

## ***Monoctonus leclanti* sp. n. (Hymenoptera: Braconidae: Aphidiinae) from high-montane areas of southeastern Europe, and key to related species**

Željko Tomanović, Petr Starý & Olivera Petrović

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*Monoctonus leclanti* sp. n., a parasitoid of *Delphiniobium junackianum* Karsch. (Hemiptera: Aphididae) on *Aconitum toxicum bosniacum* and *Aconitum pentheri* in the high mountains of the Balkans is described. The species is an additional member of the high-montane aphid parasitoid guild determined in the area. A key to related species is included.

Željko Tomanović, Institute of Zoology, Faculty of Biology, University of Belgrade, Studentski trg 16, 11000 Belgrade, Yugoslavia; E-mail: ztoman@bf.bio.bg.ac.yu

Petr Starý, Institute of Entomology, Academy of Sciences of the Czech Republic, Branišovská 31, 370 05 České Budějovice, Czech Republic; E-mail: stary@entu.cas.cz

Olivera Petrovic, Department of Plant Protection, Faculty of Agriculture, University of Belgrade, Nemanjina 6, 11081 Zemun, Yugoslavia; E-mail: petrovic@agrifaculty.bg.ac.yu

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### **1. Introduction**

The great variety of habitats and high diversity of plant species in southeastern Europe, originating from its complex geological history, has apparently contributed to the great diversity of aphids and their parasitoids in this area. Investigations of aphid parasitoids in high-montane areas and some refugial canyons and gorges of southeastern Europe have revealed many new and rare aphid parasitoid species and associations (Starý *et al.* 1998, Tomanović *et al.* 1998, Tomanović & Brajković 2000, Kavallieratos *et al.* 2001, Tomanović & Starý 2001, Tomanović 2002). This ongoing research has also led to the discovery of

an undescribed *Monoctonus* species, which is a member of the high-montane parasitoid guild in the area. The species is described in this paper.

### **2. Material and methods**

Aphid parasitoid material was collected on Mt. Kopaonik (1450 m a.s.l.) and Mt. Durmitor (1400 m a.s.l.). Two aphid host plants, *Aconitum toxicum bosniacum* and *Aconitum pentheri*, were sampled for aphid parasitoids. *Aconitum toxicum bosniacum* is a montane-subalpine species, distributed in mainly humid, calcareous habitats of the Carpathians and montane areas of the western Balkan Peninsula, while *Aconitum pentheri* is an endemic plant of central Balkan mountains (Gajić & Niketić 1992).

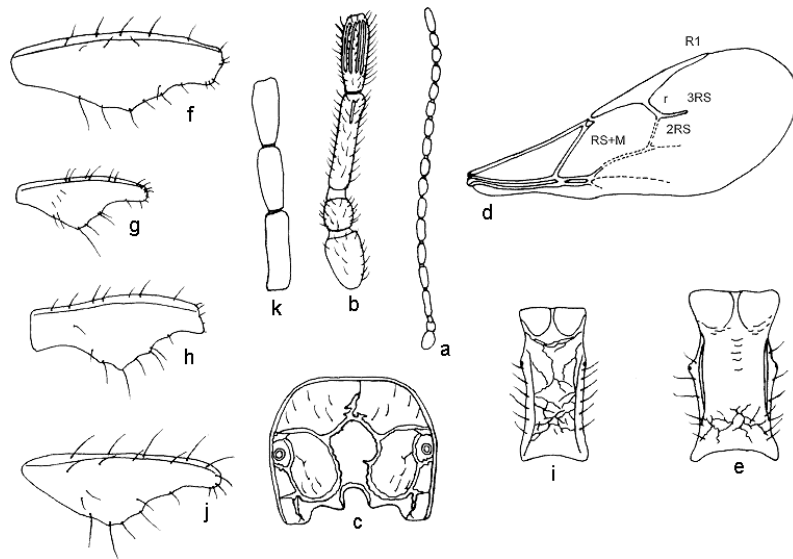


Fig. 1. a–f. *Monoctonus leclanti* sp. n., female. — a. Antenna. — b. Base of antenna ( $F_1$  and  $F_2$ ). — c. Propodeum. — d. Forewing (distal abscissa of  $R_1$ ; 2RS, 3RS, RS+M, and r, wing vein). — e. Petiole. — f. Ovipositor sheath. g–i. *Monoctonus nervosus*, female. — g. Ovipositor sheath. — i. Petiole. — h. *Monoctonus paulensis*, female ovipositor sheath. j–k. *Monoctonus caricis*, female. — j. Ovipositor sheath. — k. base of antenna ( $F_1$ ,  $F_2$  and  $F_3$ ).

The samples from *A. toxicum bosniacum* and *A. pentheri* with an aphid colony were reared until aphid parasitoids emergence. Adult aphids were preserved in 90% ethanol and 75% lactic acid 2:1 (Eastop & van Emden 1972) for later identification.

Descriptive terminology used in this paper is based on Huber and Sharkey (1993) and Wharton *et al.* (1997).

### 3. Results

#### *Monoctonus leclanti* Tomanović et Starý, sp. n.

**Diagnosis.** The new species is similar to *Monoctonus nervosus* (Haliday) regarding wing venation, but it may be easily distinguished from the latter by its yellow coloration, narrower ovipositor sheath (Fig. 1f–h, j) and its chaetotaxy, prominent spiracular tubercles on petiole (Fig. 1e, i) and the number of antennal segments.

#### 3.1. Female

**Head.** Eyes oval, medium sized, sparsely setose. Malar space equal to about 1/4 of longitudinal eye diameter. Tentorial index (tentoriocular line/

intertentorial line) about 0.30. Clypeus oval, with 9–11 long setae. Labrum with 5–6 setae. Maxillary palpus 4-segmented, labial palpus 3-segmented. Antenna 16–17-segmented, not thickened at apex (Fig. 1a). Setae on flagellomeres semierect, subequal to half segment diameter (Fig. 1b). Flagellomere 1 ( $F_1$ ), 4.5–5 times as long as median width, slightly longer than  $F_2$ , without or with single short longitudinal placode in upper part (Fig. 1b). Flagellomere 2 ( $F_2$ ), 3.0–3.3 times as long as median width, with 4 longitudinal placodes (Fig. 1b).  $F_3$ ,  $F_4$ ,  $F_5$  and  $F_6$  with 6, 6–8, 6–7 and 7 longitudinal placodes, respectively.

**Mesosoma.** Sparsely pubescent mesonotum with notaulices is distinct in the anterior part. Propodeum is areolated with clearly defined central pentagonal areola (Fig. 1c).

**Forewing.** Wing large, equal to body length. Stigma about 5.5 times as long as wide (Fig. 1d). Distal abscissa of  $R_1$  (metacarpus) equal to 1/3 to 1/4 of stigma length. RS+M vein distinct only in first quarter, the remaining part colorless. 2RS colorless, with a small part near RS+M vein effaced (Fig. 1d). 3RS and r veins distinct.

**Metasoma.** Petiole about 1.7–1.9 times as long as wide at spiracles. Spiracular tubercles very promi-

ment (Fig. 1e). Dorsal disc of petiole rugose, with weak indications of middle longitudinal carina and with 4–5 long setae along the sides (Fig. 1e). Ovipositor sheath only moderately widened (Fig. 1f).

**Colouration.** Female largely yellow. Head: Eyes, temple and stemmaticum black. The remaining parts of head yellow to yellowish. Mouthparts yellow except mandible with dark apices. Scapus yellow, pedicel brown to yellowish, base of F<sub>1</sub> yellow, the remaining parts of antenna black. Mesosoma: Mesonotum black. Propodeum black, except yellowish upper areolas. All lower parts of mesosoma yellow. Legs yellow with dark apices. Wing venation brown. Metasoma: Petiole brown. First half of metasoma brown to light brown. Second half of metasoma yellow to yellowish. Ovipositor sheath yellow.

Body length: 3.0 mm.

### 3.2. Male

Antenna 19-segmented. Head brown, except black eyes. Mesosoma black, except brown lower parts. Legs light brown. Petiole light brown. First half of metasoma brown. Second half of metasoma light brown.

### 3.3. Etymology and type individuals

**Etymology.** The name of the new species is given in honour of late professor Francois Leclant (Montpellier, France) who greatly contributed to the research of aphid diversity of Mt. Durmitor (Yugoslavia, Montenegro).

**Holotype female.** Yugoslavia, Serbia, Mt. Kopaonik — Metodje (1450 m), 20.VII.1999, reared from *Delphiniobium junackianum* Karsch. on *Aconitum toxicum bosniacum*, coll. O. Petrović. Holotype slide mounted and deposited in the collection of the Belgrade Natural History Museum (number 327/99).

**Paratypes.** Yugoslavia, Montenegro, Mt. Durmitor — Crno Jezero Lake (1400 m), 15.VIII.1997, one female, reared from *Delphiniobium junackianum* on *Aconitum toxicum bosniacum*, coll. O. Petrović (number 311/97); Yugoslavia, Serbia, Mt. Kopaonik — Metodje, 18.VIII.1998, one male on *A. toxicum bosniacum*,

coll. O. Petrović (521/98); Yugoslavia, Serbia, Mt. Kopaonik — Metodje, 20.VII.1999, 3 females on *A. toxicum bosniacum*, coll. O. Petrović (611–613/99); Yugoslavia, Montenegro, Mt. Durmitor — Crno Jezero Lake, 19.VII.2000, one female on *A. toxicum bosniacum*, coll. Ž. Tomanović (101/00); Yugoslavia, Serbia, Mt. Kopaonik — Metodje, 7.VIII.2000, one female on *Aconitum pentheri* coll. Ž. Tomanović (107/00).

Paratypes deposited in the collections of the Belgrade Natural History Museum (4 females and one male, numbers 311/97, 611–612/99, 107/00 and 521/98) and P. Starý, České Budějovice, Czech Republic (2 females, numbers 613/99 and 101/00).

### 3.4. Key to the related species, based on females

1. Ovipositor sheath gradually widened (Fig. 1f); prominent spiracular tubercles on petiole (Fig. 1e); body of prevalently yellow coloration; antenna 16–17-segmented (Fig. 1a); labial palpus 3-segmented .....  
..... *Monoctonus leclanti* sp. n.
- Ovipositor sheath ploughshare shaped (Fig. 1g-h, j); spiracular tubercles not apparent (Fig. 1i); body of prevalently brown coloration; antenna 13–16-segmented; labial palpus 3- or 2-segmented ..... 2
2. Antenna 13–14-segmented (Fig. 1k); labial palpus 2-segmented; ovipositor sheath on Fig. 1j; Host aphids: *Sitobion*, *Rhopalosiphum* and *Hyalopteroides* .....  
..... *Monoctonus caricis* (Haliday)
- Antenna 15–16-segmented; labial palpus 3-segmented; ovipositor sheath on Fig. 1g; Host aphid: *Impatiens balsamines* (Kalt.) ... *Monoctonus nervosus* (Haliday)

## 4. Discussion

### 4.1. Taxonomy

*Monoctonus leclanti* belongs to *Monoctonus nervosus* species group (van Achterberg 1989) which is represented by *M. nervosus* and *M. caricis* in Europe, and its relatives in North America include *M. paulensis* (Ashmead), *M. pacificus* Pike and Starý and *M. allisoni* Pike and Starý (Smith 1974, Starý 1974, Pike *et al.* 2000, Pike *et al.* 2002). Within *M. nervosus* group, *M. leclanti* has a narrower ovipositor sheath. On the basis of this character, *M. leclanti* is somewhat closer to the genus *Harkeria* Cameron.

#### 4.2. Parasitoid guild

The host aphid, *Delphinobium junackianum* is holocyclic and monoecious on *Aconitum* and *Delphinium* plants, and is distributed in West Palaearctic (Heie 1995, Remaudière & Remaudière 1997). The parasitoid guild of *D. junackianum* was unknown until 1988, when several *Aphidius ervi* Hal. specimens were found and a new species from Italy — *Aphidius sussi* Pennacchio & Tremblay was described (Pennacchio & Tremblay 1988). Over the period 1997–2001, we collected 269 parasitoid specimens from *D. junackianum*. *Aphidius sussi* was the dominant parasitoid species (97% of all parasitoids) and was found from June to September. Only 8 specimens of *M. leclanti* (3%) were collected between mid-July and mid-August. Also, we gathered secondary parasitoids as follows: *Alloxysta fulviceps* (Curtis), *Alloxysta victrix* (Westwood), *Alloxysta macrophadna* (Hartig) (Cynipoidea: Charipidae), *Coruna clavata* (Walker) and *Pachyneuron aphidis* (Bouché) (Chalcidoidea: Pteromalidae).

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