



Chorological Categories and Faunistic Records of Dung Beetles (Coleoptera: Scarabaeoidea: Scarabaeidae) from the Sündiken Mountains, Turkey

Yakup Şenyüz,^{1*} Kemal Dindar,¹ Hakan Çalışkan² and Davut Ümit Şirin²

¹Department of Biology, Faculty of Art and Science, Dumlupınar University, Kütahya, Turkey

²Department of Biology, Faculty of Art and Science, Eskişehir Osmangazi University, Eskişehir, Turkey

ABSTRACT

We provide faunistic information about the dung beetles of the Sündiken Mountains in Eskişehir Province, a formerly unsurveyed region, in order to alleviate the lack of enough distributional information on Turkey Scarabaeidae dung beetle species. A total of 38 species have been collected, including five new records for the province, two new records for the Internal Anatolian Region, and one new record for the Asian part of Turkey (*Nimbus contaminatus*). The obtained inventory shows that the collected species belong to 11 different chorological categories, suggesting that this region could harbour a high variety of species with different origins and climatic adaptations.

Article Information

Received 13 August 2014

Revised 28 August 2015

Accepted 4 September 2015

Available online 1 January 2016

Authors' Contributions

YS designed the study and wrote the article. YS, KD, HC and DUS collected the data.

Key words

Chorological categories, Dung beetles.

INTRODUCTION

The taxonomical and distributional information about dung beetles in Turkey has increased remarkably in recent years thanks to several studies devoted to know the species composition of regional and local dung beetle assemblages (Anlaş *et al.*, 2011a,b; Bellmann, 2007; Dellacasa and Kirgiz, 2009; Gokturk and Mihli, 2015; Küçükaykay *et al.*, 2013; Özgen *et al.*, 2009, 2011, 2011, 2012, 2013, 2014; Şenyüz and Şahin, 2009a,b, 2013; Şenyüz *et al.*, 2013; Tezcan and Pehlivan, 2001; see Fig. 1). In spite of this effort, it is necessary to increase substantially the very preliminary faunistic knowledge on the approximately 240-250 species of Aphodiinae, Scarabaeinae and Geotrupidae dung beetles currently recognized (Carpaneto *et al.*, 2000; Löbl and Smetana, 2006). This study was part of a faunistic work directed to increase the distributional and taxonomic knowledge about Turkish dung beetles by providing an initial inventory for a previously unsurveyed region: the Sündiken Mountains.

MATERIALS AND METHODS

This study was done from April to October of 2005 in ten different localities (Table I) of the Sündiken

Mountains. These mountains are situated at the north-west of the Internal Anatolian Region (39°49'-40°06' N; 30°40'-31°30' E) being the highest peak of this mountain range the peak of Kızıl Tepe (1,818 m). This region is bordered to the north by the Black Sea Region and by the Internal Anatolian Region to the south (Güner *et al.*, 2007; Fig. 1).

The specimens were collected at hand, and also using light traps in un-standardized manner. In the laboratory the dung beetle specimens were identified by using Zeiss Stemi 2000 stereomicroscope following the criteria of Schaufuss (1916), Paulian (1959), Balthasar (1963a,b, 1964), Pehlivan (1988, 1989), Martín-Piera and López-Colón (2000), Dellacasa and Dellacasa (2006), Kabakov (2006) and Şenyüz (2009). Turkey distributional data are taken from Löbl and Smetana (2006), Tuatay *et al.* (1967, 1972), Carpaneto (1973), Lodos (1978), Lodos *et al.* (1999), Carpaneto *et al.* (2000), Pittino (1982, 2004), Pehlivan (1988, 1989), Tezcan and Pehlivan (2001), Dellacasa and Kirgiz (2002), Şenyüz (2004), Bellmann (2007), Rozner and Rozner (2009), Şenyüz (2009), Şenyüz and Şahin (2009a, b), Anlaş *et al.* (2011a, b), Küçükaykay *et al.* (2013), Şenyüz *et al.* (2013a, b), Şenyüz and Şahin (2013) and Özgen *et al.* (2014).

RESULTS AND DISCUSSION

A total of 38 species of Aphodiinae (38 individuals, 9 species) and Scarabaeinae (213 individuals, 29 species) subfamilies were collected belonging to

* Corresponding author: yakupsenyuz@gmail.com
0030-9923/2016/0001-0137 \$ 8.00/0
Copyright 2016 Zoological Society of Pakistan

Table I.- Surveyed localities of the Sündiken Mountains mentioned in this study and number of Scarabaeinae and Aphodiinae species (S) collected in each one.

Localities	Latitude	Longitude	Altitude (m)	S
Ağaçhisar- yalınkaya	39.95	31.14	1335	9
Belkese (Güvem)	39.99	31.01	1268	12
Bozan -Ağaçhisar arası	39.87	31.13	1025	2
Bozan Köyü	39.81	31.10	814	18
Gökçekaya Barajı	40.03	31.02	308	3
Gökçekaya Köyü	40.02	30.98	782	3
Karacaören (Kıyak Deposu)	40.00	31.10	1282	15
Karacaören Köyü çıkışı	40.02	31.08	1288	9
Karakütük Orman Deposu	39.96	31.13	1592	5
Yalınkaya	39.97	31.27	1240	2

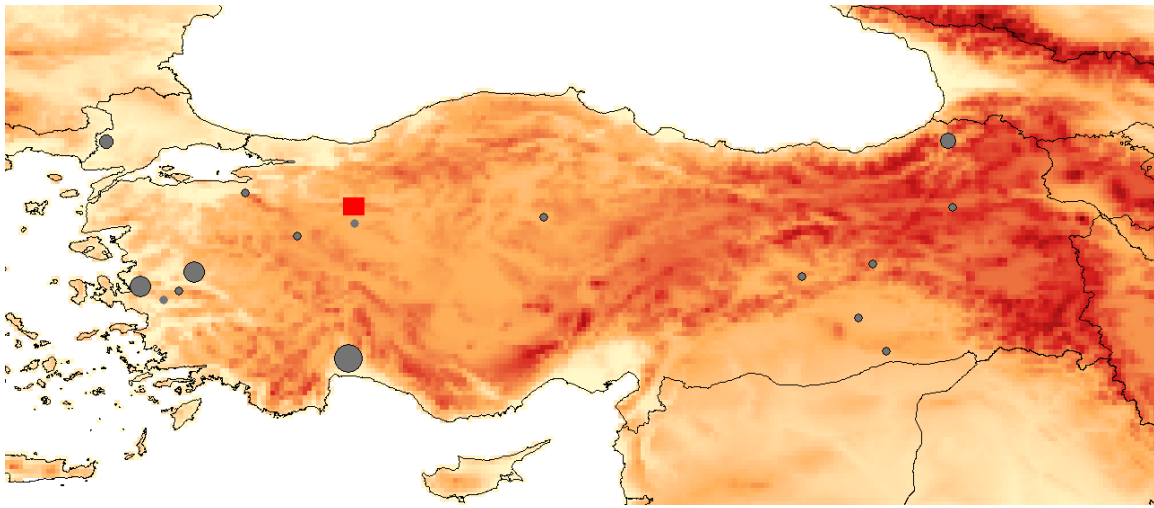


Fig. 1.- Map of Turkey including the location of former regional and local dung beetle studies (grey dots) as well as this study (red square). Dot sizes are proportional to the approximate surveyed area. The background map represents elevation variations.

Aphodiinae *Acrossus*, *Aphodius*, *Biralus*, *Chilothorax*, *Colobopterus*, *Eudolus*, *Melinopterus*, *Nimbus* and *Otophorus* genera, and *Caccobius*, *Cheironitis*, *Copris*, *Euoniticellus*, *Euonthophagus*, *Gymnopleurus*, *Onitis*, *Onthophagus*, *Scarabaeus* and *Sisyphus* Scarabaeinae genera. The general geographical distribution in Turkey of each one of the collected species was provided, as well as their elementary distribution type or chorotypes (Table II).

Family SCARABAEIDAE Latreille, 1802
 Subfamily Aphodiinae Leach, 1815
 Genus *ACROSSUS* Mulsant, 1842
Acrossus luridus (Fabricius, 1775)

Material examined

Karacaören village, 1282 m, 20.V.2005, Şenyüz

Y. leg. and det., 2 ♀♀; Karacaören village, 1288 m, 21.V.2005, Şenyüz Y. leg. and det., 2 ♀♀.

Distribution in Turkey

Adana, Adıyaman, Afyon, Ağrı, Ankara, Antalya, Artvin, Bartın, Bitlis, Bolu, Burdur, Bursa, Çorum, Denizli, Diyarbakır, Edirne, Elazığ, Erzurum, Eskişehir, Gaziantep, Gümüşhane, İzmir, Kahramanmaraş, Kars, Kırklareli, Kütahya, Manisa, Mersin, Niğde, Ordu, Osmaniye, Rize, Siirt, Sivas, Tekirdağ (Tuatay *et al.*, 1967, 1972; Lodos *et al.*, 1999; Dellacasa and Kırgız, 2002; Şenyüz, 2004; Bellmann, 2007; Rozner and Rozner, 2009; Şenyüz, 2009; Şenyüz and Şahin, 2009a; Anlaş *et al.*, 2011b; Şenyüz *et al.*, 2013a,b; Özgen *et al.*, 2014).

Table II.- Chorotypes are given according to Taglianti *et al.* (1999).*Taxa widely spread in European Region*

Asiatic – European

- Acrossus luridus* (Fabricius, 1775)
Colobopterus erraticus (Linnaeus, 1758)
Otophorus haemorrhoidalis (Linnaeus, 1758)
Aphodius fimetarius (Linnaeus, 1758)
Onthophagus (Palaeonthophagus) marginalis (Gebler, 1817)

Centralasiatic – European

- Chilothorax distinctus* (O. F. Müller, 1776)
Melinopterus prodromus (Brahm, 1790)
Euonthophagus amyntas alces (Fabricius, 1792)
Euonthophagus gibbosus (Scriba, 1790)
Onthophagus (Palaeonthophagus) verticicornis (Laicharting, 1781)

Centralasiatic – Europeo – Mediterranean

- Onthophagus taurus* (Schreber, 1759)
Sisyphus schaefferi schaefferi (Linnaeus, 1758)

Centralasiatic – Mediterranean

- Copris hispanus cavolinii* (Petagna, 1792)
Gymnopleurus flagellatus (Fabricius, 1787)
Gymnopleurus mopsis (Pallas, 1781)
Scarabaeus typhon Fischer, 1823

Turano – European

- Copris lunaris* (Linnaeus, 1758)
Onthophagus (Palaeonthophagus) fracticornis (Preyslser, 1790)

Turano – Europeo – Mediterranean

- Biralus satelliti* (Herbst, 1789)
Eudolus quadriguttatus (Herbst, 1783)
Caccobius schreberi (Linnaeus, 1767)
Euoniticeilus fulvus (Goeze, 1777)
Furonthophagus furcatus (Fabricius, 1781)
Onthophagus (Palaeonthophagus) medius (Kugelann, 1792)
Onthophagus (Palaeonthophagus) vacca (Linnaeus, 1797)

Turano – Mediterranean

- Cheironitis furcifer* (Rossi, 1792)
Euonthophagus sulcicollis (Reitter, 1892)
Gymnopleurus geoffroyi geoffroyi (Fuessly, 1775)
Onitis humerosus (Pallas, 1771)

SW – Asiatic

- Onthophagus (Palaeonthophagus) aleppensis* Redtenbacher, 1843
Onthophagus (Palaeonthophagus) osellai Pittino, 1982

Taxa more or less widely spread in Europe

European

- Nimbus contaminatus* (Herbst 1783)

Taxa more or less widely spread in Mediterranean Countries

East – Mediterranean

- Euonthophagus atramentarius* (Menetries, 1832)
Onthophagus (Palaeonthophagus) lucidus (Sturm, 1800)
Onthophagus (Palaeonthophagus) suturellus Brullé, 1832
Onthophagus (Palaeonthophagus) fissicornis Steven, 1809
Scarabaeus pius (Illiger, 1803)

Mediterranean

- Onthophagus (Palaeonthophagus) opacicollis* Reitter, 1892

General distribution

Widely distributed in the Palaearctic and Nearctic Regions and introduced also to the Afrotropical Region (Löbl and Smetana, 2006).

Chorotype: Asiatic – European (Carpaneto *et al.*, 2000)
 Genus *APHODIUS* Hellwig, 1798
Aphodius fimetarius (Linnaeus, 1758)

Material examined

Karacaören village, 1282 m, 20.V.2005, Şenyüz Y. leg. and det., 1 ♂.

Distribution in Turkey

Adana, Afyon, Amasya, Ankara, Antalya, Artvin, Balıkesir, Bartın, Bingöl, Bolu, Burdur, Bursa, Çankırı, Çorum, Denizli, Edirne, Erzurum, Eskişehir, Gaziantep, Giresun, Gümüşhane, Hatay, Isparta, İzmir, Kahramanmaraş, Kastamonu, Kayseri, Kırklareli, Kırşehir, Kütahya, Manisa, Mersin, Niğde, Ordu, Osmaniye, Rize, Samsun, Tekirdağ, Zonguldak (Tuatay *et al.*, 1967, 1972; Lodos *et al.*, 1999; Dellacasa and Kırgız, 2002; Şenyüz, 2004; Bellmann, 2007; Rozner and Rozner, 2009; Şenyüz, 2009; Şenyüz and Şahin, 2009a; Anlaş *et al.*, 2011b; Şenyüz *et al.*, 2013a,b; Özgen *et al.*, 2014).

General distribution

Species widely distributed in Palaearctic Region, Australian Region, Nearctic Region, Neotropical Region, Oriental Region (Löbl and Smetana, 2006).

Chorotype: Asiatic – European (Carpaneto *et al.*, 2000).
 Genus *BIRALUS* Mulsant & Rey, 1870
Biralus satelliti (Herbst, 1789)

Material examined

Belkese village, 1268 m, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Adana, Afyon, Ankara, Denizli, Edirne, Eskişehir, Gaziantep, Gümüşhane, İzmir, Kahramanmaraş, Kırıkkale, Kırklareli, Kırşehir, Kütahya, Mersin, Sivas, Tekirdağ, (Tuatay *et al.*, 1967, 1972; Lodos *et al.*, 1999; Dellacasa and Kırgız, 2002; Rozner and Rozner, 2009; Şenyüz, 2009).

General distribution

Species widely distributed in Palaearctic Region (Löbl and Smetana, 2006).

Chorotype: Turano – Europeo – Mediterranean
(Carpaneto *et al.*, 2000).

Genus *CHILOTHORAX* Motschulsky, 1859
Chilothorax distinctus (O. F. Müller, 1776)

Material examined

Ağaçhisar village -Yalınkaya village, 1335 m,
20.V.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Ağrı, Ankara, Antalya, Bartın, Bolu, Denizli,
Edirne, Eskişehir, Karaman, Kastamonu, Kırşehir,
Konya, Kütahya, Manisa, Mersin, Nevşehir, Niğde
(Tuatay *et al.*, 1967, 1972; Lodos *et al.*, 1999; Dellacasa
and Kırgız, 2002; Şenyüz, 2004; Bellmann, 2007; Rozner
and Rozner, 2009; Şenyüz, 2009; Şenyüz and Şahin,
2009; Anlaş *et al.*, 2011b).

General distribution

Species widely distributed in Palaearctic Region
and Nearctic Region (Löbl and Smetana, 2006).

Chorotype: Centralasiatic – European
(Carpaneto *et al.*, 2000).

Genus *COLOOPTERUS* Mulsant, 1842
Colobopterus erraticus (Linnaeus, 1758)

Material examined

Ağaçhisar village - Yalınkaya village, 1335 m,
20.V.2005, Şenyüz Y. leg. and det., 1 ♂; Bozan village,
814 m, 20.V.2005, Şenyüz Y. leg. and det., 1 ♂;
Karacaören village, 1282 m, 20.V.2005, Şenyüz Y. leg.
and det., 1 ♂; Karacaören village, 1282 m, 21.V.2005,
Şenyüz Y. leg. and det., 3 ♂♂; Belkese village (Güven),
1268 m, 21.V.2005, Şenyüz Y. leg. and det., 4 ♂♂, 1 ♀;
Karacaören village, 1288 m, 21.V.2005, Şenyüz Y. leg.
and det., 2 ♂♂; Belkese village, 1268 m, 10.VI.2005,
Şenyüz Y. leg. and det., 5 ♂♂; Karacaören village, 1282
m, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♂.

Distribution in Turkey

Adana, Adıyaman, Afyon, Amasya, Ankara,
Antalya, Artvin, Aydın, Balıkesir, Bartın, Bolu, Burdur,
Bursa, Çorum, Diyarbakır, Edirne, Erzincan, Erzurum,
Eskişehir, Gaziantep, Giresun, Gümüşhane, Hatay,
Isparta, İstanbul, İzmir, Kahramanmaraş, Karaman, Kars,
Kastamonu, Kayseri, Kırklareli, Kırşehir, Konya,
Kütahya, Manisa, Mersin, Muğla, Nevşehir, Niğde,
Osmaniye, Ordu, Rize, Sakarya, Samsun, Siirt, Sinop,
Sivas, Tekirdağ, Tokat, Trabzon, Zonguldak (Tuatay *et al.*,
1967, 1972; Carpaneto, 1973; Lodos, 1978; Lodos *et al.*,
1999; Dellacasa and Kırgız, 2002; Şenyüz, 2004;
Bellmann, 2007; Rozner and Rozner, 2009; Şenyüz,

2009; Şenyüz and Şahin, 2009; Anlaş *et al.*, 2011b;
Şenyüz *et al.*, 2013a,b; Özgen *et al.*, 2014).

General distribution

A widespread Palaearctic species (Löbl and
Smetana, 2006).

Chorotype: Asiatic – European (Carpaneto *et al.*, 2000).

Genus *EUDOLUS* Mulsant & Rey, 1870
Eudolus quadriguttatus (Herbst, 1783)

Material examined

Ağaçhisar village -Yalınkaya village, 1335 m,
20.V.2005, Şenyüz Y. leg. and det., 2 ♂♂; Bozan Köyü,
814 m, 20.V.2005, Şenyüz Y. leg. and det., 2 ♂♂, 1 ♀.

Distribution in Turkey

Adana, Adıyaman, Afyon, Ankara, Antalya,
Burdur, Bursa, Çorum, Denizli, Edirne, Erzincan,
Erzurum, Eskişehir, Gaziantep, Giresun, Gümüşhane,
Hatay, Isparta, Kahramanmaraş, Kars, Kastamonu,
Kırklareli, Kırşehir, Kütahya, Mersin, Niğde, Osmaniye,
Samsun, Sivas, Van, Zonguldak (Tuatay *et al.*, 1967,
1972; Lodos *et al.*, 1999; Dellacasa and Kırgız, 2002;
Şenyüz, 2004; Bellmann, 2007; Rozner and Rozner,
2009; Şenyüz, 2009; Şenyüz and Şahin, 2009; Şenyüz *et al.*,
2013b).

General distribution

A widespread Palaearctic species (Löbl and
Smetana, 2006).

Chorotype: Turano – Europeo – Mediterranean
(Carpaneto *et al.*, 2000).

Genus *MELINOPTERUS* Mulsant, 1842
Melinopterus prodromus (Brahm, 1790)

Material examined

Ağaçhisar village -Yalınkaya village, 1335 m,
20.V.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Adana, Ankara, Antalya, Burdur, Çorum, Edirne,
Erzurum, Eskişehir, Gaziantep, Giresun, Hatay,
Kırklareli, Kırşehir, Kütahya, Mersin, Van (Tuatay *et al.*,
1967, 1972; Lodos *et al.*, 1999; Dellacasa and Kırgız,
2002; Bellmann, 2007; Rozner and Rozner, 2009;
Şenyüz, 2009).

General distribution

Species widely distributed in Palaearctic Region
and Nearctic Region (Löbl and Smetana, 2006).

Chorotype: Centralasiatic – European
(Carpaneto *et al.*, 2000).

Genus *NIMBUS* Mulsant & Rey. 1870
Nimbus contaminatus (Herbst 1783)

Material examined

Bozan village, 814 m, 20.X.2005, Şenyüz Y. leg. and det., 5 ♂♂.

Distribution in Turkey

Edirne, Kırklareli (Dellacasa and Kırgız, 2002).

General distribution

Species widely distributed in Palaearctic Region (Löbl and Smetana, 2006).

Chorotype: European (Carpaneto *et al.*, 2000).

Genus *OTOPHORUS* Mulsant, 1842
Otophorus haemorrhoidalis (Linnaeus, 1758)

Material examined

Ağaçhisar village -Yalınkaya village, 1335 m, 20.V.2005, Şenyüz Y. leg. and det., 1 ♂.

Distribution in Turkey

Amasya, Artvin, Balıkesir, Bartın, Bolu, Bursa, Edirne, Eskişehir, Hatay, Kahramanmaraş, Kastamonu, Kayseri, Kırklareli, Kütahya, Mersin, Ordu, Osmaniye, Rize, Sakarya, Samsun, Sinop, Tekirdağ, Zonguldak (Lodos *et al.*, 1999; Dellacasa and Kırgız, 2002; Rozner and Rozner, 2009; Şenyüz, 2009; Şenyüz *et al.*, 2013a, b).

General distribution

Widely distributed in the Palaearctic and Nearctic Regions and introduced also to the Neotropical Region (Löbl and Smetana, 2006).

Chorotype: Asiatic – European (Carpaneto *et al.*, 2000).

subfamily Scarabaeinae Latreille, 1802

Tribe Coprini Leach. 1815

Genus *COPRIS* Geoffroy, 1762

Copris hispanus cavolinii (Petagna, 1792)

Material examined

Bozan village, 814 m, 20.IV.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Adana, Adıyaman, Afyon, Ankara, Antalya, Bursa, Çanakkale, Çorum, Denizli, Diyarbakır, Eskişehir, Gaziantep, Hatay, Isparta, İzmir, Kahramanmaraş, Kastamonu, Kayseri, Kırıkkale, Kırşehir, Mersin, Muğla,

Nevşehir, Niğde, Osmaniye, Sivas, Tekirdağ, Uşak, (Tuatay *et al.*, 1967, 1972; Lodos, 1978; Lodos *et al.*, 1999; Bellmann, 2007; Rozner and Rozner, 2009).

General distribution

A widespread Palaearctic species, except in northern and western Europe (Löbl and Smetana, 2006).

Chorotype: Centralasiatic – Mediterranean

(Carpaneto *et al.*, 2000).

Copris lunaris (Linnaeus, 1758)

Material examined

Ağaçhisar village - Yalınkaya village, 1335 m, 20.V.2005, Şenyüz Y. leg. and det., 1 ♀; Yalınkaya village, 1240 m, 20.V.2005, Şenyüz Y. leg. and det., 1 ♂; Belkese village, 1268 m, 21.V.2005, Şenyüz Y. leg. and det., 2 ♂♂, 1 ♀; Karacaören village, 1288 m, 21.V.2005, Şenyüz Y. leg. and det., 1 ♀; Karacaören village, 1282 m, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♂.

Distribution in Turkey

Adana, Afyon, Ankara, Balıkesir, Bartın, Bolu, Çorum, Edirne, Erzincan, Eskişehir, Giresun, Gümüşhane, İzmir, Kahramanmaraş, Karaman, Kars, Kastamonu, Kayseri, Kırşehir, Kütahya, Manisa, Mersin, Nevşehir, Ordu, Osmaniye, Samsun, Sivas, Yozgat, Zonguldak (Tuatay *et al.*, 1967, 1972; Lodos 1978; Lodos *et al.*, 1999; Şenyüz, 2004; Rozner and Rozner, 2009; Anlaş *et al.*, 2011a, b; Şenyüz *et al.*, 2013a; Şenyüz and Şahin, 2013).

General distribution

Species widely distributed in Australian Region and Palearctic Region except in North Africa (Löbl and Smetana, 2006).

Chorotype: Turano – European (Carpaneto *et al.*, 2000)

Tribe Gymnopleurini Lacordaire, 1856

Genus *GYMNOPLEURUS* Illiger, 1803

Gymnopleurus flagellatus (Fabricius, 1787)

Material examined

Bozan village, 20.V.2005, Şenyüz Y. leg. and det., 3 ♂♂, 1 ♀.

Distribution in Turkey

Adana, Adıyaman, Afyon, Ağrı, Aksaray, Ankara, Balıkesir, Bilecik, Burdur, Çanakkale, Çorum, Eskişehir, Gaziantep, Giresun, Gümüşhane, Isparta, İzmir, Kahramanmaraş, Kars, Kırıkkale, Kırklareli, Kütahya, Rize, Siirt, Sivas (Lodos, 1978; Pehlivan, 1988; Lodos *et al.*, 1999; Rozner and Rozner, 2009; Şenyüz and Şahin, 2013).

General distribution

Species widely distributed in Palaearctic Region and Australian Region (Löbl and Smetana, 2006).

Chorotype: Centralasiatic – Mediterranean
(Carpaneto *et al.*, 2000).

Gymnopleurus geoffroyi geoffroyi (Fuessly, 1775)

Material examined

Bozan village, 814 m, 20.V.2005, Şenyüz Y. leg. and det., 1 ♂. ; Bozan village, 814 m, 10.VI.2005, Şenyüz Y. leg. and det., 1♂, 1♀. ; Gökçekaya village, 782 m, 21.V.2005, Şenyüz Y. leg. and det., 19 ♂♂ 15 ♀♀.

Distribution in Turkey

Adana, Adıyaman, Afyon, Amasya, Ankara, Antalya, Balıkesir, Bartın, Bilecik, Bitlis, Bolu, Burdur, Bursa, Çorum, Çanakkale, Denizli, Diyarbakır, Edirne, Eskişehir, Gaziantep, Giresun, Hakkari, Hatay, Isparta, İzmir, Kahramanmaraş, Karabük, Kastamonu, Kayseri, Kırklareli, Kırşehir, Kocaeli, Kütahya, Manisa, Mersin, Muğla, Osmaniye, Samsun, Siirt, Tekirdağ, Tokat, Uşak, Zonguldak (Tuatay *et al.*, 1967, 1972; Pehlivan, 1988; Lodos *et al.*, 1999; Bellmann, 2007; Rozner and Rozner, 2009; Anlaş *et al.*, 2011b; Şenyüz *et al.*, 2013a, b).

General distribution

A widespread Palaearctic species, except in Western Europe (Löbl and Smetana, 2006).

Chorotype: Turano – Mediterranean
(Carpaneto *et al.*, 2000).

Gymnopleurus mopsus (Pallas, 1781)

Material examined

Bozan village, 814 m, 20.V.2005, Şenyüz Y. leg. and det., 3 ♂♂ 1 ♀; Bozan village, 814 m, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Adana, Afyon, Ağrı, Ankara, Antalya, Aydın, Balıkesir, Bilecik, Bolu, Burdur, Çanakkale, Çankırı, Çorum, Denizli, Edirne, Eskişehir, Gaziantep, Hatay, Isparta, İzmir, Kahramanmaraş, Karabük, Kastamonu, Kayseri, Kırklareli, Kırşehir, Kütahya, Malatya, Manisa, Mardin, Mersin, Muğla, Nevşehir, Niğde, Osmaniye, Sinop, Tokat Zonguldak (Tuatay *et al.*, 1967, 1972; Lodos, 1978; Pehlivan, 1988; Lodos *et al.*, 1999; Rozner and Rozner, 2009; Anlaş *et al.*, 2011b; Şenyüz *et al.*, 2013a).

General distribution

A widespread Palaearctic species, except in North Africa (Löbl and Smetana, 2006).

Chorotype: Centralasiatic – Mediterranean
(Carpaneto *et al.*, 2000).

Tribe Oniticellini H.J. Kolbe, 1905

Genus *EUONITICELLUS* A. Janssens, 1953

Euoniticellus fulvus (Goeze, 1777)

Material examined

Belkese village, 1268 m, 21.V.2005, Şenyüz Y. leg. and det., 2 ♂♂; Karacaören village, 1288 m, 21.V.2005, Şenyüz Y. leg. and det., 2 ♂♂, 2 ♀♀; Gökçekaya dam, 308 m, 21.V.2005, Şenyüz Y. leg. and det., 1 ♂, 1 ♀; Belkese village, 1268 m, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♀; Karacaören village, 1282 m, 10.VI.2005, Şenyüz Y. leg. and det., 2 ♂♂, 1 ♀.

Distribution in Turkey

Adana, Afyon, Amasya, Ankara, Antalya, Artvin, Aydın, Balıkesir, Bartın, Bolu, Burdur, Bursa, Çankırı, Çorum, Denizli, Edirne, Eskişehir, Gaziantep, Giresun, Gümüşhane, Isparta, Karabük, Karaman, Kastamonu, Kayseri, Kırklareli, Kırşehir, Konya, Kütahya, Manisa, Mersin, Muğla, Nevşehir, Niğde, Osmaniye, Ordu, Rize, Sakarya, Samsun, Siirt, Tekirdağ, Tokat, Uşak, Zonguldak (Tuatay *et al.*, 1967; Lodos *et al.*, 1999; Şenyüz, 2004; Bellmann, 2007; Rozner and Rozner, 2009; Anlaş *et al.*, 2011b; Şenyüz *et al.*, 2013a,b; Şenyüz and Şahin, 2013; Özgen *et al.*, 2014).

General distribution

Species widely distributed in Palaearctic Region and Australian Region (Löbl and Smetana, 2006).

Chorotype: Turano – Europeo – Mediterranean
(Carpaneto *et al.*, 2000).

Tribe Onitini Laporte de Castelnau, 1840

Genus *CHEIRONITIS* van Lansberge, 1875

Cheironitis furcifer (Rossi, 1792)

Material examined

Karacaören village, 1282 m, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Adana, Adıyaman, Antalya, Bursa, Gaziantep, Manisa (Lodos *et al.*, 1999; Rozner and Rozner, 2009; Anlaş *et al.*, 2011b).

General distribution

Species widely distributed in Mediterranean Region (Löbl and Smetana, 2006).

Chorotype: Turano – Mediterranean
(Carpaneto *et al.*, 2000).

Genus *ONITIS* Fabricius, 1798
Onitis humerosus (Pallas, 1771)

Material examined

Bozan village, 814 m, 20.V.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Adana, Adıyaman, Afyon, Ankara, Denizli, Diyarbakır, Gaziantep; İzmir, Manisa, Mersin; Uşak (Tuatay *et al.*, 1967; Rozner and Rozner, 2009; Anlaş *et al.*, 2011b).

General distribution

A widespread Palaearctic species, except Central Europe, Western Europe and North Africa Ethiopian, Neotropic, Oriental (Löbl and Smetana, 2006; Siddiqui *et al.*, 2014).

Chorotype: Turano – Mediterranean
(Carpaneto *et al.*, 2000).

Tribe Onthophagini Burmeister, 1846
Genus *CACCOBIUS* C. G. Thomson, 1859
Caccobius schreberi (Linnaeus, 1767)

Material examined

Karacaören village, 1282 m, 20.V.2005, Şenyüz Y. leg. and det., 4 ♂♂, 2 ♀♀; Karacaören village, 1282 m, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♀; Karacaören village, 1288 m, 21.VI.2005, Şenyüz Y. leg. and det., 2 ♂♂.

Distribution in Turkey

Adana, Adıyaman, Ağrı, Amasya, Ankara, Antalya, Artvin, Aydın, Bolu, Burdur, Bursa, Çorum, Denizli, Erzincan, Eskişehir, Gaziantep, Giresun, Gümüşhane, Hatay, Isparta, İzmir, Kahramanmaraş, Karaman, Kastamonu, Kayseri, Kırşehir, Konya, Kütahya, Manisa, Mersin, Niğde, Ordu, Osmaniye, Rize, Sakarya, Siirt, Sivas, Tekirdağ, Uşak, Yozgat, Zonguldak (Tuatay *et al.*, 1967, 1972; Lodos, 1978; Lodos *et al.*, 1999; Şenyüz, 2004; Bellmann, 2007; Rozner and Rozner, 2009; Anlaş *et al.*, 2011b; Şenyüz *et al.* 2013a, b; Şenyüz and Şahin, 2013).

General distribution

Species widely distributed in Palaearctic Region (Löbl and Smetana, 2006).

Chorotype: Turano – Europeo – Mediterranean
(Carpaneto *et al.*, 2000).

Genus *EUONTHOPHAGUS* Balthasar, 1959
Euonthophagus amyntas alces (Fabricius, 1792)

Material examined

Karacaören village, 1282 m, 20.V.2005, Şenyüz Y. leg. and det., 1 ♂; Belkese village, 1268 m, 21.V.2005, Şenyüz Y. leg. and det., 3 ♂♂; Karacaören village, 1288 m, 21.V.2005, Şenyüz Y. leg. and det., 8 ♂♂, 1 ♀; Ağaçhisar village, 1025 m, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♀; Karacaören village, 1282 m, 10.VI.2005, Şenyüz Y. leg. and det., 4 ♂♂, 1 ♀; Karakütük, 1592 m, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♂, 1 ♀.

Distribution in Turkey

Adana, Adıyaman, Afyon, Ağrı, Ankara, Antalya, Aydın, Balıkesir, Burdur, Bursa, Çanakkale, Çorum, Denizli, Diyarbakır, Edirne, Eskişehir, Gaziantep, Giresun, Gümüşhane, Hatay, Isparta, İzmir, Kahramanmaraş, Kars, Kastamonu, Kayseri, Kütahya, Manisa, Mersin, Nevşehir, Niğde, Osmaniye, Rize, Samsun, Siirt, Sivas, Tekirdağ, Uşak, Van (Tuatay *et al.*, 1967, 1972; Lodos, 1978; Pehlivan, 1989; Lodos *et al.*, 1999; Şenyüz, 2004; Bellmann, 2007; Rozner and Rozner, 2009; Anlaş *et al.*, 2011b; Şenyüz *et al.* 2013b; Şenyüz and Şahin, 2013).

General distribution

A widespread Palaearctic species, except North Africa (Löbl and Smetana, 2006).

Chorotype: Centralasiatic – European
(Carpaneto *et al.*, 2000).

Euonthophagus atramentarius (Ménétriés, 1838)

Material examined

Ağaçhisar village, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♀; Belkese village, 21.V.2005, Şenyüz Y. leg. and det., 1 ♂, 3 ♀♀; Bozan village, 10.VI.2005, Şenyüz Y. leg. and det., 5 ♂♂, 6 ♀♀; Gökçekaya village, 21.V.2005, Şenyüz Y. leg. and det., 2 ♀♀; Karacaören village, 21.V.2005, Şenyüz Y. leg. and det., 6 ♂♂, 5 ♀♀; Karakütük, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♂.

Distribution in Turkey

Adana, Adıyaman, Afyon, Ankara, Antalya, Burdur, Çanakkale, Çorum, Denizli, Diyarbakır, Edirne, Eskişehir, Gaziantep, Hatay, Isparta, İzmir, Kahramanmaraş, Kırşehir, Kütahya, Manisa, Mersin, Niğde, Uşak (Tuatay *et al.*, 1967; Pehlivan, 1989; Lodos

et al., 1999; Şenyüz, 2004; Bellmann, 2007; Rozner and Rozner, 2009; Anlaş *et al.*, 2011b; Şenyüz and Şahin, 2013).

General distribution

A widespread Palaearctic species, except West Europe (Löbl and Smetana, 2006).

Chorotype: East – Mediterranean
(Carpaneto *et al.*, 2000).

Euonthophagus gibbosus (Scriba, 1790)

Material examined

Karacaören village, 21.V.2005, Şenyüz Y. leg. and det., 1 ♀; Karakütük, 10.VI.2005, Şenyüz Y. leg. and det., 3 ♀♀.

Distribution in Turkey

Adana, Adıyaman, Ankara, Antalya, Artvin, Burdur, Bursa, Çorum, Erzincan, Eskişehir, Gaziantep, Hatay, Kahramanmaraş, Kastamonu, Kayseri, Kırklareli, Kırşehir, Kütahya, Mersin, Nevşehir, Niğde, Osmaniye, Rize, Siirt, Sivas, Tokat (Tuatay *et al.*, 1967, 1972; Pehlivan, 1989; Lodos *et al.*, 1999; Şenyüz 2004; Rozner and Rozner, 2009; Şenyüz *et al.*, 2013a; Şenyüz and Şahin, 2013).

General distribution

Species widely distributed in Palaearctic Region, except North Africa and West Europe (Löbl and Smetana, 2006).

Chorotype: Centralasiatic – European
(Carpaneto *et al.*, 2000).

Euonthophagus sulcicollis (Reitter, 1892)

Material examined

Gökçekaya Barajı, 308 m, 21.V.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Carpaneto *et al.* (2000) and Ziani (2006), reported the species from Turkey but the record was not given locality.

General distribution

Species widely distributed in Turan Region and Mediterranean Region, except North Africa (Löbl and Smetana, 2006).

Chorotype: Turano – Mediterranean
(Carpaneto *et al.*, 2000).

Genus *ONTHOPHAGUS* Latreille, 1802
Furconthophagus furcatus (Fabricius, 1781)

Material examined

Bozan village, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♂; Bozan village, 20.V.2005, Şenyüz Y. leg. and det., 2 ♀♀; Karacaören village, 21.V.2005, Şenyüz Y. leg. and det., 2 ♂♂, 8 ♀♀; Yalınkaya, 20.V.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Adana, Adıyaman, Afyon, Ağrı, Ankara, Antalya, Artvin, Aydın, Balıkesir, Bartın, Bolu, Burdur, Bursa, Çanakkale, Çankırı, Çorum, Denizli, Diyarbakır, Edirne, Elazığ, Eskişehir, Gaziantep, Giresun, Gümüşhane, Hatay, İzmir, Kahramanmaraş, Karabük, Karaman, Kastamonu, Kayseri, Kırkkale, Kırşehir, Kütahya, Manisa, Mardin, Mersin, Muğla, Nevşehir, Niğde, Osmaniye, Rize, Samsun, Siirt, Sinop, Sivas, Tekirdağ, Tokat, Uşak, Van, Yozgat, Zonguldak (Tuatay *et al.*, 1967, 1972; Lodos *et al.*, 1999; Pehlivan, 1989; Tezcan and Pehlivan, 2001; Bellmann, 2007; Rozner and Rozner, 2009; Anlaş *et al.*, 2011a,b; Şenyüz *et al.*, 2013a; Özgen *et al.*, 2014).

General distribution

Species widely distributed in Palaearctic Region (Löbl and Smetana, 2006).

Chorotype: Turano – Europeo – Mediterranean
(Carpaneto *et al.*, 2000).

Onthophagus (Onthophagus) taurus (Schreber, 1759)

Material examined

Belkese village, 1268 m, 21.V.2005, Şenyüz Y. leg. and det., 1 ♂.

Distribution in Turkey

Adana, Afyon, Ankara, Antalya, Artvin, Aydın, Balıkesir, Bartın, Bilecik, Bursa, Çorum, Diyarbakır, Edirne, Erzincan, Gaziantep, Giresun, Hatay, Isparta, İstanbul, Kahramanmaraş, Karaman, Kastamonu, Kayseri, Kırklareli, Kırşehir, Konya, Kütahya, Manisa, Mersin, Muğla, Niğde, Ordu, Osmaniye, Rize, Sakarya, Sivas, Tekirdağ, Tokat, Uşak, Zonguldak (Tuatay *et al.*, 1967, 1972; Lodos, 1978; Pehlivan, 1989; Lodos *et al.*, 1999; Rozner and Rozner, 2009; Anlaş *et al.*, 2011a,b; Şenyüz *et al.*, 2013a; Şenyüz and Şahin, 2013; Özgen *et al.*, 2014).

General distribution

Species widely distributed in Palaearctic Region, Nearctic Region and Australian Region (Löbl and Smetana, 2006).

Chorotype: Centralasiatic – Europeo – Mediterranean (Carpaneto *et al.*, 2000).

Onthophagus (Palaeonthophagus) aleppensis
Redtenbacher, 1843

Material examined

Bozan village, 814 m, 20.V.2005, Şenyüz Y. leg. and det., 1 ♂.

Distribution in Turkey

Gaziantep (Pehlivan, 1989).

General distribution

Species distributed in SW Asia (Löbl and Smetana, 2006).

Chorotype: SW – Asiatic (Carpaneto *et al.*, 2000).

Onthophagus (Palaeonthophagus) fissicornis
Steven, 1809

Material examined

Bozan village, 20.V.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Adana, Adıyaman, Afyon, Ankara, Antalya, Artvin, Balıkesir, Burdur, Bursa, Çanakkale, Denizli, Diyarbakır, Edirne, Eskişehir, Gaziantep, Gümüşhane, Hatay, Isparta, İzmir, Kahramanmaraş, Kars, Kastamonu, Kayseri, Kırşehir, Konya, Kütahya, Mersin, Niğde, Osmaniye, Sivas, Tekirdağ, Tokat, Uşak (Tuatay *et al.*, 1967, 1972; Lodos, 1978; Pehlivan, 1989, Lodos *et al.*, 1999; Şenyüz, 2004; Bellmann, 2007; Rozner and Rozner, 2009; Şenyüz *et al.*, 2013a, b; Şenyüz and Şahin, 2013).

General distribution

Species widely distributed in Eastern Mediterranean Region (Löbl and Smetana, 2006).
Chorotype: East – Mediterranean (Carpaneto *et al.*, 2000).

Onthophagus (Palaeonthophagus) fracticornis
(Preyßler, 1790)

Material examined

Belkese village, 1268 m, 21.V.2005, Şenyüz Y. leg. and det., 1 ♂, 1 ♀; Karacaören village, 1282 m,

21.V.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Adana, Afyon, Ankara, Antalya, Balıkesir, Burdur, Denizli, Erzincan, Eskişehir, Gaziantep, Hatay, Isparta, Kahramanmaraş, Kars, Kütahya, Manisa, Mersin, Muğla, Ordu, Osmaniye, Rize (Tuatay *et al.*, 1967, 1972; Pehlivan, 1989; Lodos *et al.*, 1999; Bellmann, 2007; Rozner and Rozner, 2009; Anlaş *et al.*, 2011b; Şenyüz *et al.*, 2013a; Şenyüz and Şahin, 2013).

General distribution

A widespread Palaearctic species, except North Africa (Löbl and Smetana, 2006).

Chorotype: Turano – European (Carpaneto *et al.*, 2000).

Onthophagus (Palaeonthophagus) lucidus (Sturm, 1800)

Material examined

Bozan village, 814 m, 20.V.2005, Şenyüz Y. leg. and det., 2 ♀♀; Belkese village, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♂.

Distribution in Turkey

Adana, Afyon, Ankara, Antalya, Bartın, Bolu, Burdur, Bursa, Denizli, Diyarbakır, Erzurum, Eskişehir, Gümüşhane, İzmir, Kahramanmaraş, Kars, Kastamonu, Kırşehir, Kütahya, Mersin, Niğde, Sivas, Uşak, Van, Zonguldak (Tuatay *et al.*, 1967, 1972; Pehlivan, 1989; Lodos *et al.*, 1999; Bellmann, 2007; Rozner and Rozner, 2009; Şenyüz *et al.*, 2013b).

General distribution

Species widely distributed in East Europe and East Mediterranean Region (Löbl and Smetana, 2006).

Chorotype: East – Mediterranean

(Carpaneto *et al.*, 2000).

Onthophagus (Palaeonthophagus) marginalis
Gebler, 1817

Material examined

Karacaören village, 21.V.2005, Şenyüz Y. leg. and det., 1 ♂, 2 ♀♀.

Distribution in Turkey

Adana, Adıyaman, Ankara, Burdur, Çanakkale, Çorum, Eskişehir, İzmir, Kahramanmaraş, Kırıkkale, Kırşehir, Konya, Kütahya, Niğde, Osmaniye, Rize, Sivas, Van (Tuatay *et al.*, 1967, 1972; Pehlivan, 1989; Lodos *et al.*, 1999; Şenyüz, 2004; Rozner and Rozner, 2009; Şenyüz and Şahin, 2013).

General distribution

A widespread Palaearctic species, except in northern and western Europe (Löbl and Smetana, 2006).

Chorotype: Asiatic – European (Carpaneto *et al.*, 2000).

Onthophagus (Palaeonthophagus) medius
(Kugelann, 1792)

Material examined

Belkese Köyü, 1268 m, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♀; Karakütük, 1592 m, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Bursa, Çorum, Manisa (Anlaş *et al.*, 2011b; Şenyüz *et al.*, 2013a, b).

General distribution

Species widely distributed in Palaearctic Region (Löbl and Smetana, 2006).

Chorotype: Turano – Europeo – Mediterranean
(Carpaneto *et al.*, 2000).

Onthophagus (Palaeonthophagus) opacicollis Reitter,
1893

Material examined

Karacaören village, 20.V.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Adana, Antalya, Balıkesir, Bolu, Eskişehir, Gaziantep, Hatay, Kahramanmaraş, Kütahya, Manisa, Mersin, Niğde, Ordu, Tokat (Pehlivan, 1989; Lodos *et al.*, 1999; Şenyüz, 2004; Bellmann, 2007; Rozner and Rozner, 2009; Anlaş *et al.*, 2011b; Şenyüz *et al.*, 2013a; Şenyüz and Şahin, 2013).

General distribution

Species widely distributed in Mediterranean Region (Löbl and Smetana, 2006).

Chorotype: Mediterranean (Carpaneto *et al.*, 2000).

Onthophagus (Palaeonthophagus) osellai Pittino, 1982

Material examined

Ağaçhisar village - Yalınkaya village, 1335 m, 20.V.2005, Şenyüz Y. leg. and det., 4 ♂♂; Karacaören village, 1282 m, 20.V.2005, Şenyüz Y. leg. and det., 1 ♂; Bozan village, 814 m, 20.V.2005, Şenyüz Y. leg. and det., 1 ♂.

Distribution in Turkey

Adana, Adıyaman, Afyon, Amasya, Ankara,

Antalya, Bolu, Burdur, Bursa, Çankırı, Çorum, Denizli, Erzincan, Erzurum, Gaziantep, Hatay, Kahramanmaraş, Kars, Kastamonu, Kütahya, Mersin, Yozgat, Zonguldak (Pittino, 1982, 2004; Rozner and Rozner, 2009; Şenyüz *et al.*, 2013b).

General distribution

Species distributed in SW Asia (Löbl and Smetana, 2006).

Chorotype: SW – Asiatic (Carpaneto *et al.*, 2000).

Onthophagus (Palaeonthophagus) suturellus
Brullé, 1832

Material examined

Bozan village, 814 m, 20.V.2005, Şenyüz Y. leg. and det., 1 ♂; Bozan village, 814 m., 10.VI.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Adıyaman, Ankara, Burdur, Denizli, Eskişehir, Gaziantep, Kırşehir, Konya, Kütahya, Nevşehir, Niğde, Siirt, Sivas (Tuatay *et al.*, 1967, 1972; Pehlivan, 1989; Lodos *et al.*, 1999; Rozner and Rozner, 2009).

General distribution

Species widely distributed in West Asia and East Europe (Löbl and Smetana, 2006).

Chorotype: East – Mediterranean
(Carpaneto *et al.*, 2000).

Onthophagus (Palaeonthophagus) vacca
(Linnaeus, 1767)

Material examined

Belkese village, 21.V.2005, Şenyüz Y. leg. and det., 2 ♂♂, 9 ♀♀; Karacaören village, 21.V.2005, Şenyüz Y. leg. and det., 1 ♂, 2 ♀♀; Karakütük, 10.V.2005, Şenyüz Y. leg. and det., 2 ♂♂, 10 ♀♀.

Distribution in Turkey

Adana, Afyon, Ağrı, Amasya, Ankara, Antalya, Aydın, Balıkesir, Bursa, Çanakkale, Çorum, Denizli, Edirne, Erzincan, Eskişehir, Gümüşhane, İzmir, Kahramanmaraş, Kars, Kırşehir, Kütahya, Manisa, Mersin, Niğde, Osmaniye, Sivas, Tekirdağ (Tuatay *et al.*, 1967, 1972; Pehlivan, 1989; Lodos *et al.*, 1999; Şenyüz 2004; Bellmann, 2007; Rozner and Rozner, 2009; Anlaş *et al.*, 2011b; Şenyüz *et al.*, 2013a, b; Şenyüz and Şahin, 2013).

General distribution

Species widely distributed in Palaearctic Region and Australian Region (Löbl and Smetana, 2006).

Chorotype: Turano – Europeo – Mediterranean
(Carpaneto *et al.*, 2000).

Onthophagus (Palaeonthophagus) verticicornis
(Laicharting, 1781)

Material examined

Ağaçhisar village -Yalınkaya village, 1335 m, 20.V.2005, Şenyüz Y. leg. and det., 1 ♀; Belkese village, 1268 m, 21.V.2005, Şenyüz Y. leg. and det., 2 ♀♀; Gökçekaya village, 782 m, 21.V.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Afyon, Bursa, Eskişehir, Isparta, İzmir, Kırklareli (Rozner and Rozner, 2009; Şenyüz *et al.*, 2013b).

General distribution

Species widely distributed in Central Europe, SW Asia (Löbl and Smetana, 2006).

Chorotype: Centralasiatic – European
(Carpaneto *et al.*, 2000).

Tribe Scarabaeini Latreille, 1802
Genus *Scarabaeus* Linnaeus, 1758
Scarabaeus pius (Illiger, 1803)

Material examined

Bozan village, 814 m, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♂.

Distribution in Turkey

Adıyaman, Ankara, Antalya, Bilecik, Bolu, Bursa, Çanakkale, Çorum, Denizli, Diyarbakır, Eskişehir, Gaziantep, Isparta, İzmir, Kahramanmaraş, Kayseri, Kırklareli, Kırşehir, Konya, Kütahya, Manisa, Mersin, Muğla, Niğde, Siirt, Tokat, Urfa, Van (Tuatay *et al.*, 1967, 1972; Pehlivan, 1988; Lodos *et al.*, 1999; Rozner and Rozner, 2009; Özgen *et al.*, 2014).

General distribution

Species widely distributed in East Mediterranean Region except North Africa (Löbl and Smetana, 2006).

Chorotype: East – Mediterranean
(Carpaneto *et al.*, 2000).

Scarabaeus typhon Fischer de Waldheim, 1823

Material examined

Bozan village -Ağaç village, 1025 m, 20.V.2005, Şenyüz Y. leg. and det., 1 ♂; Gökçekaya dam, 308 m, 20.V.2005, Şenyüz Y. leg. and det., 1 ♂; Ağaçhisar village -Yalınkaya village, 1335 m, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♀; Bozan village, 814 m, 10.VI.2005,

Şenyüz Y. leg. and det., 1 ♂; Karacaören village, 1282 m, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Afyon, Ağrı, Balıkesir, Çanakkale, Kayseri, Kırklareli, Sivas (Rozner and Rozner, 2009; Sürgüt *et al.*, 2014).

General distribution

A widespread Palaearctic species, except North Africa (Löbl and Smetana, 2006).

Chorotype: Centralasiatic – Mediterranean
(Carpaneto *et al.*, 2000).

Tribe Sisyphini Mulsant, 1842
Genus *SISYPHUS* Latrielle, 1807
Sisyphus schaefferi schaefferi (Linnaeus, 1758)

Material examined

Karacaören village, 1288 m, 21.V.2005, Şenyüz Y. leg. and det., 6 ♂♂; Bozan village, 814 m, 10.VI.2005, Şenyüz Y. leg. and det., 1 ♀.

Distribution in Turkey

Adıyaman, Ankara, Antalya, Balıkesir, Bilecik, Burdur, Bursa, Çorum, Edirne, Erzurum, Eskişehir, Gümüşhane, Hatay, Isparta, İzmir, Kahramanmaraş, Kars, Kırklareli, Kütahya, Manisa, Mersin, Muğla, Osmaniye, Rize, Samsun, Sivas, Tekirdağ, Uşak, Van (Tuatay *et al.*, 1967, 1972; Lodos, 1978; Lodos *et al.*, 1999; Şenyüz, 2004; Bellmann, 2007; Rozner and Rozner, 2009; Anlaş *et al.* 2011a, b; Şenyüz *et al.*, 2013a, b; Şenyüz and Şahin, 2013).

General distribution

A widespread Palaearctic species (Löbl and Smetana, 2006).

Chorotype: Centralasiatic – Europeo – Mediterranean
(Carpaneto *et al.*, 2000).

General characteristics of the collected inventory

The survey carried out for the first time in the Sündiken Mountains provide a first dung beetle list for this region but also new faunistic records for the Eskişehir province (*Onitis humerosus*, *Onthophagus taurus*, *O. aleppensis*, *O. medius* and *O. osellai*), as well as new records for the Fauna of the Internal Anatolian Region (*Onthophagus aleppensis* and *O. medius*). Interestingly, *Nimbus contaminatus* was also a new record for the Asian part of Turkey (Löbl and Smetana, 2006).

The obtained inventory shows that the collected species belong to 11 different chorological categories,

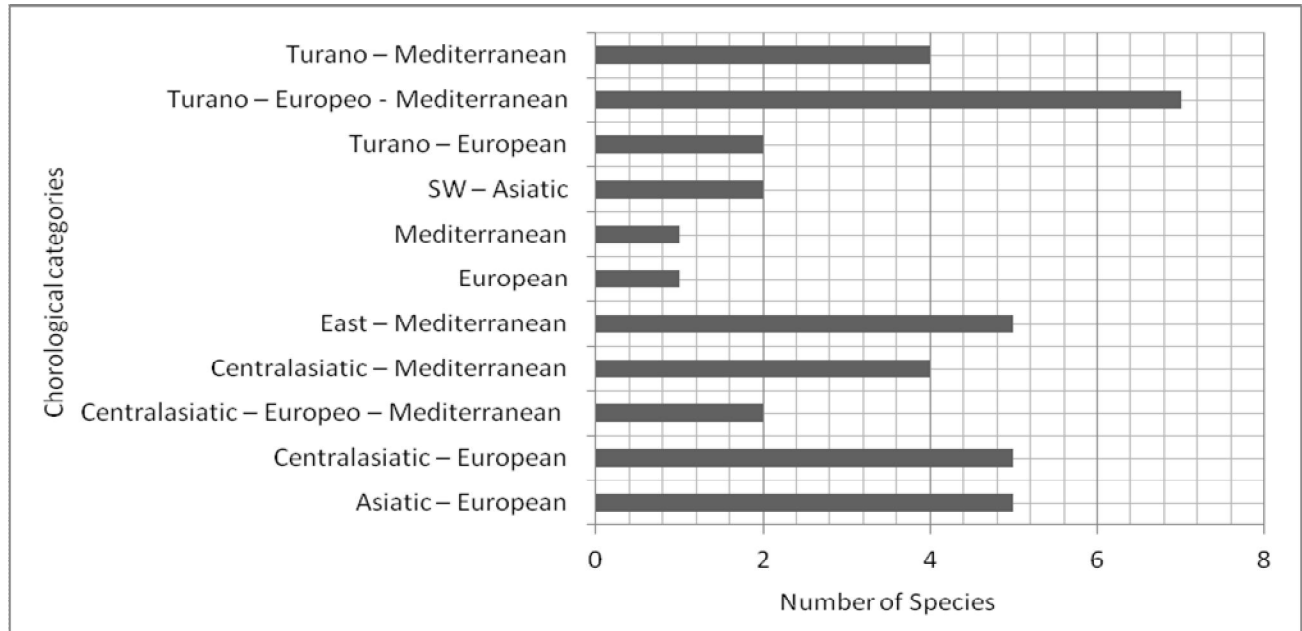


Fig. 2. Number of species belonging to each one of the chorological categories for the collected dung beetles of the Sündiken Mountains.

being the Turano-Europeo-Mediterranean (18% of total species) the most frequent one (Table II; Fig. 2). Both the number and variety of the different dung beetle chorotypes found in this region suggest that Sündiken Mountains can be considered a region characterized by a mixture of Centralasian and Mediterranean elements, in which many species with different origins and climatic adaptations may coexist. The accomplishment of future new surveys in this region probably will provide new and interesting records capable of improving the current knowledge about Turkey dung beetle fauna.

REFERENCES

- Anlaş, S., Keith, D. and Tezcan, S., 2011a. Notes on the pitfall trap collected Scarabaeoidea (Coleoptera) species in Bozdağlar Mountain of western Turkey. *Anadolu Doğa Bilimleri Dergisi*, **2**: 1-5.
- Anlaş, S., Keith, D. and Tezcan, S., 2011b. Notes on the seasonal dynamics of some coprophagous Scarabaeoidea (Coleoptera) species in Manisa province, western Anatolia. *Türk. entomol. Derg.*, **35**: 447-460.
- Balthasar, V., 1963a. *Monographie der Scarabaeidae und Aphodiidae der palaearktischen und orientalischen region*, Band 1, Verlag der Tscherhoslowakischen Akademie der Wissenschaften Prag, pp. 392.
- Balthasar, V., 1963b. *Monographie der Scarabaeidae und Aphodiidae der palaearktischen und orientalischen region*, Band 2, Verlag der Tschechoslowaischen Akademie der Wissenschaften, pp. 628.
- Balthasar, V., 1964. *Monographie der Scarabaeidae und Aphodiidae der palaearktischen und orientalischen region*, Band 3, Verlag der Tschechoslowaischen Akademie der Wissenschaften Prag, pp. 654.
- Bellmann, A., 2007. Beitrag zur Kenntnis der Aphodiinae der Türkei (Coleoptera: Scarabaeoidea). *Ent. Z. Stuttgart*, **117**: 132-136.
- Carpaneto, G.M., 1973. Una Nuova Specie Di Aphodius (Coleopterus) Dell'Armenia Turca. (Col. Aphodiidae). *Frag. Ent. Roma*, **9**: 21-33.
- Carpaneto, G.M., Piattella, E. and Pittino, R., 2000. The scarab beetles of Turkey: An updated checklist and chorotype analysis (Coleoptera, Scarabaeoidea). *Biogeographia*, **21**: 217-240.
- Dellacasa, G. and Dellacasa, M., 2006. Fauna d'Italia. Coleoptera Aphodiidae, Aphodiinae. - (Edizioni Calderini). *Bologna*, **41**: 1-484.
- Dellacasa, M. and Kirgiz, T., 2002. Records of Aphodiinae (Coleoptera, Scarabaeoidea, Aphodiidae) from Edirne province and neighbouring areas (European Turkey). *Italian J. Zool.*, **69**: 71-82.
- Göktürk, T. and Mihli, A., 2015. New contributions to Scarabaeidae (Insecta: Coleoptera) fauna of the Artvin province in Turkey. *Annals of Agrarian Science*, **13**: 71-78.

- Güner, Ş.T., Çömez, A. and Genç, M., 2007. Some determinations in the natural regeneration areas of the scotch pine and Anatolian black pine: a case study of Sündiken Mountain – Eskişehir – 1. *J. Forest Engin.*, **44**: 16-18.
- Kabakov, O.N., 2006: *Plastinchatousye zhuki podsemeistva Scarabaeinae fauny Rossii i sopredel'nykh stran. [The lamellicorn beetle subfamily Scarabaeinae (Insecta: Coleoptera: Scarabaeidae) in the fauna of Russia and adjacent countries.]* 1091 figs, 2 col. plates, pp. 374. (in Russian).
- Küçükayki, E.C., Şenyüz, Y., Şirin, Ü., Çalışkan, H. and Destire, C., 2013. New Contributions To Scarabaeidae (Insecta: Coleoptera) Fauna Of The Eskişehir Province. *Anadolu Univ. J. Sci. Technol – C Life Sci. Biotechnol.*, **3**: 23-30.
- Lodos, N., 1978. The study of the harmful insect fauna of Marmara and Aegean regions. Publications of Food, Agriculture and Animal Husbandary Ministry of Republic of Turkey, Ankara. Pp. 301. (in Turkish)
- Lodos, N., Önder, F., Pehlivan, E., Atalay, R., Erkin, E., Karsavuran, Y., Tezcan, S. and Aksoy, S., 1999. *Faunistic Studies on Scarabaeoidea (Coleoptera) of Western Black Sea, Central Anatolia and Mediterranean Regions of Turkey.* Ege Üniversitesi basım evi. İzmir, pp. 64.
- Löbl, I. and Smetama, A., 2006. *Catalogue of Palaearctic Coleoptera*, Apollo Books Stenstrup, pp. 690.
- Martín-Piera, F. and López-Colón, J.I., 2000. Coleoptera, Scarabaeoidea I. En: (eds. M.A. Ramos et al. eds. *Fauna Iberica*, Vol. 14. Museo Nacional de Ciencias Naturales (CSIC), Madrid, pp. 526.
- Özgen, İ., Şenyüz, Y. and Temizer, A., 2014. Contributions to the Knowledge of Scarabaeoidea (Coleoptera) Fauna of Southeast and East Anatolia Region of Turkey. *J. Anatolian Nat. Sci.*, **5**: 20-29.
- Paulian, R., 1959. *Faune De France*. Editions Paul Lechevalier, Paris, pp. 298.
- Pehlivan, E., 1988. Les travaux taxonomiques sur la famille Scarabaeidae (Coleoptera) de la Turquie. I. Scarabaeus L., Gymnopleurus Ill. Sisyphus Latr. *Turk. J. Ent.*, **12**: 221-230.
- Pehlivan, E., 1989. Les travaux taxonomiques sur la famille Scarabaeidae (Coleoptera) de la Turquie. II. Onthophagus Latr. *Turk. J. Ent.*, **13**: 25-42.
- Pittino, R., 1982. Due nuovi Onthophagus Latr. anatolici del gruppo ovatus (L.) (Coleoptera, Scarabaeidae). *Frag. Ent.*, **16**: 189-203.
- Pittino, R., 2004. New or noteworthy taxa of the genus Onthophagus (subg. Palaeonthophagus) from south-eastern Europe and the Near East (Coleoptera, Scarabaeidae). *Frag. Ent* **36**: 145-214.
- Rozner, I. and Rozner, G., 2009. Additional data to the Lamellicornia Fauna of Turkey (Coleoptera: Lamellicornia). *Natura Somogyiensis, Kaposvár*, **15**: 69-100.
- Schaufuss, C., 1916. *Calwer's Käferbuch* Band I-II 6. aufl. E.Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, pp. 1390.
- Sürgüt, H., Tüven, A., Varli, S.V., Polat, A. and Tezcan, S., 2014. An Evaluation on the pitfall trap collected Scarabaeoidea (Coleoptera) species in Western Turkey. *Munis Ent. Zool.*, **9**: 812-818.
- Siddiqui, H., Ahmed, Z. and Khatri, I., 2014. Distributional notes and new records for the dung beetles (Coleoptera: Scarabaeidae: Scarabaeinae) of Pakistan. *Pakistan J. Zool.*, **46**: 295-307.
- Şenyüz, Y., 2004. Determining of Scarabaeidae (Coleoptera) Fauna in Kütahya Province, Eskişehir Osmangazi University, Institute of Science, Department of Biology Master Thesis, pp. 104.
- Şenyüz, Y., 2009. Fauna of subfamily Aphodiinae (Scarabaeidae, Coleoptera) in Turkmen Mountain, Dumlupınar University, Institute of Science, Department of Biology. PhD Thesis. pp. 90.
- Şenyüz, Y. and Şahin, Y., 2009a. Faunistic studies on Aphodiinae Subfamily (Coleoptera, Scarabaeidae) of Kütahya (Turkey). *Linzer Biol. Beit.*, **14**: 1757-1766.
- Şenyüz, Y. and Şahin, Y., 2009b. Faunistic studies on Cetoniinae, Dynastinae, Melolonthinae, Rutelinae (Coleoptera: Scarabaeidae) Geotrupinae (Geotrupidae) of Kütahya Province, Turkey. *Munis Ent. Zool.*, **4**: 536-541.
- Şenyüz, Y., Dindar, K. and Altunsoy, F., 2013a. Contributions to the knowledge of Scarabaeidae (Coleoptera) fauna of the Middle and East Black Sea Region of Turkey. *Munis Ent. Zool.*, **8**: 772-781.
- Şenyüz, Y., Dindar, K., Gülmez, M. and İzgördü, H., 2013b. A faunistic study on the species of Aphodiinae and Scarabaeinae (Coleoptera: Scarabaeidae) in Bursa, Journal of Science of Dumlupınar University **32**: 1-12.
- Şenyüz, Y. and Şahin, Y., 2013. Faunistic, ecological and zoogeographical evaluations on the dung beetles (Coleoptera: Scarabaeidae: Scarabaeinae) of Kütahya province, (Turkey). *Turk. J. Ent.*, **37**: 433-448.
- Taglianti, A.V., Audisio, P.A., Biondi, M., Bologna, M.A., Carpaneto, G.M., Biase, A.D., Fattorini, S., Piattella, E., Sindaco, R., Venchi, A. and Zapparoli, M., 1999. A proposal for a chorotype classification of the near east fauna, in the framework of the western Palearctic Region. *Biogeographia*, **20**: 31 – 59
- Tezcan, S. and Pehlivan, E., 2001. Evaluation of the Lucanoidea and Scarabaeoidea (Coleoptera) fauna of ecological cherry orchards in İzmir and Manisa provinces of Turkey. *Ege Üniv. Zir. Fakült. Derg.*, **38**: 31-37.
- Tuatay, N., Gül, S., Demirtola, A., Kalkandelen, A. and Çağatay, N., 1967. Catalogue of insect of plant protection museum (1961-1966). Zirai Mücadele ve Zirai Karantina

Gn. Md. Yayınları, Ankara, pp. 66.

Tuatay, N., Kalkandelen, A. and Aysev, N., 1972. Catalogue of insect of Plant Protection museum, T.C. Tarım Bakanlıđı Zıraii Mücadele Genel Müdürlüğü Yayınları, Ankara, pp. 119.

Ziani, S., 2006. Remarks on some near Eastern *Euonthophagus* species with the description of two new species from Iran (Insecta Coleoptera Scarabaeidae: Onthophagini). Quaderno di Studi e Notizie di Storia Naturale della Romagna, *Cesena*, **23**: 95-130.