

## The first record of *Deroceras invadens* (Gastropoda: Pulmonata: Agriolimacidae) for Montenegro

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The name *Deroceras panormitanum* (Lessona & Pollonera, 1882) has until recently been applied to a terrestrial slug that has spread worldwide and sometimes has been regarded as a pest; earlier this species had also been called *Deroceras caruanae* (Pollonera, 1891). Neither of these names are appropriate as the taxonomic descriptions apply to a species from Sicily and Malta, a species with hardly any records outside these islands. The truly invasive species has been formally redescribed as *D. invadens* Reise *et al.*, 2011.

In a recent review of the worldwide distribution of *D. invadens*, it was shown that records from the Balkans are almost absent (Hutchinson *et al.* 2014). Records by Wiktor (2000, 2001) from Bulgaria and Greece were of slugs with anatomical characteristics that do not fit either the true *D. panormitanum* or *D. invadens* and probably should be best considered as of an undescribed species (Hutchinson *et al.* 2014; Reise *et al.*, 2011). The only reliable record from the Balkans is from Crete, being confirmed by CO1-barcoding (Rowson *et al.* 2014a).

The absence of more records of *D. invadens* in the Balkans might be due to a low resistance to dry summers (Hutchinson *et al.* 2014), although this should not prevent a more local presence in moist habitats. Because this species is especially abundant in synanthropic habitats and has a wide distribution in Western and Central Europe, the likelihood of introductions into the Balkans should be considered high. So the lack of records might be better explained by the species having been overlooked and/or by an insufficient number of studies of slugs in the Balkans.

During the 5th International Conference "Hirudinea: taxonomy, faunistics, biology" from 8 to 10 October 2014 in the city of Tivat (Montenegro) three specimens of *D. invadens* were collected at the eastern rim of the city (42°26.177'N 18°42.725'E). The habitat was a pile of domestic waste, mainly consisting of small pieces of building material such as wood and plastics. In this habitat it was accompanied by several specimens of *D. sturanyi* (Simroth, 1894), a species indigenous to the Balkans and common in synanthropic environments (Wiktor 2000). *Deroceras sturanyi* is already known to occur in Montenegro (Wiktor and Jurkowska 2007).

The specimens of *D. invadens* were already in the field suspected to be this species because of the combination of the pinkish tinge, a keel that is steeply truncate at the tip of the tail and a rim of the breathing pore which is contrastingly paler than the rest of the body (Rowson *et al.* 2014b) (Fig. 1A). Internally the caecum of the rectum is very short, the stimulator is conical, the penial gland consists of many, worm-like processes and the two blunt penial appendages are alike (Fig. 1B). These are characteristic of *D. invadens* and exclude *D. panormitanum* s.s. as the latter species has one blunt penis appendage and one which is tapering to a point (Reise *et al.* 2011, Rowson *et al.* 2014b).

As this is the first record from Montenegro and the Balkan mainland, it is most likely that these specimens are the result of a relatively recent introduction. Only further collecting can shed light on the

possibilities of this species establishing more widely in Montenegro and of a currently wider occurrence in the Balkans.



**Figure 1A-B.** Living specimen of *D. invadens* from Tivat, Montenegro (left – 1A) and the penis with its gland and appendages of the same specimen (right – 1B).

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