

Orijinal araştırma (Original article)

Current status of Dermaptera (Insecta) fauna of Turkey and Cyprus

Türkiye ve Kıbrıs Dermaptera (Insecta) faunasının güncel durumu

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Summary

Dermaptera fauna of Turkey and Cyprus were evaluated on the basis of recently collected specimens, revisions of museum and private collections and data from the literature. New data are reported on the occurrence of 18 species from Turkey and three species from Cyprus. The total number of species known from Turkey is 19 and from Cyprus is six. *Isolaboides kosswigi* (Burr, 1947) is the only endemic species in the Turkish dermapteran fauna. The first precise records of *Isolabella graeca* Verhoeff, 1901 and *Forficula lucasi* Dohrn, 1865 from Turkey are presented and the occurrence of *Anechura zubovskii* (Semenov, 1901) is confirmed by recent records. *Forficula auricularia* Linnaeus, 1758 is recorded from Cyprus for the first time. A key to the Dermaptera species of Turkey and Cyprus is also provided.

Key words: Dermaptera, fauna, Turkey, Cyprus, species key

Özet

Bu çalışmada Türkiye ve Kıbrıs Dermaptera faunasının son durumu, yakın zamanda toplanan örnekler, müze revizyonları, kişisel koleksiyon örnekleri ve literature dayanılarak gözden geçirilmiştir. Türkiye'den 18, Kıbrıs'dan 3 türe ait yeni lokalite kayıtları sunulmuş olup, bilinen toplam tür sayısı Türkiye'den 19, Kıbrıs'tan 6 tür olmuştur. *Isolaboides kosswigi* (Burr, 1947) türü Türkiye için tek endemik tür olarak bulunmuştur. Türkiye için *Isolabella graeca* Verhoeff, 1901 ve *Forficula lucasi* Dohrn, 1865 türlerinin ilk kesin lokalite kaydı verilmiş ve *Anechura zubovskii* (Semenov, 1901) türünün ise varlığı doğrulanmıştır. *Forficula auricularia* Linnaeus, 1758 türü Kıbrıs'tan ilk defa kaydedilmiştir. Ek olarak Türkiye ve Kıbrıs'dan bilinen Dermaptera türlerinin tanı anahtarı sunulmuştur.

Anahtar sözcükler: Dermaptera, fauna, Türkiye, Kıbrıs, tanı anahtarı

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Introduction

Dermaptera or earwigs are a relatively small, well defined and homogenous insect order that comprises about 2.200 species, which are mainly distributed throughout the warm and wet tropics, but with a minority of species in North America, Europe and Southern Asia (Popham, 2000). A fraction of the world's diversity, just over one hundred species (Steinmann, 1973, 1986, 1989b, 1990a, 1993), occurs in the Palaearctic region.

The Dermaptera fauna of Turkey has not been studied as a whole. All that is currently known is based on some older taxonomic works, regional species lists, recent revisions, species descriptions and summaries of the results of individual field trips. The publications have focused on some selected species of Dermaptera (Hincks, 1947; Burr, 1947a, b, 1952; Haas & Henderickx, 2002; Kočárek, 2007), or on fauna and ecological notes of some small areas (Tezcan & Kočárek, 2009; Anlaş et al., 2010). Some other concrete faunistic data are available from catalogues of museums (Burr, 1912; Steinmann, 1983; Önder, et al. 1999). Monographs dealing with the Dermaptera of larger geographical areas contain general information about their occurrence in Turkey (Fischer, 1853; Brunner von Wattenwyl, 1882; Werner, 1901; Bey-Bienko, 1936; Harz & Kaltenbach, 1976; Albouy & Caussanel, 1990; Steinmann, 1986, 1989a, b, 1990a, 1993; Herera Mesa, 1999). However, these monographs usually do not contain detailed faunistic data. The most comprehensive lists of Turkish Dermaptera were published by Weidner (1957) and Haas (2011) who listed 21 species belonging to 5 genera. The same applies to Cyprus; there are only a few publications that reported original data regarding the occurrence of Dermaptera (Burr, 1912; Werner, 1936; Harz & Kaltenbach, 1976; Reichardt, 1978; Haas & Henderickx, 2002).

The aim of the present study was to supplement the current knowledge of the Dermaptera of Turkey and Cyprus, based on the material collected and identified by the junior author, and material collected by other researchers and identified by the senior author. A check-list and identification key for the Dermaptera of Turkey and Cyprus are added.

Materials and Methods

Most specimens were collected by the first author during the years 2002-2011. Besides these, additional specimens from other collections were studied. We used the monographs of Steinmann (1986, 1989b, 1990a, 1993) to identify the specimens and nomenclature. The materials referred to in this study are deposited in the following collections:

LEMT	Lodos Entomological Museum, Izmir, Turkey (Serdar Tezcan)
NMP	National Museum of Prague, Czech Republic
ZDEU	Zoology Department of Ege University, Turkey (Bekir Keskin)
cAnI	First author's private collection
cKoc	Second author's private collection
cMal	Private collection of Zdeněk Malinka, Opava, Czech Republic
cOzg	Private collection of İnaç Özgen, Diyarbakır, Turkey
cYag	Private collection of Ersen Aydın Yağmur, Izmir, Turkey

Provinces of Turkey is given in Fig. 1.



Figure 1. Provinces of Turkey (<http://mad.serp.sitemynet.com>).

Results

More than 900 individuals of Dermaptera from Cyprus and Turkey, representing 18 species from Anisolabididae, Labiduridae and Forficulidae were collected and identified. Including published records, the Dermaptera fauna of Turkey and Cyprus consists of 19 and six species, respectively. *Isolaboides kosswigi* (Burr, 1947) is the only endemic species of Turkish Dermaptera fauna. The data are listed below.

Anisolabididae

Carcinophorinae

Anisolabis maritima (Bonelli, 1832)

Material examined: TURKEY: Artvin: 1 ex., 02.VII.2008, Yusufeli, Tekkale, leg. Yağmur (cAnI). Gaziantep: 1 ex., 19.XI.2006, Oğuzeli 1 km N, leg. Yağmur (cAnI); 3 exs., 15.XI.2010, Nurdağı, Sakçagözü, ca. 1000 m, leg. Anlaş & Yağmur (cAnI); 7 exs., 16.XI.2010, Şehitkamil, Kartal 1 km S, leg. Anlaş & Yağmur (cAnI, cYag). Hatay: 2 exs., 03.V.2007, Kumlu, Hamam, leg. Yağmur (cAnI). Manisa: 2 exs. 23.XI.2006, Central province, Karakoca, leg. Anlaş (cAnI). Muğla: 3 exs., 18.VI.2005, Milas, Konak ca. 600 m, 37°04'N, 27°54'E, leg. Anlaş (ZDEU, cAnI).

Published records: Turkey: Balıkesir, İzmir, Yalova (Werner, 1901; Burr, 1912, 1952b; Weidner, 1957; Mañan, 1977; Reichardt, 1978; Albouy & Caussanel, 1990; Haas & Henderickx, 2002).

Comments: This cosmopolitan species (Steinmann, 1989a) occurs especially in coastal areas (Albouy & Caussanel, 1990). In our study, *A. maritima* is recorded from Northeast, Central Southeast and West Anatolia.

Euborellia annulipes (Lucas, 1847)

Material examined: TURKEY: Antalya: 4 exs., 09.I.2010, Alanya, Taşatan Yaylası, 1057 m, 36°37'53"N, 32°03'53"E, leg. Yağmur & Kunt (cAnI). Burdur: 2 exs., 16.X.2009, Central province 5 km S, 1050 m, 37°42'07"N, 30°18'26"E, leg. Yağmur (cAnI). Hatay: 1 ex., 27.IV.2007, Reyhanlı, Bükülmez, leg. Yağmur; 2 exs., 04.V.2007, Kırıkhan, Narlıhopor 4 km W, leg. Yağmur (cAnI).

Published records: Turkey: Adana, Bolu, Bursa, Istanbul, Izmir, Yalova (Fischer, 1853; Brunner von Wattenwyl, 1882; Werner, 1901; Burr, 1952a, b; Weidner, 1957; Mařan, 1977; Reichardt, 1978; Önder et al., 1999; Haas & Henderickx, 2002).

Comments: This cosmopolitan species (Steinmann, 1989a) occurs in a variety of habits from plains to high altitude, usually in decaying organic matter. *E. annulipes* is recorded from South Anatolia.

***Euborellia moesta* (Géné, 1839)**

Published records: Cyprus: Larnaka (Burr, 1902; Reichardt, 1978). Turkey: not exact locality, Adana environs, Toros Dađları (= Cilicischer Taurus) (Werner, 1901; Mařan, 1977; Reichardt, 1978; Haas & Henderickx, 2002).

Comments: The species distributed in Africa, Southern Europe, Cyprus and Asia Minor (Reichardt, 1978; Steinmann, 1989a). *E. moesta* is known in Turkey only from the literature.

Labiduridae

Labidurinae

***Labidura riparia* (Pallas, 1773)**

Material examined: TURKEY: Adana: 8 exs., 6-9.VI.1996, Pozantı, 900 m, leg. Malinka (cMal). Afyonkarahisar: 3 exs., 11.VIII.2010, Şuhut, Dadak 2 km N, 1320 m, 38°36'18"N, 30°26'59"E, leg. Anlaş (cAnl). Adıyaman: 4 exs., 08.VII.2006, Besni, Eğri bank of creek, leg. Anlaş; 5 exs., 05.IV.2008, Besni, Belören 3 km NW, 37°40'22"N, 33°32'57"E, leg. Yađmur (cAnl). Aydın: 1 ex., 20.VI.2005, Incirliova, Arzular, 103 m, 37°53'44"N, 27°41'28"E, leg. Anlaş (ZDEU). Balıkesir: 4 exs., 30.X.2009, Havran, Çakirdere, 270 m, 39°30'09"N, 27°09'43"E, leg. Anlaş (LEMT, cAnl). Batman: 1 ex., 14.V.2005, Hasankeyf, Dicle river valley, leg. Malinka (cMal); 1 ex., 14.V.2005, Kozluk env., Ceyhan, leg. Malinka (cMal). Burdur: 4 exs., 11.VIII.2010, Eğirdir, Barla 10 km NE, Eğirdir lake, leg. Anlaş (cAnl). Diyarbakır: 1 ex., 15.IV.2010, Silvan 3 km N, Köcekdađ, 1184 m, 38°11'21"N, 41°00'30"E, leg. Yađmur & Özgen (cAnl); 2 exs., 06.VI.2010, Diyarbakır 20 km SW, Silvan road, Köprübaşı, leg. Özgen (cOzg), 1 ex., 26.V.2010, Ergani 7 km SW, near Çayönü, 850 m, 38°13'00"N, 39°43'09"E, leg. Özgen (cOzg). Elazığ: 2 exs., 01.VIII.2010, Central province, Dođukent, 1080 m, 38°40'50"N, 39°15'42"E, leg. Özgen (cOzg); 4 exs., 09.IV.2011, Keban 8 km SE, Ulupınar, Birvan creek, 1021 m, 38°43'53"N, 38°50'04"E, leg. Özgen & Yađmur (cAnl). Gaziantep: 1 ex., 17.IV.2006, Şahinbey, Ozanlı, leg. Yađmur (cAnl); 4 exs., 07.VII.2006, Araban, Gelinbuđdayı 3 km NE, leg. Anlaş (cAnl); 4 exs., 07.VII.2006, Şahinbey, bank of Karababa creek, leg. Anlaş. 1 ex., 12.XI.2006, Şahinbey, Sarısalkım 1 km S, leg. Yađmur (cAnl). Hatay: 3 exs., 14.IV.2007, Reyhanlı, Çakırıyıt 1 km W, leg. Yađmur (cAnl). Isparta: 1 ex., 10.VIII.2010, Aksu 10 km NE, Çayırıayla road, 1458 m, 37°48'06"N, 31°09'34"E, leg. Anlaş (cAnl). Izmir: 1 ex., 17.V.2004, Kemalpaşa, leg. Anlaş (cAnl). 2 exs., 04.X.2008, Aliađa, Karakuzu, 350 m., ca. 38°44'N, 27°10'E, leg. Anlaş (cAnl); 1 ex., 13.VI.2010, Kemalpaşa, Dereköy, leg. Yađmur (cYag). Kahramanmaraş: 8 exs, 04.VI.2006 and 09.III.2008 Türkođlu, Kızıleniř 3 km SW, 37°22'11"N, 36°48'54"E, leg. Yađmur (cAnl, cYag); 2 exs., 09.VII.2006, Nurhak, Nurhak Dađları, Kullartatlar, leg. Anlaş (cAnl); 4 exs., 31.V.2008, Elbistan, Büyükyapalak, 1365 m, 38°24'39"N, 37°18'27"E, leg. Yađmur (cAnl, cYag); 1 ex., 15.XI.2010, Pazarcık, Narlı 3 km N, 700 m 37°19'33"N, 37°09'38"E leg. Anlaş (cAnl). Karabük: 1 ex., central province 20 km E, 22-23.V.1996, leg. Malinka (cMal). Kilis: 3 exs., 08.VII.2006, Musabeyli, Akbayır, leg. Anlaş (cAnl); 1 ex., 16.III.2008, Ömerli 1 km SE, 1200 m, 36°52'01"N, 37°12'02"E, leg. Yađmur (cAnl). Kırklareli: 1 ex., 02.X.2009, Demirköyköy, İgneada, ca. 20 m, Hamam Lake, 41°49'43"N; E 27°57'31"E, leg. Kunt (cAnl). Konya: 1 ex., 13.VII.2010, Beyşehir, Çamlık, environs of Körükini Cave, leg. Kunt (cAnl). Kütahya: 3 exs., 24.IV.2010, Şaphane, Üçbař 2 km N, 900 m, 38°59'57"N, 29°54'22"E, leg. Anlaş (cAnl). Malatya: 2 exs., 09.VII.2006, Dođanşehir, Kapıdere, leg. Anlaş (cAnl); 1 ex., 02.V.2008, Dođanşehir, Boruk Dađı, 1100 m, 37°53'08"N, 37°43'04"E, leg. Yađmur (cAnl); 2 exs., 10.IX.2007, Yazıhan, Mısırdere, 715 m, 38°31'16"N, 38°08'05"E, leg. Anlaş (cAnl). Manisa: 2 exs., 11.II.2002, Gölmarmara, Haciveliler, leg. Anlaş (ZDEU).

cAnl); 3 exs., 03.IX.2003, Alaşehir, Azıtepe, leg. Anlaş (ZDEU, cAnl); 26 exs., 22.V.2002, 12.VI.2002, 27.IV.2003, 16.V.2004, 03.VI.2005 and 25.XI.2005, Turgutlu, Çıkrıkçı, ca. 300 m, 38°28'N, 27°49'E, leg. Anlaş (ZDEU, LEMT, cAnl); 1 ex., 24.II.2007, Central province, Örencik, leg. Anlaş (cAnl). Mardin: 1 ex., 31.V.2010, Derik, 820 m, 37°22'05"N, 40°57'59"E, leg. Özgen (cOzg). Mersin: 1 ex., 24.-26.VIII.1970, Erdemli, leg. Expedition of the National Museum in Prague (NMP). 1 ex., 18.VII.2010, Central province 20 km N, Aladağ 1,5 km W, 640 m., 36°56'21"N, 34°29'09"E, leg. Anlaş (cAnl); 1 ex., 20.VII.2010, Erdemli 17 km NW, Aydınlar 8 km SE, Sorgun çayı, 880 m., 36°45'41"N, 34°11'41"E, leg. Anlaş (cAnl). Muğla: 9 exs., 18.VI.2005, Central province, Derinkuyu, leg. Anlaş (ZDEU, cAnl); 3 exs., 18.VI.2005, Milas, Ören, leg. Anlaş (cAnl). Nevşehir: 1 ex., 15.VI.1970, Gülşehir, leg. Expedition of the National Museum in Prague (NMP). Osmaniye: 1 ex., 15.XI.2010, Bahçe, İnderesi 3 km NE, 1200 m 37°15'52"N, 36°39'40"E leg. Anlaş (cAnl). Şanlıurfa: 2 exs., 04.VII.2006, Central province 13 km E, leg. Yağmur (cAnl); 1 ex., 18.III.2007, Birecik, Adacık, leg. Yağmur (cAnl). Siirt: 3 exs., 19.VII.2010, Baykan 4 km E, ca. 770 m, 38°11'42"N, 41°49'03"E, leg. Yağmur (cAnl, cYag). Tunceli: 2 exs., 13.IX.2007, Central province 3 km N, Munzur river banks, 923 m, 39°07'12"N, 39°30'48"E, leg. Anlaş (cAnl); 4 exs., 13.IX.2007, Ovacık, Ağaçpınar 6 km E, Munzur river bank, 1197 m, 39°21'28"N, 39°19'51"E, leg. Anlaş (cAnl); 8 exs., 14.IX.2007, Çemişgezek 1,5 km NW, Ormanyolu creek, 948 m, 39°04'06"N, 38°54'18"E, leg. Anlaş & Yağmur (cAnl). Uşak: 3 exs., 29.V.2010, Eşme, Kısık 2 km NE, Gediz river bank, 470 m, 38°38'06"N, 28°57'19"E, leg. Anlaş (cAnl).

Published records: Turkey: Adana, Ankara, Aydın, Balıkesir, Burdur, Bursa, Edirne, Elazığ, Eskişehir, Gaziantep, İstanbul, Kahramanmaraş, Kayseri, Kilis, Manisa, Mardin, Mersin, Muğla, Van, Yalova and Tuz Gölü, (Werner, 1901, 1907; Ebner, 1910; Burr, 1952a, b; Weidner, 1957; Čejchan & Mařan, 1974; Harz & Kaltenbach, 1976; Mařan, 1977; Reichardt, 1978; Albouy & Caussanel, 1990; Önder et al., 1999; Haas & Henderickx, 2002; Anlaş et al., 2010).

Comments: This cosmopolitan species (Steinmann, 1989a, b) is very common and is recorded from nearly all parts of Anatolia and Thrace. *Labidura riparia* varies greatly in body colouration and size, shape of pronotum, texture and extent of elytra and wings, and shape of ultimate tergite and forceps. Many variations have been described and then synonymized (Steinmann, 1993). It is a carnivorous species (Haas & Henderickx, 2002).

Nalinae

Nala lividipes (Dufour, 1828)

Material examined: TURKEY: Giresun: 2 exs., 05.VII.2008, Çanakçı 10 km N, 40°57'44"N, 38°59'29"E, leg. Yağmur (cAnl). Kütahya: 2 exs., 24.IV.2010, Simav, Gölköy, leg. Anlaş (cAnl). Rize: 3 exs., 28.VI.2008, Çamlıhemşin, Ayder Yaylası, 40°55'49"N, 41°55'49"E, leg. Yağmur (cAnl).

Published records: Turkey: Adana (Mařan, 1977).

Comments: *Nala lividipes* is known from southern Europe to North Africa and the eastern half of Africa south of Sahara to Arabia, Iran, India and other parts of South-East Asia, China, Japan, Philippines and Australia (Steinmann, 1989a, b); Pakistan (Steinmann, 1975), Afghanistan (Bey-Bienko, 1967). *Nala lividipes* is often synanthropic and occasionally reported as a pest (Albouy & Caussanel, 1990). In our study, this species was recorded from North and West Anatolia.

Spongiphoridae

Isolaboidinae

Isolaboides kosswigi (Burr, 1947)

Material examined: TURKEY: Afyonkarahisar: 4 exs., 23.IV.2010, Sinanpaşa 15 km SW, Elvan 3 km SW, 1600 m, 38°42'48"N, 30°04'40"E, leg. Anlaş (cAnl); 1 ex., 23.IV.2010, Sinanpaşa, Uluköy 2 km

N, 1590 m, 38°45'28"N, 30°00'43"E, leg. Anlaş (cAnI). Bolu: 1 ex., 4.VI.1996, Abant Gölü, 1200 m, leg. Vavra (cKoc). Bursa: 1 ex., 19.IV.1992, Mudurnu env., 19.4.1992, leg. Malinka (cKoc); 1 ex., 26.IX.2010, Mezit 4 km S, Kestane village, ca. 600 m, 39°56'58"N, 29°42'05"E, leg. Yağmur (cAnI). Gaziantep: 6 exs., 16.XI.2010, Şehitkamil, Kartal 1 km S, leg. Anlaş & Yağmur (cAnI). İzmir: 4 exs., 21.V.2006, Bozdağlar, Ödemiş, 5 km SE Horzum, Subatan Yaylası, leaf litter and mushrooms sifted, leg. Anlaş (LEMT, cAnI); 2 exs., 27.III.2009, Yamanlar Dağı, ca. 600 m, 38°33'N, 27°10'E, leg. Anlaş (cAnI). Karabük: 8 ex., 22.X.2009, Yenice, Yazıkoy, 41°11'47"N, 32°20'16"E, leg. Kočárek (cKoc). Konya: 7 exs., 26.III.2011, Beyşehir Gölü, Hacıakif Adası, leg. Yağmur (cAnI). Manisa: 17 exs., 01.V.2002, 14.V.2004 and 03.VII.2007, environs of Dağmarmara, ca. 900 m, 38°28'N, 27°50'E, leg. Anlaş (LEMT, ZDEU, cAnI). Muğla: 2 exs., 07.VII.2009, Fethiye, Çiçek Dağı, 1750m, 37°03'40"N, 28°48'29"E, leg. Yağmur (cAnI).

Published records: Turkey: Burdur (Çavdır), Denizli, Manisa and Bosante? (Burr, 1947a, b, 1952b; Hincks, 1947; Mařan, 1977; Haas & Henderickx, 2002; Anlaş et al., 2010).

Comments: This species is endemic to Turkey (Steinmann, 1990a), and recorded from Northwest, West and Central Anatolia. There is also a record from the Gaziantep province of Central Southeast Anatolia. According to Anlaş et al. (2010), *I. kosswigi* prefers high elevations, and it is physiologically or behaviourally resistant to low temperatures.

Labiinae

***Isolabella graeca* Verhoeff, 1901**

Material examined: TURKEY: Balıkesir: 2 exs., 30.X.2009, Altınoluk, Adatepe, 300 m, 29°34'24"N, 26°37'18"E, leg. Anlaş (cAnI).

Published records: Turkey: Aydın, Burdur, Denizli, Muğla (those records are probably misidentifications, see comments) (Burr, 1947a, b; Harz, 1975; Harz & Kaltenbach, 1976; Reichardt, 1978).

Comments: *Isolabella graeca* is known from Greece (Steinmann 1990a). Harz & Kaltenbach (1976) published a record of *Isolabella graeca* from Denizli, but the record is based on the type specimens of *Isolaboides kosswigi* collected by Kosswig. Harz & Kaltenbach's description of *I. graeca* is confused with the description of *Isolaboides kosswigi*, because the authors considered these two species as synonyms, as did Reichardt 1978). The drawings published in Harz & Kaltenbach (1976) explicitly deal with *Isolaboides kosswigi*, not *Isolabella graeca*. Therefore, the presented finding from Altınoluk is the first correct record from Turkey.

***Labia minor* (Linnaeus, 1758)**

Material examined: TURKEY: Antalya: 1 ex., 08.I.2010, Alanya, İncekum, 24 m, 36°38'23"N, 31°45'30"E, leg. Yağmur & Kunt (cAnI). İzmir: 2 exs., 22.I.2011, environs of Balçova Barajı, leg. Anlaş (cAnI). Karabük: 1 ex., 7.V.2005, Safranbolu, 41°17'50"N, 32°42'15"E, leg. Kment (NMP). Kütahya: 2 exs. 24.IV.2010, Simav 10 km NW, near Simav Gölü, 720 m, 39°10'32"N, 28°55'21"E, leg. Anlaş (cAnI). Mersin: 3 exs., 24.-26.VIII.1970, leg. Expedition of the National Museum in Prague (NMP); 1 ex., 6.V.2007, Silifke, Kızkalesi env., Adamkavalar, 281 m, 36°29'01"N, 34°07'09.5"E, leg. Kment, (NMP).

Published records: Turkey: Adana, Edirne, Eskşehir, İstanbul, İzmir, Mersin (Brunner von Wattenwyl, 1882; Werner, 1901; Ebner, 1910; Burr, 1912, 1952b; Bey-Bienko, 1936; Weidner, 1957; Čejchan & Mařan, 1974; Mařan, 1977; Reichardt, 1978; Önder et al., 1999; Haas & Henderickx, 2002).

Comments: This cosmopolitan species (Steinmann, 1990a) was recorded from South, North and West Anatolia in our study.

Forficulidae**Anechurinae*****Anechura bipunctata* (Fabricius, 1781)**

Material examined: TURKEY: Ağrı: 5 exs., 18.VI.1970, Tahir Geçidi, 2475 m, leg. Expedition of the National Museum in Prague, (NMP); 1 ex., 1.5.1999, Dogubayazit, leg. Orszulik (cKoc). Bayburt: 1 ex., 14.V.2005, Bayburt castle, 1595 m, 40°15'53.6''N, 40°13'34.8''E, leg. Kment (NMP). Erzurum: 2 ex., 26.-28.VI.2004, 15 km SW Erzurum, Palandoken Dağları, Tekederesi village env., 1930-2625 m, leg. Hájek & Růžička (NMP). Hatay: 2 exs., 29.IV.2007, Yayladağı 1 km N, leg. Yağmur (cAnl); 5 exs., 29.IV.2007, Yayladağı, Denizgören, Çandır vill., Keldağ, leg. Yağmur & Yalçın. Kahramanmaraş: 5 exs., 31.V.2008, Elbistan, Büyükyapalak, 1365 m, 38°24'39''N, 37°18'27''E, leg. Yağmur (cAnl, cYag). Kayseri: 3 exs., 17.IX.1998, Erciyes Dağı, 3300 m, leg. Bezdek, (cKoc). 12 exs., 07.VII.2007, Erciyes Dağı, 2075 m, 38°35'19''N, 35°29'54''E, leg. Yağmur & Gramov (cAnl, cYag). Van: 6 exs., 27.VI.1993, Muradiye Kalesi, leg. Bosak, (cKoc); 3 exs., 21.VI.1993, Gevaş, leg. Bosak, (cKoc). Niğde: 2 exs., 19.V.2005, Ala Dağlar, Kavaktepe, Camardı env., 1750-2200 m, leg. Malinka (cMal); 1 ex., 19.5.2005, Ala Dağlar, Demirkazık, Cimbar canyon, leg. Malinka (cMal).

Published records: Turkey: Ağrı, Amasya, Ankara? (Elmadağ), Antalya, Bayburt, Bursa, Hakkari, Izmir, Kars, Kayseri, Niğde-Mersin (Bolkar Dağları), Tunceli, Van and Keldi dağ? [Werner (1901), Burr (1912, 1952b), Weidner (1957), Mañan (1977), Harz & Kaltenbach (1976), Reichardt (1978), Steinmann (1983), Albouy & Caussanel (1990), Herera Mesa (1999), Önder et al. (1999), Haas & Henderickx (2002)].

Comments: This alpine species is distributed in Europe, West and Central Asia (Steinmann, 1989a, 1993); Armenia (Albouy & Caussanel, 1990), Afghanistan, Turkmenistan (Albouy & Caussanel, 1990), Iran (Kočárek, 2011). In our study, *A. bipunctata* is recorded especially from high mountains in Turkey.

***Anechura zubovskii* (Semenov, 1901)**

Material examined: TURKEY: Kahramanmaraş: 1 ex., 31.V.2008, Elbistan, Büyükyapalak, 1365 m, 38°24'39''N, 37°18'27''E, leg. Yağmur (cAnl). Van: 12 exs., 22.VI.2007, Başkale 25 km NW, Gökdağ Mts., 2500 m, 38°10'52''N, 43°56'12''E, leg. Koç & Gramov (cAnl); 2 exs., 21.VI.2007, Kozluca, 2076 m, 38°28'45''N, 42°32'24''E, leg. Koç & Gramov (cAnl).

Published records: Turkey: Ağrı (Semenov, 1901).

Comments: *A. zubovskii* occurs in mountainous regions of China, India, Turkmenistan and Iran (Steinmann, 1993; Kočárek, 2011). Its distribution in Turkey includes mountainous regions of Ağrı province (Semenov, 1901). The presented findings confirm the occurrence of this species in Turkey more than 100 years after the last report.

Forficulinae***Apterygida media* (Hagenbach, 1822)**

Published records: Cyprus: Pano Platrás (Werner, 1936; Herrera Mesa, 1999; Reichardt, 1978; Haas & Henderickx, 2002).

Comments: This European species is distributed from England to Spain, and Greece, former Yugoslavia, Hungary, Austria, Switzerland, Germany and Belgium (Steinmann 1989b).

***Forficula aetolica* Brunner, 1882**

Material examined: CYPRUS: Girne: 3 exs., 13.III.2011, Selvilitepe 1 km N, 980 m, 35°19'11''N, 33°09'47''E, leg. Anlaş (cAnl). Lefkoşa: 1 ex., 12.III.2011, Değirmenlik, Yaylatepe 2 km S, environs Alevkayası, 820 m, 35°17'28''N, 33°33'03''E, leg. Anlaş (cAnl). 1 ex., 13.III.2011, Yılmazköy, 700 m,

35°18'16''N, 33°13'27''E, leg. Anlaş (cAnl). Pafos: 1 ex., 01.01.2011, central province, leg. Silha (cKoc). TURKEY: Burdur: 1 ex., 16.X.2009, Central province 5 km S, 1050 m, 37°42'07''N, 30°18'26''E, leg. Yağmur (cAnl). Gaziantep: 4 exs., 17.III.2007, Şahinbey, Çimenli, leg. Yağmur (cAnl). Manisa: 2 exs., 11.VI.2004, Göl marmara Lake, leg. Anlaş (cAnl); 2 exs., 19.II.2006, Turgutlu, Ayvacık, leg. Anlaş (cAnl). Mersin: 1 ex., 10.-12.VII.1998, Erdemli 15 km NW, Aslanlı, Göktepe Dağı, leg. Bezdek (cKoc). Osmaniye: 1 ex., 9-11.2005, Hasanbeyli env., Nur Dağları, Nurdağı-Kuşçubeli Geçidi, 1120-1250 m, leg. Malinka (cKoc). Siirt: 1 ex., 11.IV.2011, Kurtalan 5 km W, 850 m, 37°58'07''N, 41°43'54''E, leg. Yağmur & Özgen (cAnl). Şanlıurfa: 3 exs., 11.IV.2008, Siverek 15 km S, 37°39'00''N, 39°12'52''E, leg. Yağmur (cAnl). Van: 4 exs., 21.VI.2007, Kozluca, 2076 m, 38°28'45''N, 42°32'24''E, leg. Koç & Gramov (cAnl).

Published records: Cyprus: Siná and Pizoula (Burr, 1912; Reichardt, 1978; Haas & Henderickx, 2002). Turkey: Bursa, Izmir, Manisa (Brunner von Wattenwyl, 1882; Werner, 1901; Harz, 1975; Reichardt, 1978; Steinmann, 1990a; Haas & Henderickx, 2002; Anlaş et al., 2010).

Comments: The species occurs in Crimea, Caucasus, Asia Minor, Lebanon, Greece and Cyprus (Steinmann, 1993). In our study, it was recorded from East, West, Central South and Southern Anatolia.

***Forficula auricularia* Linnaeus, 1758**

Material examined: CYPRUS: Lefkoşa: 2 exs., 12.III.2011, Değirmenlik, Yaylatepe 2 km S, environs Alevkayası, 820 m, 35°17'28''N, 33°33'03''E, leg. Anlaş (cAnl). TURKEY: Adıyaman: 3 exs., 11.III.2007, Tut 5 km SW, leg. Yağmur (cAnl); 3 exs., 20.IV.2008, Gerger, Koşarköy 2 km N, 38°02'25''N, 39°05'26''E, leg. Yağmur (cAnl); 5 exs., Gerger, Gölyurt 10 km SW, 38°06'04''N, 39°07'03''E, leg. Yağmur (cAnl, cYag). Artvin: 1 ex., 1.-3.VII.1997, near Murgul, Damar leg. Prudek & Riha (cKoc). Aydın: 2 exs., 25.XII.2005, Kuşadası, Dilek Yarımadası, pine and oak litter, 950 m, 37°39'23''N, 27°08'14''E, leg. Anlaş (cAnl). Burdur: 3 exs., 16.X.2009, Central province 5 km S, 1050 m, 37°42'07''N, 30°18'26''E, leg. Yağmur (cAnl). Diyarbakır: 5 exs., 13.IV.2010, Çüngüş, Camiisak, 1025 m, 38°12'50''N, 39°16'50''E, leg. Yağmur & Özgen (cAnl, cOzg). Elazığ: 1 ex., 27.V.2010, Central province, Doğukent, 1080 m, 38°40'50''N, 39°15'42''E, leg. Özgen (cOzg). Gaziantep: 5 exs., 12.XI.2006, Şahinbey, Sarısalıkım, leg. Yağmur (cAnl); 8 exs., 25.V.2007, Islahiye, Hanağzı, 37°03'33''N, 36°36'24''E, leg. Yağmur (cAnl, cYag); 9 exs., 15.XI.2010 and 18.XI.2010, Islahiye, Kabaklar, 775 m, 37°02'08''N, 36°34'03''E, leg. Anlaş & Yağmur (cAnl); 2 exs., 16.XI.2010, Şehitkamil, Kartal 1 km S, leg. Anlaş & Yağmur (cAnl). Hakkari: 3 exs., 19.V.2010, Çukurca 2 km SE, leg. Yağmur (cAnl). Hatay: 1 ex., 04.V.2005, Nur Dağları, Belen, Topboğazı Geçidi, 750-800 m, leg. Malinka (cMal); 5 exs., 15.IV.2007, Hassa 2 km S, leg. Yağmur (cAnl); 2 exs., 14.IV.2007, Hassa, Küreci-Zeytinoba, leg. Yağmur (cAnl); 5 exs., 15.V.2007, Hassa, Aktepe, 36°41'25''N, 36°29'34''E, leg. Özkörük (cAnl); 4 exs., 23.IV.2008, Akbez, Koruhöyük 2 km E, 36°49'05''N, 36°36'04''E, leg. Yağmur (cAnl). Izmir: 7 exs., 21.V.2006, Bozdağlar, Ödemiş, 5 km SE Horzum, Subatan Yaylası, leg. Anlaş (cAnl); 4 exs., 22.I.2011, environs of Balçova Barajı, leg. Anlaş (cAnl). Kastamonu: 1 ex., 18.V.2009, Pınarbaşı environs, 670 m, 41°36'39''N, 33°06'55''E, leg. Koç (cAnl). Kırklareli: 1 ex., 30.IX.2009, Demirköy, Yıldız Dağları, Mahya Mountain, 815 m, 41°47'00''N, 27°35'59''E, leg. Kunt (cAnl). Kilis: 1 ex., 01.III.2008, Kilis Hassa road, Kilis 22 km W, ca. 36°49'N, 36°53'E, leg. Yağmur (cAnl). Konya: 16 exs., 26.III.2011, Beyşehir Gölü, Hacıakif Adası, leg. Yağmur (cAnl); 1 ex., 26.III.2011, Beyşehir, Yeşildağ, leg. Yağmur (cYag). Malatya: 2 exs., 02.V.2008, Doğanşehir, Boruk Dağı, 1100 m, 37°53'08''N, 37°43'04''E, leg. Yağmur (cAnl). Mardin: 6 exs., 24.VII.2006, Yeşilli, Gül mahalle, leg. Ahmet; 2 exs., 17.IV.2007, Yeşilli, Tepebaşı, leg. Yağmur (cAnl); 2 exs., 30.I.2008, Yeşilli 1 km W, leg. Anlaş; 5 exs., 16.IV.2010, Savur, Sürgücü 2 km N, leg. Yağmur (cAnl). Manisa: 9 exs., 15.IV.2002, 11.III.2003, 14.IV.2003, Çıkrıkçı, leg. Anlaş (ZDEU, LEMT, cAnl); 1 ex., 21.X.2006, Köprübaşı, Dibekdağı, leg. Anlaş (cAnl); 3 exs., 26.XI.2006, Kula, Balıbey, leg. Anlaş (cAnl); 1 ex., 26.XI.2006, Kula, Incesu, leg. Anlaş (cAnl); 2 exs., 18.XI.2006, Göl marmara, Beyler 1 km NE, 120 m, 38°42'10''N, 27°58'56''E, leg. Anlaş (cAnl); 1 ex., 16.XII.2006, Akhisar, Pekmezci, leg. Anlaş (cAnl); 1 ex., 16.XII.2006, Gördes, Çiçekli, leg. Anlaş (cAnl); 1 ex., 23.XII.2006, Central province, Spil Dağı, 1100 m, 38°33'44''N, 27°23'10''E, leg. Anlaş (cAnl). Mersin: 1 ex., 8.-9.VI.1996, Camlıyayla, 1000-1200 m, leg. Vavra (cKoc). Güzeloluk env., Göktepe

Dağı, 1400 m, leg. Bezdek (cKoc). Nevşehir: 1 ex., 20.IV.1992, Hacibektaş and Gümüşkent env., leg. Malinka (cMal). Siirt: 4 exs., 21.V.2010 and 19.XI.2010, Baykan 4 km E, ca. 770 m, 38°11'42"N, 41°49'03"E, leg. Anlaş & Yağmur (cAnl, cYag). Şırnak: 4 exs., 12.V.2007, Yalıntepe, Dicle 4 km W, leg. Yağmur (cAnl); 8 exs., 20.V.2010, Silopi, Görümlü, 1010 m, 37°20'10"N, 42°34'30"E, leg. Yağmur (cAnl, cYag). Tunceli: 5 exs., 13.IX.2007, Ovacık, Ağaçpınar 6 km E, Munzur river banks, 1197 m, 39°21'28"N, 39°15'51"E, leg. Anlaş (cAnl). Van: 2 exs., 08.VII.1973, Gevaş-Reşadiye leg. Expedition of the National Museum in Prague (NHP); 4 exs., 21.VI.2007, environs of Reşadiye, 1700 m, 38°28'45"N, 42°32'24"E, leg. Koç & Gramov (cAnl); 8 exs., 21.VI.2007, Kozluca, 2076 m, 38°28'45"N, 42°32'24"E, leg. Koç & Gramov (cAnl).

Published records: Turkey: Adıyaman, Afyonkarahisar, Amasya, Ankara, Antalya, Artvin, Bitlis, Bolu, Burdur, Bursa, Çanakkale, Çankırı, Çorum, Diyarbakır, Elazığ, Eskişehir or İzmir (Boz Dağı), Giresun, Hakkari, İstanbul, İzmir, Kahramanmaraş (Engizek Dağı), Kayseri, Kırşehir, Konya, Malatya, Manisa, Mardin, Muş, Rize, Samsun, Siirt, Tokat, Trabzon, Van, Zonguldak, without provinces: Eastern Anatolia (Karasu and Kandilli) and Toros Dağları, (Brunner von Wattenwyl, 1882; Werner, 1901; Ebner, 1910; Burr, 1912, 1947, 1952a, b; Weidner, 1957; Čejchan & Mařan, 1974; Mařan, 1977; Reichardt 1978; Albouy & Caussanel, 1990; Önder et al., 1999; Haas & Henderickx, 2002; Tezcan & Kočárek, 2009; Anlaş et al., 2010).

Comments: This cosmopolitan species (Steinmann 1989a) is eurytopic, with a strong tendency to synanthropy. It is a pest on many cultural plants and fruits, but also with beneficial potential. In Turkey it is recorded from nearly all regions. This species is here recorded from Cyprus for the first time.

***Forficula decipiens* Gén , 1832**

Material examined: TURKEY: Adıyaman: 5 exs., 11.III.2007, Tut 5 km SW, leg. Yağmur (cAnl). Kahramanmaraş: 2 exs., 08.III.2008, Pazarcık, Çınar 2 km S, 37°29'47"N, 37°20'25"E, leg. Yağmur (cAnl).

Published records: Turkey: İstanbul, İzmir, Kastamonu (Brunner von Wattenwyl, 1882; Redtenbacher, 1900; Werner, 1901; Burr, 1952b; Harz, 1957; Weidner, 1957; Harz & Kaltenbach, 1976; Mařan, 1977; Reichardt, 1978; Albouy & Caussanel, 1990; Herera Mesa, 1999; Haas & Henderickx, 2002).

Comments: *F. decipiens* occurs in Northern Africa, Southern Europe, Asia Minor and Iran (Steinmann, 1989a, 1993). In our study, it is recorded from Central Southeast Anatolia.

***Forficula lucasi* Dohrn, 1865**

Material examined: TURKEY: Balıkesir: 4 exs., 30.X.2009, Altınoluk, Adatepe, 300 m, 29°34'24"N, 26°37'18"E, leg. Anlaş (cAnl). Şırnak: 2 exs., 12.V.2007, Yalıntepe, Dicle 4 km W, leg. Yağmur (cAnl).

Published records: Turkey: Without specific locality (Steinmann, 1989a; Herera Mesa, 1999; Haas & Henderickx, 2002).

Comments: The species is known from Eastern Africa and West, Central and East Asia, eastwards to Vietnam (Steinmann, 1989a, 1993). In our study, it is recorded from West and Southeast Anatolia. Thus, the first precise records of this species from Turkey are presented here.

***Forficula lurida* Fischer, 1853**

Material examined: CYPRUS: Girne: 1 ex., 12.III.2011, Beşparmak, 530 m, 35°16'59"N, 33°28'21"E, leg. Anlaş (cAnl); 9 exs., 13.III.2011, Karşıyaka 2 km N, 280 m, 35°20'11"N, 33°06'36"E, leg. Anlaş & Yağmur (cAnl). Pafos: 2 exs., 01.01.2011, central province, leg. Silha (cKoc). TURKEY: Adana: 1 ex., 6-9.VI.1996, Pozantı, 900 m, leg. Malinka (cMal); 1 ex., 9.5.2007, Hacımusalı env. hill above the village, abandoned field, 604 m, 37°21'01.3"N, 35°15'39.4"E, leg. Kment (NMP). Adıyaman: 1 ex., 27.-28.IV.1997, Nemrut Dağı, 1700-1900 m, leg. Vrabec (cKoc). Afyonkarahisar: 2 exs.,

23.IV.2010, Sinanpaşa 15 km SW, Elvan 3 km SW, 1600 m, 38°42'48"N, 30°04'40"E, leg. Anlaş (cAnl). Balıkesir: 1 ex., 30.X.2009, Altınoluk, Adatepe, 300 m, 29°34'24"N, 26°37'18"E, leg. Anlaş (cAnl). Adıyaman: 2 exs., 11.III.2007, Tut 5 km SW, leg. Yağmur (cAnl); 2 exs., 02.VI.2007, Gölbaşı, Akçalar, leg. Yağmur (cAnl); 3 exs., 18.IV.2008, Central province 8 km N, 37°50'03"N, 38°18'56"E, leg. Yağmur (cAnl); 4 exs., 20.IV.2008 Gerger, Koşarköy 2 km N, 38°02'25"N, 39°05'26"E, leg. Yağmur (cAnl). Antalya: 5 exs., 06.V.1997, Korkuteli, leg. Jeziorski (cKoc); 1 ex., 17.VI.1996, Elmalı, leg. Vavra (cKoc). Aydın: 4 exs., 25.XII.2005, Kuşadası, Dilek Yarımadası, pine and oak litter, 950 m, 37°39'23"N, 27°08'14"E, leg. Anlaş (ZDEU, cAnl). Burdur: 3 exs., 16.X.2009, Yeşilova, Salda 5 km N, 1220 m, 37°32'47"N, 29°35'46"E, leg. Yağmur (cAnl). Denizli: 3 exs., 17.X.2009, Honaz Dağı 870 m, 37°44'16"N, 29°15'47"E, leg. Yağmur (cAnl); 1 ex., 17.X.2009, Denizli, Honaz 2 km W, 435 m, 37°49'20"N, 29°16'37"E, leg. Yağmur (cAnl). Diyarbakır: 1 ex., 12.IV.2008, Ergani, Salihli 1 km W, 38°13'38"N, 39°40'07"E, leg. Yağmur (cAnl); 3 exs., 13.IV.2008, Ergani, Yukarı Kuyulu 1 km N, 38°11'14"N, 39°57'07"E, leg. Yağmur (cAnl); 1 ex., 21.V.2010, Silvan, Boyunlu, leg. Özgen (cOzg). Gaziantep: 5 exs., 22.III.2006, İslahiye, Kabaklar 2 km NW, 800 m, 37°01'56"N, 36°33'44"E, leg. Yağmur (cAnl, cYag); 3 exs., 07.IV.2006, Şahinbey, Ozanlı, leg. Yağmur; 2 exs., 10.IV.2006, Şehitkamil, Iskenderli, leg. Yağmur (cAnl); 2 exs., 17.III.2007, Şahinbey, Çimenli, leg. Yağmur (cAnl); 3 exs., 17.V.2007, Karataş 5 km NW, 700 m, ca. 37°01'N, 37°23'E, leg. Yağmur (cAnl). 7 ex., 12.XI.2006 and 28.III.2007, Şahinbey, Sarısalkım 1 km NE, 1040 m, 37°05'54"N, 37°17'07"E, leg. Yağmur (cAnl, cYag); 1 ex., 12.XII.2007, İslahiye, OPET Anadolu Lisesi garden, leg. Yağmur (cAnl); 2 exs., 01.01.2008, İslahiye 1 km S, 560 m, 37°00'28"N, 36°36'47"E, leg. Yağmur (cAnl); 2 exs., 28.III.2008, Şehitkamil, Kartal 2 km SE, 37°05'26"N, 36°57'20"E, leg. Yağmur (cAnl); 1 ex., 21.III.2009, Nurdağ 5 km W, 37°10'19"N, 36°42'00"E, leg. Yağmur (cAnl). Hakkari: 7 exs., 19.V.2010, Çukurca 1km E, leg. Yağmur (cAnl). Hatay: 1 ex., 22.IV.1992, Altınözü, leg. Malinka (cMal); 4 exs., 2-3.V.2005, Nur Dağları, Erzin, leg. Malinka (cMal); 3 exs., 04.V.2005, Nur Dağları, Belen, Topboğazı Geçidi, 750-800 m, leg. Malinka (cKoc, cMal); 1 ex., 8.V.2005, Nur Dağları, Kırıkhan leg. Malinka (cMal); 5 exs., 14-15.IV.2007 Hassa, Küreci-Zeytinoba, leg. Yağmur (cAnl); 2 exs., 13.IV.2007, Hassa 3 km N, leg. Yağmur (cAnl); 1 ex., 02.V.2007, Belen, Iskan, leg. Yağmur (cAnl); 8 exs., 15.IV.2007 and 22.V.2007, Kırıkhan, Narlıhopor, leg. Yağmur (cAnl); 2 exs., 26.IV.2007, Reyhanlı, Kavalcık, leg. Yağmur (cAnl); 3 exs., 27.IV.2007, Reyhanlı, Bükülmez, leg. Yağmur (cAnl); 2 exs., 28.IV.2007, Yayladağı, Çandır, leg. Yalçın (cAnl); 1 ex., 28.IV.2007, Yayladağı, Karaköse, leg. Yağmur & Yalçın (cAnl); 1 ex., 29.IV.2007, Yayladağı, Göveççi 3 km N, leg. Yağmur & Yalçın (cAnl); 2 exs., 29.IV.2007, Yayladağı 2 km N, leg. Yağmur & Yalçın (cAnl); 2 exs., 30.IV.2007, Iskenderun, Işıklı, leg. Yağmur (cAnl); 2 exs., 15.XII.2007, İslahiye 1 km E, 37°01'06"N, 36°38'44"E leg. Yağmur (cAnl); 7 exs., 02.III.2008, Hassa 4 km N, 36°50'13"N, 36°32'09"E, leg. Yağmur (cAnl); 5 exs., 22.III.2008, Nurdağ 2 km NW, 37°10'47"N, 36°42'41"E, leg. Yağmur (cAnl); 2 exs., 21.V.2008, İslahiye, Fevzipaşa, 530 m, ca. 37°06'N, 36°39'E, leg. Yağmur & Özkörük (cAnl); 1 ex., 22.VII.2008, İslahiye Altınüzüm 5 km W, 36°56'36"N, 36°32'28"E, leg. Yağmur (cAnl); 1 ex., 30.IV.2009, Samandağ, Titus tüneli, leg. Yağmur (cAnl); 2 exs., 14.XI.2010, Samandağ, Tekepınar 5 km N, 340 m, 36°12'17"N, 35°57'45"E, leg. Anlaş & Yağmur (cAnl); 1 ex., 14.XI.2010, Yayladağı, Leylekli 2 km NW, 660 m, 35°57'34"N, 36°02'29"E, leg. Anlaş & Yağmur (cAnl). İzmir: 2 exs., 27.XII.2005, Karaburun, pasture with stones on limestone, ca. 440 m, 38°38'N, 26°29'E, leg. Anlaş (cAnl); 2 exs., 26.III.2006, Ödemiş, Bozdağ 5 km E, leg. Anlaş; 4 exs., 10.XII.2008, Bayındır, Yakapınar, leg. Anlaş (cAnl); 3 exs., 19.XII.2008, Karaburun, Hasseki, 415 m, 38°38'17"N, 26°24'13"E, leg. Anlaş (cAnl); 3 exs., 11.X.2009, Buca, Kaynaklar, leg. Anlaş & Yağmur (cAnl, cYag). Kahramanmaraş: 3 exs., 07.IV.2006, Pazarcık, Karabıyıklı, leg. Yağmur (cAnl); 14 exs., 01.IV.2006 and 07.III.2008, Central province, Narlı 5 km N, 38°27'35"N, 37°05'51"E, leg. Yağmur (cAnl, cYag); 2 exs., 01.III.2008, Türkoğlu, Kızıleniş 3 km SW, 37°22'11"N, 36°48'54"E, leg. Yağmur (cAnl); 4 exs., 08.III.2008, Pazarcık, Çınar 2 km S, 37°29'47"N, 37°20'25"E, leg. Yağmur (cAnl). Karabük: 1 ex., 22.X.2009, Yenice, Yazıkoy, 508 m, 41°10'30"N, 32°20'21"E, leg. Kočárek (cKoc). Kilis: 3 exs., 22.IV.2006, Central province, Yuvabaşı, leg. Yağmur (cAnl); 2 exs., 01.III.2008, Kilis Hassa road, Kilis 30 km W, 36°49'34"N, 36°53'39"E, leg. Yağmur (cAnl); Central province, Kesmelik, ca. 36°44'N, 37°07'E, 01.III.2008, leg. Yağmur (cAnl). Kütahya: 1 ex., 24.IV.2010, Şaphane, Üçbaş 2 km N, 900 m, 38°59'57"N,

29°54'22"E, leg. Anlaş (cAnl); 1 ex., 24.IV.2010, Simav, Gölköy, leg. Anlaş (cAnl). Malatya: 5 exs., 02.V.2008, Doğanşehir, Boruk Dağı, 1100 m, 37°53'08"N, 37°43'04"E, leg. Yağmur (cAnl). Manisa: 3 exs., 22.VI.2002, Turgutlu, Baktırlı, leg. Anlaş (ZEDU, LEMT, cAnl); 4 exs., 11.VIII.2003, Akhisar, Yayakırıldık, leg. Anlaş (cAnl); 5 exs., 27.IX.2003, Kırkağaç, Bakır, leg. Anlaş (cAnl); 7 exs., 08.VI.2005 and 06.IX.2005, ca. 200 m, 38°28'N, 27°49'E, leg. Anlaş ZDEU, cAnl); 3 exs., 24.XII.2005, Turgutlu, Baktırlı, leg. Anlaş (cAnl); 1 ex., 19.II.2006, Turgutlu, Ayvacık, leg. Anlaş (cAnl); 1 ex. 26.III.2006, Alaşehir 14 km N, leg. Anlaş (cAnl); 2 exs., 14.V.2006, Ahmetli, Çaypınar, leg. Anlaş (cAnl); 9 exs., 24.V.2006 and 30.IX.2006, Central province, Spil Dağı, 1100 m, 38°33'44"N, 27°23'10"E, leg. Anlaş (cAnl); 5 exs., 21.X.2006, Alaşehir, Kestanederesi, leg. Anlaş (cAnl); 3 exs., 21.X.2006, Salihli, Bektaşlar, leg. Anlaş (cAnl); 6 exs., 18.XI.2006, Gölarmara, Beyler 1 km NE, 120 m, 38°42'10"N, 27°58'56"E, leg. Anlaş (cAnl); 1 ex., 26.XI.2006, Kula, Incesu, leg. Anlaş (cAnl); 5 exs., 26.XI.2006, Kula, Balıbey, leg. Anlaş (cAnl); 1 ex., 16.XII.2006, Akhisar, Dağdere, leg. Anlaş (cAnl); 2 exs. 16.XII.2006, Gördes, Çiçekli, leg. Anlaş (cAnl); 1 ex., 16.XII.2006, Akhisar, Pekmezci, leg. Anlaş (cAnl); 2 exs., 02.II.2007, Central province, Pelitalan, leg. Anlaş (cAnl); 1 ex., 24.XI.2007, Central province, Osmanlı, leg. Anlaş (cAnl); 7 exs., 04.X.2008 Central province, Ottoman, 330 m, 38°44'47"N, 27°10'34"E, leg. Anlaş (cAnl); 1 ex., 17.IV.2009, Saruhanlı, Çullugörece 1 km NW, leg. Anlaş (cAnl). Mersin: 1 ex., 25.IV.1992, Silifke, Demircili, leg. Malinka (cMal); 1 ex., 11-12.VI.1996, Güzeloluk, 1200-1400 m, leg. Malinka (cMal); 2 exs., 04.V.2007, above road to Karaman, Alahan env. Juniperus forest, 1415 m, 36°51'22.1"N, 33°17'21.3"E, leg. Kment (NMP); 1 ex., 06.V.2007, Kızkalesi env., Adamkavalı, maquis on limestone, 281 m, 36°29'01.6"N, 34°07'09.5"E, leg. Kment (NMP); 1 ex., 8-9.VI.1996, Çamlıyayla, 1000-1200 m, leg. Vavra (cKoc); 1 ex., 10-12.VII.1998, Aslanlı, Göktepe Dağı, leg. Bezdek (cKoc). 1 ex., 20-21.V.2005, Tarsus, Olukkoyağı, leg. Malinka (cMal). Osmaniye: 1 ex., 9-11.2005, Hasanbeyli env., Nur Dağları, Nurdağı-Kuşçubeli Geçidi, 1120-1250 m, leg. Malinka (cMal); 6 exs., 19.V.2008, Bahçe, Aşağıaracaklı, 726 m, 37°11'29"N, 36°36'54"E, leg. Yağmur (cAnl). Rize: 5 exs., 28.VI.2008, Çamlıhemşin, Ayder Yaylası, 40°55'49"N, 41°55'49"E, leg. Yağmur (cAnl). Şanlıurfa: 6 exs., 08.V.2006, Central province, Tepedibi 3 km E, leg. Yağmur (cAnl); 1 ex., 16.XI.2010, Birecik, Kelaynak Valley, leg. Anlaş (cAnl). Siirt: 2 exs., 19.V.2009, Central province, Meydandere 2 km E, leg. Yağmur (cAnl). Şırnak: 5 exs., 12.V.2007, İdil, Yörük, leg. Yağmur (cAnl, cYag); 6 exs., 12.IV.2011, İdil, Cizre 20 km N, 684 m, 37°21'57"N, 41°59'58"E, leg. Yağmur & Özgen (cAnl).

Published records: Cyprus: Adonis, Afgas, Akamas forest, Larnaka, Lefkoşa (Nicosia), Limasol, Skouriotissa, Troodos (Burr, 1902, 1912; Weidner, 1957; Reichardt, 1978; Haas & Henderickx, 2002). Turkey: Adana, Aydın, Balıkesir, Bilecik, Burdur, Bursa, Çanakkale, Denizli, Elazığ, Eskişehir, Isparta, İstanbul, İzmir, Kahramanmaraş, Kocaeli, Kayseri, Manisa, Mardin, Mersin, Muğla, Yalova, Zonguldak and Gökdere? (Fischer, 1853; Brunner von Wattenwyl, 1882; Werner, 1901; Burr, 1912; 1947a, 1952a, b; Weidner, 1957; Harz & Kaltenbach, 1976; Mañan, 1977; Reichardt, 1978; Steinmann, 1983, 1989a; Önder et al., 1999; Herera Mesa, 1999; Haas & Henderickx, 2002; Tezcan & Kočárek, 2009; Anlaş et al., 2010).

Comments: *Forficula lurida* is distributed in South-Eastern Europe, Asia Minor, Syria, Israel, Iran and Iraq (Steinmann, 1989a, 1993) and is one of the most common and widely distributed species in Turkey.

***Forficula smyrnensis* Audinet-Serville, 1839**

Material examined: TURKEY: Ağrı: 1 ex., 01.V.1999, Doğubeyazıt, leg. Orszulik (cKoc). Bursa: 2 ex., 10-14.VII.1997, Çağlıyan env., leg. Prudek & Riha (cKoc). Hatay: 3 exs., 6-8.V.2005, Asi Nehri river valley, Karaçay, leg. Malinka (cKoc, cMal). İzmir: 4 exs., 22.I.2011, Balçova Barajı, leg. Anlaş (cAnl). Karabük: 1 ex., 22.X.2009, Yenice, Yazıkoy, 340 m, 41°11'47"N, 32°20'16"E, leg. Kočárek (cKoc). Kütahya: 2 exs., 24.IV.2010, Şaphane, İlicasu 1 km N, 720 m, 38°56'58"N, 29°17'29"E, leg. Anlaş (cAnl). Manisa: 4 exs., 23.XII.2004, Turgutlu, Baktırlı, leg. Anlaş (cAnl); 3 exs., 19.II.2006, Turgutlu, Ayvacık, leg. Anlaş (cAnl).

Published records: Cyprus: Pomos, Siná and Pizoula (Burr, 1912; Reichardt, 1978; Haas & Henderickx, 2002). Turkey: Adana, Amasya, Denizli, Eskişehir or İzmir (Boz Dağı), Hatay, İstanbul, İzmir, Manisa, Muğla, Trabzon, Yalova, (Serville, 1839; Fischer, 1853; Brunner von Wattenwyl, 1882; Werner, 1901;

Bey-Bienko, 1936; Burr, 1912; 1947b, 1952, Weidner, 1957; Harz & Kaltenbach, 1976; Mařan, 1977; Reichardt, 1978; Steinmann, 1993; Haas & Henderickx, 2002; Tezcan & Kořárek, 2009; Anlař et al., 2010).

Comments: This species was described from Izmir, Turkey. It occurs in Hungary, Bulgaria, the former Yugoslavia, Corsica, Lebanon, Iraq, the Caucasus and Syria (Steinmann, 1993). In our study, it was recorded from East, West, Northwest and Southeast Anatolia.

***Forficula tomis* (Kolenati, 1846)**

Material examined: TURKEY: Antalya: 1 ex., 01.III.2009, Alanya 7 km N, leg. Kunt (cAnI).

Published records: Turkey: Erzurum and Van (Burr, 1912, 1952b; Bey-Bienko, 1936; Harz & Kaltenbach, 1976; Mařan, 1977; Haas & Henderickx, 2002).

Comments: *Forficula tomis* is distributed in the Eastern Palaearctic - Afghanistan, Iran, Armenia, Turkmenistan, Siberia, Korea and Japan (Bey-Bienko 1936; Steinmann 1989a, b, Kořárek, 2011). In our study, this species was recorded from Antalya province.

***Guanchia brignolii* Vigna Taglianti, 1974**

Material examined: TURKEY: Hatay: 1 ex., 6-8.V.2005, Asi river valley, Karaçay, leg. Malinka (cMal).

Published records: Turkey: Hatay, Gaziantep-Osmaniye (Kuřçubeli Geçidi) (Kiss, 1995; Harz & Kaltenbach, 1976; Herrera Mesa, 1999; Haas & Henderickx, 2002; Kořárek, 2007), – partly published as *Guanchia pubescens* (Géné, 1837), see Kořárek (2007).

Comments: Harz & Kaltenbach (1976) and Albouy & Caussanel (1990) made the general statement that all specimens of *G. pubescens* from Syria, Israel and Turkey belong to *G. brignolii*. According to current knowledge, the distribution of *G. pubescens* is probably restricted to the western part of the Mediterranean region (Morocco, Algeria, Tunisia, Portugal, Spain, France and Italy) and *G. brignolii* is distributed in the eastern Mediterranean (Lebanon, Syria, Israel and Turkey), with the exact limits of the distribution unknown. So, the occurrence of *G. pubescens* in Turkey is very improbable and the previous reports (Herrera Mesa, 1999; Haas & Henderickx, 2002) most probably belong to *G. brignolii*, as noted by Kořárek (2007).

***Guanchia hincksi* (Burr, 1947)**

Material examined: TURKEY: Aydın: 1 ex., 19.VI.2005, Karpuzlu, Esentepe, leg. Anlař (cAnI). Bolu: 1 ex., 4.VI.1996, Abant Gölü, 1200 m, leg. Vavra (cKoc). Bursa: 1 ex., 10-14.VII.1997, Çaęlıyan env., leg. Prudek & Riha (cKoc). Izmir: 3 exs., 19.XII.2008, Karaburun 5 km W, 415 m, 38°38'17"N, 26°24'13"E, leg. Anlař (cAnI). Mersin: 5 exs., 10.-12.VII.1998, Erdemli 15 km NW, Aslanlı, Göktepe Daęı, leg. Bezdek (cKoc). 1 ex., 23-24.V.2005, Güzeloluk, 1500 m, leg. Malinka (cMal). Nięde: 3 exs., 18-19.V.2005, Ala Daęlar, Elekgölü, Çamardı env., leg. Malinka (cMal).

Published records: Cyprus: without specific locality (Mařan, 1977). Turkey: Adana, Ankara, Denizli, Eskiřehir or Izmir (Boz Daęı), Izmir (Ören), Manisa, Mersin (Burr, 1947a, b, 1952; Hinckx, 1947; Weidner, 1957; Mařan, 1977; Reichardt, 1978; Haas & Henderickx, 2002; Tezcan & Kořárek, 2009; Anlař et al., 2010).

Comments: The species occurs only in Turkey and Cyprus (Mařan, 1977; Steinmann, 1993), In our study, it was recorded from West, South and Northwest Anatolia.

Discussion

Dermaptera species of Turkey and Cyprus belong to Labiduridae, Anisolabididae, and Forficulidae, which are typical for the warmer regions of the Palaearctic Region. Taxa with a centre of distribution in

the tropics and exclusively tropical taxa (Pygidicranidae, Diplatyidae, Karschiellidae, Apachyidae and Chelisochidae) are completely absent.

The most common and the most frequently observed species across Turkey are *Forficula lurida*, *F. auricularia* and *Labidura riparia*. These two species of the *Forficula* are eurytopic, and occupy a wide variety of habitats including anthropogenic. *Labidura riparia* is a cosmopolitan species, preferring sandy habitats, often beaches and riverbanks, but also lives away from those environments. It probably occurs in Cyprus. The remaining species are less frequently found. Because there are only few individual records from Cyprus, the frequency of occurrence cannot be discussed.

The Turkish Dermaptera fauna has only one endemic species, *Isolaboides kosswigi*, not recorded from neighbouring territories yet. The other four species in this genus are found in India, Pakistan and Lebanon and *I. kosswigi* is the most western species of Isolabidinae. Other interesting species are *Guanchia hincksi* and *Isolabella graeca*. *Guanchia hincksi* has been described from the surroundings of Silifke-Mersin, on southern coast of Turkey, is distributed widely through Anatolia (Burr, 1952b) and also recorded from Cyprus (Mařan, 1977). *Isolabella graeca* is the only species of this genus distributed in Greece and neighbouring areas of Turkey. *Anechura zubovskii* is distributed in mountainous regions of China, India, Turkmenistan?, Iran (Steinmann, 1993), and its distribution in Turkey also includes mountainous areas in eastern regions. Semenov (1901) published a record from Ararat (=Ađrı Dađı) and the presented findings confirm the occurrence of this species in Turkey. The Dermaptera fauna of Cyprus includes the species *Apterygida media* which has not been reported from Turkey yet. *Apterygida media* is a species with European distribution and the occurrence on Cyprus represents the most south-eastern limit of its distribution.

Forficula senegalensis Audinet-Serville, 1839 was included by Haas (2011) in the check-list of Dermaptera fauna of Turkey without any details and records. The species is distributed in Africa (Steinmann, 1993) but there is no evidence for its occurrence in Turkey. Therefore, we excluded the species from the current list of Turkish Dermaptera.

Current knowledge on the distribution and fauna of the Dermaptera in Turkey and Cyprus is still incomplete, and the occurrence of some species that are known to occur in neighbouring countries can be suspected. In particular, the occurrence in Turkey of the following species seems likely or at least possible: *Oreasiolabia fedtschenkoi* (Saussure, 1874), which has been reported in Pakistan, Afghanistan, and Turkmenistan (Steinmann, 1989a); the occurrence of *Guanchia kaznakovi* (Semenov, 1903) is probable (Burr, 1952) and with regard to reports from the neighbouring Caucasus (Bey-Bienko 1936, Steinmann, 1989a). *Chelidura specifica* Steinmann, 1989 has been described from the Caucasus and the occurrence in neighbouring mountainous regions of Turkey is also possible.

Key to the Dermaptera species of Turkey and Cyprus

- | | | |
|---|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| 1 | Apterous or squamipterous species | 2 |
| - | Tegminae fully developed (alae in some caces reduced) | 6 |
| 2 | Male forceps asymmetrical, trigonal basally | 3 |
| - | Male forceps symmetrical, not strongly trigonal basally | 5 |
| 3 | Squamipterous species | <i>Euborellia moesta</i> (Géné, 1839) |
| - | Entirely apterous species | 4 |
| 4 | Antennae 16–18 segmented; legs at least partly dark annulated; entire body length ♂ 8 – 12 mm, ♀ 10 – 13 mm | <i>Euborellia annulipes</i> (Lucas, 1847) |
| - | Antennae (19-) 22–25 segmented; legs yellowish; entire body length ♂ 15 – 20 mm, ♀ 12 – 20 mm | <i>Anisolabis maritima</i> (Bonelli, 1832) |

- 5 Pygidium trapezoidal, prominent from dorsal view; ultimate tergite with incised hind margin.
 *Isolabella graeca* Verhoeff, 1901
- Pygidium with trigonal medial projection, invisible from dorsal view; ultimate tergite with straight hind margin
 *Isolaboides kosswigi* (Burr, 1947)
- 6 Antennae more than 20-segmented 7
- Antennae less than 16-segmented 8
- 7 Length of entire body with forceps >18 mm *Labidura riparia* (Pallas, 1773)
- Length of entire body with forceps <15 mm. *Nala lividipes* (Dufour, 1828)
8. 2nd tarsomere simple, cylindrical; small species, < 10 mm *Labia minor* (Linnaeus, 1758)
- 2nd tarsomere bilobate, markedly heart shaped, species > 11 mm 9
- 9 Male forceps bent in horizontal and vertical planes; pronotum broader than long 10
- Male forceps bent only in horizontal plane; pronotum approximately quadrate 11
- 10 Head entirely black *Anechura zubovskii* (Semenov, 1901)
- Head reddish brown *Anechura bipunctata* (Fabricius, 1781)
- 11 Alae entirely absent 12
- Alae always present 17
- 12 Forceps with long and conspicuous pubescence *Apterygida media* (Hagenbach, 1822)
- Forceps bare, at most sparsely and shortly pubescent 13
- 13 Posterior margin of tegminae transversely truncate 14
- Posterior margin of tegminae obliquely truncate 16
- 14 Tegminae longer than the length of pronotum measured along suture 15
- Tegminae as short as the length of pronotum measured along suture
 *Forficula aetolica* Brunner, 1882
- 15 Forceps with inner margins of basal flange strongly dentated, distal end of the flange ending smoothly or with a blunt tooth; the flange distinctly shorter than half the length of the forceps.
 *Forficula decipiens* Gén , 1832
- Forceps with inner margins of basal flange crenulated, distal end of the flange ending with a pointed angle; the flange usually about as long as half the length of the forceps or only little shorter
 *Forficula tomis* (Kolenati, 1846)
- 16 Inner basal flange of male forceps broad, with parallel inner margins; forceps without tooth on inner margin *Guanchia hincksi* (Burr, 1947)
- Inner basal flange of male forceps slender, with divergent inner margins; forceps with a sharp, prominent tooth *Guanchia brignolii* Vigna Taglianti, 1974
- 17 Inner basal flange of male forceps strongly crenulated basally, usually not parallel sided; each branch of forceps with a single, sharp tooth distally from the flange.
 *Forficula auricularia* Linnaeus, 1758
- Inner basal flange parallel sided, forceps without single tooth distally from flange 18

- 18 Inner basal flange of male forceps broad and long, as long as or longer than 1/3 of total length of forceps, with parallel inner margins*Forficula lucasi* Dohrn, 1865
- Inner basal flange of male forceps short, as short as or shorter than 1/4 of total length of forceps; inner margins parallel or not 19
- 19 Tegminae unicolour; branches of forceps strongly arcuate; inner basal flange broadly rounded internally, with a short parallel section or inner margins with smaller or larger denticles.....*Forficula lurida* Fischer, 1853
- Each tegmina with well distinct yellow or yellowish spot; inner basal flange of male forceps forming smaller or larger lobe, shorter than 1/6 of total length of forceps.....*Forficula smyrnensis* Audinet-Serville, 1839

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References

- Albouy, V. & C. Caussanel, 1990. Dermaptères ou Perce-oreilles. Faune de France 75. Fédération Française des Sociétés de Sciences Naturelles, Paris, 245 pp.
- Anlaş, S., F. Haas & S. Tezcan, 2010. Dermaptera (Insecta) fauna of Bozdaglar Mountain, Western Turkey. Linzer Biologische Beiträge, 42 (1): 389-399.
- Bey-Bienko, G. Y., 1936. Nasekomye kochistokrylye (Dermaptera). Fauna SSSR 5. Uzdatelstvo Akademii Nauk USSR, Moskva-Leningrad, 239 pp.
- Brunner von Wattenwyl, C., 1882. Prodrömus der europäischen Orthopteren. Verlag von Wilhelm Engelmann, Leipzig, 466 pp.
- Burr, M., 1902. On the Forficularia of the Hungarian National Museum of Budapest. Természetrzaji Füzetek, 25: 477-488.
- Burr, M., 1912. Die Dermapteren des K.K. Naturhistorischen Hofmuseum in Wien. Annalen des K. K. Naturhistorischen Hofmuseums, 26: 63-108.
- Burr, M., 1947a. More notes on Turkish Dermaptera. Entomologist's Record, 59: 112-113.
- Burr, M., 1947b. Two new species of Dermaptera from Turkey. Proceedings of the Royal entomological Society of London (B), 16: 60-65.
- Burr, M., 1952a. Field notes from Anatolia. IX. A circular tour. Entomologist's Record, 64: 309-315.
- Burr, M., 1952b. On the distribution of Turkish Dermaptera. Revue de la Faculté des Sciences de l'Université d'Istanbul, Série B, 17 (2): 131-134.
- Čejchan, A. & J. Mařan 1974. Results of the Czechoslovak-Iranian entomological expedition to Iran 1970 (Together with results of collections made in Anatolia). No. 8: Dermaptera. Acta Entomologica Musei Nationalis Pragae, Supp. 6: 95-97.
- Ebner, R., 1910. Ein Beitrag zur Orthopterenfauna der europäischen Türkei mit besonderer Berücksichtigung von Albanien. Zoologische Jahrbücher Systematik, Jena, 29: 401-414.
- Fischer, L. H., 1853. Orthoptera europaea. Guil. Engelmann, Lipsiae, Frider. Klincksieck, Parisis, Williams et Norgate, Londini, 454 pp.
- Haas, F. & H. Henderickx, 2002. Dermaptera from Cyprus and Turkey. Beiträge zur Entomologie, 52: 235-239.
- Haas, F., 2011. Earwig Research Centre – ERC – The site on earwig biology. (Web page: <http://www.earwigs-online.de/TR/tr.html>), (Accessed on 22 February 2012).
- Harz, K., 1957. Die Geradflüger Mitteleuropas. Gustav Fischer Verlag, Jena, 494 pp.

- Harz, K., 1975. Neue Orthopterenarten und unterarten aus der Paläarktis. B. Dermaptera. *Articulata*, 1 (8): 5-16.
- Harz, K. & A. Kaltenbach, 1976. The Orthoptera of Europe III - Die Orthopteren Europas III. *Series Entomologica*, 12: 434 pp.
- Herera Mesa, L., 1999. Catalogue of the Dermaptera of Spain. Newbook Ediciones, Navarra, 203 pp.
- Hincks, W. D., 1947. Brief notes on the genital armature of *Pseudisolabis kosswigi* and *Forficula hincksi*. *Proceedings of the Entomological Society in London (B)*, 16: 66-68.
- Kiss, B., 1995. Dermaptères et Hétéroptères d'Israël. In: Fauna of Israel 1. Academia Române, București, pp. 139-134.
- Kočárek, P., 2007. Guanchia brignolii Vigna Taglianti, 1974 in Turkey (Dermaptera: Forficulidae). *Acta Entomologica Slovenica*, 15: 91-94.
- Kočárek, P., 2011. Dermaptera of Iran with description of *Euborellia angustata* sp. nov. *Acta Entomologica Musei Nationalis Pragae*, 51 (2): 381-390
- Mařan, J., 1977. 34. Wissenschaftliches Ergebnis der zoologischen Expedition des National Museums in Prag nach der Türkei. *Dermaptera. Acta Entomologica Musei Nationalis Pragae*, 39: 253-261.
- Önder, F., E. Pehlivan, Y. Karsavuran, S. Tezcan & Ş. Kismali, 1999. Catalogue of the collection of Dermaptera preserved in the Prof. Dr. Niyazi Lodos Museum, İzmir, Turkey. *Ege Üniversitesi Ziraat Fakültesi Dergisi*, 36: 157-161.
- Popham, E. J., 2000. The geographical distribution of the Dermaptera (Insecta) with reference to continental drift. *Journal of Natural History*, 35: 2007-2027.
- Redtenbacher, J., 1900. Die Dermapteren und Orthopteren (Ohrwürmer und Geradflügler) von Österreich-Ungarn und Deutschland. C. Gerolds Sohn, Wien, 148 pp.
- Reichardt, H. G., 1978. Ohrwürmer Griechenlands und angrenzender Gebiete (Insecta: Dermaptera). *Senckenbergiana Biologica*, 58 (3-4): 211-244.
- Semenov, A., 1901. *Anechura* Scudd. *Forficula* (L.) Scudd. (Orthoptera, Forficulidae). *Horae Societatis Entomologicae Rossicae*, 35: 185-201.
- Serville, M. A., 1839. *Histoire naturelle des Insectes. Orthopteres*. Paris
- Steinmann, H., 1973. A zoogeographical check-list of world Dermaptera. *Folia Entomologica Hungarica*, 26: 145-154.
- Steinmann, H., 1975. The Dermaptera of the Moravske Muzeum, Brno (ČSSR). *Acta Musei Moraviae, Scientiae Naturales*, 60: 157-160.
- Steinmann, H., 1983. The survey of the Dermaptera material in the Staatliches Museum für Tierkunde Dresden. *Reichenbachia*, 21: 43-59.
- Steinmann, H., 1986. *Dermaptera: Catadermaptera I. Tierreich 102*. Walter de Gruyter, Berlin – New York, 345 pp.
- Steinmann, H., 1989a. *World Catalogue of Dermaptera. Series Entomologica*, 43: 1-934.
- Steinmann, H., 1989b. *Dermaptera Catadermaptera 2. Tierreich 108*. Walter de Gruyter, Berlin – New York, 709 pp.
- H. 1990a: *Dermaptera: Eudermaptera I. Tierreich 106*. Walter de Gruyter, Berlin – New York, 558 pp.
- Steinmann, H., 1990a. *Dermaptera: Eudermaptera I. Tierreich 106*. Walter de Gruyter, Berlin – New York, 558 pp.
- Steinmann, H., 1990b. A revision of the genus *Anechura* Scudder, 1876 (Dermaptera: Forficulidae). *Acta Zoologica Hungarica*, 36: 135-155.
- Steinmann, H., 1993. *Dermaptera: Eudermaptera II. Tierreich 108*. Walter de Gruyter, Berlin – New York, 709 pp.
- Tezcan, S. & P. Kočárek 2009. Dermaptera fauna of the ecologically managed cherry orchards in western Turkey. *Munis Entomology & Zoology*, 4 (2): 500-504.
- Weidner, H., 1957. Die Ohrwürmer der Türkei. *Entomologische Mitteilungen aus dem Zoologischen Staatsinstitut und Zoologischen Museum Hamburg*, 10: 290-305.
- Werner, F., 1901. Die Dermapteren und Orthopteren Kleinasiens. *Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften. Mathematisch-naturwissenschaftliche Classe*, 110: 14-19.
- Werner, F., 1907. Die Dermapteren und Orthopteren Bosniens und der Herzegowina. *Wissenschaftliche Mitteilungen aus Bosnien und der Herzegowina*, 10: 645-655.
- Werner, F., 1936. Zur Kenntnis der Orthopterenfauna von Cypern. *Zoologischer Anzeiger*, 114: 14-19.