

Arion (Kobeltia) intermedius Normand, 1852 (Pulmonata: Stylommatophora: Arionidae), a New Slug Species for Bulgaria

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Abstract: The hedgehog slug *Arion (Kobeltia) intermedius* Normand, 1852 is recorded for the first time in Bulgaria and the Balkans from the park Knyaz-Borisova Gradina in the city of Sofia. Although the park and its gastropod fauna have been intensely studied in the past, only the most recent collecting activity revealed the presence of *A. intermedius* in the area. Therefore, we consider the species a recent introduction to the Bulgarian gastropod fauna.

Key words: Bulgarian gastropod fauna, new record, urban environment, possible introduction

Introduction

Arion intermedius was originally described in 1852 by N. A. J. Normand from forests surrounding the city of Valenciennes, northernmost France (nowadays within the region Nord-Pas-de-Calais-Picardie), an area reaching altitudes of ca. 20-30 m a.s.l. Currently, that species is known from several European countries: southern central Norway, along the coasts of Sweden, west to the British Isles, Iceland and Faroe Islands, south to the Iberian Peninsula and Azores, Italy, Sardinia and Corsica, scattered throughout central Europe and reaching the east boundaries of its range in Poland and the Czech Republic (WELTER-SCHULTES 2012). The hedgehog slug has also been transported to North and South America, further to North and South Africa, Australasia and some Pacific Islands (CÁDIZ et al.

2007). In this communication, we report the species from an urban park within the city of Sofia, Bulgaria, for the first time. This is also the first record from the Balkan Peninsula.

Materials and Methods

While studying the gastropod fauna of the city of Sofia, we sampled extensively one of the largest forested areas in the city, i.e. the park Knyaz-Borisova Gradina. The sampling locality was dominated by *Pinus sylvestris* L. and *Quercus* spp. (the introduced *Q. rubra* L. accounted for approximately 1/3 of the oak trees); other trees and bushes that were dominant on the sampling site included *Fagus sylvatica* L., *Acer pseudoplatanus* L., *Acer platanoides* L., *Tilia*

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sp., *Fraxinus angustifolia* Vahl, *Carpinus betulus* L., *Betula* sp., *Populus nigra* L. and *Sambucus nigra* L. (Fig. 1). The ground cover consisted mainly of *Hedera helix* L., which occurred patchy in very dense stands, and *Rubus* sp. The habitat was shaded and at the time the slugs were collected (early afternoon), the soil was moderately moist and wet beneath the scattered logs.

We collected three slug specimens on the 6th of November 2015 (GPS: N42.678632° E23.351539°; 584 m a.s.l.; leg. I. K. Dedov, U. E. Schneppat, I. Stoyanov, R. Cornu). They are stored in the collection of U. E. Schneppat at the Bündner Naturmuseum (BNM), Chur, Switzerland, accession nos. BNM068474, BNM068495 and BNM068496.

Results and Discussion

Arion intermedius is a much smaller slug than most of the other small Arionidae, with typical points or prickles on the dorsal wrinkles, more prominent in sub-adult specimens (especially at the posterior end of the back; Fig. 2). However, these can be incon-

spicuous for an observer without good lens. The present finding extends the known range of the hedgehog slug about 1150 km south-east from the populations known from western Poland and about 1050 km from the nearest populations known from the Czech Republic (HLAVAČ & HORSÁK 2000, WIKTOR 2004, WELTER-SCHULTES 2012). Other slug species found on the spot were *Arion* (*Arion*) cf. *vulgaris* Moquin-Tandon, 1855 (about ten specimens, some of them laying eggs), *Limax* cf. *maximus sensu* Wiktor (1983: 126-129, partim), three specimens, the only snail noticed on the spot was *Helix lucorum* L., 1758.

The gastropod fauna of the park Knyaz-Borisova Gradina was first studied by DEDOV & PENEV (2000, 2004). Since 2011, our team has visited the park regularly during subsequent collecting trips. Further sites within the boundaries of the city of Sofia and adjacent regions have been visited too, but we have never found *A. intermedius* until now. This fact suggests that the species must be a recent introduction to Bulgaria, given the rich introduction history of *A. intermedius* to other con-



Fig. 1. The habitat where *Arion* (*Kobeltia*) *intermedius* Normand, 1852 was collected for the first time on the Balkan Peninsula: park Knyaz-Borisova Gradina, Sofia, Bulgaria



Fig. 2. *Arion (Kobeltia) intermedius* Normand, 1852: specimens from the park Knyaz-Borisova Gradina, Sofia, Bulgaria, photographed *in vivo*; scale at top of image = 25 mm

tinents. It could easily colonise the suitable habitats in Bulgaria due to its ability to self-fertilise, which would allow a single individual to spread throughout by successfully reproducing (CÁDIZ & GALLARDO 2007). The hedgehog slug has not always been considered a pest (ROWSON et al. 2014 a, b) but it could pose a potential threat to the local

gastropod populations (CÁDIZ & GALLARDO 2007).

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