

ARAŞTIRMA MAKALESİ/RESEARCH ARTICLE

**NEW CONTRIBUTIONS TO SCARABAEIDAE (INSECTA: COLEOPTERA) FAUNA OF
THE ESKİŞEHİR PROVINCE**

**Ebru Ceren KÜÇÜKKAYKI¹, Yakup ŞENYÜZ², Ümit ŞİRİN¹, Hakan ÇALIŞKAN¹,
Ceyhun DESTİRE³**

ABSTRACT

This study is based on Scarabaeidae species collected from Eskişehir Osmangazi University Meşelik campus between May–July 2007–2011. Totally, 14 species of Scarabaeidae are firstly recorded in the research area and also 12 of them are new for Eskişehir Province. For each species, the World and Turkey distributions and chorotypes are given.

Key Words : Scarabaeidae, Coleoptera, Dung Beetle, Eskişehir, Fauna

**ESKİŞEHİR İLİ SCARABAEIDAE (INSECTA: COLEOPTERA) FAUNASINA YENİ
KATKILAR**

ÖZ

Bu çalışma Eskişehir Osmangazi Üniversitesi Meşelik Kampüsü'nden Mayıs-Temmuz 2007-2011 yılları arasında toplanan Scarabaeidae türleriyle gerçekleştirilmiştir. Araştırma alanından toplamda 14 Scarabaeidae türü ilk kez kaydedilmiştir ve 12 türün Eskişehir için yeni kayıt olduğu tespit edilmiştir. Her bir türün korotipleri, Dünya ve Türkiye dağılımları listelenmiştir.

Anahtar Kelimeler: Scarabaeidae, Coleoptera, Mayıs böceği, Eskişehir, Fauna

¹ Eskişehir Osmangazi University, Faculty of Arts and Science, Department of Biology, Meşelik Campus, Eskişehir.

e-posta: ebruceren@ogu.edu.tr

² Dumlupınar University, Faculty of Arts and Science, Department of Biology, Kütahya.

³ Eskişehir Osmangazi University, Institute of Science, Meşelik Campus, Eskişehir.

Received:27 August 2012 ; **Revised:** 21 February 2013 ; **Accepted:** 11 March 2013

1. INTRODUCTION

Coleoptera is the biggest order of Insects with approximately 350,000 species. This number is 40% of all known insect species (Elzinga, 2000; Marshall, 2006; Grimaldi and Engel, 2006). The Scarabaeidae is one of the largest families of beetles in the World with 27.800 species belong to 2,000 genus. In Turkey, 522 species represent in 86 genus (Carpaneto, et. all, 2000).

Beetles of this family are popular with collectors because of their bright colors and the large horns in some groups. If we analyze the life-cycle we can observe that they feed in many different ways as on live plant matter, plant roots or rotting wood, manure, carrion, fungi, plants, pollen, fruit, compost (Şenyüz, 2009). Some species are being used in various countries for the biological control of important parasites of livestock because they decrease the availability of sites for reproduction of those parasitic organisms. The effectiveness of these insects in removing organic matter makes them essential components in maintaining and regulating of terrestrial ecosystems in which they live (Silva, 2011). Distributions of these beetles are strongly influenced by the vegetative cover, fragmentation, physical structure, and environmental elevation.

Taxonomic and ecological studies about Scarabaeidae species of Turkey are considerably insufficient. Besides there has been no research about Scarabaeidae species of the Eskişehir Meşelik Campus until now. So, the species composition of Scarabaeidae on mentioned area was firstly determined by this work. However, further studies are needed about ecological and biological features and Turkey distributions of this family.

2. MATERIAL AND METHODS

2.1. Study Area

Meşelik forest (Figure 1), is between 39°–44° north latitude and 30°–29° east meridians in south of Eskişehir province. This area is 3–3.5 km away from the center of province. The altitude of the region varies from 850m to 1050 m. The aspect direction is northern. Forest, soil depth is shallow and medium (less than 60 cm), flat and very inclined (0–24%). Area shows the climatic characteristics of Central Anatolia Region (Varol, 2008).



Figure.1: General View of Study Area

2.2. Sampling and Identification

This study is based on Scarabaeidae specimens from Meşelik Campus between 2007–2011. Samples were collected by aspirator and forceps, killed by 70% ethyl alcohol. Identifications were made by using Baraud, 1992. The specimens are deposited in the Department of Biology, Faculty of Arts and Science, Eskişehir Osmangazi University, Eskişehir.

3. RESULTS AND DISCUSSION

Totally, 14 species of Scarabaeidae are recorded from the study area between May–July 2007–2011. Species list, Turkey and World distribution and chorotypes are given below;

Family **SCARABAEIDAE** Latreille. 1802
Subfamily **Cetoniinae** Leach. 1815
Tribe **Cetoniini** Leach. 1815
Cetonia aurata (Linnaeus, 1761)

Material examined: 30.V.2007, 1 specimen; 24.V.2009, 1 specimen; 25.V.2010, 1 specimen; 28.V.2011, 3 specimens.

Records of Turkey: Adana, Bartın, Bolu, Gaziantep, Karaman, Kütahya, Muğla, Sinop (Şenyüz and Şahin, 2009).

Records of World: Albania, Austria, Belarus, Belgium, Bosnia Herzegovina, Bulgaria, Channel Is., Corsica, Croatia, Cyclades Is., Czech Republic, Danish mainland, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Kaliningrad region, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Netherlands, Norway, Poland, Romania, Russia: Central European Territory, Russia: North European Territory, Russia: South European Territory, Sardinia, Sicily, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, Yugoslavia. Asia: Iran, Kazakhstan, Kyrgyzstan, Mongolia, Russia: East Siberia, Russia: West Siberia, Turkey, Uzbekistan, Xinjiang (Löbl and Smetana, 2006; Fauna Europea).

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

Oxythyrea cinctella (Shaum, 1841)

Material examined: 20.V.2007, 2 specimens; 16.VI.2008, 8 specimens; 15.V.2009, 12 specimens; 25.V.2009, 14 specimens; 26.VI.2009, 10 specimens; 10.V.2010, 13 specimens; 20.V.2011, 6 specimens; 15.VI.2011, 8 specimens.

Records of Turkey: Adana, Afyon, Ankara, Antalya, Aydın, Balıkesir, Bartın, Bilecik, Burdur, Bursa, Çanakkale, Çankırı, Çorum, Denizli, Gaziantep, Hatay, Isparta, İçel, İzmir, Kahramanmaraş, Karabük, Karaman, Kastamonu, Kayseri, Kırıkkale, Kırklareli, Kırşehir, Kilis, Konya, Kütahya, Manisa, Muğla, Nevşehir, Niğde, Osmaniye, Sakarya, Tekirdağ, Uşak (Şenyüz and Şahin, 2009).

Records of World: Albania, Armenia, Azerbaijan, Bulgaria, Georgia, Greece, Macedonia, Russia: South European Territory, Turkey, Yugoslavia. Asia: Afghanistan, Iran, Iraq, Israel, Jordan, Kazakhstan, Kyrgyzstan, Lebanon, Pakistan, Syria, Tajikistan, Turkey, Turkmenistan, Uzbekistan, Xinjiang (Löbl and Smetana, 2006).

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

Protaetia (Netocia) ungarica anatolica (Medvedev, 1947)

Material examined: 02.VI.2007, 2 specimens; 23.V.2008, 1 specimen; 24.V.2009, 3 specimens; 25.V.2010, 1 specimen; 26.VI.2011, 3 specimens.

Records of Turkey: Amasya, Ankara, Bolu, Bursa, Çankırı, Çorum, Eskişehir, Isparta, İstanbul, İzmir, Konya, Kütahya, Nevşehir, Trabzon, Yozgat (Tauzin, 1994; Demir, 2005).

Records of World: Europe: Azerbaijan, Turkey. Asia: Iran, Kazakhstan, Turkmenistan, Turkey (Löbl and Smetana, 2006).

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

Protaetia (Netocia) ungarica armeniaca (Menetries, 1832)

Material examined: 02.VI.2007, 4 specimens; 26.IV.2008, 2 specimens; 25.V.2009, 1 specimen; 25.V.2010, 1 specimen; 05.VI.2011, 2 specimens.

Records of Turkey: Adana, Afyon, Aksaray, Amasya, Ankara, Artvin, Burdur, Denizli, Diyarbakır, Erzincan, Erzurum, Gümüşhane, Hatay, Isparta, İzmit, Kars, Kayseri, Kayseri, Konya, Malatya, Muş, Nevşehir, Niğde, Sivas, Tokat, Tunceli, Van, Yozgat (Tauzin, 1994; Demir, 2005).

Records of World: Europe: Armenia, Azerbaijan, Georgia. Asia: Iran, Syria, Turkey, Turkmenistan (Löbl and Smetana, 2006).

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

Potosia cuprea ignicollis (Gory & Pech. 1833)

Material examined: 27.V.2007, 1 specimen; 02.VI.2007, 1 specimen.

Records of Turkey: Adana, Hatay, Konya, Mersin (Demir, 2005).

Records of World: North Africa: Egypt, Asia: Israel, Lebanon, Syria, Turkey (Löbl and Smetana, 2006).

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

Tropinota hirta hirta (Poda von Neuhaus, 1761)

Material examined: 26.IV.2008, 2 specimens; 20.V.2008, 3 specimens; 23.V.2008, 2 specimens; 25.V.2009, 2 specimens; 16.VI.2010, 2 specimens; 25.VI.2011, 1 specimen.

Records of Turkey: Adana, Afyon, Ankara, Antalya, Aydın, Balıkesir, Bilecik, Burdur, Bursa, Bolu, Çanakkale, Çankırı, Çorum, Denizli, Edirne, Gaziantep, Hatay, Isparta, İçel, İzmir, Kahramanmaraş, Karabük, Karaman, Kastamonu, Kayseri, Kırıkkale, Kırklareli, Kırşehir, Kilis, Konya, Kütahya, Manisa, Muğla,

Niğde, Osmaniye, Sakarya, Tekirdağ, Uşak (Şenyüz and Şahin, 2009).

Records of World: Europe: Albania, Andorra, Austria, Balearic Is., Belarus, Belgium, Bosnia Herzegovina, Bulgaria, Channel Is., Corsica, Crete, Croatia, Cyclades Is., Cyprus, Czech Republic, Dodecanese Is., Estonia, France, Georgia, Germany, Greece, Hungary, Italy, Kaliningrad region, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Moldova, Netherlands, Poland, Portugal, Romania, Russia: Central European Territory, Russia: North European Territory, Russia: South European Territory, Sardinia, Sicily, Slovakia, Slovenia, Spain, Switzerland, Turkey, Ukraine, Yugoslavia. North Africa: Morocco. Asia: Kazakhstan, Turkey (Löbl and Smetana, 2006; Fauna Europea).

Chorotype: Europeo-Mediterranean (Carpaneto et al., 2000).

Tribe Valgini Mulsant, 1842

Valgus hemipterus (Linnaeus, 1758)

Material examined: 20.IV.2008, 1 specimen; 26.V.2011, 2 specimens.

Records of Turkey: Burdur, Çanakkale, Edirne, Isparta, İzmir, Manisa, Muğla, Sakarya, Tekirdağ (Lodos et al., 1978).

Records of World: Europe: Albania, Armenia, Austria, Balearic Is., Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Russia: Central European Territory, Corsica, Crete, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Great Britain, Germany, Georgia, Hungary, Italy, Kazakhstan, Latvia, Lithuania, Luxembourg, Macedonia, Netherlands, Poland, Portugal, Romania, Sardinia, Sicily, Slovakia, Slovenia, Spain, Russia: South European Territory, Sweden, Switzerland, Turkey, Ukraine, Yugoslavia, North Africa: Algeria, Morocco, Tunisia, Asia: Russia: East Siberia, Russia: Far East, Iran, Kyrgyzstan, Kazakhstan, China: Southeastern Territory, Tajikistan, Uzbekistan (Löbl and Smetana, 2006; Fauna Europea).

Chorotype: European (extended to African Maghrebmand Caucasus) (Piattella, 2008).

Subfamily **Dynastinae** MacLeay, 1819

Tribe **Pentodontini** Mulsant, 1842

Pentodon bidens sulcifrons (Küster, 1848)

Material examined: 22.V.2008, 1 specimen.

Records of Turkey: Antalya, Karaman, Konya, Kütahya (Şenyüz and Şahin, 2009).

Records of World: Azerbaijan, Ukraine, Afghanistan, Cyprus, India: Kashmir, Kazakhstan, Kyrgyzstan, Palestine, Russia: West Siberia, Tajikistan, Turkmenistan, Uzbekistan, Xinjiang (Löbl and Smetana, 2006; Global Species).

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

Subfamily **Melolonthinae** Samouelle, 1819

Tribe **Pachydemini** Burmeister, 1855

Tanyproctus reichii (Rambur, 1843)

Material examined: 15.IV.2008, 1 specimen.

Records of Turkey: Aydın, İzmir (Lodos et al., 1978).

Records of World: Europe: Greece, Turkey (Löbl and Smetana, 2006).

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

Tribe **Rhizotrogini** Burmeister, 1855

Haplidia transversa (Fabricius, 1801)

Material examined: 25.V.2009, 1 specimen.

Records of Turkey: Muğla (Rozner and Rozner, 2009).

Records of World: Europe: Albania, Austria, Bosnia Herzegovina, Bulgaria, Crete, Croatia, Greece, Hungary, Italy, Macedonia, Romania, Slovenia, Switzerland, Turkey, Yugoslavia. Asia: Turkey (Löbl and Smetana, 2006; Fauna Europea).

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

Subfamily **Rutelinae** Macleay, 1819

Tribe **Anomalini** Mulsant, 1842

Blitopertha nigripennis (Reitter, 1888)

Material examined: 25.05.2009, 3 specimens; 25.V.2010, 4 specimens; 26.VI.2011, 10 specimens.

Records of Turkey: Adana, Antalya, Gaziantep, Hatay, İçel, Kahramanmaraş, Kastamonu, Kayseri, Kütahya, Osmaniye, Sinop (Şenyüz and Şahin, 2009).

Records of World: Europe: Armenia, Azerbaijan, Cyprus, Georgia, Russia: South European Territory. Asia: Cyprus, Iran, Israel, Jordan, Lebanon, Syria, Turkey, Turkmenistan (Löbl and Smetana 2006; Fauna Europea).

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

Chaetopteropia segetum velutina
(Erichson, 1847)

Material examined: 05.V.2011, 1 specimen.

Records of Turkey: Afyon, Ağrı, Antalya, Balıkesir, Bursa, Çanakkale, Çorlu, Denizli, Edirne, Erzurum, Eskişehir, İzmir, Kars, Konya, Manisa, Muğla, Ordu, Sivas, Tekirdağ (Lodos et al., 1978; Rozner and Rozner, 2009).

Records of World: Europe: Greece, Rhodes, Ukraine. Asia: Krim, Turkey (Löbl and Smetana, 2006; Catalogue of life).

Chorotype: Sibero-European (Carpaneto et al., 2000).

Subfamily **Scarabaeinae** Latreille. 1802

Tribe **Onthophagini** Burmeister, 1846

Onthophagus illyricus (Scopoli, 1763)

Material examined: 20.V.2008, 1 specimen.

Records of Turkey: Adana, Antalya, Bartın, Gaziantep, Hatay, İçel, Kahramanmaraş, Karaman, Kastamonu, Kayseri, Kırşehir, Niğde, Osmaniye, Zonguldak (Lodos et al., 1999).

Records of World: Europe: Albania, Armenia, Austria, Azores, Belgium, Bosnia Herzegovina, Belarus, Bulgaria, Croatia, Corsica, Croatia, Russia: Central European Territory, Czech Republic, Danish mainland, France, Germany, Georgia, Greece, Hungary, Italy, Luxembourg, Macedonia, Moldova, Netherlands, Poland, Portugal, Romania, Sardinia, Sicily, Slovakia, Slovenia, Spain, Russia: South European Territory, Sweden, Switzerland, Turkey, Ukraine, Yugoslavia, Asia: Afghanistan, Cyprus, Iran, Iraq, Israel, Syria, Turkestan, Turkey (Löbl and Smetana, 2006; Fauna Europea; Global species).

Chorotype: Turano-European (Piattella, 2008).

Tribe **Scarabaeini** Latreille, 1802

Scarabaeus sacer, Linnaeus, 1758

Material examined: 25.V.2011, 2 specimens.

Records of Turkey: Adana, Adıyaman, Kahramanmaraş (Rozner and Rozner, 2009; Aydın and Kazak, 2007; Öztürk and Kalkar, 2011).

Records of World: Europe: Azerbaijan, Albania, Armenia, Balearic Is., Bosnia and Herzegovina, Bulgaria, Corsica, Crete, Croatia, Cyclades Is., Cyprus, France, Greece, Hungary, Italy, Macedonia, Portugal, Romania, Sardinia, Sicily, Slovenia, Spain, Russia: South European Territory, Ukraine, Yugoslavia. North Africa: Algeria, Egypt, Libya, Morocco, Tunisia, Asia: Afghanistan, Iran, Iraq, Israel, Jordan, India: Kashmir, China: Northeast Territory, Pakistan, Saudi Arabia, Transcaspia, Turkestan, Egypt: Sinai, Syria, Turkey (Löbl and Smetana, 2006; Fauna Europea; Global Species).

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

All species are firstly reported from the study area. Furthermore, *Cetonia aurata*, *Protaetia (Netocia) ungarica armeniaca*,

Oxythyrea cinctella, *Potosia cuprea ignicollis*, *Tropinota hirta hirta*, *Valgus hemipterus*, *Pentodon bidens sulcifrons*, *Tanyproctus reichii*, *Haplidia transversa*, *Blitopertha nigripennis*, *Onthophagus illyricus* and *Scarabaeus sacer* are new record for Eskişehir province. Additionally, there is no data about living of the three species, *Tanyproctus reichii*, *Haplidia transversa*, *Scarabaeus sacer*, *Valgus hemipterus* and *Blitopertha nigripennis* in internal Anatolia until this paper.

4. REFERENCES

- Aydın, G. and Kazak, C. (2007). Çukurova Deltası (Adana) biyotoplarında böceklerin farklı insan aktivitelerine biyolojik gösterge olarak kullanılma olanakları. *Türkiye Entomoloji Dergisi*. 31 (2): 111-128.
- Baraud, J., (1992). Coleopteres Scarabaeoidea' Europe. *Faune de France* 78: 1-856.
- Booth, R.G., Cox, M.L. and Madge, R.B. (1990). *Guides to Insect of Importance to Man 3. Coleoptera*. University Press, Cambridge, U.K. 384 p.
- Carpaneto, G.M., (1986), Unanuova specie di Aphodius (Aphodiinus) del Peloponneso (Coleoptera, Aphodiidae), *Fragmenta Entomologica*, 19 (1): 145-154.
- 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.
- Catalogue of life: <http://www.catalogueoflife.org/col/search/all> [accessed 11.03.2013]
- Demir, A. (2005). *Gazi Üniversitesi zooloji müzesindeki Cetoniidae (Coleoptera) familyası örneklerinin değerlendirilmesi*. Master thesis. Ankara. Gazi university.

- Elzinga, R.J. (2000). *Fundamental of Entomology*. Prentice-Hall Inc. USA, 494 p.
- Fauna Europea:
<http://www.faunaeur.org/index.php>
[accessed 14.03.2013]
- Global Species: <http://www.globalspecies.org/>
[accessed 14.03.2013]
- Grimaldi, D. and Engel, M.S. (2006). *Evolution of the Insects*. Cambridge University Press, Hong Kong, 755 p.
- Lodos, N., F. Önder, E. Pehlivan and R. Atalay, (1978). *Ege ve Marmara Bölgesinin Zararlı Böcek Faunasının Tespiti Üzerine Çalışmalar*. Zirai Mücadele ve Zirai Karantina Genel Müdürlüğü, Ankara, 301 s.
- Löbl, I. and Smetana, A. (2006). *Catalogue of Palaearctic Coleoptera*. 3: *Scarabaeoidea, Scirtoidea, Dascilloidea, Buprestoidea and Byrrhoidea*. Apollo Books, Strenstrup. 690.
- Marshall, S.A. (2006). *Insects Their Natural History And Diversity: With A Photographic Guide To Insects Of Eastern North America*. Firefly Boks (U.S) Inc. Canada, 732.
- Öztürk, Ö.Ö. and Kalkar, Ö. (2011). Kahramanmaraş Menzelet Baraj Gölü Çevresindeki Coleoptera Faunası Üzerine Ön Bir Araştırma. *Kahramanmaraş Sütçü İmam Üniversitesi Doğa Bilimleri Dergisi* 14 (2) 22-27.
- Piattella, E. (2008). Contribution to the Knowledge of Scarab Beetles of Vincheto Di Celarda Nature Reserve (Coleoptera: Scarabaeoidea). Research on the Natural Heritage of Vincheto Di Celarda and Val Tovanella. *Quaderni Conservazione Habitat*. Belluno Province, Italy. 117-124.
- Rozner I. and Rozner G. (2009). Additional Data to the Lamellicornia Fauna of Turkey. *Natura Somogyiensis* 15:69-100.
- Silva, P. G., (2011). Dung Beetles (Coleoptera: Scarabaeidae: Scarabaeinae) of Two Non-Native Habitats in Bagé, Rio Grande do Sul, Brazil. *Zoological Studies* 50(5): 546-559.
- Şenyüz, Y. (2009). Türkmen Dağı Aphodiinae (Scarabaeidae, Coleoptera) Altfamilyasının Faunası. PhD Thesis. Kütahya. Dumlupınar University.
- Şenyüz, Y. and Şahin, Y. (2009). Faunistic studies on Cetoniinae, Dynastinae, Melolonthinae, Rutelinae (Coleoptera: Scarabaeidae) Geotrupinae (Geotrupidae) of Kütahya province, Turkey. *Munis Entomology & Zoology* 4 (2): 536-541.
- Tauzin, P. (1994). Précisions Sur La Répartition De Quelques Espèces De Cetoniinae Paléarctiques Quatrième Note: *Netocia* Costa, *L'Entomologiste*, 50(1): 33-62.
- Varol, Ö., (2008). *Eskişehir Meselik Ormanı Ornitofaunası*. Master thesis. Eskişehir. Eskişehir Osmangazi University.