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**New Taxonomic and Faunistic Data on the
Genus *Meteorus* HALIDAY, 1835
(Hymenoptera: Braconidae: Euphorinae) of Gökçeada (Imbros)
and Bozcaada (Tenedos) from Turkey**

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A b s t r a c t : The Euphorinae FOERSTER, 1862 is one of the most interesting and diversified subfamily of Braconidae with about 1100 species distributed all around the world. The Meteorini CRESSON, 1887 are small to medium size (2-10 mm) euphorine braconids, classified into two genera: the species-rich and cosmopolitan *Meteorus* HALIDAY, 1835 and the small Holarctic and Neotropical *Zele* CURTIS, 1832. *Meteorus* species are koinobiont endoparasitoids of the larvae of either Lepidoptera or Coleoptera, and most species of *Meteorus* are solitary parasitoids (rarely gregarious). Adult specimens of *Meteorus* were collected from various habitats and altitudes of Gökçeada and Bozcaada between 2010 and 2015. Sweeping nets were used to obtain samples on grass-type plants. 8 species had not previously been found in Gökçeada and Bozcaada. In the present study, *Meteorus rubens* was found to be the most commonly parasitic wasp in the study area fauna.

K e y w o r d s : *Meteorus*, Braconidae, Hymenoptera, Bozcaada, Gökçeada

Introduction

The Euphorinae is one of the most interesting and diversified subfamily of Braconidae (Hymenoptera, Ichneumonidae) with about 1.100 species distributed all around the world, of which 456 species are from Palaearctic region (YU et al. 2012). This highly polymorphic and biologically peculiar subfamily is characterized by only one character, obligatory practically for all its members: the first brachial cell open apically (TOBIAS 1986). As a group, the subfamily Euphorinae has a host range substantially broader than other braconid subfamilies. The group is characterized by great diversity in host association matched by a similarly great morphological diversity. Euphorinae are solitary or gregarious koinobiont endoparasitoids, which parasitize the adult stages of holometabolous insects or nymphs and adults of hemimetabolous insects especially within the order Coleoptera, Hymenoptera, Lepidoptera, Neuroptera, Hemiptera, Psocoptera, and Orthoptera. Occasionally the parasitoids of holometabolous insects oviposit into larvae as well as adults, but this only occurs where larvae are ecologically coincident with adults, living and feeding on the same plants (SHAW 1988, 1997; YU et al. 2012). There exist different approaches on classification of the genera. For instance, SHAW (1985) reviewed the genera and recognized nine tribes and recognition of the subfamily Meteorinae CRESSON for the genera *Meteorus* HALIDAY and *Zele* CURTIS. However, only four tribes, Euphorini, Cosmophorini, Centistini and Meteorini are recognised by van

ACHTERBERG (1993) while YU et al. (2012) listed 14 tribes (Centistini, Cosmophorini, Cryptoxilonini, Dinocampini Euphorini, Helorimorphini, Meteorini, Myiocephalini, Neoneurini, Oncometeorini, Perilitini, Proclithrophorini, Syntretini and Tainitermini).

Study area Imbros and Tenedos, also known by their official names since 1970 of Gökçeada and Bozcaada, are two neighboring North Aegean islands which belong to Turkey. They form the districts of Gökçeada and Bozcaada, in Çanakkale province. While Gökçeada is the biggest island of Turkey, Bozcaada is the third largest Turkish island after Gökçeada and Marmara islands.

Materials and methods

Following a sampling of the hymenopteran parasitoid fauna in Gökçeada and Bozcaada, and identification of the collected specimens, the taxonomical aspects of the genus *Meteorus* (Hymenopteran, Braconidae, Euphorinae) have been studied. This study area included six localities in Gökçeada and seven localities in Bozcaada. Adult wasps were collected by sweeping nets from different altitudes and habitats of Islands. The studied materials were examined in the laboratory under a binocular stereomicroscope and are deposited in the Zoological Museum of the Biology Department of Trakya University. For the terminology used in this paper and for the identification of the subfamily, see van ACHTERBERG (1993), SHAW (1985) and (TOBIAS1986).

Subfamily E u p h o r i n a e FÖRSTER, 1862

Tribe M e t e o r i n i CRESSON, 1887

Genus *Meteorus* HALIDAY, 1835

Meteorus abdominalator (NEES, 1811)

Material examined: Çanakkale-Bozcaada-Amerikan çeşme mevkii, 30.08.2012, pasture, 80 m., ♀, ♂; -Gökçeada-Uğurlu, 27.07.2011, vegetable garden, 70 m., ♀.

General distribution: Palaearctic (Armenia, Azerbaijan, Belgium, Bosnia Hercegovina, Bulgaria, Croatia, former Czechoslovakia, Finland, France, Germany, Hungary, Ireland, Italy, Italy, Kazakhstan, Korea, Latvia, Lithuania, Moldova, Netherlands, Norway, Poland, Romania; Russia, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, former Yugoslavia) (YU et al. 2012).

Distribution in Turkey: Adapazarı, Amasya, Artvin, Gümüşhane, Konya, Nevşehir, Rize (KOLDAS et al. 2013).

Meteorus eadyi HUDDLESTON, 1980

Material examined: Çanakkale-Gökçeada-Eşelek, 26.07.2011, vegetable garden, 40 m., ♀.

General distribution: Palaearctic (Belarus, Bulgaria, Croatia, France, Germany, Hungary, Italy, Lithuania, Turkey, Netherland, Romania, Russia, Slovakia, Switzerland, United Kingdom) (YU et al. 2012).

Distribution in Turkey: Bolu, Kastamonu, Isparta (YILMAZ et al. 2010).

***Meteorus ictericus* (NEES, 1811)**

Material examined: Çanakkale-Bozcaada-Ayazma-Sulubahçe, 03.09.2014, Vineyard and pasture, 15 m., ♀, 2♂♂; -Bozcaada-Latif çamlığı, 08.07.2010, pasture, 50 m. 1♀.

General distribution: Australasian, Oceanic, Oriental, Palaearctic (Armenia, Austria, Azerbaijan, Belarus, Belgium, Bulgaria, Czech Republic, former Czechoslovakia, China, Croatia, Finland, France, Israel, Italy, Japan, Kazakhstan, Korea, Latvia, Lithuania, Moldova, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Slovenia, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, former Yugoslavia) (YU et al. 2012).

Distribution in Turkey: Adana, Afyon, Artvin, Erzincan, Kayseri, Samsun, Trabzon (KOLDAS et al. 2013).

***Meteorus longicaudis* (RATZEBURG, 1848)**

Material examined: Çanakkale-Gökçeada-Eşelek, 10.07.2010, vegetable garden, 40 m., ♀.

General distribution: Palaearctic (Croatia, Finland, Germany, Netherlands, Poland, Sweden) (YU et al. 2012).

Distribution in Turkey: Burdur, Gümüşhane, Tokat (YILMAZ et al. 2010).

***Meteorus obsoletus* (WESMAEL, 1835)**

Material examined: Çanakkale-Bozcaada-Ayazma-Sulubahçe, 03.09.2014, Vineyard and pasture, 15 m., ♀.

General distribution: Palaearctic (Austria, Belgium, Bulgaria, former Czechoslovakia, France, Germany, Ireland, Italy, Japan, Korea, Moldova, Netherlands, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, former Yugoslavia) (YU et al. 2012).

Distribution in Turkey: Eskişehir, Malatya, Ordu, Samsun, Sivas, Tokat (KOLDAS et al. 2013).

***Meteorus pendulus* (MÜLLER, 1776)**

Material examined: Bozcaada-Tuzburnu, 08.07.2012, olive garden and pasture, 30 m, 1♀.

General distribution: Oriental, Palaearctic (Austria, Azerbaijan, Belgium, Bulgaria, China, Croatia, Cyprus, former Czechoslovakia, Denmark, Egypt, Finland, France, Germany, Greece, Hungary, Iran, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Moldova, Mongolia, Norway, Poland, Romania, Russia, Slovakia, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, former Yugoslavia) (YU et al. 2012).

Distribution in Turkey: Adana, Çanakkale (KOLDAS et al. 2013).

***Meteorus politutele* SHENEFELT, 1969**

Material examined: Çanakkale-Gökçeada-Yenibademli, 26.07.2011, orchard and vegetable garden, 35 m., ♀.

General distribution: Palaearctic (Turkey, Uzbekistan) (YU et al. 2012).

Distribution in Turkey: Samsun, Yalova (YILMAZ et al. 2010).

***Meteorus rubens* (NEES VON ESENBECK, 1811)**

Material examined: Çanakkale-Bozcaada-Amerikan çeşme mevkii, 30. 08. 2012, pasture, 80 m., ♀, ♂; -Bozcaada-Ayazma-Sulubahçe, 03.09.2014, vineyard and vegetable garden, 15 m., ♀; -Bozcaada-Göztepe, 30.06.2011, pasture and orchard, 70 m., ♀; -Bozcaada-İğdelik, 08.07.2012, olive garden and pasture, 21 m., ♀; -Bozcaada-Latif çamlığı, 08.07.2010, pasture, 50 m., ♀; -Bozcaada-Merkez, 09.07.2012, clover field and pasture, 10m., 2♀♀; Bozcaada-Tuzburnu, 08.07.2012, olive garden and pasture, 30 m., 1♀; -Gökçeada-Eşelek, 26.07.2011, vegetable garden, 40 m., ♀; -Gökçeada-Center, 26.07.2011, orchard and vegetable garden, 40m., ♀; -Gökçeada-Kaleköy, 22.08.2013, pasture, 30m., 2♀♀; -Gökçeada-Yenibademli, 26.07.2011, orchard and vegetable garden, 35 m., 2♀♀; -Gökçeada-Zeytinliköy, 22.07.2012, olive garden and pasture, 70 m., 2♀♀, ♂.

General distribution: Nearctic, Neotropical, Oriental, Palaearctic (Algeria, Armenia, Austria, Azerbaijan, Belgium, Bulgaria, China, Croatia, Cyprus, Czech Republic, former Czechoslovakia, Denmark, Egypt, Finland, France, Germany, Greece, Hungary, Iran, Iraq, Ireland, Israel, Italy, Japan, Kazakhstan, Korea, Latvia, Lithuania, Moldova, Mongolia, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tunisia, Turkey, Turkmenistan, Ukraine, United Kingdom, former Yugoslavia) (YU et al. 2012).

Distribution in Turkey: Adana, Adapazarı, Adıyaman, Afyon, Ağrı, Amasya, Antalya, Ankara, Artvin, Balıkesir, Bayburt, Bilecik, Bolu, Bursa, Çanakkale (Gökçeada), Çorum, Denizli, Edirne, Kırklareli, Elazığ, Erzurum, Gaziantep, Giresun, Gümüşhane, Isparta, İçel, Kastamonu, Kayseri, Kırklareli, Kırşehir, Konya, Malatya, Muğla, Niğde, Ordu, Osmaniye, Rize, Samsun, Sinop, Sivas, Şanlıurfa, Tekirdağ, Tokat, Trabzon, Van (KOLDAS et al. 2013).

***Meteorus rufus* (DEGEER, 1778)**

Material examined: Çanakkale-Bozcaada-Göztepe, 30.06.2011, pasture, orchard, 70m., 2♀♀; -Gökçeada-Center, 26.07.2011, orchard and vegetable garden, 40 m., ♀.

General distribution: Oceanic, Oriental, Palaearctic (Austria, Belgium, Croatia, Cyprus, former Czechoslovakia, France, Germany, Hungary, Ireland, Israel, Italy, Poland, Romania, Switzerland, Turkey, Ukraine, United Kingdom, former Yugoslavia) (YU et al. 2012).

Distribution in Turkey: Adana, Adıyaman, Bayburt, Bolu, Hatay, İçel, Isparta, Karaman, Kayseri, Niğde, Tekirdağ (KOLDAS et al. 2013).

***Meteorus versicolor* (WESMAEL, 1835)**

Material examined: Çanakkale-Gökçeada-Eşelek, 22.07.2015, vegetable garden, 40 m., ♀.

General distribution: Nearctic, Oriental, Palaearctic (Armenia, Austria, Azerbaijan, Belgium, Bulgaria, China, Croatia, Czech Republic, former Czechoslovakia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Madeira Islands, Moldova, Mongolia, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Tajikistan, Turkey, Ukraine, United Kingdom, Uzbekistan, former Yugoslavia) (YU et al. 2012).

Distribution in Turkey: Adana, Adıyaman, Afyon, Aydın, Amasya, Çanakkale (Gökçeada), Edirne, Hatay, Elazığ, İçel, Kayseri, Malatya, Muğla, Tekirdağ, Van, Zonguldak (KOLDAS et al. 2013).

Zusammenfassung

Euphorinae FOERSTER, 1862 ist mit über 1.100 Arten und weltweiter Verbreitung eine der interessantesten und artenreichsten Unterfamilien der Braconidae. Tribus Meteorini CRESSON, 1887 sind kleine bis mittelgroße (2-10 mm) Brackwespen, bestehend aus zwei Gattungen: die artenreiche und weltweit vorkommende *Meteorus* HALIDAY, 1835 und die kleine holarktische und neotropische *Zelex* CURTIS, 1832. *Meteorus*-Arten sind koinobiont-parasitoid in Larven von Lepidoptera oder Coleoptera sich entwickelnde Arten. Die meisten *Meteorus*-Arten leben meist solitär und treten selten gehäuft auf. Mit Streifnetzen erfolgte Aufsammlungen adulter *Meteorus* stammen aus unterschiedlichen Lebensräumen und Höhenlagen in den Gebieten Gökçeada und Bozcaada zwischen 2010 und 2015. Acht Arten konnten in diesen Regionen erstmals nachgewiesen werden, wobei sich *Meteorus rubens* als die am häufigsten vorkommende Art herausstellte.

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