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Notes on the Family Staphylinidae (Coleoptera) Collected by Pitfall Traps in Gölcük Natural Park, Isparta Province of Turkey

George JAPOSHVILI[1*] Sinan ANLAŞ[2]

[1]Entomology and Biocontrol Research Centre, Ilia State University, Tbilisi, GEORGIA
[*]Corresponding author, e-mail: giorgij70@yahoo.com

[2]Department of Biology, Faculty of Science, University of Ege, 35100 Bornova, İzmir TURKEY, e-mail: sinan.anlas@gmail.com

ABSTRACT

In this study, species of Staphylinidae collected by pitfall trap method in Gölcük Natural Park, Isparta province of Turkey during the years of 2008-2009 have been evaluated. A total of 27 species belonging to 17 genera have been recorded. Among them *Sepedophilus rufulus* (Hochhuth, 1849) and *Ocypus brenskei* Reitter, 1884 are the first record for the Turkish fauna. *Ocypus mus* (Brullé, 1832), *Ocypus orientis* Smetana & Davies, 2000 and *Ocypus brenskei* Reitter, 1884 were the most common and abundant species.

Keywords: Staphylinidae, *Ocypus* species, fauna, new records, Isparta, Turkey.

INTRODUCTION

The Staphylinidae, or rove beetles, is perhaps the most diverse family of the order Coleoptera, comprising about 57.000 species belonging to 33 subfamilies in all zoogeographical regions of the world (Newton, 2007; Grebennikov & Newton, 2009). According to Anlaş (2009), 1.600 species and subspecies of Staphylinidae have been reported for Turkey. However, many Turkish regions and provinces are sparsely investigated regarding their Staphylinidae inventory.

The rove beetles most often occur in association with decaying organic materials, as predators of other invertebrates, as parasites of birds and mammals, as inquilines of ants or termites, in fungi, leaf litter, caves, and numerous other habitats.

Golcuk Natural Park (GNP) is located in an arid region 8 km southwest of Isparta province and its special characteristics make it an important recreation area. With its diverse vegetation and wildlife, geomorphological structure, aesthetically pleasing landscape and recreational opportunities, GNP is one of the most important areas of the Lakes District in Turkey. This area of 5,925 ha (700 ha lost from intro.), was proclaimed a National Park, but its condition is deteriorating because it has no master plan and minimal management (Gül *et al.*, 2005).

The aim of this study is to further enhance knowledge on the distibutions of Staphylinidae in Turkey.

MATERIAL AND METHODS

Insect samples were collected from March to October, 2008 and 2009, using the pitfall traps. The lowest altitude for trapping was 1227 m and the highest was 1611 m. In all sampling places we set 10 pitfall traps and distance between them was 15-20 m. The pitfall traps consisted of circular pots, each 11cm in diameter and 11 cm deep, and were dug into the soil with the opening at the soil surface. We put in the traps 2% formaldehyde. Traps were checked weekly. After collecting the captured insects, they were transferred to jars of 75% alcohol or dried and pinned promptly. Material in alcohol was later dried and mounted.

The study was conducted in different plant associations: A – Main entrance to GNP, this is the area which is close to the lake, with areas reforested with *Robinia pseudoacacia* which were planted between 1960-1965. Some natural plants like: *Crataegus orientalis*, *Cotoneaster nummularia*, *Pistacea terebinthus* and other plants are also represented in this site which has high human activity (picnic area), altitude 1396 m; B – This sampling site represents an old (50 years old) apple orchard (39.9 ha) which is surrounded by a *Robinia pseudoacacia* reforested area planted in 1956. 6.3% of the *Robinia pseudoacacia* reforested area is composed of endemic plants, altitude 1424 m; C – This site is represented by xerophilic natural plants with a reforested area with pine trees (*Pinus* sp.) and cedars (*Cedrus* sp.) planted between 1959 - and 1969 (Şahdubak and Cengiz, 2007). About 4.8% of the plants that were recorded from this area were endemic also, altitude 1417 m; D – Xerophilic natural shrubland with different dominant *Astragalus* spp., many of them which are endemic, altitude 1452 m; E – Natural park highland, which was reforested in 1989 with *Cedrus* sp. and *Robinia pseudoacacia,* altitude 1611 m.; F – Natural *Quercus coccifera* and *Cistus laurifolius* forest, with mesophilic plantations, altitude 1227 m. (Japoshvili *et.al*., 2009). As the material was collected fragmentary we could not statistically analyze the results.

Classification and nomenclature of the follow Herman (2001) and Smetana (2004) has been followed in this study. Material was identified by the second author. All material is deposited to the Entomological Museum of Plant Protection Department, Süleyman Demirel University, Isparta, Turkey.

RESULTS

A total of 27 species belonging to 17 genera of seven subfamilies have been recorded. Among them *Sepedophilus rufulus* (Hochhuth, 1849) and *Ocypus brenskei* Reitter, 1884 are first records for the Turkish fauna. *Ocypus mus* (Brullé, 1832), *Ocypus orientis* Smetana & Davies, 2000 and *Ocypus brenskei* Reitter, 1884 are the dominant species.

Family Staphylinidae Latreille, 1802

Subfamily Omaliinae MacLeay, 1825

***Omalium cinnamomeum* Kraatz, 1857**

Material examined: 1 ex, 23.VI.2008, B. Aslan; 1 ex., 09.X.2008, G. Japoshvili; 1 ex., 23.X.2008, B. Aslan.

Distribution in Turkey: Ankara, Antalya, Isparta (Kovada), İzmir, Manisa, Mersin (Anlaş, 2009).

Subfamily Tachyporinae MacLeay, 1825

***Lordithon exoletus* (Erichson, 1839)**

Material examined: 1 ex., 03.VII.2008, G. Japoshvili; 1 ex., 04.IX.2008, M. Kaya. Distribution in Turkey: İzmir, Mersin, Muğla (Anlaş, 2009; Anlaş & Rose, 2009c).

***Lordithon thoracicus* (Fabricius 1777)**

Material examined: 1 ex., 23.VII.2008, G. Japoshvili.

Distribution in Turkey: Antalya, Manisa, Mersin (Anlaş, 2009; Anlaş & Rose, 2009c).

***Mycetoporus eppelsheimianus* Fagel, 1968**

Material examined: 1 ex., 11.VI.2008, G. Japoshvili; 1 ex., 23.VI.2008, B. Aslan. Distribution in Turkey: Artvin, Bolu, Kastamonu, Mersin, Ordu, Sinop, Trabzon (Anlaş, 2009).

***Sepedophilus obtusus* (Luze, 1902)**

Material examined: 2 exs., 23.VI.2008, M. Kaya.

Distribution in Turkey: Adana, Ankara, Antalya, İzmir, Kayseri, Manisa, Mersin (Anlaş, 2009; Anlaş & Rose, 2009c).

Sepedophilus rufulus* (Hochhuth, 1849)

Material examined: 1 ex., 03.VII.2008, G. Japoshvili. Remarks: According to Smetana (2004), *S. rufulus* is recorded from Azarbaijan, Armenia, Afganhistan, Iran, Pakistan, Russia and Uzbekistan The species is here reported from Turkey for the first time.

***Tachinus corticinus* Gravenhorst, 1802**

Material examined: 1 ex., 23.VI.2008, M. Kaya.

Distribution in Turkey: Antalya, Bursa, İzmir (Anlaş, 2009; Anlaş & Rose, 2009c).

***Tachinus bonvouloiri* Pandellé, 1869**

Material examined: 1 ex., 11.VI.2008, B. Aslan.

Distribution in Turkey: Gaziantep, Konya (Assing, 2006; Anlaş, 2009).

***Tachyporus hypnorum* (Fabricius 1775)**

Material examined: 1 ex., 24.VII.2008, B. Aslan; 1 ex., 07.VIII.2008, B. Aslan; 1 ex., 27.XI.2008, G. Japoshvili.

Distribution in Turkey: Adana, Adıyaman, Ankara, Antalya, Aydın, Bayburt, Bilecik, Erzincan, Erzurum, İzmir, Kahramanmaraş, Kars, Manisa, Malatya, Mersin, Muğla, Şırnak, Tunceli (Anlaş, 2009; Anlaş & Rose, 2009c; Kesdek *et al.*, 2009).

***Tachyporus nitidulus* (Fabricius 1781)**

Material examined: 1 ex., 23.VI.2008, B. Aslan.

Distribution in Turkey: Ankara, Antalya, Ardahan, Aydın, Bayburt, Bursa, Diyarbakır, Erzurum, İstanbul, İzmir, Kars, Kayseri, Manisa, Mersin, Mersin-Karaman and/or environs (Anlaş, 2009; Tezcan & Anlaş, 2009; Anlaş & Rose, 2009c; Kesdek *et al.*, 2009).

Subfamily Aleocharinae Fleming, 1821

***Aleochara laevigata* Gyllenhal, 1810**

Material examined: 2 ex., 03.VII.2008, G. Japoshvili.

Distribution in Turkey: Bitlis, Erzurum, İstanbul, İzmir, Kastamonu, Mersin, Şanlıurfa, Van (Anlaş, 2009; Assing, 2009b; Kesdek *et al.*, 2009).

***Aleochara tristis* Gravenhorst, 1806**

Material examined: 1 ex., 23.VI.2008, B. Aslan.

Distribution in Turkey: Artvin, Bingöl, Bitlis, Bursa, Erzurum, Gaziantep, Hatay, İzmir, Kahramanmaraş, Konya, Malatya, Manisa, Mardin, Mersin, Osmaniye (Anlaş, 2009; Tezcan & Anlaş, 2009; Kesdek *et al.*, 2009).

***Drusilla canaliculata* (Fabricius, 1787)**

Material examined: 2 ex., 11.IX.2008, G. Japoshvili; 3 exs., 25.IX.2008, M. Kaya. Distribution in Turkey: Ardahan, Bitlis, Bolu, Bursa, Çankırı, Erzurum, Gümüşhane, İstanbul, Kahramanmaraş, Kastamonu, Kars, Kayseri, Konya, Osmaniye, Sinop (Anlaş, 2009; Assing, 2009a).

Subfamily Oxytelinae Fleming, 1821

***Anotylus inustus* (Gravenhorst, 1806)**

Material examined: 1 ex., 23.VI.2008, B. Aslan.

Distribution in Turkey: Artvin, Bursa, Erzurum, İstanbul, İzmir, Kilis, Konya, Mersin (Anlaş, 2009; Tezcan & Anlaş, 2009; Anlaş & Rose, 2009a; Kesdek *et al.*, 2009).

***Anotylus tetracarinatus* (Block, 1799)**

Material examined: 1 ex., 15.V.2008, B. Aslan.

Distribution in Turkey: Ankara, Antalya, Diyarbakır, Gaziantep, Hatay (Anlaş, 2009; Anlaş & Rose, 2009a).

Subfamily Steninae MacLeay, 1825

***Stenus maculiger* (Gravenhorst, 1806)**

Material examined: 1 exs., 23.X.2008, B. Aslan.

Distribution in Turkey: Adana, Adıyaman, Ankara, Antalya, Bilecik, Bitlis, Bolu, Burdur, Diyarbakır, Gümüşhane, Hakkari, Isparta, İstanbul, İzmir, Manisa, Mersin, Muğla, Trabzon (Anlaş, 2009).

Subfamily Paederinae Fleming, 1821

***Rugilus tauricus* (Rougemont, 1988)**

Material examined: 1 ex., 25.IX.2008, M. Kaya.

Distribution in Turkey: Antalya, Konya (Anlaş, 2009; Anlaş & Rose, 2009d).

Subfamily Staphylininae Latreille, 1802

Ocypus brenskei* Reitter, 1884

Material examined: 10 exs., 10.IV.2008; 3 exs., 13.IV.2008; 4 exs., 17.IV.2008; 1 ex., 20.IV.2008;

6 exs., 24.IV.2008; 4 exs., 09.X.2008; 4 exs., 23.X.2008; 2 exs., 06.XI.2008; 2 exs., 27.XI.2008; 1 ex., 22.IV.2009; 3 exs., 09.V.2009.

Remarks: According to Smetana (2004), *O. brenskei* is recorded from Albania, France, Greece and Macedonia. The species is here reported from Turkey for the first time.

Ocypus mus (Brullé, 1832)

Material examined: 4 exs., 23.III.2008, B. Aslan; 4 ex., 27.III.2008, G. Japoshvili; 8 exs., 10.IV.2008, B. Aslan and G. Japoshvili; 1 ex., 13.IV.2008, G. Japoshvili; 2 exs., 17.IV.2008, B. Aslan and G. Japoshvili; 1 ex., 20.IV.2008, M. Kaya; 2 exs., 22.IV.2008, G. Japoshvili; 5 exs., 24.IV.2008, M. Kaya and G. Japoshvili; 2 ex., 01.V.2008, B. Aslan and G. Japoshvili; 1 ex., 09.V.2008, G. Japoshvili; 3 exs., 15.V.2008, M. Kaya and G. Japoshvili; 1 ex., 22.V.2008, B. Aslan; 1 ex., 19.VI.2008, M. Kaya; 1 ex., 03.VII.2008, G. Japoshvili; 2 exs., 24.VII.2008, G. Japoshvili; 1 ex., 07.VIII.2008, M. Kaya; 1 ex. 28.VIII.2008, G. Japoshvili; 3 exs., 18.IX.2008, B. Aslan and G. Japoshvili; 2 ex., 25.IX.2008, M. Kaya and B. Aslan; 20 exs., 09.X.2008, B. Aslan and G. Japoshvili; 13 exs., 23.X.2008, B. Aslan and G. Japoshvili; 17 exs., 06.XI.2008 M. Kaya and G. Japoshvili; 3 exs., 27.XI.2008, M. Kaya and B. Aslan.

Distribution in Turkey: Ankara, İzmir, Manisa, Mersin, Muğla, Şanlıurfa, Trabzon (Anlaş, 2009; Anlaş & Rose, 2009b).

Ocypus orientis Smetana & Davies, 2000

Material examined: 1 exs., 23.III.2008, B. Aslan; 5 exs., 27.III.2008, G. Japoshvili; 3 exs., 10.IV.2008, B. Aslan; 14 exs., 17.IV.2008, M. Kaya and G. Japoshvili; 6 exs., 20.IV.2008, M. Kaya and B. Aslan; 9 exs., 24.IV.2008, M. Kaya and B. Aslan; 1 ex., 01.V.2008, B. Aslan; 1 ex., 09.X.2008, B. Aslan; 1 ex., 18.IX.2008, B. Aslan; 1 exs., 06.XI.2008, G. Japoshvili; 7 exs., 27.XI.2008, G. Japoshvili; 2 ex., 22.IV.2009, G. Japoshvili; 4 exs., 09.V.2009, G. Japoshvili.

Distribution in Turkey: Bursa, İzmir, Manisa (Anlaş, 2009; Anlaş & Rose, 2009b).

Ocypus sericeicollis (Ménétriés, 1832)

Material examined: 3 exs., 17.IV.2008, M. Kaya and G. Japoshvili; 2 ex., 20.IV.2008, B. Aslan; 1 ex., 24.IV.2008, B. Aslan; 1 ex., 18.IX.2008, B. Aslan; 1 ex., 23.X.2008, M. Kaya; 1 ex., 16.VI.2009, G. Japoshvili; 1 ex., 03.IX.2009, G. Japoshvili.

Distribution in Turkey: Ankara, Antalya, Erzurum, İzmir, Manisa, Şanlıurfa (Anlaş, 2009; Anlaş & Rose, 2009b; Kesdek *et al.*, 2009).

Ontholestus murinus (Linnaeus, 1758)

Material examined: 1 ex., 05.VI.2008, M. Kaya.

Distribution in Turkey: Erzurum, Gaziantep, İzmir, Kütahya, Manisa (Anlaş, 2009; Anlaş & Rose, 2009b; Kesdek *et al.*, 2009).

Othius lapidicola Märkel & Kiesenwetter, 1848

Material examined: 1 exs., 09.X.2008, B. Aslan.

Distribution in Turkey: Adana, Afyonkarahisar, Antalya, Artvin, Aydın, Bitlis, Bursa, Denizli, Erzurum, Giresun, Gümüşhane, İzmir, Kars, Kastamonu, Manisa, Mersin, Ordu, Rize, Trabzon, Tunceli, Van (Coiffait, 1965, 1978; Anlaş, 2009).

Philonthus nitidicollis (Lacordaire, 1835)

Material examined: 2 exs., 23.X.2008, B. Aslan.

Distribution in Turkey: Adana, Ankara, Antalya, Gaziantep, İzmir, Konya (Anlaş, 2009; Anlaş & Rose, 2009b).

***Quedius coloratus* Fauvel, 1875**

Material examined: 1 ex., 11.IX.2008, G. Japoshvili; 1 ex., 18.IX.2008, B. Aslan. Distribution in Turkey: Adana, Bolu, Hatay (Scheerpeltz, 1958; Anlaş, 2009).

***Quedius ochripennis* (Ménétriés, 1832)**

Material examined: 1 ex., 18.IX.2008, M. Kaya.

Distribution in Turkey: Adana, Hatay, İstanbul, Kayseri, Mardin (Anlaş, 2009).

***Staphylinus caesareus* Cederhjelm, 1798**

Material examined: 1 ex., 10.VII.2008, B. Aslan.

Distribution in Turkey: Adıyaman, Ankara, Antalya, Ardahan, Artvin, Bayburt, Bolu, Denizli, Erzincan, Erzurum, Giresun, Kastamonu, Kars, Kayseri, Konya, Malatya, Mersin, Niğde, Ordu, Trabzon, Tunceli (Anlaş, 2009; Anlaş & Rose, 2009b; Kesdek *et al*., 2009).

DISCUSSION

At the end of the study, 27 species of seven subfamilies belonging to Staphylinidae have been reported. 25 species were reported for the first time from Isparta province. *Sepedophilus rufulus* (Hochhuth, 1849) and *Ocypus brenskei* Reitter, 1884 are the first records for the Turkish fauna.

In total, 348 specimens of the Staphylinidae species were collected at all location by pitfall traps. 240 samples were identified until species level and rest 108 samples until genus level because of there poor condition. From the total collected number most abundant genus was *Ocypus* with 82 % (287) of total specimens. Only genus *Oxypoda* was not included in our list as identify species was impossible due to the poor conditions. *Ocypus mus* is the most abundant species with 98 specimens (28 %), *O. orientis* with 55 specimens (16 %), and *O. brenskei* with 40 specimens (12 %).

Eight species (29,63 %) can be attributed to the Europeo-Mediterranean subregion, 5 species (18,52 %) are Palaearctic, 4 species (14,81 %) to the Asiatic-European subregion, 3 species (11,11 %) to the S-European subregion and the other 7 species (25,93 %) are Turano-European-Mediterranean, Turanian, Cosmopolitan or Subcosmopolitan.

Although no single sampling method can be used to survey all taxa pitfall trapping is one of the most commonly used methods to catch surface-active invertebrates (Spence & Niemelä, 1994). Like ground beetles, most rove beetles are predators of other insects and live on or in the soil, in ground litter, moss, or in decomposing organic matter. Staphylinids play an important role in soil ecosystem and environmental impact assessments. Pitfall traps, are biased toward highly active insects, particularly predators, the more active litter inhabiting staphylinids, from the total collected number most abundant genus was *Ocypus* in our study, for example. Thus pitfall traping is a most suitable method to sample rove beetles of the soil surface.

Consequently it was determined that the study areas were rich in species of staphylinids. In the future, the number of species likely would increase if different

methods were used. For this reason, it is important to preserve the rich flora and fauna of Gölcük National Park.

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