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A contribution to the knowledge of the Geotrupidae, Trogidae, and Hybosoridae fauna of Turkey (Coleoptera: Scarabaeoidea)

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Abstract

This study is based upon material from families Geotrupidae, Trogidae and Hybosoridae of the superfamily Scarabaeoidea collected from different localities of Turkey between 1974 and 2014. The study resulted in recording for Turkish fauna of six species from three genera of Geotrupidae, one species from one genus of Trogidae and one species from one genus of Hybosoridae. Among them, *Geotrupes (Geotrupes) spiniger* (MARSHAM, 1802) from Geotrupidae, *Trox (Trox) scaber* (LINNAEUS, 1767) from Trogidae and *Hybosorus roei* WESTWOOD, 1846 from Hybosoridae have been found the most abundant and widespread species. In addition, new localities have been found for some species and subspecies, which have already been reported from Turkey.

Zusammenfassung

In dieser Studie wird Material der Familien Geotrupidae, Trogidae und Hybosoridae der Überfamilie Scarabaeoidea behandelt, welches in verschiedenen Lokaltäten der Türkei zwischen 1974 und 2014 gesammelt wurde. Für die türkische Fauna werden sechs Arten aus drei Gattungen der Geotrupidae, eine Art aus einer Gattung der Trogidae und eine Art aus einer Gattung der Hybosoridae erfasst. Als häufigste und am weitesten verbreitete Arten erwiesen sich *Geotrupes (Geotrupes) spiniger* (MARSHAM, 1802) (Geotrupidae), *Trox (Trox) scaber* (LINNAEUS, 1767) (Trogidae) und *Hybosorus roei* WESTWOOD, 1846 (Hybosoridae). In Ergänzung werden für einige, bereits vermerkte Arten und Unterarten neue Fundangaben gemacht.

Introduction

Geotrupidae is moderate-sized family of about 45 genera and 600 species, including those commonly called dor beetles. They are round or slightly elongate, very convex, and glabrous or hairy. Their coloration is usually brown or black, more or less metallic, and is occasionally pattered. Body length is from 6 to 30 mm. Geotrupid adults dig deep

burrows in the soil which they stock with organic material like fungi, rotting vegetation, dung, and sometimes carrion, for their larvae. Some of their burrows can be till 2 m deep. If the burrowing occurs in golf courses and lawns, the extruded piles of soil may be a nuisance and the beetles regarded as pests (BOOTH et al. 1990).

Trogidae is a small family of 4 genera and about 300 species. All species are black or brown, somewhat elliptic in outline, and strongly convex. They usually bear sparse, coarse setae, which are sometimes arranged in clusters. Body length is from 2 to 20 mm. Trogids feed mostly on dried carrion, or can be collected in burrows of small mammals, or in nests of predatory birds, although they are sometimes attracted to carnivore dung, bird pellets, and mushrooms. They are usually among the last of the succession of insects that invade carcasses. Larvae usually occur at a shallow depth in the soil, beneath old carcasses where the adults have been feeding. They retreat into their vertical burrows when disturbed. Trogids are of no agricultural importance pests (BOOTH et al. 1990).

Hybosoridae is a small family of about 100 species. The upper surface is convex and the sides are usually slightly rounded, occasionally parallel. They are usually black or brown, rarely patterned. Body length is from 4 to 23 mm. Little is known on the biology of this family. Some species feed on carrion and/or dung; the larvae are thought to live in decomposing organic matter, such as cow dung. None is known to be of agricultural importance, although specimens of *Hybosorus roei* WESTWOOD, 1846, a widespread species in Africa, and extending north into southern Europe and east to India, and introduced into the USA, is sometimes sent by farmers at the International Institute of Entomology for identification.

Turkey is biogeographically one of the most interesting countries in the West Palaearctic region. Some faunistic studies on some genera of the superfamily Scarabaeoidea that occur in Turkey have been made by BAYKAL (1963), LODOS (1995), LODOS et al (1999), PETROVITZ (1963; 1967; 1971), REY (1999), CARPANETO et al. (2000), KARACA et al. (2006), ŞENYÜZ & ŞAHİN (2009), ROZNER & ROZNER (2009) and SÜRGÜT et al. (2014). Aim of this paper is to present some further records of Geotrupidae, Trogidae and Hybosoridae from Turkey.

Material and Methods

Geotrupidae, Trogidae and Hybosoridae (Coleoptera: Scarabaeoidea) species herein recorded were collected from different localities of Turkey between 1974 and 2014. In addition, material collected in previous years from other Turkish localities, preserved in Atatürk University, Faculty of Agriculture, Department of Plant Protection, the Entomology Museum, Erzurum, Turkey (EMET) has been also evaluated. Provinces of the collected specimens are given in alphabetical order. The material is deposited in the Entomology Museum, Erzurum, Turkey (EMET). Systematic and nomenclature follows LÖBL & LÖBL (2016). The study was supported by the Atatürk University Scientific Research Fund (Project Number: 2011/339) and is a partial summary of Alper POLAT's PhD thesis (Atatürk University, Institute of Science, Department of Plant Protection), adopted on 31.05.2016.

Results and Discussion

In this study, six species of three genera of Geotrupidae, one species of one genus of Trogidae and one species of one genus of Hybosoridae are recorded. These records improve the knowledge of the Scarabaeoidea fauna of Turkey.

Family Geotrupidae LATREILLE, 1802

Subfamily Geotrupinae LATREILLE, 1802

Tribe Enoplotrupini PAULIAN, 1945

Genus *Typhaeus* LEACH, 1815

Typhaeus fossor WALT, 1838

Material examined: Canakkale: Biga, Karabiga, 12.III.2010, ♀.

Tribe Geotrupini LATREILLE, 1802

Genus *Geotrupes* LATREILLE, 1797

Geotrupes (Geotrupes) mutator (MARSHAM, 1802)

Material examined: Amasya: 18.IX.1983, 2♂♂; Erzurum: Yakutiye, N 39°54'50.09", E 41°15'52.01", 1856 m, 14.IV.2014, ♀; Kars: Susuz, 1680 m, 10.VII.2011, ♀, 1680 m, 25.VII.2011, ♀.

Geotrupes (Geotrupes) spiniger (MARSHAM, 1802)

Material examined: Amasya: 18.IX.1983, ♀, ♂; Balıkesir: İvrindi, Korucu, 396 m, 25.VI.2010, ♂; Erzincan: Işıkpınar, 850 m, 12.VIII.2012, ♂; Erzurum: İspir, 1236 m, 28.V.2011, ♀, Tortum, Bağbaşı, 10.IX.1997, ♀; Giresun: Keşap, Güneyköy, 315 m, 22.VII.2012, ♀, ♂; Gümüşhane: Torul, 04.VII.1994, ♀; Kayseri: Yahyalı, 1063 m, 8.VII.2011, ♂; Malatya: Battalgazi, Alişar, 08.VII.1994, ♀; Mersin: Gözne, 07.IX.1992, ♂, Tarsus, 12.IX.1995, ♂; Ordu: Çakırlı, 1200 m, 07.VIII.2013, ♀; Rize: 20.IX.1990, ♀, Fındıklı, 26.VIII.1992, ♂; Trabzon: 12.VII.1996, ♀, 21.VII.1996, 3♂♂, 17.VIII.1996, ♂, 20.VIII.1991, ♀.

Geotrupes (Geotrupes) stercorarius (LINNAEUS, 1758)

Material examined: Ardahan: 07.V.1974, ♀; Erzincan: Merkez, Kavakyolu, 06.VIII.2011, ♂; Erzurum: Aziziye, Kuzgun, N 40°10'58", E 41°04'16.4", 2118 m, 03.VI.2012, ♀; Giresun: Keşap, Güneyköy, 315 m, 22.VI.2012, ♀.

Genus *Trypocopris* MOTSCHULSKY, 1860

Trypocopris (Pseudotrypocopris) amedei (FAIRMAIRE, 1861)

Material examined: Antalya: Yukarı Beymelek, 170 m, 20.VI.2013, ♀; Burdur: Bucak, Ürkütlü, 844 m, 20.VIII.2012, ♀; Denizli: Servergazi, 13.VII.2008, ♀, 16.VII.2008, ♀, 23.VII.2008, ♂.

Trypocopris (Trypocopris) caspius (MOTSCHULSKY, 1845)

Material examined: Trabzon: Çaykara, 15.VIII.2000, ♀.

Family Trogidae MACLEAY, 1819

Subfamily Troginae MACLEAY, 1819

Genus *Trox* FABRICIUS, 1775

Trox (Trox) scaber (LINNAEUS, 1767)

Material examined: Erzurum: Yakiye, Atatürk University Field, 1850 m, 26.VI.1996, 2♀, 28.VI.1997, 2♂♂, 29.VI.1996, 2♂♂, 15.VII.1997, ♂, 06.VIII.1996, ♀, 10.VIII.1997, ♀.

Family Hybosoridae ERICHSON, 1847

Subfamily Hybosorinae ERICHSON, 1847

Genus *Hybosorus* MACLEAY, 1819

***Hybosorus roei* WESTWOOD, 1846 [= *Hybosorus illigeri* (REICHE, 1853)]**

Material examined: Adana: Kozan, 01.IX.1983, ♀; Aydın: Çine, 700 m, 20.VIII.2010, ♀; Hatay: Erzin, 08.VII.1999, ♀?, 3♂♂, 11.VII.1999, ♀, ♂; Osmaniye: Kadirli, Kabayar, 14.VII.1997, ♀, 15.VII.1997, ♀, ♂, 16.VII.1997, ♀, ♂; Sanlıurfa: Bozova, 440 m, 12.VII.2013, ♂.

Remarks: According to KUIJTEN (1983) *Hybosorus illigeri* (REICHE, 1853) is a senior synonym of *H. roei* WESTWOOD, 1846. The Opinion 2230 (ICZN, 2009) stated that if the two taxa are considered synonyms, the precedence is to be given to *Hybosorus roei*. We herein accept the synonymy – even if it is not followed by BALLERIO & BEZDĚK (2016) E-mail: – and use *H. roei* as valid name.

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