

Turkish Journal of Zoology

http://journals.tubitak.gov.tr/zoology/

Short Communication

Turk J Zool (2017) 41: 946-950 © TÜBİTAK doi:10.3906/zoo-1611-66

The first record of Greek endemic weevil *Hypera (Boreohypera) moczarskii* (Coleoptera: Curculionoidea, Curculionidae) in Central Serbia, with elements for species redescription

Snežana B. PEŠIĆ*

Department of Biology and Ecology, Faculty of Science, University of Kragujevac, Kragujevac, Serbia

Received: 29.11.2016 • Accepted/Published Online: 12.03.2017 • Final Version: 28.09.2017

Abstract: The rare weevil species *Hypera* (*Boreohypera*) *moczarskii* Penecke, 1936, previously recorded only in Greece, has been registered for the first time in Central Serbia. Two adult males were collected in 1993 and 1994, in two places in the area of Kragujevac (Central Serbia). These findings extend *H. moczarskii*'s distribution area to the north, and this rare species should no longer be considered as Greek, but rather as endemic to the Balkan Peninsula. Both specimens are males, and drawings of the aedeagus are shown for the first time. *Hypera moczarskii* is one of two European members of the subgenus *Boreohypera* Korotyaev, 1999, besides *H.* (*B.*) *diversipunctata* (Schrank, 1798). The distribution areas of these two species, as well as morphological and ecological data, are presented in parallel.

Key words: Hypera (Boreohypera) moczarskii, rare species, Balkan Peninsula endemic weevil, Hypera (Boreohypera) diversipunctata

Since the weevil fauna has an important role in different terrestrial ecosystems, especially in biodiversity hotspots (such as the Balkan Peninsula), further research into it is of great significance. On the Balkan Peninsula, the weevil fauna has not been studied to the same degree across the whole territory. In Serbia, there were numerous but partial efforts to investigate this issue (Pešić, 2006). The most comprehensive collecting of weevil material was conducted in Central Serbia (vicinity of Kragujevac) from 1987 to 1994 (Pešić, 1998).

Hypera Germar, 1817 is a genus of medium-sized weevils (3–9 mm) (Freude et al., 1983), distributed in the Holarctic (Alonso-Zarazaga and Lyal, 1999; Alonso-Zarazaga, 2013). These weevils have a colorful top side of the body ranging from black to yellowish-white (the pattern consists of a variety of hairs and scales). The biology of the Hypera species is related to plants from the families Fabaceae, Apiaceae, Polygonaceae, and Caryophyllaceae, depending on where females deposit eggs, i.e. on the feeding choice of their legless larvae (Skuhrovec, 2006, 2015). Some of them are regarded as legume pests (Angelov, 1978).

Hypera moczarskii (Penecke, 1936) is a rarely found species, represented by only a few examples in European entomological collections. When Penecke (1936) described this species, he stated the name of the locality where the

This paper reports on the first finding of *H. moczarskii* outside of Greece, in Serbia, and gives some details about its biology. The morphological, anatomical, ecological, and distributional data are compared with those of another European member of the same subgenus Boreohypera: *Hypera* (*Boreohypera*) *diversipunctata* (Schrank, 1798).

Adult weevils were collected in the springtime of 1993 and 1994, in two places on the territory of Kragujevac (Central Serbia) (Figure 1), by sweeping herbaceous plants with an entomological net.

Insects were killed by ethyl acetate and prepared for study by careful isolation of each specimen's genitalia.

Specimens were deposited in the author's weevil collection at the Faculty of Science, University of Kragujevac.

As a part of much broader ecological research of weevil fauna in Kragujevac and its surrounding area (Figure 1), two males of *H. moczarskii* were collected:

- one on 21 March 1993, in Šumarice Memorial park, near Sušički stream (44°01′33.61″N, 20°53′17.97″E), at 200 m altitude, on a valley meadow with flowering *Tussilago farfara*, and

material (one male and three females) had been collected (Volo in Thessaly, Greece), but he gave no information about their habitat or biology. The primary type material was collected by Penecke's friend, Emil Moczarski, to whom the species was dedicated.

^{*} Correspondence: snpesic@kg.ac.rs

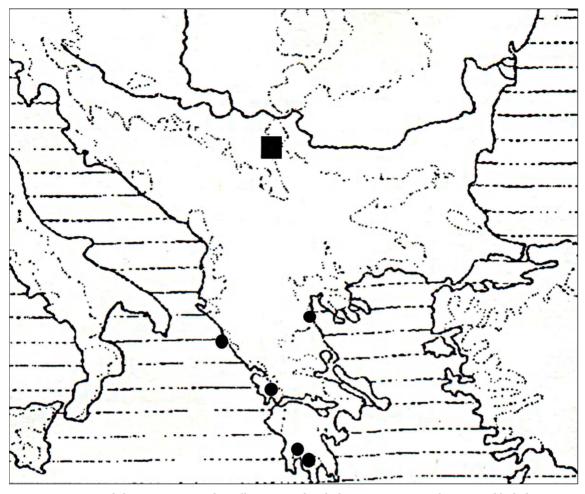


Figure 1. *H. moczarskii*'s occurrences on the Balkan Peninsula. Black square: Kragujevac's position; black dots: recent findings in Greece according to Bahr et al. (2013).

- the second on 21 May 1994, at approximately 457 m altitude, on a Žeželj hill meadow (43°58′09.25″N; 20°57′18.90″E), near a beech forest.

All subsequent attempts to collect more specimens have been without success.

At first, the lack of adequate identification keys or guides led to the misidentification of the samples and they were referred to as *Hypera elongata* (Paykull, 1792) by Pešić in a study published in 1998. In 2003, their reexamination was conducted by German Hyperini specialist Herbert Winkelmann, who correctly recognized and identified those specimens as *Hypera* (*Boreohypera*) *moczarskii*.

The two Serbian male specimens can be regarded as valuable collection material since no other specimens have been registered in museums such as the Natural History Museum (London, UK) (Pešić, 2000, 2003a, 2003b), as well as the fact that despite their efforts, Professor Anastasios Legakis and Magdalini Christodoulou have

not found any specimen of *H.* (*B.*) *moczarskii* in Greek collections or electronic databases.

Besides these (Serbian) *H. moczarskii* findings, in the Catalogue of the Curculionoidea (Coleoptera) of Greece (Bahr et al., 2013) the finding details for 12 recently collected (1995, 2002, 2009, 2011, 2012 and 2013) specimens in Greece are given: West Greece 2 exemplars, Central Macedonia 2 exemplars, Peloponnese 6 exemplars, and Ionian Islands 2 exemplars (Figure 1). Unfortunately, the sex of all these specimens has remained unpublished. The specimen found on Pydna Beach was not collected in its adult form, but as a larva, which was then reared in the laboratory. Thanks to this lucky coincidence, Winkelmann made the first photo of an adult *H. moczarskii* available on the Internet (Winkelmann et al., 2010).

Penecke, in the description of *H. moczarskii*, treated this species as a relative of *Hypera tessselatus* (Herbst 1795), which is now recognized as *Donus tessellatus* (Boheman, 1834).

Recently published data (Bahr et al., 2011, 2013; Skuhrovec, 2013) gave information on *H. moczarskii* as a member of the *Hypera* subgenus *Boreohypera* Korotyaev (Khruleva and Korotyaev, 1999). This subgenus can be distinguished from the subgenus *Hypera* by its broad forehead, prominent but not very large eyes, and short, slightly curved, laterally not constricted rostrum with a small tooth at the base from below. The *Boreohypera* species have a body shape similar to those of the genus *Donus*: elongated body, rounded shoulders at the elytra, and a lack of hind wings.

There are 46 *Hypera* species in Europe, while the subgenus *Boreohypera* contains only two. *H. diversipunctata* [its senior synonym is *H. elongata* (Paykull, 1792)] is present in almost all European countries (except Greece, Spain, and Portugal) and the Nearctic, while *H. moczarskii* has been, until now, observed only in Greece (Alonso-Zarazaga, 2004; Skuhrovec, 2009, 2013). Another six species from this subgenus are distributed in Asia (Khruleva and Korotyaev, 1999; Skuhrovec, 2013).

It is interesting that both European *Boreohypera* species are present in Serbia. In the author's collection, a few *H. diversipunctata* specimens from Vidlič and the Stara Planina mountains exist, collected in 1993 and 1997 (author's personal, unpublished data). This provides an opportunity for comparing these two species.

A common characteristic for both *H. moczarskii* and *H. diversipunctata* is that the upper side of their body is covered with hairs and deeply split (almost to the base) scales. In the Table and Figures 2a and 2b, a short comparative analysis of the males' characteristics (body shape, dimensions, proportions, and details of the rostrums and aedeagi) of these two species is presented. Drawings of dorsal and lateral views of the *H. moczarskii* aedeagus are shown for the first time, while photos of the

H. diversipunctata aedeagus already exist (Skuhrovec, 2010b).

The comparison clearly indicates that *H. diversipunctata* and *H. moczarskii* are morphologically similar. This is particularly noticeable in their prolonged oval body shape, as well as their slightly curved and toothed-from-below rostrums (Figure 2). However, the form of bilaterally asymmetrical male genitalia is clearly different: the aedeagus of *H. moczarskii* is obviously much more asymmetrical (Figure 2b).

Besides the anatomical, there are obvious biogeographical and ecological differences between these two species. H. diversipunctata is widely distributed through Europe, Asia, and the Nearctic Region (Khruleva and Korotyaev, 1999; Skuhrovec, 2010a). In high alpine environments on the Vidlič and Stara Planina mountains in Serbia, this species prefers a cold, humid biotope (author's personal observations in the field). It develops on different species from the family Caryophyllaceae, particularly Stellaria, Minuartium, Cerastium, and Myosoton (Zaslavskii, 1936; Freude et al., 1983; Khruleva and Korotyaev, 1999).

Hypera (B.) moczarskii is the second European member of the subgenus Boreohypera besides H. (B.) diversipunctata, but it is distributed in the southeastern part of Europe, where H. (B.) diversipunctata is not recorded.

Since there is a lack of relevant literature for *H*. (*B*.) *moczarskii*, based on personal data and those gathered by German colleagues (Bahr et al., 2013), it could be concluded that this rare species is distributed on the Balkan Peninsula at an elevation of 0–750 m. It is active in springtime and lives in less humid habitats than *H*. (*B*.) *diversipunctata*, in very small populations, and its host plant(s) remain(s) a mystery. The findings of *H*. (*B*.) *moczarskii* in Central

Table. Comparative review of male H. (B.) divers	ipunctata and H. (B.) moczarskii characteristics.
---	---

Species characteristics	H. diversipunctata	H. moczarskii
Total body length from rostrum base (mm)	6.23-6.28	5.37-5.43
Rostrum length / rostrum width between the eyes	2.63	3
Prothorax length / prothorax width	0.85-0.89	0.85
Elytra length / elytra width	1.62-1.67	1.53
Greatest width of elytra	Before the middle	In the middle
Antennal groove shape	Stretching to the bottom of the rostrum, ending far before the eye	Widened in front of the eye
Distance between compound eyes dorsally / distance between antennal grooves on the top of the rostrum	1-1.07	0.79-0.85
Forehead hairs between the eyes	Short	Long, as eyelash

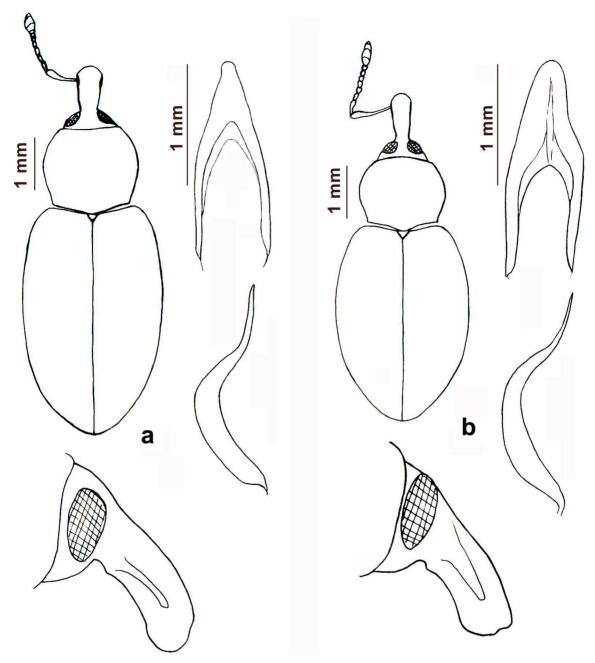


Figure 2. Male's body shape, head, and aedeagus (dorsal and lateral view): a) H. (B.) diversipunctata, b) H. (B.) moczarskii.

Serbia, in the territory of Kragujevac, expand *H.* (*B.*) *moczarskii*'s distribution area northwards. In other words, this species should no longer be considered Greek, but as endemic to the Balkan Peninsula.

Acknowledgments

The author is very much obliged to Herbert Winkelmann for having correctly identified the collected material, as well as to Dr Chris Lyal from the Natural History Museum (London, UK) and Dr Boris Korotyaev from the Zoological Institute of the Russian Academy of Science (St Petersburg, Russia), for very helpful suggestions during the manuscript preparation. A deep sense of gratitude is extended to colleagues from Greece, Professor Anastasios Legakis and Magdalini Christodoulou, for their efforts in finding more data. Thanks to the anonymous referees for the suggestions for text improvements, as well as to PhD student Dragana Predojević for her help in checking the final version of manuscript.

References

- Alonso-Zarazaga MA (2013). Coleoptera 1, Curculionidae. Fauna Europaea Web Service, Version 2.6.2. Available online at https://fauna-eu.org/.
- Alonso-Zarazaga MA, Lyal CHC (1999). A World Catalogue of Families and Genera of Curculionoidea (Insecta: Coleoptera) (Excepting Scolytidae and Platypodidae). Barcelona, Spain: Entomopraxis.
- Angelov P (1978). Fauna na B'lgariya; t-7; Coleoptera, Curculionidae, II chast: Brachyderinae, Brachycerinae, Tanymecinae, Cleoninae, Curculioninae, Myorhininae. Sofia, Bulgaria: BAN (in Bulgarian).
- Bahr F, Winkelmann H, Bayer C (2011). Illustrated Up-to-Date Catalogue of the Curculionoidea Fauna of Greece. Le Charançon: Catalogues and Keys, No. 4. Mönchengladbach, Germay: Curculio Institute.
- Bahr F, Winkelmann H, Bayer C (2013). The Curculionoidea -Fauna of Greece. Le Charançon: Catalogues and Keys, No. 4. Mönchengladbach, Germany: Curculio Institute.
- Freude H, Harde KW, Lohse GA (1983). Die Käfer Mitteleuropas; Band 11. Krefeld, Germany: Goecke and Evers Verlag (in German).
- Khruleva OA, Korotyaev BA (1999). Weevils (Coleoptera: Apionidae, Curculionidae) of Wrangel Island. Entomologicheskoe Obozrenie 78: 648-670 (article in Russian with a summary in English).
- Penecke KA (1936). Neubeschreibungen, kritische Darlegungen und kurze Mitteilungen über paläarktische Curculioniden. Koleopterologische Rundschau, Wien 21: 206-227 (in German).
- Pešić S (1998). The fauna of Weevils (Coleoptera: Attelabidae, Apionidae, Curculionidae, Rhynchophoridae) in Kragujevac Basin (Serbia). In: Colonnelli E, Louw S, Osella G, editors. Taxonomy, Ecology and Distribution of Curculionoidea (Coleoptera: Polyphaga): Proceedings of the XX International Congress of Entomology; 28 August 1996; Florence, Italy. Turin, Italy: Atti Museo Regionale di Scienze Naturali Torino, pp. 163-182.
- Pešić S (2000). The type specimens of Balkan weevils in the Natural History Museum London. Acta Entomologica Serbica 5: 29-34.

- Pešić S (2002). Zoogeographic analysis of weevil fauna (Coleoptera, Curculionoidea: Rhynchitidae, Apionidae, Nanophyidae, Curculionidae, Rhynchophoridae) in Kragujevac Basin (Serbia). Kragujevac Journal of Science 24: 105-110.
- Pešić S (2003a). Balkan weevils (Curculionoidea) in The Natural History Museum London (world part). Kragujevac Journal of Science 25: 139-162.
- Pešić S (2003b). Balkan weevils (Curculionoidea) in The Natural History Museum London (Reitter's collection). Kragujevac Journal of Science 25: 163-172.
- Pešić S (2006). A review of the investigation of weevils (Coleoptera: Curculionoidea) in Serbia and Montenegro. Trudy Russkogo Entomologicheskogo Obshchestva 77: 259-266 (article in Russian with an abstract in English).
- Skuhrovec J (2008). Taxonomic changes within the tribe Hyperini (Coleoptera: Curculionidae). Acta Entomologica Musei Nationalis Pragae 48: 677-690.
- Skuhrovec J (2009). Digital weevil determination for Curculionoidea of West Palaearctic. Transalpina: *Hypera / Limobius / Metadonus* (Hyperinae: Hyperini). Snudebiller 10: 39-47.
- Skuhrovec J (2010a). An Illustrated Up-to-Date Catalogue of Palearctic Hyperini (Curculionidae: Hyperinae). Le Charançon: Catalogues and Keys, No. 5. Mönchengladbach, Germany: Curculio Institute.
- Skuhrovec J (2010b). Taxonomic changes inside Hyperini II. (Coleoptera: Curculionidae: Hyperinae). Snudebiller 11: 96-101.
- Skuhrovec J (2013). Subfamily Hyperinae Marseul, 1863 (1848). In: Löbl I, Smetana A, editors. Catalogue of Palaearctic Coleoptera, Volume 8, Curculionoidea II. Leiden, the Netherlands: Brill, pp. 423-436.
- Winkelmann H, Bahr F, Bayer C (2010). Ergebnisse der Frühjahrsexkursion 2009 (1. Teil Zentralgreichenland) zur Erforschung der griechischen Rüsselkäfer. Zweiter Beitrag zur Fauna von Griechenland (Coleoptera: Curculionoidea). Weevil News. Mönchengladbach, Germany: Curculio Institute (in German).
- Zaslavskii VA (1961). Obzor vidov listovyh dolgonosikov roda *Phytonomus* Schönh. (Coleoptera, Curculionidae). Entomologicheskoe Obozrenie 40: 624-635 (article in Russian).