

CONTRIBUTION TO THE KNOWLEDGE OF CARABIDAE FAUNA FROM ESKİŞEHİR OSMANGAZİ UNIVERSITY MEŞELİK CAMPUS

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[Fidan, E. C., Şirin, Ü., Kısım, E., Destire, C. & Çalışkan, H. 2014. Contribution to the knowledge of Carabidae fauna from Eskişehir Osmangazi University Meşelik Campus. *Munis Entomology & Zoology*, 9 (1): 258-265]

ABSTRACT: We here reported 16 species and one subspecies of Carabidae from Meşelik Campus of Eskişehir Osmangazi University and the distribution of species both in Turkey and Palearctic are also given. Three of collected species which *Calathus (Calathus) syriacus* Chaudoir, 1863, *Harpalus (Harpalus) distinguendus* (Duftschmid, 1812) and *Harpalus sulphuripes* Germar, 1824 are new records for Eskişehir province.

KEY WORDS: Carabidae, Ground beetles, Fauna, Meşelik, Turkey.

The family, Carabidae as ground beetles is one of the best-known taxa in insects. These beetles have been studied intensively by generations of coleopterists, who have clarified the taxonomy and phylogeny, geographic distribution, habitat associations and ecological requirements (Kotze et al., 2011).

There are many studies published by many authors on Turkish Carabidae fauna and the prominent ones can be listed as Lodos (1983), Yücel & Şahin (1988); Casale & Taglianti (1999); Kesdek & Yıldırım (2003, 2010), Kocatepe & Mergen (2004); Avgın (2006); Avgın & Özdikmen (2007); Anlaş & Tezcan (2010); Tezcan et al. (2011); Avgın & Cavazutti (2011); Surgut & Varlı (2012). On the other hand, there is no current checklist about ground beetles of Turkey but according to Casale & Taglianti (1999) 1100 Carabidae species in 170 genera have been found in Turkey until now and 41 % of them are endemic. Furthermore, the knowledge of the ground beetle species living in Turkey and distributional patterns in the country have been not sufficient yet, concerning to the species richness of the family and the biodiversitital potential of Turkey.

The aim of this study is reveal the Carabidae fauna of Meşelik Campus and to make a contribution to the knowledge of Turkish Carabidae fauna.

MATERIAL AND METHODS

Study Area

Meşelik Campus (Figure 1), and the forestry area are 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%). The climatic characteristics of the area is typically of Central Anatolia Region (Varol, 2008).

Collecting and Identification

Ground beetles were collected by using hand and pitfall traps, during to March and November in 2007-2012. The catches were sieved on site, and stored

in vials with 70% ethyl alcohol until sorting and identification in the laboratory. For identification, the keys written by Lindroth, 1985; Trautner and Geigenmüller, 1987; Hurka, 1996; Avgin, 2006 were used. All specimens are deposited in the Eskişehir Osmangazi University Entomology Collection.

RESULTS

Totally 337 specimen belong to 16 species and one subspecies were recorded. The alphabetic list of the collected species, associated with Turkey and Palearctic distribution were also given below;

Amara (Amara) aenea (De Geer, 1774)

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

Distribution in Turkey: : Adana, Ardahan, Artvin, Erzincan, Erzurum, Eskişehir, Iğdır, Kahramanmaraş, Kars, Konya, Malatya (Türktaş, 1998; Avgin, 2006; Kesdek & Yıldırım, 2010b).

Distribution in Palearctic: Afghanistan, Albania, Algeria, Andorra, Armenia, Austria, Azerbaijan, Azores, Belarus, Belgium, Bosnia and Herzegovina, Britain, Bulgaria, China, Crimea, Croatia, Cyprus, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Germany, Georgia, Greece, Himalaya, Hungary, India, Iran, Iraq, Ireland, Israel, Italy, Jordan, Kazakhstan, Kyrgyzstan, Lake Baikal, Latvia, Lebanon, Libya, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madeira Archipelago, Malta, Moldova, Mongolia, Montenegro, Morocco, Nepal, Netherlands, Norway, North America, Pakistan, Poland, Portugal, Romania, Russia, Serbia, Siberia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Tajikistan, the Canary Islands, the Caucasus, the Urals, Transcaucasia, Tunisia, Turkmenistan, Turkey, Uzbekistan, Ukraine (Gueorguiev & Gueorguiev, 1995; Hurka, 1996; Löbl & Smetana, 2003).

Amara (Amara) eurynota (Panzer, 1796)

Material examined: 25.V.2010 1ex.

Distribution in Turkey: Eskişehir, Gaziantep, Kahramanmaraş, Kayseri (Avgin, 2006; Küçükaykay, 2013).

Distribution in Palearctic: Albania, Algeria, Altai, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Britain, Bulgaria, Caucasia, China, Crimea, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Georgia, Hungary, Holland, Iran, Ireland, Italy, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Macedonia, Malta, Moldova, Montenegro, Morocco, North America, Norway, Poland, Portugal, Romania, Russia, Serbia, Siberia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Tajikistan, Transcaucasia, Tunisia, Turkey, Ukraine (Gueorguiev & Gueorguiev, 1995; Hurka, 1996; Löbl & Smetana, 2003).

Brachinus (Brachynidius) explodens Duftschmid, 1812

Material examined: 27.IV.2008, 1 ex.

Distribution in Turkey: Adıyaman, Bingöl, Çorum, Erzincan, Eskişehir, Erzurum, Gaziantep, Giresun, Kahramanmaraş, Kayseri, Kars, Tokat (Yücel & Şahin, 1988; Avgin, 2006; Kesdek & Yıldırım, 2007; Kocatepe, 2011)

Distribution in Palearctic: Azerbaijan, Albania, Armenia, Austria, Belgium, Bosnia Herzegovina, Bulgaria, Byelorussia, Croatia, Czech Republic, Estonia, France, Germany, Georgia, Greece, Hungary, Iran, Iraq, Israel, Italy, Kyrgyzstan, Kazakhstan, Latvia, Lithuania, Luxembourg, Moldova, Poland, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Syria, Turkey, Tadjikistan, Turkmenistan, Ukraine, Uzbekistan, Yugoslavia (Löbl & Smetana, 2003)

Calathus (Neocalathus) ambiguus (Paykull, 1790)

Material examined: 31.VII.2012, 1 ex.; 13.VIII.2012, 4 ex.; 22.VIII.2012, 1 ex.; 27.IX.2012, 3 ex.; 21.XI.2012, 1 ex.

Distribution in Turkey: Ardahan, Artvin, Erzincan, Erzurum, Eskişehir, Iğdır (Yücel & Şahin, 1988; Kesdek & Yıldırım, 2010a)

Distribution in Palearctic: Afghanistan, Azerbaijan, Albania, Armenia, Austria, Belgium, Bosnia Herzegovina, Bulgaria, Byelorussia, Croatia, Czech Republic, Denmark, Estonia,

France, Germany, Great Britain, Greece, Hungary, Iran, Israel, Italy, Kazakhstan, Latvia, Lithuania, Luxembourg, Macedonia, Moldavia, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Syria, Sweden, Switzerland, Tadjikistan, Turkmenistan, Turkey, Ukraine, Uzbekistan, Yugoslavia (Löbl & Smetana, 2003).

Calathus (Neocalathus) cinctus Motschulsky, 1850

Material examined: 27.VII.2012, 2 ex.; 31.VII.2012, 7 ex.; 13.VIII.2012, 86 ex.; 22.VIII.2012 47 ex.; 27.IX.2012, 12 ex.; 27.XI.2012, 56 ex.

Distribution in Turkey: Ardahan, Bingöl, Erzincan, Erzurum, Eskişehir, Kars, Konya (Kesdek & Yıldırım, 2004, 2010a; Küçükkaykı, 2013).

Distribution in Palearctic: Austria, Belgium, Czech Republic, Great Britain, Germany, Greece, Hungary, Italy, Latvia, Luxembourg, Netherlands, Portugal, Slovakia, Spain, Switzerland, Turkey (Löbl & Smetana, 2003).

Calathus (Neocalathus) erratus Sahlberg, 1827

Material examined: 22.V.2008, 1 ex.; 25.V.2009, 2 ex.; 25.V.2010, 1 ex.; 25.V.2011, 1 ex.

Distribution in Turkey: Eskişehir (Küçükkaykı, 2013).

Distribution in Palearctic: Albania, Austria, Belgium, Bosnia Herzegovina, Bulgaria, Byelorussia, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Great Britain, Germany, Hungary, Italy, Kyrgyzstan, Kazakhstan, Latvia, Lithuania, Luxembourg, Macedonia, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Turkmenistan, Ukraine, Yugoslavia (Löbl & Smetana, 2003).

Calathus (Calathus) fuscipes (Goeze, 1777)

Material examined: 23.V.2007, 1 ex.; 18.V.2008, 1 ex.; 26.V.2011, 1 ex.; 25.V.2010, 3 ex.; 26.VI.2011, 1 ex.; 02.VI.2011, 1 ex.; 03.VI.2011, 1 ex.

Distribution in Turkey: Afyon, Ankara, Eskişehir, Kayseri, Sivas (Yücel & Şahin, 1988; Kocatepe & Mergen, 2004)

Distribution in Palearctic: South Europe, South Russia, Caucasia, North Africa, Middle Asia, Turkey (Kocatepe & Mergen, 2004).

Calathus (Neocalathus) melanocephalus Linne, 1758

Material examined: 22.VIII.2012, 1 ex.; 27.XI.2012, 1 ex.

Distribution in Turkey: Afyon, Ankara, Ardahan, Artvin, Çankırı, Çorum, Erzurum, Erzincan, Eskişehir, Kars, Kayseri, Rize Tokat (Yücel & Şahin, 1988; Kocatepe & Mergen, 2004; Kesdek & Yıldırım, 2010a; Kocatepe, 2011, Küçükkaykı, 2013)

Distribution in Palearctic: (All 3 subspecies) Afghanistan, Algeria, Albania, Armenia, Austria, Azerbaijan, Belgium, Bosnia Herzegovina, Bulgaria, Byelorussia, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Great Britain, Germany, Georgia, Greece, Hungary, Iceland, Israel, Italy, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Moldavia, Mongolia, Morocco, Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tadjikistan, Turkey, Ukraine, Yugoslavia (Löbl & Smetana, 2003).

Calathus (Calathus) syriacus Chaudoir, 1863

Material examined: 27.VII.2012, 27.VII.2012, 9 ex.; 31.VII.2012, 5 ex.; 27.IX.2012, 6 ex.; 13.VIII.2012, 4 ex.; 22.VIII.2012, 6 ex.; 27.XI.2012, 2 ex.

Distribution in Turkey: Adana, Ankara, Antalya, Artvin, Bayburt, Bingöl, Elazığ, Erzincan, Erzurum, Kars, Malatya, Mersin; Muğla (Kesdek & Yıldırım, 2004, 2010a)

Distribution in Palearctic: Azerbaijan, Armenia, Georgia, Greece, Iran, Israel, Lebanon, Russia, Syria, Turkey, Ukraine (Löbl & Smetana, 2003).

Carabus (Pachystus) graecus morio Mannerheim, 1830

Material examined: 19.V.2008, 1 ex.; 22.V.2008, 2 ex.; 29.V.2009, 1 ex.; 23.V.2009, 1 ex.; 27.V.2011, 4 ex.; 26.V.2011, 2 ex.; 03.VI.2011, 1 ex.; 13.VI.2011, 1 ex.; 13.VIII.2012, 6 ex.; 22.VIII.2012, 8 ex.; 27.IX.2012, 4 ex.; 27.XI.2012, 7 ex.

Distribution in Turkey: Eskişehir; Kahramanmaraş (Avgın, 2006; Küçükkaykı, 2013)

Distribution in Palearctic: Albania, Bulgaria, Greece, Macedonia, Romania, Turkey (Gueorguiev & Gueorguiev, 1995; Löbl & Smetana, 2003).

Cicindela (Cicindela) campestris Linne, 1758

Material examined: 27.IV.2008, 2 ex.; 20.V.2008, 1 ex.; 26.IV.2008, 1 ex.; 09.III. 2008, 1 ex.; 25.V.2010, 2 ex.

Distribution in Turkey: Aksaray, İçel, Eskişehir (Franzen, 2007; Küçükkaykı, 2013)

Distribution in Palearctic: Albania, Andorra, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Belorussia, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Great Britain, Germany, Hungary, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Macedonia, Moldavia, Netherlands, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Yugoslavia, Iran, Kyrgyzstan, Kazakhstan, Uzbekistan (Löbl & Smetana, 2003; Avgin & Özdikmen, 2007).

Harpalus (Harpalus) distinguendus (Duftschmid, 1812)

Material examined: 12.V.2007, 1 ex.; 18.V.2008, 1 ex.; 02.VI.2011, 1 ex.

Distribution in Turkey: Ankara, Antalya, Ardahan Erzincan, Erzurum, Iğdır, İzmir, Kars, Konya, Trabzon Gaziantep, Kahramanmaraş, Rize, Sivas (Kesdek & Yıldırım, 2003; Kocatepe & Mergen, 2004; Avgin & Emre, 2007; Tezcan et al., 2011; Kocatepe, 2011; Kesdek, 2013).

Distribution in Palearctic: Afghanistan, Albania, Algeria, Armenia, Austria, Azerbaijan Azores, Belgium, Bosnia and Herzegovina, Bulgaria, Belorussia, Canary Island, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Georgia, Greece, Hungary, Iran, Israel, Italy, Kyrgyzstan, Kazakhstan, Latvia, Lithuania, Macedonia, Moldavia, Mongolia, Morocco, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Tadjhikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan, Yugoslavia (Löbl & Smetana, 2003).

Harpalus (Harpalus) sulphuripes Germar, 1824

Material examined: 25.V.2011, 1 ex.; 04.VI.2011, 1 ex.

Distribution in Turkey: No location, Turkey (Casale & Taglianti, 1999).

Distribution in Palearctic: Albania, Austria, Bosnia Herzegovina, Bulgaria, Croatia, France, Germany, Greece, Italy, Macedonia, Poland, Portugal, Romania, Slovenia, Spain, Switzerland, Turkey, Ukraine, Yugoslavia (Löbl & Smetana, 2003).

Ophonus (Hesperophonus) azureus (Fabricius, 1775)

Material examined: 18.05.2008, 2 ex.

Distribution in Turkey: Ankara, Bayburt, Erzurum, Eskişehir, Kahramanmaraş, Kayseri, Sinop, Tokat, Trabzon (Yücel & Şahin, 1988; Kesdek & Yıldırım, 2003; Kocatepe & Mergen, 2004; Avgin, 2006; Kocatepe, 2011; Küçükaykay, 2013).

Distribution in Palearctic: Afghanistan, Albania, Algeria, Armenia, Austria, Azerbaijan Azores, Belgium, Bosnia and Herzegovina, Bulgaria, Belorussia, Canary Island, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Georgia, Greece, Hungary, Iran, Israel, Italy, Kyrgyzstan, Kazakhstan, Latvia, Lithuania, Macedonia, Moldavia, Mongolia, Morocco, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Tadjhikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan, Yugoslavia (Löbl & Smetana, 2003).

Poecilus (Poecilus) cupreus (Linné, 1758)

Material examined: 15.V.2007, 1 ex.; 18.V.2008, 1 ex.

Distribution in Turkey: Adana, Adıyaman, Çorum, Eskişehir, Gaziantep, Kahramanmaraş, Malatya, Tokat (Türkkan, 1998; Avgin, 2006; Kocatepe, 2011)

Distribution in Palearctic: Azerbaijan, Albania, Armenia, Austria, Belgium, Bosnia Herzegovina, Bulgaria, Byelorussia, Czech Republic, Denmark, Estonia, Finland, France, Great Britain, Germany, Georgia, Greece, Hungary, Ireland, Italy Kazakhstan, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Moldova, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Spain, Syria, Sweden, Switzerland, Tadjhikistan, Turkmenistan, Turkey, Ukraine, Uzbekistan, Yugoslavia (Löbl & Smetana, 2003).

Pterostichus (Platysma) niger niger (Schaller, 1783)

Material examined: 27.V.2011, 1 ex.; 22.VIII.2012, 1 ex.; 27.IX.2012, 3 ex.

Distribution in Turkey: Adana, Erzurum, Eskişehir, Iğdır, Kahramanmaraş, Kars, Kayseri (Avgin, 2006; Kesdek, 2007; Küçükaykay, 2013)

Distribution in Palearctic: Azerbaijan Austria, Belgium, Bosnia Herzegovina Bulgaria, Byelorussia, Croatia, Czech Republic Denmark, Estonia, Finland, France, Great Britain, Germany, Greece, Hungary, Iran, Ireland, Italy, Kazakhstan, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Macedonia, Moldova, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Sweden Switzerland, Tadjhikistan, Turkey Ukraine, Uzbekistan, Yugoslavia (Löbl & Smetana, 2003).

Zabrus (Zabrus) tenebrioides (Goeze, 1777)

Material examined: 03.V.2007, 1 ex.; 15.V.2007, 1 ex.; 24.V.2007, 4 ex.; 25.V.2009, 1 ex.; 30.V.2009, 1 ex.; 31.V.2009, 1 ex.; 04.VI.2011, 1 ex.

Distribution in Turkey: Adıyaman, Artvin, Bingöl, Edirne, Erzurum, Eskişehir, Diyarbakır, İstanbul, Kars, Kırklareli, Kocaeli, Muş, Sakarya (Lodos, 1983; Kesdek & Yıldırım, 2010a).

Distribution in Palearctic: Caucasia, Crimea, Moldavia, Turkey, Siberia, Ukraine (Gueorguiev & Gueorguiev, 1995; Casale & Taglianti, 1999).

16 species and one subspecies has determined from the study area. Three of them are new record for Eskişehir province.

LITERATURE CITED

Anlaş, S. & Tezcan, S. 2010. Species composition of Ground beetles (Carabidae, Coleoptera) collected by hibernation trap-bands in agricultural landscapes, Bozdağlar Mountain of western Turkey. *Acta Biol. Univ. Daugavpils*, 10 (2): 193-198.

Avgın, S. 2006. Kahramanmaraş ili ve çevresi Carabidae (Coleoptera) faunası ve taksonomisi üzerine çalışmalar Doktora Tezi. Çukurova Üniversitesi. Fen Bilimleri Enstitüsü. Biyoloji Anabilimdalı..Adana. 352 pp.

Avgın, S. & Cavazutti, P. 2011. The studies made on Turkish Carabinae with checklist and bibliography (Coleoptera: Carabidae). *Turkish Journal of Zoology*, 35 (3): 403-432.

Avgın, S. & Özdikmen, H. 2007. Check-list of the tiger beetles of Turkey with a review of distribution and biogeography (Coleoptera: Cicindelidae). *Munis Entomology & Zoology*, 2 (1): 87-102.

Casale, A. & Taglianti, V. 1999. Caraboid Beetles (excl. Cicindelidae) of Anatolia, and their biogeographical significance (Coleoptera, Caraboidea). *Biogeographia, Lavori della Società Italiana di Biogeografia*, Siena, Italy, 20: 277-406.

Franzen, M. 2007. A new species of tiger beetle of the *Cicindela campestris* group from southern Turkey, with remarks on the identity of *C. herbacea* Klug, 1832 and other taxa related to *C. desertorum* Dejean, 1825 (Insecta, Coleoptera, Cicindelidae). *Spixiana*, 30 (1): 13-24.

Guerguiev, V. B. & Gueorguiev, B. V. 1995. Catalogue of the ground-beetles of Bulgaria (Coleoptera: Carabidae). *Pensoft, Sofia-Moscow*, 279 pp.

Hurka, K. 1996. Carabidae of the Czech and Slovak Republics – Illustrated key: Kabourek, Zlín, 565 pp.

Kesdek, M. 2007. Kuzeydoğu Anadolu Bölgesi Pterostichinae (Coleoptera: Carabidae:) Türleri Üzerinde Faunistik ve Sistemik Çalışmalar. PhD thesis. Erzurum University. Department of Plant Protection. 238 pp.

Kesdek, M. 2013. Contributions to the knowledge of the genus *Harpalus* Latreille, 1802 fauna of Turkey (Coleoptera: Carabidae: Harpalinae). *Munis Entomology & Zoology*, 8 (1): 191-198.

Kesdek, M. & Yıldırım, E. 2003. Contribution to the knowledge of Carabidae fauna of Turkey Part 1: Harpalini (Coleoptera, Carabidae, Harpalinae). *Linzer Biolo. Beitr.*, 35 (2): 1147-1157.

Kesdek, M. & Yıldırım, E. 2004. Contribution to the knowledge of carabidae fauna of Turkey Part 2: Platynini (Coleoptera, Carabidae). *Linz. Biol. Beitr.*, 36 (1): 527-533.

Kesdek, M. & Yıldırım, E. 2007. Contribution to the Knowledge of Carabidae Fauna of Turkey. Part 5: Brachinini (Coleoptera: Carabidae, Brachininae). *Linzer Biolo. Beitr.*, 39 (2): 979-982.

Kesdek, M. & Yıldırım, E. 2010a. Contribution to the knowledge of Carabidae fauna of Turkey Part 6: Notiophilini and Platynini (Coleoptera, Carabidae, Notiophilinae and Pterostichinae). *Entomofauna*, 31 (2): 5-16.

Kesdek, M. & Yıldırım, E. 2010b. Contribution to the knowledge of Carabidae fauna of Turkey Part 8: Amarini (Coleoptera, Carabidae, Pterostichinae). *Entomofauna*, 31: 1-8.

Kocatepe, N. 2011. Orta ve Doğu Karadeniz Bölgesi Carabidae (Coleoptera) Familyası Üzerinde Sistemantik Çalışmalar. Phd Thesis. Hacettepe University. Institute of Science Department of Biology. 211 pp.

Kocatepe, N. & Mergen, O. 2004. Ankara ili Carabidae (Coleoptera) familyası türleri üzerinde faunistik araştırmalar. Türkiye Entomoloji Dergisi, 28 (4): 295-309.

Küçükaykay, E. C. 2013. Türkmen Dağları (Eskişehir: Kütahya) Yer Böceklerinin (Coleoptera: Carabidae) Fenolojileri ve Vertikal Tür Çeşitliliğinin Araştırılması. Master Thesis. Eskişehir Osmangazi University. Institute of Science. Department of Biology. 75 pp.

Kotze, J., Brandmayr, P., Casale, A., Dauffy-Richard, E., Dekoninck, W., Koivula, M. J., Lövei, G. L., Mossakowski, D., Noordijk, J., Paarmann, W., Pizzolotto, R., Saska, P., Schwerk, A., Serrano, J., Szyszko, J., Taboada, A., Turin, H., Venn, S., Vermeulen, R. & Zetto, T. 2011. Forty years of carabid beetle research in Europe – from taxonomy, biology, ecology and population studies to bioindication, habitat assessment and conservation. ZooKeys, 100: 55-148.

Lindroth, C. H. 1985. The Carabidae (Coleoptera) of Fennoscandia and Denmark fauna, Fauna Entomologica Scandinavica. Scandinavian Science Press, Leiden, 15 (1): 225 pp.

Lodos, N. 1983. Türkiye faunasına ait ekin kambur böcekleri, Zabrus Clairv. (Coleoptera: Carabidae) cinsinin yeniden gözden geçirilmesi. Türkiye Bitki Koruma Dergisi, 7: 51-63.

Löbl, I. & Smetana, A. 2003. Catalogue of Palaartic Coleoptera. Volume I. Archostemata-Myxophaga-Adephaga. Apollo Books. Stenstrup, Denmark, 819 pp.

Surgut, H. & Varlı, S. V. 2012. An evaluation on Coleoptera (Insecta) species collected by pitfall traps in Karabiga (Çanakkale province) of Turkey. Munis Entomology & Zoology, 7 (1): 449-461.

Trautner, J. & Geigenmüller, K. 1987. Tiger beetles, ground beetles – Illustrated key to the Cicindelidae and Carabidae of Europe. J. Margraf Verlag, Aichtal, Germany, 488 pp.

Türktaş, H. 1998. Eskişehir çevresi Carabidae (Insecta: Coleoptera) üzerine faunistik araştırmalar. Yüksek Lisans Tezi, Eskişehir Osmangazi Üniversitesi Fen Bilimleri Enstitüsü, Eskişehir, 34 pp.

Tezcan, S., Anlaş, S. & Jeanne, C. 2011. Species composition and habitat selection of Ground beetles (Carabidae, Coleoptera) collected by pitfall traps in Bozdağlar Mt., Western Turkey. Munis Entomology & Zoology, 6 (2): 676-685.

Varol, Ö. 2008. Eskişehir Meselik Ormanı Ornitofaunası. Master thesis. Eskişehir. Eskişehir Osmangazi University. 77 pp.

Yücel, E. & Şahin, Y. 1988. Eskişehir ve yöresi bazı Carabidae (Coleoptera) türlerinin morfolojisi ve ekolojisi üzerine çalışmalar. Journal of Anadolu University Science and Art Faculty, 25-29.



Amara aenea



Amara eurynota



Brachinus explodens

*Calathus ambiguus**Calathus cinctus**Calathus erratus**Calathus fuscipes**Calathus melanocephalus**Calathus syriacus**Carabus graecus**Cicindela campestris**Harpalus distinguendus*



Harpalus sulphuripes



Ophonus azureus



Poecilus cupreus



Pterostichus niger niger



Zabrus tenebrioides



Figure 1. General view of the study area.