*Vestnik zoologii,* **39**(1): 55—58, 2005


UDC 595.765

# DESCRIPTION OF THE LARVA OF *ATHOUS MONILICORNIS* (COLEOPTERA, ELATERIDAE) WITH NOTES ON THE SPECIES DISTRIBUTION

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Accepted 24 January 2005

**Description of the Larva of *Athous monilicornis* (Coleoptera, Elateridae), with Notes on the Species Distribution. Penev L.** — First description of the larva of *Athous* (*Haplathous*) *monilicornis* Schwarz, 1897, a species endemic to the Balkan Peninsula, known so far from Bulgaria, and reported in this paper from Macedonia and Greece as well. The larva differs from the other representative of subgenus *Haplathous* occurring in the high mountains of Bulgaria *Athous subfuscus* (Müller), by the width of the pit of the urogomphi. *Athous monilicornis* is confined to the subalpine habitats and the upper coniferous forests belt of the mountains of Bulgaria, Macedonia and Greece.

Key words: Coleoptera, Elateridae, click beetles, *Athous monilicornis, A. subfuscus,* larva, Balkan Peninsula.

**Описание личинки *Athous monilicornis* (Coleoptera, Elateridae), с замечаниями о распространении вида. Пенев Л.** — Впервые описана личинка щелкуна *Athous* (*Haplathous*) *monilicornis* Schwarz, 1897, вида, эндемичного для Балканского п-ова и известного из Болгарии, а также Греции и Македонии. От личинок встречающегося в высокогорьях Болгарии *Athous* (*Haplathous*) *subfuscus* (Müller) отличается шириной ямки на урогомфах. Распространение *A. monilicornis* в горах Болгарии, Македонии и Греции ограничено субальпикой и верхней частью пояса хвойного леса.

Ключевые слова: Coleoptera, Elateridae, жуки-щелкуны, *Athous monilicornis, A. subfuscus,* личинка, Балканский полуостров.

This paper is dedicated with deep affection to the memory of Professor Vladimir Gdalich Dolin (1932—2004) who was my teacher, mentor, and eventually a close and dear friend, and who stimulated my interest and research career in the systematics of elaterid beetles and their larvae. I shall always be deeply obliged to Professor Dolin for his patience, understanding and encouragement for my work since my earliest student's days, and for his continued unstinting enthusiasm, help and wonderful hospitality during several visits to Kyiv and his home.

## Introduction

The larva of this species was discovered some 25 years ago on Vitosha Mt., Bulgaria, when I was preparing my master degree, greatly inspired by the appearance of Dolin's fundamental work "The larvae of click-beetles of the USSR fauna" (Dolin, 1978). The larva was not described because I failed to rear it. A few years ago, on 21.06.2001, during a field excursion in Pirin Mt., Bulgaria, on the way between Vihren Hut and Muratovo Lake, at 2150 m a. s. l., I collected a larva and pupa with exuvium in the upper soil layer of subalpine meadow, near the roots of *Veratrum lobellianum* Bernh. The larva was identical to the exuvium. Some characters of the pupa, especially the shape of the antennal segments, as well as the morphological differences of the larva from those of the only *Haplathous* species recorded from the high mountains of Bulgaria — *Athous subfuscus* (Müller) — convinced us that the larva may belong only to *Athous monilicornis* Schwarz.

In this study, material (adult beetles) deposited in the following collections was examined: DEI — Deutsche Entomologisches Institut, Zentrum für Agrarlandschafts- und Landnutzungsforschung, Müncheberg (formerly Eberswalde), Germany; MTD — National Museum of Zoology (Staatliches Museum für Tierkunde), Dresden, Germany; NMP — National Museum (Narodný Muzeum), Prague (Kunratice), Czech Republic; NMNHS — National Museum of Natural History, Sofia, Bulgaria.

***Athous monilicornis*** O. Schwarz, 1897 (fig. 1, *A–G;* 2)

Schwarz, 1897: 134.

Material. Immature stages. Bulgaria, Pirin Mt., between Vihren Hut and Muratovo Lake, 2150 m a. s. l., 21.06.2001, 1 larva and pupa with exuvium, coll. L. Penev.

Adults. Bulgaria: "Balkan, Merkl", 5 specimens; Sofia, Vitosha, 21.07.1908, 1 specimen; Rila Geb., 07.1911, 1 specimen, M. Hilf; Bulg. Rila-Kloster, 10.7.1911, 1 specimen, M. Hilf; Bulg., Rhodope-Geb., 1 specimen, M. Hilf; ibid., 21.7, 1 specimen, M. Hilf (DEI); "Bulg., Sofia, Vitoša pl., 21.07[19].08", 2 specimens, Rambousek (coll. Pecirka), one of the specimens determined by E. Reitter; Bulgaria, Mussala, 2 specimens, leg. Purkyne (coll. Pecirka); "Haut Pirin, 07.1932", several specimens, Marjan et Taborsky leg., coll. et det. Jagemann; "Bulg., Kostenec, Rhodopy" (sic!) 07.1935, Taborsky leg., coll. et det. Jagemann [the last locality is questionable, as Kostenec is situated in Rila Mt, not in Rodopi Mt. – L. P.] (NMP); Strandzha Mt. (Bulg.), coll. Markovitch, 1 specimen (NMNHS) [this record requires confirmation because of the lack of subalpine belt in Strandzha Mt., which is the typical habitat of *Athous monilicornis*].

Macedonia (FYRO Macedonia): "Maced. Perister alpin., VII.14, Rmbs.", 1 specimen, det. Rambousek (MTD); "Maced. Perister alpin., VII.14, Rmbs.", coll. Pecirka, 8 specimens (NMP); Greece: "Turc. Chalkid.[iki], Mt. Athos, 7.09, Rmbs", 1 specimen (NMP).

Type locality: "Balkan: Bulgarien".

Description. Larva. Body. Length to 18 mm, width 2.5 mm, ratio length to width 7.5 (fig. 1, *A*). Body more or less parallel-sided, widest part at both metathorax and 1st abdominal segment. Shape of body almost cylindrical, moderately flattened, relatively straight and only slightly curved ventrally in proximal part. Ventral surfaces sclerotized and intensively pigmented in reddish-yellow to dark reddish-brown at hind edge of terga. Ventral surfaces lightly pigmented.

Head prognathous and protracted, 1.2 wider than long (fig. 1, *B*). Head capsule shiny and scarcely punctated. Five usual subnasal pairs of setae present, parietal, proximal, and mesal pairs absent. Lateral parts of head capsule with 3 setae. Front middle part of head capsule with a long seta and 5 smaller setae situated in a vertical row behind it. Epicranium truncated at base, epicranial suture absent (fig. 2, *B*). Mandibles strong with sclerotized retinaculum on middle. Nasale short and tridentate, three teeth of similar size present, external ones slightly divergent.

Thorax. Protergum longer than meso- and metaterga, ratio width to length 1.14; thoracal terga shiny, scarcely punctated without asperities and with clear furrow in the middle. Protergum with 3—4 setae situated laterally both at base and in fore part, meso- and metaterga with a pair of setae in fore lateral part and 3 setae in hind lateral part.

Abdomen. Abdominal terga shiny (fig. 1, *D—G*), scarcely punctated, with very slight rows of asperities, with clear furrow in middle, basal flap interrupted in middle and reaches ca. 3/4 to 4/5 of width of tergum. Terga with 6—8, in most cases 7, setae on both sides at base and a seta in fore lateral side near to tracheal gill (fig. 1, *D*; 2, *A*). Abdominal tergum 8 with additional pairs of setae laterally in middle. Abdominal tergum 9 forming a plate (fig. 1, *F*; 2, *A*), very slightly wider than long (ratio 1.1); with patches of asperities; with paired processes or urogomphi; with a pit between urogomphi; pit slightly wider than base of urogomphus; edges of tergal plate with 5 well-expressed tubercula, 5th pair situated slightly below base of urogomphus, ca. 1.5x less than 4th pair. Urogomphi bifurcate; external processes thin, posteriorly oriented, ca. 1.5x longer than internal (fig. 1, *E*, *F*; 2, *A*). Pleurites with 1 seta at base, hyposternites with 1 pair of setae at base; sternites shiny, very scarcely punctated, slightly pigmented in middle at base; with 2—3 setae at fore lateral part and 4 setae at base (fig. 1, *D*, *E*, *G*).

The larva of *Athous monilicornis* can be distinguished from that of *Athous subfuscus* by the following characters:

1 (2). Pit of caudal segment slightly wider than base of urogomphus (fig. 1, *F*; 2, *A*); internal processes of urogomphi with well-expressed angle on external edge; 5th lateral tuberculum of segment 9 ca. 1.5x less than 4th (fig. 1, *F*). ..... *Athous monilicornis* Schwarz

2 (1). Pit of caudal segment narrower than base of urogomphus (fig. 1, *H*); internal processes of urogomphi with flattened external edge; 5th lateral tuberculum of segment 9 more than 2x less than 4th (fig. 1, *H*). ..... *Athous subfuscus* (Müller)

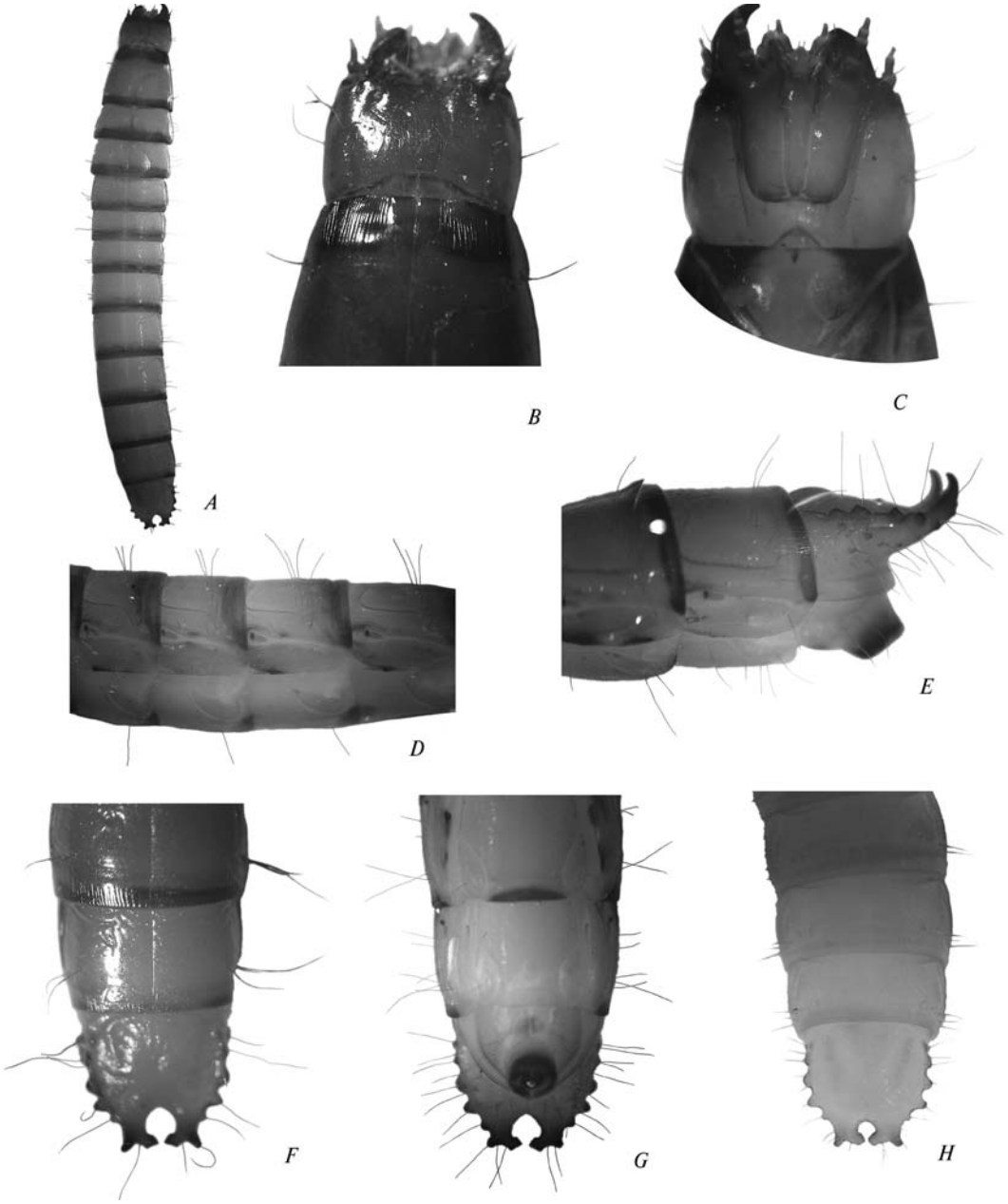


Fig. 1. *Athous monilicornis* (*A—G*) and *A. subfuscus* (H): *A* – total view; *B* – head and prothorax, dorsal view; *C* – head and part of prosternum, ventral view; *D* – abdomen, lateral view; *E* – 8th and 9th abdominal segments, lateral view; *F*, *H* – 7th, 8th and 9th abdominal segments, dorsal view; *G* – same, ventral view.

Рис. 1. *Athous monilicornis* (*A—G*) è *A. subfuscus* (H): *A* – общий вид; *B* – голова и переднегрудь, дорсально; *C* – голова и часть простернума, вентрально; *D* – брюшко, латерально; *E* – 8-й и 9-й брюшные сегменты, латерально; *F*, *H* – 7-й, 8-й и 9-й брюшные сегменты, дорсально; *G* – то же, вентрально.

Distribution. Described from Bulgaria without providing details of a more precise locality (Schwarz, 1897). In the subsequent revision, it was classified into the subgenus *Haplathous* Stephen, and its distribution was mentioned as being "Bulgarien: Balkangebirge" (= Stara planina Mts. – L. P.) (Reitter, 1905). The species seems to be rather common in the mountains and was often recorded in several papers devoted to the click beetle fauna of Bulgaria.

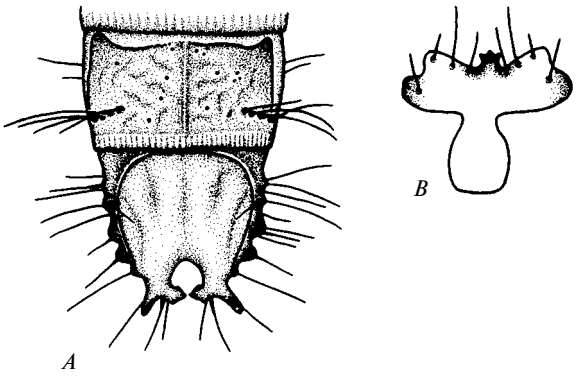


Fig. 2. *Athous monilicornis*. *A* – 8th and 9th abdominal segments, dorsal view; *B* – epicranium.

Рис. 2. *Athous monilicornis*. *A* – 8-й и 9-й брюшные сегменты, дорсально; *B* – лобная пластинка.

Until now, the species has been reported from Vitosha Mt.: Vitosha (Rambousek, 1912; Roubal, 1936), Cherni Vrah (Joakimov, 1904), Bistrishko Branishte, Aleko, Pogledets, Kumata, Kominite (Penev, Stoimenowa, 1990); Rila Mt.: Tcham-Kouria (= Borovets – L. P.), Mussala Peak, Ovnarsko (Roubal, 1936), Cerna Mesta (Tarnawski, 1984), Parangalitsa, Govedartsi (Penev, Stoimenova, 1986); Pirin Mt.: Banderitsa, El-Tepe (= Vihren Peak – L. P.), Cerna voda (Roubal, 1936), Bansko, Sandanski, Tremosnica, Melnik (Tarnawski, 1984). From the region of Stara Planina Mts., the species has been recorded from Veliko Tarnovo (Roubal, 1936) and Ledenika (Tarnawski, 1984). A few localities are known also from Osogovo Mt.: Garliano (sic!) (Tarnawski, 1984), Sredna Gora Mt.: Hisar (sic!), Koprivshtitsa (sic!) (Tarnawski, 1984) and Plana Mt.: Germanski manastir (sic!) (Roubal, 1936).

A form of this species slightly distinct from Bulgarian specimens, occurs in Macedonia and Greece (see Material).

Habitat preferences. Most localities in Bulgaria known to me are situated above 1500 m a. s. l. Rarely, the species is found below 1500 m a. s. l., as for instance on Vitosha Mt. (Penev, Stoimenowa, 1990). Therefore, records from localities such as Bansko, Sandanski, Melnik, Garliano, Koprivshtitsa and Hisar (Tarnawski, 1984), and Veliko Tarnovo and Germanski manastir (Roubal, 1936) refer most probably to areas situated far above these towns or villages.

Generally, the species is quite common in the upper part of the coniferous forest belt and on subalpine meadows. Adult beetles appear in July to August, although single specimens are recorded from the end of May and June. The beetles can be caught in quantities, usually on herbs of subalpine meadows and adjacent coniferous forests being often observed there on *Luzula* spp. (Penev, Stoimenowa, 1990).

My thanks are due to Prof. Derek Brown for linguistic editing of the manuscript and to Dr. Gergana Vasileva, Vera Antonova and Teodor Georgiev for the help in preparing the photos and drawings.

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