

First record of the Asian seed beetle *Megabruchidius dorsalis* (Fåhraeus, 1839) (Chrysomelidae: Bruchinae) in Bulgaria

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Abstract. Asian seed beetle *Megabruchidius dorsalis* (Fåhraeus, 1839) is reported for the first time from Bulgaria. The beetles were reared from seed pods of *Gleditsia triacanthos* L., collected in a city park in Sofia.

Key words: alien species, Coleoptera, *Gleditsia triacanthos*

Introduction

The genus *Megabruchidius* Borowiec, 1984 (Chrysomelidae: Bruchinae) includes three species, native to East Asia (Tuda & Morimoto 2004, Yus Ramos 2009). In the 80s of the last century two of the species – *M. tonkineus* (Pic, 1914) and *M. dorsalis* (Fåhraeus, 1839) were found in Europe and subsequently reported in many European countries (Yus Ramos 2009, Šipek *et al.* 2022). The species *M. tonkineus* was reported from Bulgaria as well (Stojanova 2007). The most comprehensive reviews on the history of colonization of the two species in Europe can be found in Horvat & Sajna (2021b) and Šipek *et al.* (2022). Species of the genus develop in seeds of a number of Fabaceae species, most often in those of the genus *Gleditsia* L. (Tuda & Morimoto 2004, Di Iorio 2015). In the European part of their range *M. tonkineus* and *M. dorsalis* commonly develop in seed pods of the honey locust *G. triacanthos* L. – North American species, widely planted as ornamental tree in many parts of the world (Yus-Ramos *et al.* 2014).

Currently *M. dorsalis* is expanding its range in Europe (e.g. Korotyaev 2016, Horvat & Sajna 2021b, Šipek *et al.* 2022). This species has been recently found in the Balkan Peninsula – Romania (including Northern Dobruzha) (Pintilioaie *et al.* 2018), Montenegro, Albania and Bosnia and Herzegovina (Šipek *et al.* 2022). In the present work *M. dorsalis* is reported for the first time from Bulgaria.

Materials and Methods

Seed pods of *Gleditsia triacanthos* with emergence holes of beetles were collected by the author on the ground in Borisova Gradina Park, city of Sofia, on the 9th, 15th and 16th of January 2022 (Fig. 1A). Several pods were dissected and examined for presence of beetle larvae or adults. The other pods were placed in plastic boxes, placed at room temperature and regularly inspected for emerging adults. A total of 33 pods were kept for the beetle development. The obtained beetle specimens are preserved in the Zoological Collection of Sofia University, Faculty of Biology (BFUS).

Results and Discussion

Megabruchidius dorsalis (Fåhraeus, 1839)

Material examined: Bulgaria, Sofia, Borisova Gradina Park, 42°41'08.2"N 23°20'00.5"E, 560 m a.s.l., 09.i.2022, 1 ♂, 1 ♀ (emerged between February 1st and 5th); the same locality, 15.i.2022, 1 ♀ (emerged between February 1st and 5th); the same locality and date, 3 ♂♂, 2 ♀♀ (emerged between February 5th and 11th); the same locality and date, 1 ♂, 2 ♀♀ (emerged between February 11th and 16th); the same locality, 16.i.2022, 2 ♂♂, 2 ♀♀ (emerged between February 5th and 11th); the same locality and date, 1 ♂ (emerged between February 11th and 16th).

A total of 16 adults (eight males and eight females) were obtained from the collected pods by mid-February. The first three adult specimens were observed emerged from the podson the 5th of February. Most of the adults (nine specimens) emerged between February 5th and 11th, about three weeks after the pods were collected. Larvae of Bruchinae, most likely belonging to the same species, have been observed in dissected pods immediately after collection in early January (Fig. 1B). *Megabruchidius dorsalis* has a multivoltine life cycle and overwinters as larvae and adults (Kurota & Shimada 2001). In the present study, no adult beetles were found in the pods in January and adult emergence started two weeks after collecting the pods. The small scale of the research however, does not allow conclusions about the life cycle of the species in the newly occupied area.

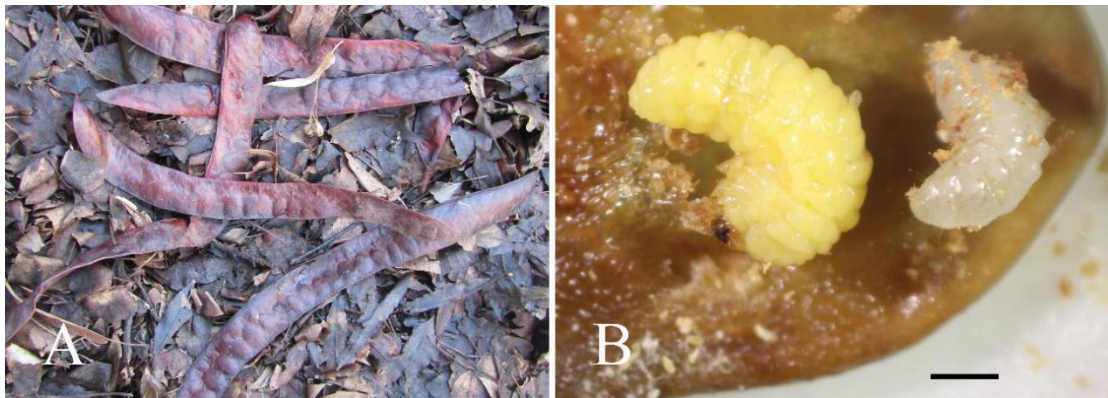


Fig. 1. Seed pods of *Gleditsia triacanthos* on the ground in Borisova Gradina Park, Sofia (A) and larvae of Bruchinae from dissected pod (B). Scale bar (B): 1 mm.

Megabruchidius dorsalis differ from *M. tonkineus* by the absence of a long tooth at the apex of the hind tibia and also in the mainly black elytra (in fully sclerotized specimens) (Yus Ramos 2009, Korotyayev 2015) (Fig. 2). The morphology of the male genitalia of the examined specimens corresponds to that illustrated by Borowiec (1987) and Yus Ramos (2009) (Fig. 3).

The main host plant of *M. dorsalis* in Europe - *G. triacanthos*, is a non-native ornamental species and no immediate threat to natural habitats can be expected after establishment of the new alien beetle species. Moreover, in cases of moderate damage to the seeds of *G. triacanthos*, *M. dorsalis* can facilitate their germination (Horvat & Sajna 2021a).

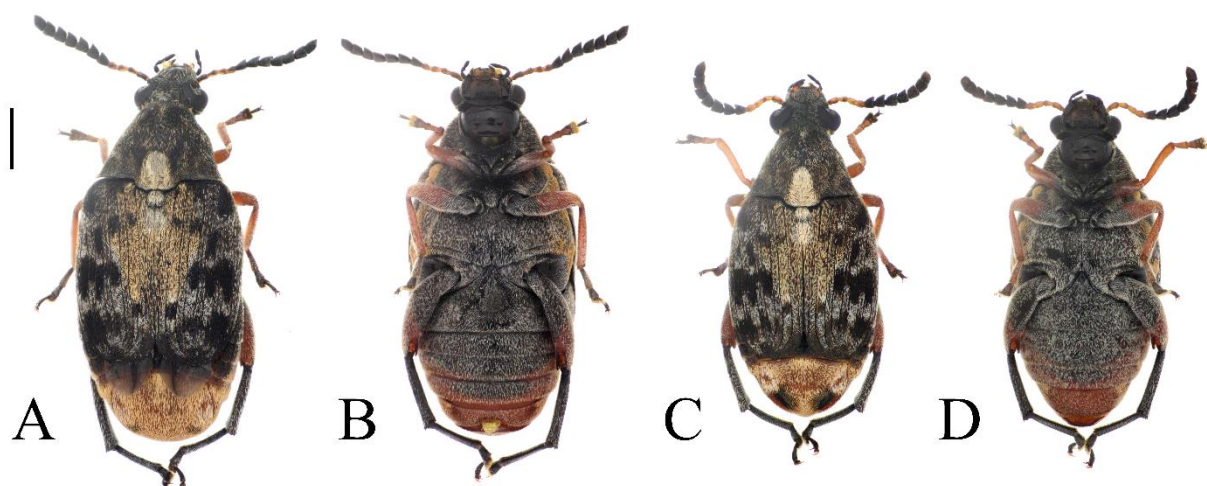


Fig. 2. Adults of *Megabruchidius dorsalis*, emerged from seed pods of *G. triacanthos* from Sofia, dorsal and ventral views. A, B: male; C, D: female. Scale bar: 1 mm.

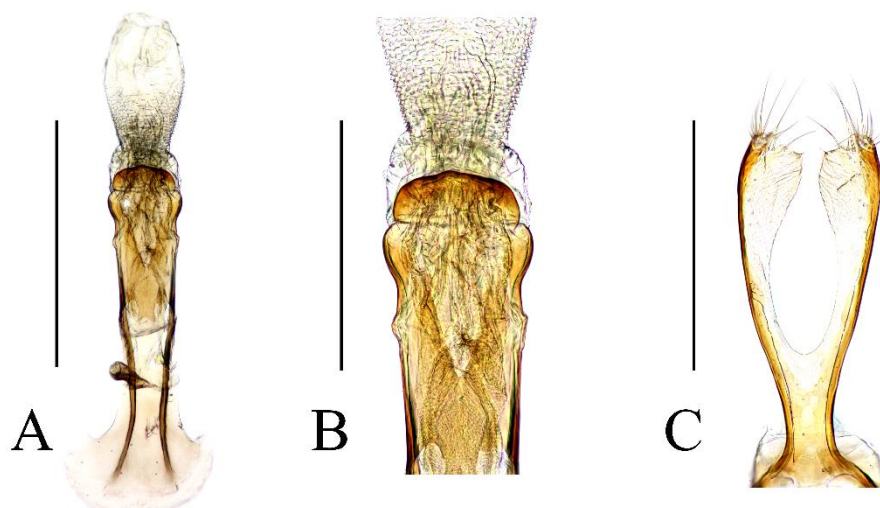


Fig. 3. Male genitalia of *Megabruchidius dorsalis*, Sofia locality. A: median lobe; B: apex of the median lobe; C: lateral lobes. Scale bars: 1 mm (A); 0.5 mm (B, C).

References

- Borowiec, L. (1987) The genera of seed-beetles (Coleoptera, Bruchidae). *Bulletin Entomologique de Pologne*, 57: 3–207.
- Di Iorio, O. R. (2015) A new previously predicted larval host for the Asian seed beetle *Megabruchidius tonkineus* (Pic, 1904), and the incorporation of *M. dorsalis* (Fåhræus, 1839) to the Argentinian fauna of Bruchinae (Coleoptera: Chrysomelidae). *Boletín de la Sociedad Entomológica Aragonesa*, 56: 327–334.
- Horvat, E. & Sajna, N. (2021a) Exploring the impact of a non-native seed predator on the seed germination of its non-native host. *Biological Invasions*, 23: 3703–3717.
- Horvat, E., Sajna, N. (2021b) First record of the Asian seed beetle *Megabruchidius dorsalis* (Fåhræus, 1839) (Coleoptera, Chrysomelidae, Bruchinae) in Croatia. *BioInvasions Records*, 10 (2): 477–482.
- Korotyaev, B. A. (2015) Record of the Second Species of the East Asian Seed-Beetle Genus *Megabruchidius* Borowiec (Coleoptera, Bruchidae) in the *Gleditsia* Seeds in

- Krasnodar and Stavropol Territories, Russia. *Entomological Review*, 95 (9): 1237–1239.
- Korotyayev, B. A. (2016) First Records of an East Asian Seed Beetle *Megabruchidius dorsalis* Fåhræus (Coleoptera, Bruchidae) from Germany and the Black Sea Coast of Crimea and Caucasus. *Entomological Review*, 96 (4): 460–461.
- Kurota, H. & Shimada, M. (2001) Photoperiod- and temperature-dependent induction of larval diapause in a multivoltine bruchid, *Bruchidius dorsalis*. *Entomologia Experimentalis et Applicata*, 99: 361–369.
- Pintilioaie, A. M., Mancu, C. O., Fusu, L., Mitroiu, M. D. & Rădac, A. I. (2018) New invasive bruchine species (Chrysomelidae: Bruchinae) in the fauna of Romania, with a review on their distribution and biology. *Annales de la Societe Entomologique de France*, 54: 401–409.
- Šipek, M., Horvat, E. & Sajna, N. (2022) First records of seed beetles *Megabruchidius dorsalis* (Fåhræus, 1839) and *M. tonkineus* (Pic, 1904) from three Balkan countries. *BioInvasions Records*, 11 (in press)
- Stojanova, A. (2007) *Megabruchidius tonkineus* (Pic, 1904) (Chrysomelidae: Bruchinae), a New Seed Beetle to the Bulgarian Fauna. *Acta Zoologica Bulgarica* 59 (1): 109–110.
- Tuda, M., Morimoto, K. (2004) A new species *Megabruchidius sophorae* (Coleoptera, Bruchidae), feeding on seeds of *Styphnolobium* (Fabaceae) new to Bruchidae. *Zoological Science*, 21: 105–110.
- Yus Ramos, R. (2009) Revisión del género *Megabruchidius* Borowiec, 1984 (Coleoptera: Bruchidae) y nuevas citas para la fauna europea. *Boletín Sociedad Entomológica Aragonesa*, 45: 371–382.
- Yus-Ramos, R., Ventura, D., Bensusan, K., Coello-García, P., György, Z. & Stojanova, A. (2014) Alien seed beetles (Coleoptera: Chrysomelidae: Bruchinae) in Europe. *Zootaxa*, 3826 (3): 401–448.