

Full Length Research Paper

A review of the Turkish *Orthopelmatinae* (Insecta: Hymenoptera: *ichneumonidae*)

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Two Orthopelmatinae species from Turkey are reported, redescribed and figured. One species is a new record for Turkish fauna. A key for Turkish *Orthopelma* species is given.

Key words: *Ichneumonidae*, orthopelmatinae, Turkey, fauna, key, redescription.

INTRODUCTION

The *Ichneumonidae* represents the largest family of Hymenoptera with 42 generally recognized subfamilies, which is one of the largest families of the insects. The probable number of the species was estimated by Rasnitsin (1978) to be more than 100000 species. There are parasites of different insect groups such as Lepidoptera, Hymenoptera, Diptera, Coleoptera etc. and less frequently of spiders and a few other groups (Austin, 1985; Finch, 2005). Generally, the biology of *ichneumonids* is very variable and all forms of parasitism are represented, but something common to all *ichneumonids* is that they kill their host (Laurenne, 2008). Most species are as important as biological control agents are to harmful insect pests. A key for identification of *Ichneumonidae* subfamilies was given by Wahl and Sharkey (1993).

Orthopelmatinae is a very small *ichneumonid* subfamily and includes a single genus with Holarctic distribution. The main features include projected semicircular labrum, short but sharp notaulus with small fosse in front end, interrupted postpectal carina in front of each middle coxa, front wing without areolet, ovipositor thin and without subapical dorsal notch (Townes, 1971). They are koinobiont endoparasitoids on galls of Cynipoidea, developed on *Rubus* and *Rosa*.

The members of the last superfamily give damages on mostly *Rosa* and *Rubus* species. Both generally are of high economical values in Turkey. Particularly, *Rosa* species have been used in many ways for example dried

fruits, marmalades, jams, fruit juice, tea etc. in Turkey (Ercisli, 2005). The country has very rich rose germplasm. The areas most densely populated by rose species are East, North and North-East Anatolia, in which the Gumushane, Tokat, Sivas, Erzincan, Erzurum, Kars and Van provinces are the main centers of the rose (especially rose hip) production (Ercisli and Esitken, 2004). The species of the *Orthopelmatinae* are natural enzymes of Cynipoidea and any data of their relationships are highly appreciated.

Until now, the Turkish fauna was known only in one *Orthopelma* species (Fahringer, 1922; Kolarov, 1995; Ozbek et al., 1999). In the present paper we report data of two species; one of them is a new record for Turkish fauna. Both species are redescribed and figured. A key for identification of Turkish *Orthopelma* species is given.

MATERIALS AND METHODS

An *Orthopelma* specimen for this study was collected from North and North-Eastern Turkey during 2001 to 2007 by using sweeping nets and Malaise traps. Some specimens were reared in laboratory from galls of *Diplolepis* spp. The galls were collected on the late autumn and insects fly on early spring. Known standard methods were used for preparation of the adult samples. The photos were made by Leicalas MZ 7.5 and Leica DFC420. All the specimens were deposited in the Entomology Museum of Atatürk University, Erzurum, Turkey.

RESULTS AND DISCUSSION

Orthopelma Taschenberg, 1865

Orthopelma Taschenberg, 1865. Zeitschr. Gesam.

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Figure 1. *Orthopelma mediator* Thunb. ♀, total view.



Figure 2. *Orthopelma bevicornis* Morley ♀, flagellum.

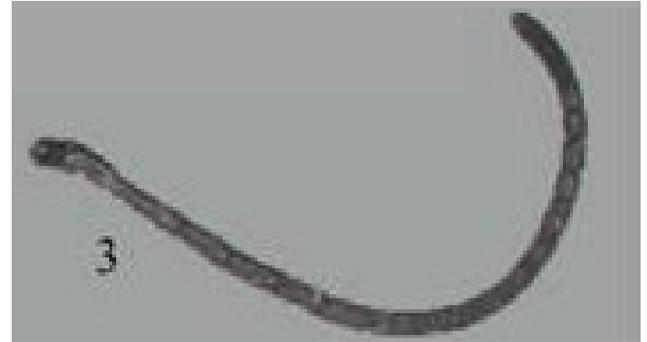


Figure 3. *Orthopelma mediator* Thunb. ♀, flagellum.

Key to the Turkish species of *Orthopelma*

- (1) *Orthopelma brevicorne* Morley: Antenna is shorter than the head and mesosoma put together. Flagellum in female has 12 to 15 segments (Figure 2). Ovipositor sheath is between 0.5 and 0.8 long as hind tibia.
- (2) *Orthopelma mediator* (Thunberg): Antenna is not shorter than the head and mesosoma put together. Flagellum in female has 16 to 19 segments (Figure 3). Ovipositor sheath ranges from 1.0 to 1.4 long as hind tibia.

Orthopelma brevicorne Morley, 1907

Orthopelma brevicorne Morley, 1907. *Ichneumonologia Britannica*. II, p. 351.

Naturw., Halle, 25, p. 137. *Proëdrus* Foerster, 1869. Verh. Naturh. Ver. Rheinlande 25, p. 147.

Type of species: (*Hemiteles luteolator* Gravenhorst) = *mediator* Thunberg.

The front wing ranges from 2.5 to 4.3 mm long. It has a moderately slender body which is clypeus small, weakly convex, separated from face by furrow and its apical ridge with small groove. The mandible is narrowly short to the apex with two teeth and the upper tooth is a little longer than the lower tooth. Male flagellum is without tyloids, sternaulus is short or weak, but with European species mesopleurum with distinct furrow on its lower part. The subtegular carina is modified, with long fissure from behind, front tibia without apical tooth, middle and hind tibia with 2 apical spurs and tarsal claws of all legs with large basal tooth. The second recurrent vein is strongly inclival with two bullae, while the nervellus inclival is not intercepted. The first metasomal tergum is almost cylindrical and curved, and its spiracles are found in the basal third. Dorsal, dorsolateral and ventrolateral carinae are strongly developed, while glymma is absent, propodeum has complete areolation and metasoma is not compressed (Figure 1).

The front wing is 3.6 mm long and the head is distinctly narrowed behind. The female flagellum has 12 to 15 segments (Figure 2); the first segment depth is 2.4 long to the last transversal. The male flagellum has 18 segments; the first segment is 2.0 long as the depth. Ocellus is small, its diameter is 0.7 long as the distance between the lateral ocellus and eye. Inner eye orbits moderately and strongly convergent downward. The distance between frontal orbits is 1.3 long as the distance between eyes orbits at the level of clypeal fovea. The frons is dense and fine punctured, face with rare and smooth punctures, vertex comparatively dense and coarse punctured. The clypeus is weakly separated from the face, with sharp and arched front edge. The mandible is strongly tapered to apex, with the upper tooth distinctly longer than the lower tooth. The malar space is 0.4 long as basal width of mandible. The occipital carina reached a high lamelliform hypostomal carina far in front of the base of the mandible at a distance no shorter than the malar space length.

Epomia is a distinct feature. The mesonotum is strongly convex and the notaulus is developed in front third of mesonotum. The scutellum is without lateral carinae, the subtegular carina is rather high, while the prepectal



Figure 4. *Orthopelma mediator* Thunb. ♀, face.



Figure 5. *Orthopelma mediator* Thunb. ♀, wings.

carina is weak. The front wing is without areolet, the pterostigma is short and wide, the second recurrent vein is strongly inclival, and arched and nervulus inclival is distinctly postfurcal. Parallel vein begins below the middle of postnervulus. Nervellus is weakly inclival and not intercepted. The hind wing has 4 to 5 distal hamuli, the legs are moderately slender and the hind femur is 4.5 as long as the width. Tibial spurs are rather short and weakly curved, the correlation between hind tarsal segments is 25:13:9:6:9, the tarsal claws has large basal tooth, the propodeum is completely areolated, the areola is not separated from the basal area, their common length is bigger than hexagonal apical area, and the propodeal spiracles are small and oval.

The first metasomal segment is 3.0 mm long with an apical width, and its spiracles are situated at the basal third and projected laterally. Postpetiolus has almost parallel lateral edges and parallel ventrolateral carinae. The second tergum is 1.06 long and is wide apically,

following terga transversal. VI - VII terga is weakly projected under V tergum. Ovipositor sheath is 0.5 to 0.8 long as hind tibia. Ovipositor is thin, weakly upscurved, with sharp apex and without nodus and subapical dorsal notch.

Black; palpi, tegulae and apical edges of III - VII terga yellow; scapus from below, the apical is 2/3 of clypeus, a spot is on basal half of mandibles, the front and middle legs (with exception of larger part of coxae) and II - IV (V) metasomal terga is reddish; the hind legs (with exception of coxae) and middle tarsus is brownish; the hind tibia with more light base; the second trochanter of hind legs is red - orange.

Parasitoid on *Diplolepis rosae* L., *D. dispar* Niblett and *D. eglanteriae* Hartig (Cynipidae).

Distribution: Sweden, United Kingdom, France, Bulgaria and Caucasus.

Material examined: Kars: Sarıkamış, Karakurt, TCK fountain, 1500 m, 12.VI.2003, 1 ♀, leg. S. Çoruh.

The species is a new record for Turkish fauna.

***Orthopelma mediator* (Thunberg, 1824)**

Ichneumon mediator Thunberg, 1824. Mémoires de l'Académie Imperiale des Sciences de Saint Petersburg, 8, p. 269.

The front wing is 2.8 to 4.0 mm long and the head is distinctly restricted behind the eyes. The female flagellum has 16 to 19 segments (Figure 3); first segment is 2.6 long as the depth (in male 2.3 long as the depth). The face is finer punctured than in *O. brevicornis* Morley. The inner eye orbits is rather weakly convergent downward, the distance between frontal orbits is only 1.2 long as the distance between eyes orbits at the level of clypeal fovea (Figure 4). Malar space has fine but distinct furrow from lower part of the eyes to the base of mandibles. Malar space is 0.6 long as basal width of mandibles. The clypeus is weakly separated from the face, not punctured, with sharp, arched front edge. The lower tooth of mandibles is shorter than the upper tooth and situated a little inside of the upper tooth. Occipital carina reached lamelliform hypostomal carina at right angle to the distance almost as malar space length. The lower part of the temples is weakly swollen.

Epomia is weak, while notaulus is short, forming in the front end small semicircular groove. Scutellum is without lateral carinae, sternaulus is short, above mesopleurum with longitudinal furrow. Lateral ending of prepectal carina not reaching the front ridge of mesopleurum. Wings are the same as in *O. brevicornis* Morley, but nervulus is weakly postfurcal to almost interstitial (Figure 5). The hind femur is 4.1 long as the width. Correlation between the hind tarsal segments is 30:14:11:6:13 and the tarsal claws has large basal tooth. Area superomedia is transversally striated, the apical area is smooth and shining and the rest part of the propodeum is wrinkly

punctured. Propodeal spiracle is closer to pleural than to lateral carina.

The first metasomal tergum is 3.2 long as the width. Its dorsal carinae have no bypass spiracles. The second tergum is 1.1 long as the width, following terga transversal. Ovipositor sheath is 1.0 to 1.4 long as the hind tibia. Ovipositor thin is gradually tapered to the apex.

Coloration is the same as in *O. brevicornis* Morley, but antennae are entirely black; hind femurs is sometimes and IV metasomal tergum is dark brown; in male II - IV metasomal terga is dark brown, with narrow yellow apical band; sometimes II - V terga has wider basal yellow band.

Common parasitoid on *Diplolepis* Fourcr. (Cynipidae). Several hosts are listed by Yu et al. (2005).

In Turkey it was reared from galls of *Diplolepis mayri* Schld. (Özbek et al., 1999; Çoruh et al., 2004) and *D. fructuum* (Rübsaamen) (? = *D. mayri* Schld.) (Güclü et al., 2007). Bayram et al. (1998) reported "*Bathythrix* sp." as a parasitoid of *D. mayri* Schld. In view of the fact that there are some resemblances of *Bathythrix* species with *Orthopelma* species, probably "*Bathythrix* sp." is incorrectly identified as *Orthopelma* sp. The species of *Bathythrix* (Förster, 1869) are idiobiont parasitoids of different insect, as Lepidoptera, Coleoptera, but mainly Hymenoptera, including secondary parasitoids on other *ichneumonids*, *braconids*, never on *Cynipoidea* (Yu et al., 2005).

Distribution: Europe, Turkey, Iran and North America.

Material examined: Gümüşhane, Vauk pass, 22. VI. 2001, 15 ♂♂ 12 ♀♀; Erzurum, 1850 m, 6. VII. 2001, 1 ♀; Kars, Sarıkamış, Karakurt, TCK fountain, 1500 m, 19.VI.2007, 3 ♀♀; Aras Valley, Akkurt, 1500 m, 18.V.2002, 1 ♂ 1 ♀.

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