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A New Species of *Elasmosoma* Ruthe, 1858 from Turkey (Hymenoptera, Braconidae, Euphorinae)

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ABSTRACT

During the studies of Braconidae fauna of Turkey, adult specimens were collected in various habitats of Turkey using light traps and sweeping nets. Among them *Elasmosoma geylanae* sp. n. is described and illustrated from Denizli. It is compared with the similar species, *E. luxemburgense* Wasmann, 1909. An identification key for the Europian species of the genus *Elasmosoma* is constructed.

Key words: Euphorinae, *Elasmosoma, geylanae, calcaratum*, Kale, Turkey.

INTRODUTION

Euphorinae is a large subfamily of Braconidae comprising nearly 1 200 described species worldwide in 53 genera of which 456 species have been reported from Palaearctic region (Yu *et al*., 2012). All euphorines are koinobiont endoparasitoids and, as most koinobionts, at the species level host ranges are normally rather narrow. Indeed, several studies suggest that in many euphorines the host range is exceptionally narrow, and this may be correlated with the high incidence of thelytoky in most genera (Shaw and Huddleston, 1991). However, the host spectrum of the subfamily as a whole is remarkably broad, involving (worldwide) at least six orders of insects: Coleoptera, Hemiptera, Psocoptera, Hymenoptera, Neuroptera and, in just one recorded case, Orthoptera (Shaw, 1985; 1988).

The *Elasmosoma* is one of the most interesting genus of the tribe Neoneurini with about 14 species distributed all around the world, of which eight species have reported from the Palaearctic region (Yu *et al*., 2012). Members of the genus *Elasmosoma* are endoparasitoids of adult ants, as far as the scanty biological information allows a conclusion (Shaw and Huddleston, 1991). The observations by Panis (2007) on *E. berolinense* Ruthe, 1858 in southern France conflict with our observations; he reported oviposition through the intersegmental membrane at the base of the metasoma. *Elasmosoma* species are highly associated with the genus *Formica* Linnaeus, 1758 (*Formica rufa* Linnaeus, 1758, *F. pratensis* (Retzius, 1783), *F. sanguinea* Latreille, 1798, *F. fusca* Linnaeus, 1758, and *F. rufibarbis* Fabricius, 1793), infrequently also with *Lasius niger* (Linnaeus, 1758), and species of *Camponotus* Mayr, 1861, and *Polyergus* Latreille, 1804).The oviposition of *E. berolinense* Ruthe was observed

by Panis (2007). He raported oviposition through the intersegmental membrane at the base of the metasoma (Durán and van Achterberg, 2011).So far *E. berolinense* Ruthe 1858 (Yilmaz *et al*., 2010) and *E. calcaratum* Tobias 1986 (Koldaş *et al*., 2013) have been known form Turkey. *Elasmosoma* and related genera had for some time been treated as the subfamily Neoneurinae, but the evidence from molecular studies (Belshaw *et al*., 2000; Belshaw and Quicke, 2002; Shi *et al*., 2005; Pitz *et al*., 2007) have obviously specified that the tribe Neoneurini belongs to the subfamily Euphorinae, a diverse subfamily containing several genera exhibiting extreme morphological adaptations for parasitizing adult insects (Panis, 2007; Shaw and Jones, 2009; Durán and van Achterberg, 2011).

MATERIAL AND METHODS

Following a sampling of the hymenopteran parasitoid fauna in Turkey and identification of the collected specimens, the taxonomical aspects of the subfamily Euphorinae have been studied. The specimens were identified mostly using the identification keys and descriptions by Tobias (1986), Belokobylskij (1992; 2004), Goulet and Mason (2006). Between 1979 and 2014, from May till September, adult Euphorinae wasps were collected by sweeping nets and light traps from different regions of Turkey. *Elasmosoma geylanae* sp. n. is recorded in Denizli-Kale and described. Important morphological diagnostic characters are figured and compared with the related species, *E. luxemburgense* Wasmann. The studied materials are deposited in the Zoological Museum of the Biology Department Bitlis Eren University. For the terminology following study was used (van Achterberg, 1993). Abbreviations: OOL = ocular-ocellar line, POL = postocellar line, OD = maximal diameter of lateral ocelli.

RESULT

***Elasmosoma geylanae* sp. n. (Figs. 1-6)**

Description Male (Holotype). Length of body 2.5 mm, of antennae 1.25 mm, of fore wing 2.25 mm, of hind wing 1.75 mm, of hind leg 2.25 mm, of mesosoma 1.00 mm, of metasoma 1.25 mm.

Head (Fig. 1). Transverse, ratios of width: length: height of head = 45: 25: 50; antenna with 14 segments, first flagellomere 2.0 times longer than its width and 1.2 times as long as second flagellomere, penultimate antennal segment 2.2 as long as its width (Fig. 2); face dome-shaped forward, transvese striato-rugulose and with white setae, width of face approximately as long as its heigth; clypeus boundaries clear; between the mandibles and clypeus formed a depression; length of eye 2.0 times as long as temple in dorsal view; ratios of width of the hypoclypeal depression 0.6 times as long as longitudinal diameter of eye and 1.7 times length of malar space; longitudinal diameter of eye 1.4 times longer than its transverse diameter; height of eye: width of face: height of face: width of head= 11.0 : 12.6: 9.3: 24; vertex and frons transvese striato-rugulose and with White setae; OOL: OD : POL = 10 : 4 : 14;

mandibles smooth shiny; temple roughly culptured; length of malar space 1.3 times as long as basal width of mandible and 0.4 times longitudinal diameter of eye.

Mesosoma (Fig. 3). Mesosoma roughly coriaceous-granulate and with sparse white setae, approximately 1.4 times longer than height; notauli not developed; scutellum compressed and longitudinally striped; sernaulus finely sculptured; pleural sulcus distinctly sculptured; flange of metapleuron distinctly developed, smooth and shiny; propodeum roughly coriaceous-granulate, rather dull, its median carina and areola absent, slightly depressed dorso-medially, posterior half largely rugose and its small and round spiracle far in front of middle of propodeum.

Wings (Fig. 4). Fore wing: Hyaline, venation typical for genus; pterostigma almost oval, length of pterostigma 2.3 times its maximal width; 3-SR r half as long as 3-SR; C+SC+R, pterostigma and metacarp dark brown sclerotized; 1A, apical half of M+CU1, 1-SR, 1-M, cu-a, largely sclerotized and brightly coloured; basal half of wing densely setose, hardly less than distal half of wing. Hind wing: wing membrane setose basally, only 1-SC+R, 2-SC+R, SC+R1 and 1-SR distinctly developed.

Hind leg (Fig. 5). Hind coxa sculptured only a triangular part smooth and shiny; femur compressed; ratios of femur: tibia: basitarsus of hind leg = 40: 53: 21; length of femur, tibia and basitarsus of hind leg 2.2, 5.8 and 5.2 times their maximum width, respectively; fore spur as long as fore basitarsus; fore tarsus shorter than middle tarsus; length of hind tibial spurs 0.70 and 0.85 times hind basitarsus; tibia and tarsus densely setose; all tarsal claws slender, setose and simple.

Metasoma (Fig. 6). Length of first tergite as long as its apical width, its surface rather matt, granulate, in front of spiracles distinctly narrowed and behind spiracles subparallel-sided, without dorso-lateral and dorsal carinae; medially rather flat and spiracles slightly protruding, situated near middle of tergite; second and third tergites distinctly granulate; second metasomal suture rather shallow, narrow and smooth; third tergite largely granulate; setae of metasoma very rarely spread, short, fourth and following tergites smooth, densely setose; second tergite with sharp lateral crease; medial length of second tergite 0.6 times as long as its apical length and almost as long as medial length of third tergite.

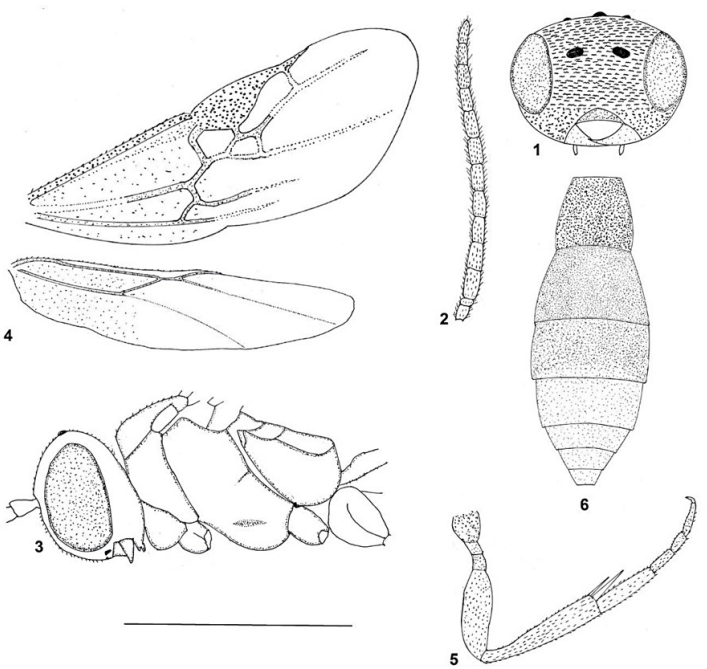
Colour Black; only mandibula and legs brown antenna dark brown; wing membrane and veins hyaline; costa+subcosta, pterostigma and metacarp yellow-brown, remainder parts spectral vein.

Female: Unknown.

Material examined. Holotype: Maler - Denizli, Kale (wheat field, *Populus* sp., 37°26′28″N, 28°50′42″E), 1060 m, 28.VI.1998, Paratypes: 2 ♂♂, same data as Holotype, leg. Ö. Çetin.

Etymology Named in honour of the cute and a little girl “Geylan”.

Differential diagnosis. *Elasmosoma geylanae* sp. n. is closely related to *E. luxemburgense* Wasmann, 1909 whereas in males of *E. geylanae* sp. n. propodeum have not distinct sinuate transverse ridge and sixth abdominal sternite without small membranous triangular area.



Figs. 1-6. *Elasmosoma geylanae* sp. n. (male), 1. Head in frontal view, 2. Antenna, 3. Mesosoma in lateral view, 4. Wings, 5. Hind leg, 6. Metasoma. Scale 0.9 mm (Figs. 1, 2, 6), 0.7 mm (Fig. 3), 1.2 mm (Figs. 4, 5).

Key to European species of the genus *Elasmosoma* Ruthe, 1858 (modified fromTobias, 1986 and van Achterberg and Koponen, 2003)

1. Ocelli in distinctly transverse triangle, interocellar distance almost 2 times ocellocular distance; second flagellar segment not longer than wide (platamonense-Group (Absent Neighbourhoods)

– Ocelli in somewhat right-angled triangle, interocellar distance roughly equaling ocellocular distance; second flagellar segment distinctly longer than wide (Fig. 2) (calcaratum-group) 2

2. Inner spur on hind tibiae longer than 1st segment of hind tarsus; hypopygium apically rectilinearly incised, on sides with 2 projections, with long setae; propodeum in posterior half with fairly coarse reticulatesculpture, forming distinct transverse ridge in middle of segment; face much higher than wide. Second flagellar segment very slightly longer than wide, remaining segments Square; foretarsi very slightly shorter than middle tarsus; sculpture and color as in previous species but lighter colored parts of body darker and wings distinctly darkened with pale brownish veins; in male face wider than long; flagellar segments longer; inner spur on hind tibiae very slightly shorter than 1st tarsal segment; body with coarse transverse folds; legs dark brown; body 2.2-2.4. Moldova…….*E. calcaratum* Tobias, 1986

– Inner spur on hind tibiae shorter than 1st segment of hind tarsus; hypopygium of other shape, always lacking projections on sides, with long setae…….3

3. Hypopygium transverse, weakly notched in middle, with long ciliate hair, as long as tergite itself or bald; legs and mouthparts yellow…….....……4

– Hypopygium elongate and deeply incised. Propodeum posterior to somewhat developed transverse ridge with reticulate sculpture….....……..5

4. Propodeum with distinct sinuate transverse ridge; sixth abdominal sternite with small membranous triangular area here; 2nd and base of 3rd tergite yellow. length of body 2.0-2.2 mm. Kazakhstan…….....*E. luxemburgense* Wasmann, 1909

– Propodeum without distinct sinuate transverse ridge; sixth abdominal sternite, without small membranous triangular area here and bald. Body black, legs and moundtparts yellow; length of body 2.5 mm. Turk..….....*Elasmosoma geylanae* sp. n.

5. Hypopygium of in lateral view distinctly narrowed apically and margination moderately setose, its branches curved and more or less crossing each other, medio-basally folded; hind tarsus pale yellowish; length of body 2.0-2.6 mm. Palaearctic…..... *E. berolinense* Ruthe, 1858

– Hypopygium of female in lateral view gradually narrowed apically, emargination densely and long setose, its branches straight and remaining far removed from each other, medio-basally distinctly depresssed; hind tarsus dark brown; length of body 2.1 mm. North Europe……...…*E. depressum* Achterberg and Koponen, 2003

DISCUSSION

This species very closely resembles *E. luxembergense* Wasmann, from which it may be distinguished by its morphological features: In *E. geylanae* sp. n. 3rd antennal segment is equal to 4th segment; hypopygium is broad but relatively short, shining, and punctate without long hairs; propodeum is roughly coriaceous-granulate, rather dull, without the median transverse carina and areola; body entirely black.

In *E. luxembergense* Wasmann, third antennal segment is longer than fourth segment; the hypopygium is broad but relatively short, shining and punctate with extremely long hairs; the propodeum is reticulate-coriaceous between prominent rugae with a strong but irregular transverse carina; body is black but 2nd tergite and base of 3rd tergite are yellow.

Species of *Elasmosoma* are not common in Turkey and only 3 species have been recorded since 1979; In addition to this species, *E. berolinense* Ruthe (Yilmaz *et al*., 2010) and *E. calcaratum* Tobias (Koldaş *et al*., 2013) have been recorded from Turkey.

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