A NEW SPECIES, *HETEROSPILUS MAGNASTIGMATA* SP. NOV. (HYMENOPTERA: BRACONIDAE: DORYCTINAE) FROM TURKEY

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[Beyarslan, A. 2019. A new species, *Heterospilus magnastigmata* sp. nov. (Hymenoptera: Braconidae: Doryctinae) from Turkey. Munis Entomology & Zoology, 14 (1): 36-41**]**

ABSTRACT: *Heterospilus magnastigmata* sp. nov. from Turkey is described and its important morphological diagnostic characters are illustrated. Its differences from the related species *H. genalis* Tobias were given. It is the first species of genus *Heterospilus* Haliday described in Turkey. However, the total number of Turkish Doryctinae species has reached to 63.

KEY WORDS: Doryctinae, *Heterospilus*, new species, Turkey

Doryctins are common in tropical and subtropical regions. The distribution area includes 342 countries over the world. However, they are also introduced to 22 countries for biological control. This is because most of Doryctinae species are idiobiont ectoparasitoids of Coleoptera, Diptera, Lepidoptera, and Hymenoptera species which are plant pests. A relatively few species are involved in biological control through release or serendipitous utilization of available harmful hosts (Quicke, 2015). The subfamily Doryctinae includes 16 tribes, 186 genera, and about 1.609 species (Yu et al., 2012).

There is a limited number of studies on the subfamily Doryctinae in Turkey. The first record in Turkey is about *Dendrosoter* (*Dendrosoter*) *protuberans* (Nees). When forest pests of Eastern Black Sea were studied, this species was determined (Schimitschek, 1939). The same author also determined *Coeloides abdominalis* (Zetterstedt) along with this species in the same region (Schimitschek, 1941). They then recorded species of *D. (D.) middendorffii* (Ratzeburg) and *Spathius* (*Spathius*) *rubidus* (Rossi) three years later (Schimitschek, 1944). Belokobylskij (2001) identified *Hormius propodealis* (Belokobylskij) species from Turkey. Afterwards, the species *D.* (*Caenopachys*) *hartigii* (Ratzeburg) was determined in studies conducted on pests of Bolu Aladağ forests (Mancini et al., 2003). The initial studies on Doryctinae fauna in Turkey were started by the author in 1979 and totally 58 species were identified under 25 genera (Beyarslan & Aydogdu, 2013; Beyarslan, 2015, 2018). Therefore, the number of Turkey's Doryctinae species increased to 63 and a checklist involving these species was prepared (Beyarslan, 2017). The author discovered a new *Heterospilus* Haliday species in the study conducted on fauna of the family Braconidae in North Eastern Anatolia region. Type locality is Dil plain of Iğdır province. There is the Mount Ararat (5 165 M) in the south. The region forms one of the depressions (collapse) connecting one another with certain junction gates on the Aras River. Whole of this depression zone created by Iğdır Plain and Erivan (Revan) plain located out of Turkey's borders is also called as "Sürmeli plain". Sürmeli Plain starts from Ergüder location where Arpaçay unites with Aras, draws a line with Armenia, and continues up to junction point of borders of Turkey-Iran-Nakhchivan where Aras River leaves borders of Turkey. In the south of the zone, there are extension of Central Taurus running roughly across the direction

of west-east as well as eastern part of the mountainous mass which starts with Munzur mountains and continues with Karasu-Aras mountains. Mountains located on this zone are Durak Mountain (2811 m), Zor Mountain (3.196 m), and Pamuk Mountain (2.639 m) from west to east (Pamuk Mountain, separated from the Greater Mount Ararat by pass of Pamuk Mountain, is separated from Durak Mountains by Asma Pass in the western part of Zor Mountain). While semi-arid climate conditions generally prevail around depression zone in the region, semi-humid cold climate conditions prevail in higher parts. Depending on these properties, steppe vegetation exists in depression zone where is located under the arboriculture limit and semi-arid climate conditions prevail; whereas, mountain steppe and alpine vegetation are present in higher parts. Region substantially lacks of forest richness economically. Halophytes are generally observed in saline-alkaline soils of the plain. This vegetation includes the plant species belonging to the family Amaranthaceae. Reeds are encountered especially in swamps and areas where underground water is high. Apricot, apple, poplar, willow, hippophae trees and economical crop plants like cotton are grown in arable lands.

Iğdır plain is one of the gates where eremial elements enter into Turkey.

MATERIALS AND METHODS

Adult specimens of Doryctinae were collected from Iğdır, Turkey. Sweeping nets were used to obtain samples on grasstype plants. Collected samples were then pinned and labeled according to taxonomic rules and regulations. The specimens are deposited in the collection of the Zoological Museum of Department of Biology, Bitlis Eren University. Relevant literature was used for taxonomical examination of the material (Belokobylskij, 1983, 2001, 2004; Tobias, 1986; Seltmann & Sharkey, 2007; Kula, 2011; Belokobylskij & Žikić, 2009; Belokobylskij & Samartsev, 2011; Belokobylskij & Kula, 2012; Ameri et al., 2014, 2015). llustrations of the new species were taken using a camera "leica DFC295" attached to a stereomicroscope "Leica S8APO". The hosts of species are given according to Yu et al. (2016). Terminology and measurements for morphological features and setation considerably follow van Achterberg, 2003 and Sharkey & Wharton (1997). Abbreviations used in diagnoses and descriptions are as in van Achterberg (1993), with the following additions:

A= analis, C= costa, CU= cubitus, M= media, R= radius, SC= subcosta, SR= sectio radii, a= transverse anal vein, cu-a= transverse cubito-anal vein, m-cu= transverse medio-cubital vein, r= transverse radial vein, r-m= transverse radio-medial vein, OOL = ocular-ocellar line, POL =postocellar line, OD = maximal diameter of lateral ocelli (Achterberg, 1993).

RESULTS

Description. Male (Figs. 1-7b).

Description. Male (holotype). Length of body was 2.87 mm, length of antennae was 3.5 mm, length of fore wing was 2.37 mm, length of hind wing was 1.7 mm, length of hind leg was 2.25 mm, length of mesosoma was 1.00 mm, and length of metasoma was 1.5 mm.

Head (Fig. 1). Head. subcubish, ratios of width: length: height of head = 38: 31: 38; length of maxillary palp 0.8 times as height as of head; width of face 0.8 times its height; antenna with 26 flagellomeres (Figs. 2a,b), first flagellomere 4.66 times as long as its width and as long as second flagellomere, penultimate flagellomere 3.0 times as long as its width (Fig. 2a,b); mandible with one teeth, tooth closet to

labiomaxillary complex setiferous; malar space smooth, glabrous, malar suture absent, length of malar space 3.75 times as long as basal width of mandible and as long as longitudinal diameter of eye; clypeus with roughly apical 1/3 setiferous and basal 2/3 glabrous; face entirely smooth, glabrous except along margin of eye setiferous; width of face as long as its height; frons and vertex smooth, except surrounding ocelli with transverse rugose, setiferous; ocelli small; gena smooth, setiferous; occiput smooth, glabrous except a few setae ventrally on both sides of head; ratios of OOL:OD:POL = 10:3:3; width of the hypoclypeal depression 0.66 times as long as longitudinal diameter of eye; temple smooth, shiny and as long as length of eye in dorsal view; basal part of mandible micro sculptured.

Mesosoma (Fig. 3). Mesosoma approximately 1.95 times as long as its height; pronotum and propleuron smooth and shiny, notauli well developed, complete and sculptured, the mesonotum between posrerior section of notauli with sculpture, median mesonotal lobe and lateral mesonotal lobes punctuated, mesopleuron smooth, glabrous and shin. Scutellar sulcus with median longitudinal carina, smooth and glabrous, scutellum smoth. Metanotum areolate and shiny, metapleuron reticulately sculptured. Propodeum sculptured and with delicate areolate.

Forewing (Figs. 5a,b)**:** Pterostigma almost triangular, length of pterostigma 3.85 times its maximal width, length of fore wing 3.65 times as long as its maximum width, marginal cell long, ending at apex of wing, 3.7 times as long as its maximum width; first section of radial vein raising distinctly from middle of pterostigma and as long as second radiomedial vein, vein 1-M parallel to vein m-cu, vein 1-SR+M straight; vein cu-a fostfurcal; ratio of r: 3-SR: SR1: 2-M: r-m = 10: 10: 42: 25: 7; CUlb and not 3-CU1 not developed.

Hind wing (Figs. 5a,b) 4 times as long as its maximum width; hind wing of male with stigmal thi ckening covering costal, basal and medial veins.

Hind leg (Figs. 6a,b) Hind coxa smooth, with long, whitish setae; femur weakly compressed; ratios of femur: tibia: basitarsus: tarsus of hind leg = 9 : 13 : 4 : 11; length of femur, tibia and basitarsus of hind leg 5.2, 8.5, and 6.0 times their maximum width, respectively; tibial spurs very short; tibia and tarsus densely setose.

Metasoma (Figs. 7a,b) The first metesomal tergite sculptured and with curved longitudinal carinae, its longitudinal midlength as long as its apical width, Second metesomal tergite longitudinally costate, its longitudinal midlength 0.6x as long as its apical width and as long as midlength of Second metesomal tergite, the basal half of third metasomal tergite is longitudinally sculpted and with a transverse depression furrow and basal area. Suture between T2 and T3 deep and straight. The basis of the fourth and fifth metasomal tergite longitudinally sculpted and apical porsion smooth. The basis of the sixth metasomal tergite coriaceous and apical part smooth.

Color. Head (excluding mandible) yellow, Mandible brown, antenna yellow basally, brown apically, legs yellow but telotarsus and tarsal claw brown; wing membrane hyaline, wing venation, pterostigma and stigmal thickening on hind wing dark brown,

Female. Unknown.

Host. Unknown.

Material examined. Holotype: Male. Iğdır, Dil plain (Dil ucu) Iğdır State Hatchery (TIGEM) (39°47'10"N 44°37'5"E), h. 844 m a.s.l.; 22.vi.2013, Leg. M. Yurtcan.

Paratype: Male, Eskişehir, Anadolu University Memorial Forest, 10.vii.2007, leg. M. Yurtcan.

Differential Diagnosis. *Heterospilus magnastigmata* sp. nov. resembles *H. genalis* Tobias. The two species are distinguishable as follows:

1. Length of malar space as long as longitudinal diameter of eye; Head behind eyes not roundly narrowed, temple as long as the transverse diameter of the eye, body lenght 2.87 mm..... .....*Heterospilus magnastigmata* sp. nov.

- Length of malar space 2/3 times as long as longitudinal diameter of eye; Head behind eyes weakly roundly narrowed, temple 0.3 times as long as the transverse diameter of the eye, body length 2.5 mm..... .....*Heterospilus genalis* Tobias

Etymology. The specific name refers to the distinctive large basal stigmal thickening on hind wing of male.

ACKNOWLEDGEMENTS

We would like to thank Dr. Belokobylskijfrom the Zoological Institute of the Russian Academy of Sciences (St Petersburg), who generously provided me with the opportunity to work in his institute and checked the new species. This study was supported by TUBİTAK (Project 111T416), I thank this organization for their financial support.

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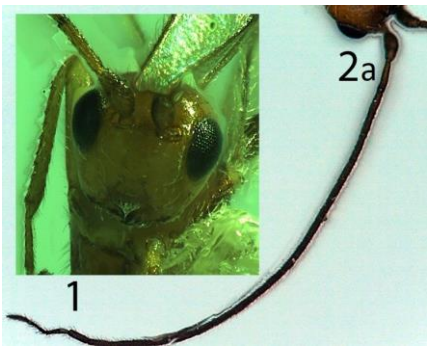

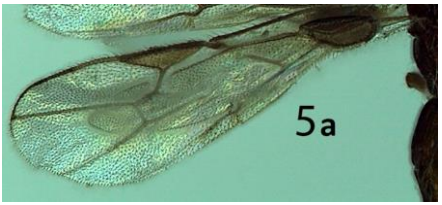

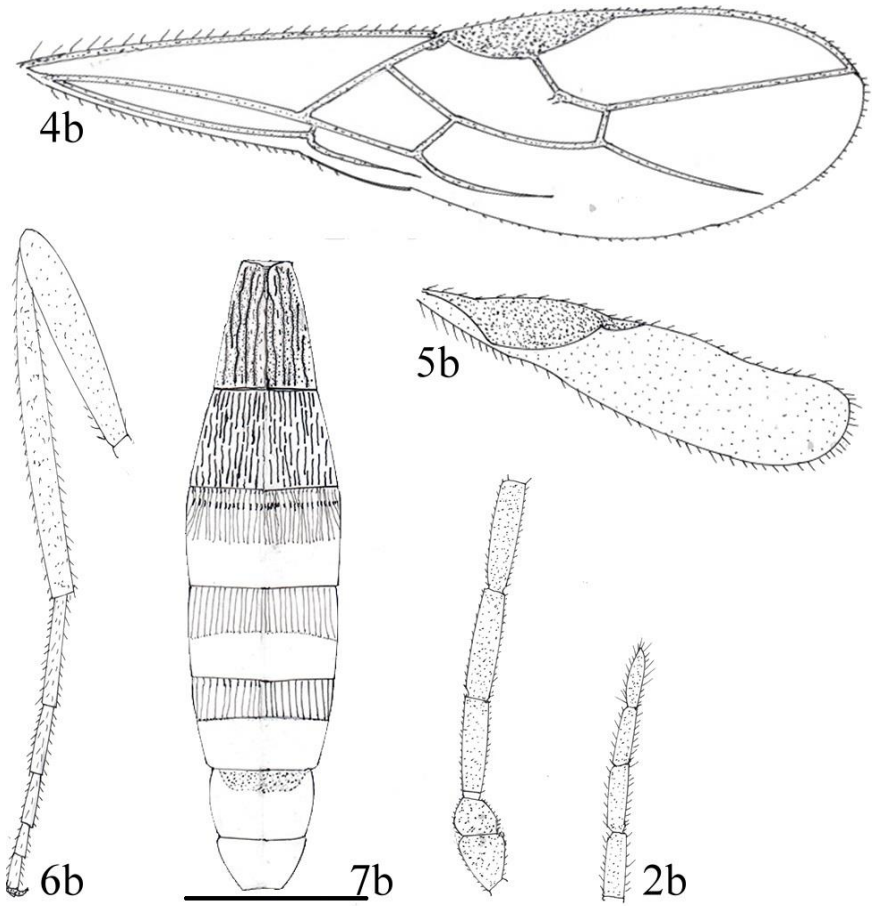

Figures 1-7b. *Heterospilus magnastigmata* sp. nov. – 1. head frontal view, 2a. antenna, 2b. antenna, 3. mesosoma lateral, 4a. fore wing, 4b. fore wing, 5a. hind wing, 5b. hind wing, 6a. femur and tibia of hind leg, 6b. hind leg, 7a. metasoma dorsal, 7b. metasoma dorsal. Scale 0.3 mm (Fig. 2b), 0.45 mm (Fig. 4b), 0.62 mm (Fig. 5b), 0.40 mm (Fig. 6b), 0.37 mm (Fig. 7b).