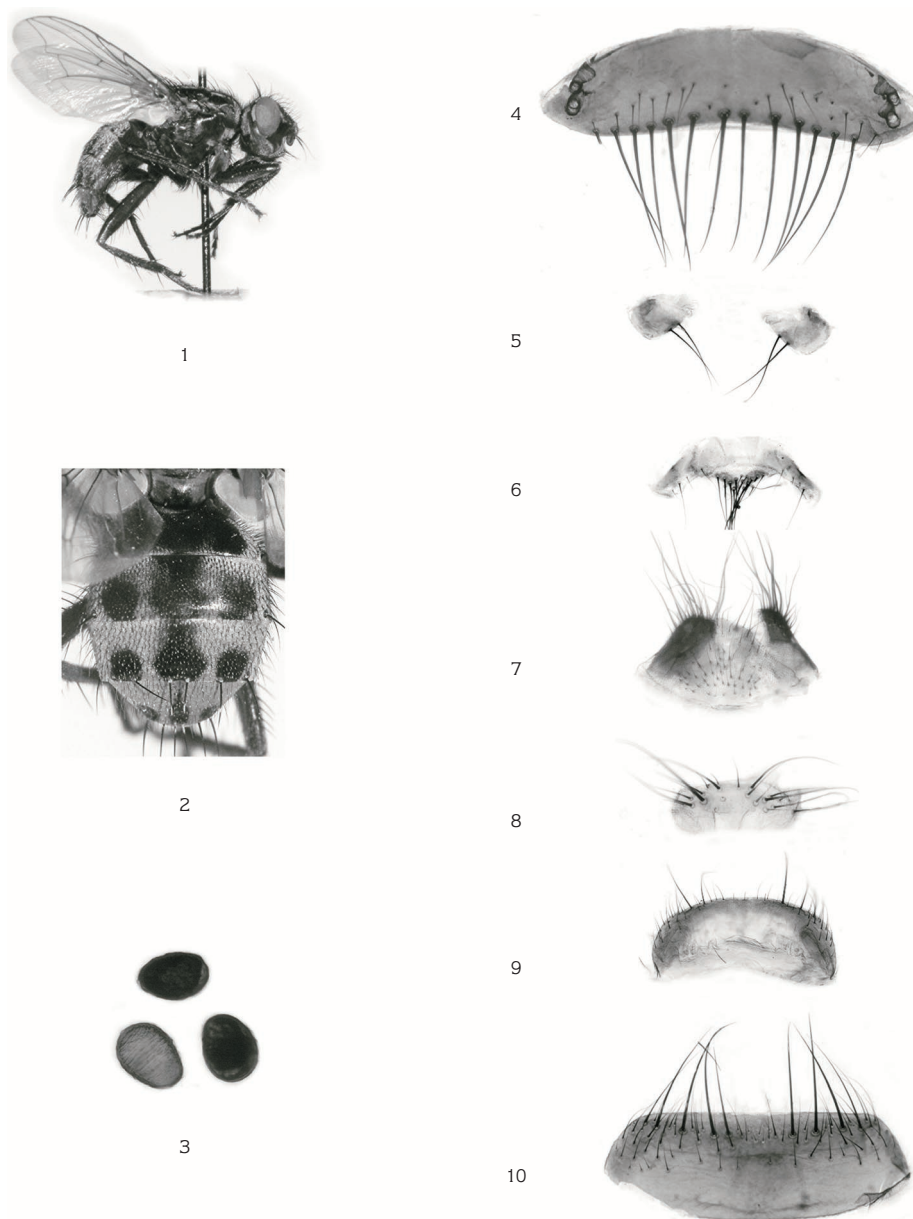


Figure 2. Female of *Wohlfahrtia meigeni* (Schiner): 1. Habitus in profile; 2. Spots on the abdomen; 3. Spermathecae; 4. TG1 (first genital tergite); 5. TG2 (second genital tergite) and epiproct (in the middle); 6. TG3 (third genital tergite) and epiproct; 7. The 2 cerci and the hypoproct; 8. ST8 (8th sternite); 9. ST7 (7th sternite); 10. ST6 (6th sternite).

Distribution: Albania, Austria, Belarus, Belgium, Britain I., Bulgaria, Canary Is., Corsica, Croatia, Cyprus, Czech Republic, Denmark, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Madeira, Moldova, Norway, Poland, Portugal, Romania, Sardinia, Sicily, Slovakia, Spain, Sweden, Switzerland, The Netherlands, Turkey, Ukraine, and Yugoslavia (Kara and Pape, 2002; Pape, 2004).

Turkish Records: No locality record (Kara and Pape, 2002), Eskişehir (Aslan, 2006).

Sarcophaga (Helicophagella) crassimargo (Pandellé, 1896)

Kayseri: 2♂ (Cırgalan, 1054 m, 21.VII. 2004, leg. N. Karabiyik-Bayrak), 1♀ (Yahyalı, Kocahacılı, 1054 m, 10.VIII.2004, leg. N. Karabiyik-Bayrak).

Distribution: Albania, Austria, Belgium, Britain I., Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Macedonia, Moldova, Norway, Poland, Romania, Slovakia, Spain, Sweden, Switzerland, The Netherlands, Turkey, Ukraine, and Yugoslavia (Kara and Pape, 2002; Pape, 2004).

Turkish Records: Amasya and Tokat (Kara and Pape, 2002).

Sarcophaga (Helicophagella) melanura (Meigen, 1826)

Kayseri: 1♀ (Cırgalan, 1054 m, 21. VII. 2004, leg. N. Karabıyık-Bayrak), 1♂ (Yenidoğan, 1054 m, 02.VIII.2004, leg. N. Karabıyık-Bayrak). Şanlıurfa: 1♂ (Çekçek, 550 m, 11.V.2005, leg. C. Yetkin), 1♀ (Karaali, 515 m, 12.V. 2005, leg. C. Yetkin).

Distribution: Albania, Austria, Belarus, Belgium, Britain I., Bulgaria, Canary Is., Corsica, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Macedonia, Malta, Moldova, Norway, Poland, Portugal, Romania, Sardinia, Sicily, Slovakia, Spain, Sweden, Switzerland, The Netherlands, Turkey, Ukraine, and Yugoslavia (Kara and Pape, 2002; Pape, 2004).

Turkish Records: No locality record (Kara and Pape, 2002), Eskişehir (Aslan, 2006).

Sarcophaga (Heteronychia) consanguinea (Rondani, 1860)

Adana: 1♂ (Kadirli, 85 m, 05.VII.1996, leg. H. Dal).

Distribution: Bulgaria, Corsica (doubtful), France, Greece, Italy, Sicily, Turkey, Ukraine, and Yugoslavia (Kara and Pape, 2002; Pape, 2004).

Turkish Records: Antalya (Kara and Pape, 2002).

Sarcophaga (Heteronychia) filia (Rondani, 1860)

Kayseri: 1♀ (Yenidoğan, 1054 m, 02.VIII.2004, leg. N. Karabıyık-Bayrak), 1♂ (Beydeğirmeni, 1054 m, 09.VIII.2004, leg. N. Karabıyık-Bayrak), Yahyalı, 1♂ (Kocahacılı, 1054 m, 10.VIII.2004, leg. N. Karabıyık-Bayrak). Trabzon: 1♀ (Center, 50 m, 31.VII.1996, leg. Ö. Kara).

Distribution: Albania, Austria, Belgium, Britain I., Bulgaria, Corsica, Czech Republic, France, Germany,

Greece, Hungary, Italy, Malta, Moldova, Poland, Romania, Slovakia, Switzerland, The Netherlands, Turkey, Ukraine, and Yugoslavia (Kara and Pape, 2002; Pape, 2004).

Turkish Records: Amasya, Antalya, Eskişehir, Tokat, and Samsun (Kara and Pape, 2002; Aslan, 2006).

Sarcophaga (Heteronychia) rondaniana (Rohdendorf, 1937)

Kayseri: 1♂ (İncesu, Derebağ, 1054 m, 09.VIII.2004, leg. N. Karabıyık-Bayrak).

Distribution: Austria, Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Hungary, Italy, Macedonia, Romania, Slovakia, Spain, The Netherlands, Turkey, and Yugoslavia (Kara and Pape, 2002; Pape, 2004).

Turkish Records: Amasya (Kara and Pape, 2002).

Sarcophaga (Heteronychia) setinervis (Rondani, 1860)

Kayseri: 1♂ (Cırgalan, 1054 m, 21.VII. 2004, leg. N. Karabıyık-Bayrak).

Distribution: Bulgaria, Cyprus, France, Greece, Hungary, Italy, Macedonia, Romania, and Turkey (Kara and Pape, 2002; Pape, 2004).

Turkish Records: No locality record (Kara and Pape, 2002).

Sarcophaga (Krameromyia) anaces (Walker, 1849)

Kayseri: 1♀ (Yenidoğan, 1054 m, 10.VIII.2004, leg. N. Karabıyık-Bayrak).

Distribution: Austria, Belgium, Britain I., Bulgaria, Croatia, Czech Republic, France, Germany, Hungary, Italy, Poland, Slovakia, Spain, Switzerland, The Netherlands, Turkey, and Ukraine (Kara and Pape, 2002; Pape, 2004).

Turkish Records: Amasya (Kara and Pape, 2002).

Sarcophaga (Liopygia) argyrostoma (Robineau-Desvoidy, 1830)

Isparta: 1♀ (Center, 1250 m, 20.VI. 2006, leg. R. Hayat). Mersin: 1♂ (Center, 50 m, 12.VII. 1998, leg. A. Ergür).

Distribution: Albania, Austria, Belgium, Britain I., Bulgaria, Canary Is., Croatia, Cyprus, Czech Republic, Denmark, France, Germany, Greece, Hungary, Italy, Macedonia, Madeira, Moldova, Poland, Portugal,

Romania, Sicily, Slovakia, Spain, Switzerland, The Netherlands, Turkey, Ukraine, and Yugoslavia (Kara and Pape, 2002; Pape, 2004).

Turkish Records: No locality record (Kara and Pape, 2002).

Sarcophaga (Sarcophaga) lehmanni (Mueller, 1922)

İğdir: 1♂ (Center, 700 m, 18.VII.1997, leg. D. Bacara). Kars: 1♂ (Kümbetli, 1200 m, 28.VII.1994, leg. M. Kardaş). Kayseri: 1♂ (Beydeğirmeni, 1054 m, 09.VIII.2004, leg. N. Karabiyik-Bayrak), 1♂ (Cırgalan, 1054 m, 21.VII.2004, leg. N. Karabiyik-Bayrak), 1♀ (Yahyalı, Sarıca, 1054 m, 10.VIII.2004, leg. N. Karabiyik-Bayrak).

Distribution: Albania, Andorra, Austria, Belarus, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Moldova, Norway, Poland, Romania, Sardinia, Sicily, Slovakia, Spain, Sweden, Switzerland, The Netherlands, Turkey, and Ukraine (Kara and Pape, 2002; Pape, 2004).

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- Turkish Records:** No locality record (Kara and Pape, 2002), İzmir and Manisa (Civelek and Tezcan, 2005, as *S. lasiostyla*), Eskişehir (Aslan, 2006).
- Sarcophaga (Sarcotachinella) sinuata* (Meigen, 1826)
- Kayseri: 1♀ (Kumarlı, 1054 m, 10.VIII.2004, leg. N. Karabiyik-Bayrak).
- Distribution:** Albania, Austria, Belarus, Belgium, Britain I., Bulgaria, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Moldova, Norway, Poland, Romania, Slovakia, Spain, Sweden, The Netherlands, Turkey, Ukraine, and Yugoslavia (Kara and Pape, 2002; Pape, 2004).
- Turkish Records:** Amasya and Tokat (Kara and Pape, 2002).

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