

Contribution to the Microgastrinae (Hymenoptera, Braconidae) fauna of Turkey, with description of a new species of *Dolichogenidea*

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Seven Microgastrinae species have been reported from Turkey in this paper. Six of these species are new to the fauna of Turkey and one species is new to science. *Dolichogenidea bilecikensis* sp. n. is described, illustrated and compared with related species.

Key words: *Dolichogenidea bilecikensis* sp. n., Microgastrinae, Braconidae, fauna, Turkey.

Introduction

Within Braconidae, the subfamily Microgastrinae is the most conspicuous single group of parasitoids of Lepidoptera in the world, both in species richness and in economic importance. Over 1,500 species have been described, and MASON (1981) has estimated that the actual world total may reach 5,000–10,000 species when the rich tropical and south temperate faunas are fully known. Microgastrines are found world-wide from tropical to arctic climates, and attack virtually the entire taxonomic and biological spectrum of Lepidoptera. More than 100 species in this group have been used in the biological control of lepidopteran pests, and this total is likely to rise (WHITFIELD, 1997; WHITFIELD et al., 2002).

The classification of Microgastrinae has become more complex over the last three decades (WHITFIELD, 1997). The generic and tribal classification of Microgastrinae has always presented

considerable problems, largely because of the size and worldwide distribution of the group and the high incidence of morphological convergence and character reduction (SHAW & HUDDLESTON, 1991). The recognition of several large genera (affecting hundreds of species) and the most recent classification of the tribes (MASON, 1981) have recently been questioned. To a large degree, these classificatory problems stem from the lack of a sound phylogenetic understanding of Microgastrinae relationships. MARSHALL (1885) and MUESEBECK (1920) have placed the majority of Microgastrinae species in *Apanteles*. More recently, MASON (1981) split up the genus *Apanteles* Foerster into a series of genera. WHITFIELD (1997) and WHITFIELD et al. (2002) have also supported Mason's general approach, but challenge some aspects of his phylogeny and classification. Criticism of MASON's (1981) phylogeny of Microgastrinae culminated in the reassessment by WALKER et al. (1990). They attempted to replicate Ma-

son's analysis using the characters plotted on his phylogenetic diagram and computer-assisted parsimony analysis. The study by WALKER et al. (1990) highlighted many problems with Mason's system, but failed to produce and improved alternative. Since the early 1990s, the outgroup relationships within the lineage of braconid subfamilies related to Microgastrinae have been analysed further using both morphological and molecular data (WHITFIELD et al., 2002). In all studies to date, the monophyly of Microgastrinae has been supported, as well as that of a "microgastroid assemblage" that also includes Cheloninae in addition to groups traditionally associated with Microgastrinae. The closest outgroup taxa in all analyses include subfamilies Miracinae and Cardiochilinae. Until now, about 156 species belonging to 11 genera of subfamily Microgastrinae have been reported from Turkey (SHENEFELT, 1972, 1973; INANC & BEYARSLAN, 2001; BEYARSLAN et al., 2002a, b).

Material and methods

Some specimens of Microgastrinae were collected from W Turkey, especially from Marmara and the Aegean region at different times. Two female specimens of the new species were collected on 17.VIII.1994 from a cultivated field of *Humulus lupulus* L. in Bilecik and Pazaryeri, about 700 m altitude (leg. A. Cakil). The other species were collected mainly from cultivated fields and fruit orchards.

The studied localities, habitats, dates of study and geographic distribution of species were recorded. The specimens were identified mostly using the keys proposed by PAPP (1978, 1981, 1982, 1983, 1987) and TOBIAS (1986). The definitions, ratios and abbreviations in this article follow those of VAN ACHTERBERG (1993) and NIXON (1972). The following abbreviations are used in the text: OOL = ocular-ocellar line, POL = post ocellar line, LOL = lateral ocellar line. Figures of the new species were drawn and measurements taken using a camera Lucida attached to a stereomicroscope. Geographical co-ordinates of the sites were added to the paper.

Type specimens of the new species and specimens of other species are deposited in the Zoological Museum of Department of Biology, Trakya University (TU), Turkey.

Dolichogenidea Viereck, 1911

Dolichogenidea bilecikensis sp. n. (Figs 1–8).

Description. Female (holotype). Length of body 2.6 mm. Head in dorsal view 1.7 times broader than long (Fig. 1). Temple 0.46 times broader than eye. OOL 1.75 times longer than POL and POL 2.5 times longer than LOL. Head

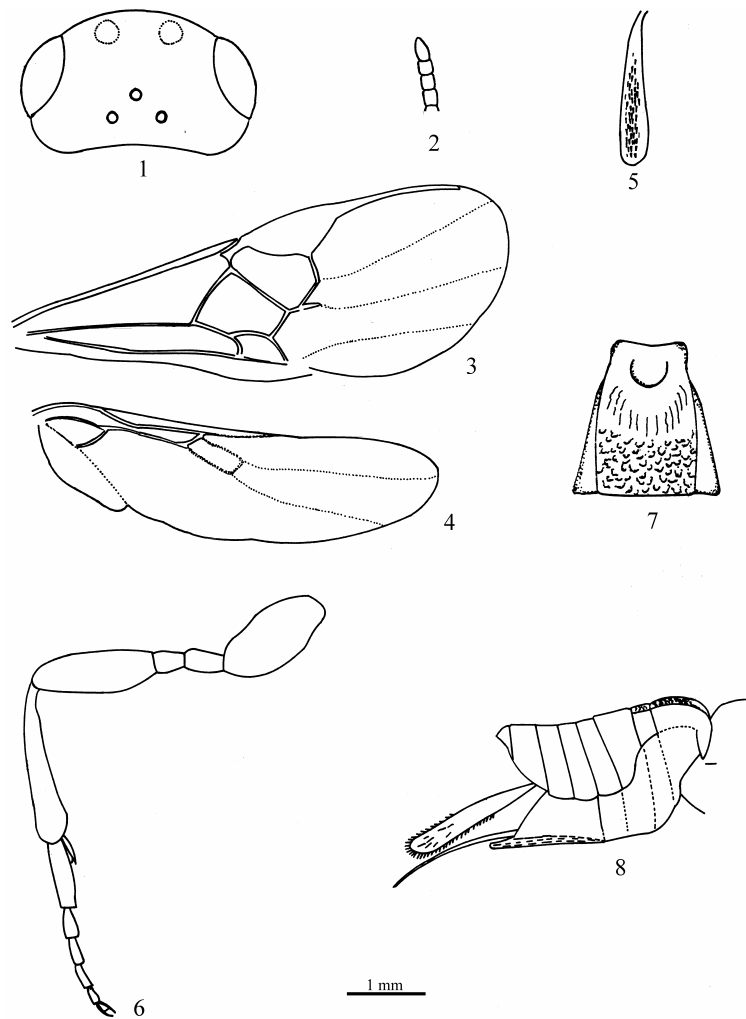
in frontal view 1.09 times broader than its height. Lateral view with eye 1.52 times longer than broad. Cheek about 1.2 times longer than basal width of mandibles. Occiput almost smooth and shine. Frons with superficial fine punctation and punctation disperse laterally, vertex with very fine punctation. Length of antenna 0.83 times longer than body and penultimate segments 1.1 times longer than broad (Fig. 2). Scape is 1.3 times longer than broad.

Mesosoma. Length of mesosoma is 2.28 times of its height. Mesonotum shiny, crowded and with very fine punctation. Notauli subshiny, deeply crowded punctated. Scutellum very shiny, punctation disperse and superficial. Scutellar sulcus very narrow, its crenula medially deep. Mesopleuron shiny, smooth, basally and laterally with superficial fine punctation. Precoxal sulcus is deep and smooth. Propodeum with a distinct small areola-like impression, rombic shaped and bordered with by very low carina. Anteriorly dispersely deep punctate and shine, posteriorly slightly rugulose, especially around lunula and laterally rugulose and subshiny.

Wings. Length of fore wings (Fig. 3) 1.04 times longer than body length. Length of pterostigma 2.43 times longer than its width, issuing radial vein almost from its middle. Length of metacarp 0.6 times longer than length of pterostigma. Length of r 1.1 times as long as 2SR. 2-Cu1, 1.07 times longer than 1-Cu1. Discal cell 0.78 times longer than its height. Length of hind wing (Fig. 4) 3.5 times longer than its height. Nervellus of hind wing faintly curved, vannal lob faintly convex.

Legs. Hind coxa slightly punctate, shiny. Ratio of femur:tibia:tarsus of hind leg: 22:28:33. Outer side of hind tibia with extremely numerous spines (Fig. 5). Outer hind tibial spur about 0.17 times longer than hind tibia. Outer hind tibial spur 1.2 times longer than inner hind tibial spur (Fig. 6).

Metasoma. Length of metasoma 1.88 times longer than its height. First tergite 1.71 times longer than broad. First tergite punctate rugulose (Fig. 7). Second tergite similar to first tergite, posteriorly finely rugulose. Second tergite 0.23 times longer than broad. Other tergites smooth and shiny. Hypopigium weakly sclerotized and with longitudinal creases. Ovipositor sheath in lateral view conspicuously broadened and evenly broadening from base to posterior end. Ovipositor sheath about 9 times longer than posteriorly wide and its length about 0.96 times as long as hind tibia (Fig. 8).



Figs 1-8. *Dolichogenidea bilecikensis* sp. n. (female): 1 - head in dorsal view; 2-15-18th joints of antenna; 3 - fore wing; 4 - hind wing; 5 - spines of outer side of hind tibia; 6 - hind leg; 7 - first tergite; 8 - metasoma in lateral view. Scale line 1 × (Fig. 3), 5 × (Figs 1, 7), 2.25 × (Figs 2, 8), 2.7 × (Figs 4-6).

Colour. Black; stigma and veins brown; antenna, palps, tegula and legs blackish brown.

Male: unknown

Material examined. Holotype: female - Bilecik, Pazaryeri (40°00'00" N, 29°53'60" E), 700 m a.s.l., from cultivated field of *Humulus lupulus* L., 17.VIII.1994, leg. A. Cakil (TU); **paratype** - 1 ♀, same data as holotype (TU).

Etymology. The new species is named after the province of Bilecik where the type locality is situated.

Differential diagnosis. *Dolichogenidea bileci-*

kensis sp. n. is nearest *D. cheles* Nixon, 1972. *D. bilecikensis* sp. n. differs from *D. cheles* in the following features: the new species has penultimate joints of flagellum 1.1 times as long as broad, (in *D. cheles* the penultimate joints of the flagellum are fully one-and three times longer than wide). Sculpturing of the mesonotum is crowded and with very fine punctation in the new species, while the mesonotum of *D. cheles* faintly dull to dull, with dense and rather strong punctation. The new species has the scutellar sulcus very narrow, only medially deep, while the scutellar sulcus of *D. cheles* is deep, well defined and very distinct. The new species has the pterostigma without a

basal spot and entirely brown, while in *D. cheles* the pterostigma has a distinct or indistinct pale spot. Ovipositor sheath of the new species is almost straight and broad, while ovipositor sheath of *D. cheles* becomes down-curved in apical third and is thin.

***Dolichogenidea emarginata* (Nees, 1834)**

Microgaster emarginatus Nees von Esenbeck, 1834, Hym. Ich. Affin. Mon. 1:182, ♀

Dolichogenidea emarginata Mason, 1981, Mem. Ent. Soc. Canada 115: 34–36.

Material examined: Edirne-Meric, Hasirciarnavut (41°10'60" N, 26°25'00" E), 40 m a.s.l., from wheat and sunflower fields, 30.VII.1992, 3 ♀♀, leg. F. Inanc; 1 ♀, leg. M. Yurtcan.

General distribution: Europe, Armenia, Azerbaidzhan (PAPP, 1978).

***Glyptapanteles* Ashmead, 1905**

Glyptapanteles mygdoniae (Nixon, 1973)

Apanteles mygdoniae Nixon, 1973, Bull. Ent. Res. 63: 169–228, ♀♂.

Glyptapanteles mygdoniae Mason, 1981, Mem. Ent. Soc. Canada 115: 105–107.

Materials examined: Izmir-Selcuk, Sirince (37°57'00" N, 27°22'00" E), 250 m a.s.l., from mixed fruit garden, 22.VII.2000, 1 ♀1 ♂, leg. A. Beyarslan; same locality, 29.VII.2000, 2 ♀♀, leg. F. Inanc.

General distribution: Europe, Bulgaria (PAPP, 1983).

***Diolcogaster* Ashmead, 1900**

Diolcogaster spreta (Marshall, 1885)

Microgaster spretus Marshall, 1885, Trans. R. Ent. Soc. Lond., 259, ♀.

Diolcogaster spreta Mason, 1981, Mem. Ent. Soc. Canada 115: 113–115.

Material examined: Edirne-Trakya Universitesi, Gullapoglu yerleskesi (41°40'00" N, 26°34'00" E), 41 m a.s.l., from Leguminosae, Euphorbiaceae and Compositae, 20.IV.2002, 2 ♀♀, leg. F. Inanc.

General distribution: W Europa, Moldavia, rare species (TOBIAS, 1986).

***Cotesia* Cameron, 1891.**

Cotesia juniperatae (Bouché, 1834)

Microgaster juniperatae Bouché, 1834, Naturg. Insect.: 154, ♀.

Cotesia juniperatae Mason, 1981, Mem. Ent. Soc. Canada 115: 110–113.

Material examined: Mugla-Yatagan, Dipsiz (37°19'60" N, 28°08'60" E), 380 m a.s.l., from mixed

vegetable garden, 18.VIII.2000, 2 ♂♂, leg. M. Aydogdu.

General distribution: England, Switzerland, Germany, Hungary (PAPP, 1987).

***Cotesia risilis* (Nixon, 1974)**

Apanteles risilis Nixon, 1974, Bull. Ent. Res. 64: 453–524, ♀♂.

Cotesia risilis Mason, 1981, Mem. Ent. Soc. Canada 115: 110–113.

Material examined: Bilecik, Pazaryeri (40°00'00" N, 29°53'60" E), 700 m a.s.l., from cultivated field of *Humulus lupulus* L., 17.VIII.1994, 2 ♀♀, leg. C. Erdem.

General distribution: England, the Netherlands, N Italy, Hungary, Slovakia, Yugoslavia, Romania ("Transylvania") (PAPP, 1987).

***Cotesia zygaenarum* (Marshall, 1885)**

Apanteles zygaenarum Marshall, 1885, Trans. R. Ent. Soc. Lond. 1885: 181, ♀♂.

Cotesiae zygaenarum Mason, 1981, Mem. Ent. Soc. Canada 115: 110–113.

Material examined: Bilecik, Çavuşköy (40°10'00" N, 29°28'00" E), 800 m a.s.l., from mixed fruit garden, 10.VII.1993, 2 ♀, A. Beyarslan; 1 ♀, leg. F. Inanc.

General distribution. Palaearctic Region (PAPP, 1987).

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