

Two new species of the genus *Orthopelma* (Hymenoptera: Ichneumonidae: Orthopelmatinae) from Caucasus and Tian-Shan

Два новых вида рода *Orthopelma* (Hymenoptera: Ichneumonidae: Orthopelmatinae) с Кавказа и Тянь-Шаня

D.R. KASPARYAN

Д.Р. КАСПАРЯН

D.R. Kasparyan. Zoological Institute, Russian Academy of Sciences, 1 Universitetskaya Emb. 1, St. Petersburg 199034, Russia. E-mail: hymenopt@zin.ru

Two new Palearctic species of ichneumon-wasps, *Orthopelma caucasicum* sp. nov. and *O. dodecameron* sp. nov. are described from mountains of the Caucasus and Middle Asia. A key to the West-Palaearctic species is given. Two species-groups in *Orthopelma* are distinguished and characterised in the key.

Два новых палеарктических вида наездников-ихневмонид – *Orthopelma caucasicum* sp. nov. and *O. dodecameron* sp. nov. описаны с гор Кавказа и Средней Азии. Составлена определительная таблица для западно-палеарктических видов. В таблице выделены две группы видов рода *Orthopelma*, и дана их характеристика.

Key words: Palearctic, Caucasus, Middle Asia, Ichneumonidae, Orthopelmatinae, *Orthopelma*, new species, taxonomy

Ключевые слова: Палеарктика, Кавказ, Средняя Азия, Ichneumonidae, Orthopelmatinae, *Orthopelma*, новые виды, таксономия

INTRODUCTION

The Orthopelmatinae is a small subfamily with a single genus *Orthopelma* Taschenberg, 1865. The genus is Holarctic and includes about 10 species (Yu & Horstmann, 1997; Yu et al., 2005). In Europe two species are recorded (one of them is Holarctic) (Callan, 1943; Gauld & Mitchell, 1977; Izquierdo, 1981; Kasparyan, 1981; Kolarov, 1984, 1989, 1995; Aubert, 1997; Kasparyan & Khalaim, 2007), one species is described from Middle Asia (Uzbekistan) (Kasparyan, 1984), and two species were described from Japan (Kusigemati, 1974). Four Nearctic species were revised by Barron (1977).

These species parasitise the galls of Cynipidae, mainly of the genus *Diplolepis* Fourcroy, 1785 (on *Rosa* spp.), and, in North America, also of the genus *Diastrophus* Hartig, 1840 (on *Rubus*). More information on the hosts and biology is given in a number of publications (Niblett, 1951; Fulmek, 1968; Barron, 1977; Nieves Aldrey, 1984; Stille, 1985; Ferrari et al., 1997; Yu, Horstmann, 1997; Belshaw et al., 1998; Özbek et al., 1999; Yu et al., 2005).

Two new species from the West Palearctic region are described here. The type material described here is deposited at the Zoological Institute, Russian Academy of Sciences, St. Petersburg (ZIN).

TAXONOMIC PARTOrder **HYMENOPTERA**Family **ICHNEUMONIDAE**Subfamily **ORTHOPELMATINAE**Genus ***Orthopelma*** Taschenberg, 1865

Type species: *Hemiteles luteolator* Graenicher, 1829 (junior synonym of *Ichneumon mediator* Thunberg, 1824).

The characters most important to diagnose the genus and subfamily follow. Fore wing 2.5–4.3 mm long. Labrum semicircular and strongly projecting downward. Mandible short with apex narrow, lower tooth shorter than upper one and slightly deepened in mouth. Segment 3 of labial palpus very short. Sternaulus absent or weak, but mesopleuron usually with median longitudinal groove expanding for whole length of mesopleuron and weakly curved downward. Propodeum completely areolated. All tarsal claws with a large basal tooth. Areolet absent. Pterostigma wide and short. Nervulus inclivous, interstitial or a little postfurcal. Brachial cell short and high (almost as high as length of its anterior margin). Nervellus not intercepted. First metasomal segment cylindrical, decurved, without glymmae; its tergite and sternite fused; sternite entirely sclerotised; tergite with ventrolateral carinae complete and with dorsomedian and dorsolateral carinae sometimes weak; spiracle of this tergite near basal third. Ovipositor sheath 0.5–1.6 times as long as hind tibia. Ovipositor slender (Fig. 8), without apical ridges and subapical dorsal notch. Head sclerites of mature larva mostly unsclerotised (only mandibles and pleurostoma very lightly sclerotised); this feature of larva as well as shape of its mandibles distinguish *Orthopelma* from other Ichneumonidae (Short, 1978).

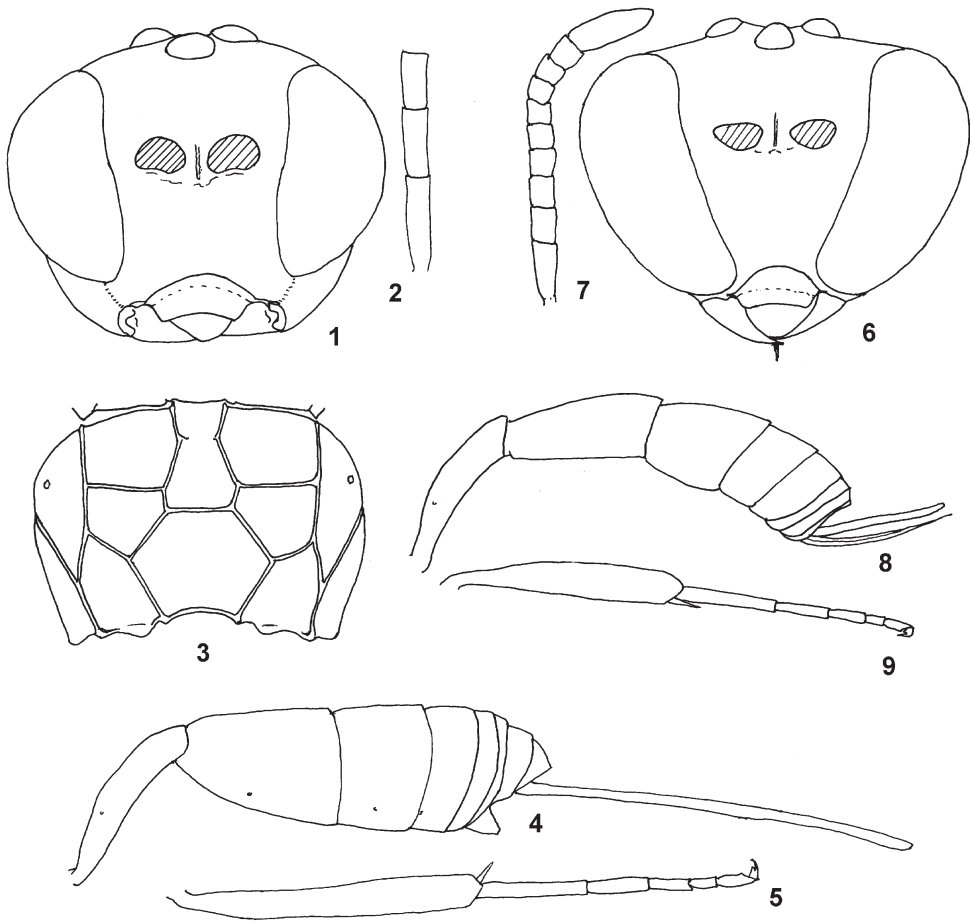
***Orthopelma caucasicum* Kasparyan, sp. nov.**
(Figs 1–5)

Holotype. Female; **Azerbaijan**, Ordubad Distr., 8 km S of Bilav, xerophytic slopes, 6 May 1982, coll. D. Kasparyan; ZIN.

Paratypes (all in ZIN). **Russia**, Dagestan: 3 males, Rutul, 28 May 1972, coll. D. Kasparyan; 2 females, 1 male, Agachaul near Makhachkala, from galls on Rosa, 10 May 1992, coll. V. Prasolov. **Azerbaijan**, Ordubad Distr.: female, same data as in holotype; 10 females, 8 males, Dasta, 9–10 km W of Ordubad, 650 m, orchard, 25–26 May 1982, coll. D. Kasparyan; female, Akdara, 2000 m, meadows with Timus, 25 May 1982, coll. D. Kasparyan. **Azerbaijan**, Lerik Dist.: 4 females, Gosmolyan, orchard, 4–14 June 1981, coll. A. Kotenko; female, Altyagach, 90 km NW of Baku, 30 May, coll. A. Kotenko; female, Zang-ezur ridge, NE of Shakhbuz, forest, 20 June 1967, coll. D. Kasparyan; 37 females, 12 males, Pirkuli, 22 km N of Shemakha; from galls of *Rhodites* [= *Diplolepis*] *mayri*, 24 May 1972, coll. M. Zerova; 3 females, 2 males, same locality, forest, 20 May 1972, coll. D. Kasparyan. **Armenia**: female, Vedi, Khosrov reserve, xerophytic landscape with Juniperus, 26 June 1981, coll. A. Kotenko; female, male, same locality, but 24 April 1984, coll. A. Manukyan.

Diagnosis. The new species differs from the closely related *O. mediator* in having the ovipositor longer (1.25–1.5 times as long as hind tibia) and hind femora reddish; from *O. japonicum* Kusigemati, 1974 (Japan) which also has a similar ovipositor and 19-segmented flagellum, it may be distinguished by the reddish hind femora, short basolateral carinae of scutellum, and presence of weak carina between basal area and areola of propodeum.

Description. Female (holotype). Length of fore wing 4.0 mm. Antenna with 18 flagellar segments; flagellum about 2.5 mm in length, 1.6 times as long as hind tibia; three basal flagellomeres combined 0.95 times as long as maximum diameter of eye; apical segment as long as two preceding segments together. Head weakly narrowed beyond the eyes; face moderately narrowed downward (Fig. 1); maximal distance between eyes at upper 0.7 of frons about 1.25 times more than minimal distance between eyes on lower part of face; malar space about 0.7 as long as basal width of mandible; malar groove distinct. Occipital carina joints hypostomal carina far beyond the mandible. Pronotum with short epomia. Mesoscutum



Figs 1–9. *Orthopelma*, female. 1–5, *O. caucasicum* sp. nov.; 6–9, *O. dodecameron* sp. nov. Head, anterior view (1, 6); flagellomeres 1–3 (2); propodeum (3); metasoma (4, 8); hind tibia and tarsus (5, 9); flagellum (7).

smooth, strongly convex anteriorly, with moderately fine and rather dense punctures; notauli almost absent. Scutellum with short basolateral carinae. Mesopleuron polished, under subtegular ridge with longitudinal rugae and scarce punctures. Sternauli weak, extends to anterior 0.4 of mesopleuron. Median longitudinal groove with transverse wrinkles, curved downward and extends to hind margin of mesopleuron slightly above its lower corner. Metapleuron with lobe in lower anterior corner, covered with rather dense superficial and moderately fine punctures. Propodeum with distinct areas

covered with fine indistinct punctures and with fine hairs; apical area polished, without hairs; basal area hardly separated from areola (Fig. 3). Fore wing with nervulus a little distad of basal vein; nervulus inclivous, but at hind part (0.3) curved perpendicularly to anal vein. Postnervulus intercepted near the middle and strongly sinuate at point of interception. Hind femur 4.5 times as long as wide; hind tibia and tarsus as in Fig. 5; spurs of hind tibia subequal (posterior spur about as long as anterior spur). Dorsomedial and dorsolateral carinae of tergite 1 more or less distinct from base to level of spiracles;

ventrolateral carinae complete and strong. Tergite 2 as long as width of its hind margin and 2.5 times as wide as tergite 1. Tergite 3 as wide as tergite 2, but slightly shorter. Ovipositor sheath straight, about 1.3 times as long as hind tibia.

Antennae entirely blackish (except for reddish extreme apex of pedicel). Head black; clypeus reddish yellow with basal 0.3 blackish; labrum yellowish; mandibles reddish-brown. Mesosoma black; tegulae light yellow; hind corners of pronotum hardly yellowish; extreme apex of epimeron slightly reddish. Fore and mid coxae reddish brown (more reddish to apex), hind coxa blackish; all trochanters I brownish with yellow apical 0.2–0.4; all trochanters II entirely yellow. Fore and mid femora, tibiae and tarsi rufous (except for darkened segment 5 of tarsi). Hind femur brownish-red; hind tibia and tarsus almost uniformly brownish-rufous with base of tibia dorsally (0.15) yellowish-rufous and with segment 5 of tarsus brownish. Metasoma with segment 1 completely black; tergites 2–4 reddish with postmedian small brownish lateral markings; tergite 5 reddish dorsally, widely brownish laterally; tergites 6–8 brownish with rufous hind margin. Sternites 2 and 3 rufous-yellow with a pair of lateral brownish spots on each; sternites 4–6 brownish with median longitudinal fold and hind margin rufous.

Variability in female. Length of body 3.3–4.8 mm; length of fore wing 2.5–4.1 mm; antenna with 16–19 flagellar segments; ovipositor sheath 1.3–2.1 mm (about 0.5 times as long as fore wing, and about 1.25–1.5 times as long as hind tibia). Hind tibia varies from light reddish to reddish brown (in studied material of *O. mediator*, hind tibia always dark brown or blackish).

Male. Length of body 3.8–4.7 mm; length of fore wing 2.7–4.2 mm; antenna with 17–20 flagellar segments. Male similar to female in main structural features and in colouration, but hind tibia of male always dark brown or blackish. No distinct differences between males of *O. caucasicum* and *O. mediator*.

***Orthopelma dodecameron* Kasparyan, sp. nov.**
(Figs 6–9)

Holotype. Female; **Kyrgyzstan**, Sary-Chelek Lake, 2000 m, slope with *Picea*, 22 June 1979, coll. D. Kasparyan; ZIN. *Paratypes*. 4 females, same data as in holotype, but 21–23 June 1979; ZIN.

Diagnosis. The new species belongs to the *O. superbum* species-group distinguished from other congeners in having the very short antenna with 10–11 flagellomeres, and very short cheeks (Fig. 6, 7). The new species may easily be distinguished from *O. superbum* Kasparyan, 1984 by its colouration (see key).

Description. Female (holotype). Length of fore wing 3.5 mm. Antenna very short, with 10 flagellar segments (Fig. 7); flagellum about 0.95 mm in length, 0.79 times as long as hind tibia; seven basal flagellomeres combined about 0.93 times as long as maximum diameter of eye (Figs 6, 7); apical segment as long as three preceding segments together. Head strongly narrowed beyond the eyes; face very strongly narrowed downward (Fig. 6); maximal distance between eyes at upper 0.8 of frons about 2.1 times as long as minimal distance between eyes; malar space about 0.25 times as long as basal width of mandible; malar groove absent. Occipital carina joints hypostomal carina far beyond mandible. Pronotum with short epomia. Mesoscutum smooth, strongly convex anteriorly, punctures very fine and rather dense; notauli present only on anterior slope of mesoscutum as short superficial grooves. Scutellum with short basolateral carinae. Mesopleuron polished, under subtegular ridge smooth, without rugae and with fine punctures. Sternauli weak, extend to anterior third of mesopleuron. Median longitudinal groove rather wide, with transverse wrinkles, curved downward and extends to hind margin of mesopleuron slightly above its lower corner. Metapleuron with lobe in lower anterior corner, covered with irregular rugosity at lower half and with moderately dense, fine punctures at upper half. Propodeum with distinct areas (simi-

lar to that in Fig. 3) covered with superficial rugosity and with fine hairs; first lateral areas almost smooth; apical area without hairs, with longitudinal rugae; apical area polished, without hairs; basal area not separated from areola. Fore wing with nervulus almost interstitial, strongly inclivous but at hind part (0.3) curved perpendicularly to anal vein. Postnervulus intercepted near the middle and weakly sinuate at point of interception. Hind femur 4.7 times as long as wide; hind tibia and tarsus as in Fig. 9; spurs of hind tibia subequal (posterior spur about as long as anterior spur). Dorsomedial and dorsolateral carinae of tergite 1 more or less distinct from base to almost hind margin of tergite; ventrolateral carinae complete and strong. Second tergite 1.2 times as long as its hind margin and 2.6 times as wide as tergite 1. Tergite 3 as wide as tergite 2 and 0.8 times as long as wide. Ovipositor sheath straight, 0.47 times as long as hind tibia.

Antennae entirely blackish (excepting reddish extreme apex of pedicel). Head black; clypeus dark brown at apical 0.5; labrum yellowish; mandibles brownish. Mesosoma black; tegulae light yellow; hind corners of pronotum hardly yellowish; extreme apex of epimeron and hind tegulae blackish-brown. All coxae blackish; all trochanters I blackish with yellow apical margin; all trochanters II entirely yellow. Fore femur rufous, brownish dorsoposteriorly (excepting apical 0.25); mid femur almost completely blackish-brown excepting extreme apex; hind femur blackish. Fore and mid tibiae yellowish-rufous, tarsi yellowish-brown. Hind tibia brownish with base (0.15) yellowish dorsally; spurs pale; hind tarsus uniformly brownish. Metasoma with segment 1 completely black; tergites 2 and 3 reddish at basal 0.25 and apically, at middle part brownish; tergites 4–7 dark brown; tergite 8 pale brown. Sternites 2 and 3 predominantly rufous-yellow with a pair of large lateral brownish spots on each; sternites 4–6 brownish with median longitudinal fold and hind margin yellowish.

Male unknown.

Key to West-Palaeartic species of *Orthopelma* (females only)

1. Malar space very short (Fig. 6). Inner orbits very strongly convergent to clypeus, maximal distance between eyes on frons about 2.5 times as great as minimal distance between eyes on lower part of face. Flagellum very short (Fig. 7), 10–11-segmented; its segments 1–7 or 1–8 combined as long as maximum diameter of eye; apical flagellomere as long as 2–3 preceding segments together. Ovipositor sheath about 0.5–0.6 times as long as hind tibia (Figs. 8, 9). Middle Asia [*O. superbum* species-group] 2
- Malar space distinct (Fig. 1). Inner orbits rather weakly convergent to clypeus, maximal distance between eyes on frons 1.15–1.5 times as great as minimal distance between eyes on lower part of face. Flagellum longer (Fig. 7), 13–19-segmented; only three or fore its basal segments combined as long as maximum diameter of eye (Fig. 1, 2); apical flagellomere shorter, or sometimes as long as two preceding segments together. Ovipositor sheath usually 0.8–1.5 times as long as hind tibia (Figs. 8, 9). Holarctic Region [*O. mediator* species-group] 3
2. Pronotum, mesonotum and upper part of mesopleuron red. All trochanters entirely light yellow. Hind tibia white dorsally and darkened ventrally *O. superbum* Kasparyan, 1984
- Thorax completely blackish (only tegulae yellow). All trochanters I blackish or partly darkened, trochanters II yellow. Hind tibia brownish with dorsal yellowish spot at basal 0.1, and usually lighter (brownish yellow) dorsally at middle 0.4–0.5 *O. dodecameron* sp. nov.
3. Flagellum shorter, 13–15-segmented; basal flagellomeres 1–3 combined 0.82(±0.06) times as long as maximum diameter of eye; about 4–5 subapical flagellomeres quadrate in profile. Face distinctly narrowed downward, maximal distance between eyes on frons about 1.4–1.5 times as great as minimal distance between eyes on lower part of face. Malar space 0.3–0.5 times as long as basal width of mandible. Ovipositor sheath about 0.85 times as long as hind tibia. Length of fore wing 2.8–3.5 mm. Tergites 2–3 or 2–4 usually brownish with red *O. brevicorne* Morley, 1907

- Flagellum longer, 16–19-segmented; basal flagellomeres 1–3 combined 0.9–1.05 times as long as maximum diameter of eye; sub-apical flagellomeres slightly elongate. Face less distinctly narrowed downward (Fig. 1), maximal distance between eyes at upper 0.7–0.8 of frons about 1.15–1.25 times as great as minimal distance between eyes on lower part of face. Malar space 0.65–0.75 times as long as basal width of mandible. Ovipositor sheath about 1.0–1.5 times as long as hind tibia. Length of fore wing 3.5–4.1 mm (rarely 3.1 mm). Tergites 2–3 or 2–4 usually completely red 4
- 4. Hind femur black. Ovipositor sheath about as long as hind tibia. Holarctic Region
. ***O. mediator*** (Thunberg, 1824)
- Hind femur red or reddish-brown. Ovipositor sheath about 1.25–1.5 times as long as hind tibia. Caucasus ***O. caucasicum* sp. nov.**

ACKNOWLEDGEMENTS

This work is supported by a grant of the Russian Foundation for Basic Research (10-04-00265).

REFERENCES

Aubert, J.F. 1997. 10ème supplément au catalogue de Galle: 129 espèces d'Ichneumonides nouvelles pour la faune française (Hymenoptera, Ichneumonidae). *Nouvelle Revue d'Entomologie*, **14**(2): 99–114.

Barron, J.R. 1977. The Nearctic species of *Orthopelma* (Hymenoptera, Ichneumonidae). *Systematic Entomology*, **2**(4): 283–299.

Belshaw, R., Fitton, M., Herniou, E., Gimeno, C., Quicke, D.L.J. 1998. A phylogenetic reconstruction of the Ichneumonoidea (Hymenoptera) based on the D2 variable region of 28S ribosomal RNA. *Systematic Entomology*, **23**(2): 109–123.

Callan, E.M. 1943. A note on *Orthopelma luteolator* Grav. and *O. brevicornis* Morley (Hymenoptera, Ichneumonidae). *Proceedings of the Royal Entomological Society of London (A)*, **18**: 30–32.

Ferrari, J., Kruess, A., Tscharrntke, T. 1997. Auswirkungen der Fragmentierung von Wildrosen auf deren Insektenlebensgemeinschaften. *Mitteilungen der Deutschen Gesellschaft für Allgemeine und Angewandte Entomologie*, **11**(1–6): 87–90.

Fulmek, L. 1968. Parasitinsekten der Insekten-gallen Europas. *Beiträge zur Entomologie*, **18**(7/8): 719–952.

Gauld, I.D. & Mitchell, P.A. 1977. *Handbooks for the identification of British insects*. Vol. VII.Part 2 (b). *Ichneumonidae. Orthopelmatinae & Anomaloniinae*. Royal Entomological Society of London. 32 p.

Izquierdo, I. 1981. Orthopelmatinae de España (Hym., Ichn.). *Eos*, **55–56**, 1979–1980: 95–100.

Kasparyan, D.R. 1981. 22. Subfam. Orthopelmatinae. In: **Medvedev, G.S.** (Ed.) *Opre-delitel nasekomykh Europejskoj chasti SSSR* [Keys to the insects of the European part of the USSR], **3**(3): 492. Nauka, Leningrad. (In Russian).

Kasparyan, D.R. 1984. A new species of the genus *Orthopelma* (Hymenoptera, Ichneumonidae) from Middle Asia. *Zoologicheskii Zhurnal*, **63**(7): 1109–1111. (In Russian).

Kasparyan, D.R. & Khalaim, A.I. 2007. Subfam. Orthopelmatinae. In: **Lehr, P.A.** (Ed.) *Opredelitel nasekomykh Dalnego Vostoka Rossii* [Keys to the insects of the Russian Far East], **4**(5): 679–680. Dal'nauka, Vladivostok. (In Russian).

Kolarov, J.A. 1984. Ichneumonidae (Hymenoptera) new for Bulgarian fauna. *Universite de Plovdiv "Paissi Hilendarski" Travaux Scientifiques*, **22**: 59–69.

Kolarov, J.A. 1989. Ichneumonidae (Hymenoptera) from Balkan peninsula and some adjacent regions. III. Ophioninae, Anomloninae, Metopiinae, Mesochorinae, Acaenitinae, Oxytorinae, Orthopelmatinae, Collyriinae, Orthocentrinae, Diplazontinae and Ichneumoninae. *Tuerkiye Entomoloji Dergisi*, **13**(3): 131–140.

Kolarov, J.A. 1995. A catalogue of the Turkish Ichneumonidae (Hymenoptera). *Entomofauna*, **16**(7): 137–188.

Kusigemati, K. 1974. Orthopelmatinae of Japan (Hymenoptera, Ichneumonidae). *Memoirs of the Faculty of Agriculture, Kagoshima University*, **10**(19): 51–55.

Niblett, M. 1951. Insects and galls of *Rhodites* spp. *Proceedings and Transactions of the South London Entomological and Natural History Society*, 1949–1950: 51.

Nieves Aldrey, J.L. 1984. Contribucion al conocimiento de la fauna de himenopteros inquilinos y parasitos en las agallas de *Diplolepis mayri* (Schlechtendal) y *Diplolepis eglante-*

- riae (Hartig) (Hym., Cynipidae), *Graellsia*, **39** (1983): 93–102.
- Özbek H., Guclu S. & Tozlu G.** 1999. Erzurum'da Kusburnu (*Rosa canina* L.)'nda zarar yapan *Diplolepis mayri* Schld. (Hymenoptera: Cynipidae)'nin biyolojisi ve dogal dusmanlari [Biology and natural enemies of *Diplolepis mayri* Schld. (Hymenoptera: Cynipidae), a pest of *Rosa canina* L. in Erzurum Province]. *Turkiye Entomoloji Dergisi*, **23**(1): 39–50.
- Short, J.R.T.** 1978. The final larval instars of the Ichneumonidae. *Memoirs of the American Entomological Institute*, **25**: 1–508.
- Stille, B.** 1985. Host plant specificity and allozyme variation in the parthenogenetic gall wasp *Diplolepis mayri* and its relatedness to *D. rosae* (Hymenoptera: Cynipidae). *Entomologia Generalis*, **10**(2): 87–96.
- Yu, D.S. & Horstmann, K.** 1997. A catalogue of world Ichneumonidae (Hymenoptera). *Memoirs of the American Entomological Institute*, **58**(1 & 2): 1–1558.
- Yu D.S., van Achterberg K. & Horstmann K.** 2005. *World Ichneumonoidea 2004. Taxonomy, Biology, Morphology and Distribution*. CD/DVD. Taxapad, Vancouver. www.taxapad.com.

Received November 27, 2011 / Accepted June 18, 2011