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DEROCERAS (DEROCERAS) PANORMITANUM (LESSONA ET POLLONERA, 1882) – A NEW INTRODUCED SLUG SPECIES IN POLAND (GASTROPODA: PULMONATA: AGRIOLIMACIDAE)

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ABSTRACT: The paper contains a description of a newly introduced slug species, *Deroceras panormitanum* (Lessona et Pollonera, 1882), spreading in Europe for several dozen years and now discovered in SW Poland, in the city of Wrocław. One third of slugs recorded from Poland are introduced species, some of them starting to penetrate also habitats under negligible human impact.

KEY WORDS: slugs, *Deroceras*, introduced, synanthrope, Poland

INTRODUCTION

Invasions of foreign, introduced species increase in intensity with progressing transformation of natural habitats, which facilitates various forms of passive dispersal. Small invertebrates are especially liable to cross the borders of their natural distribution range due to transport of fresh plant products, such as fruits, vegetables, saplings, ornamental plants etc. Pulmonate slugs, in spite of their rather small drought resistance, seem to be especially likely candidates for this kind of dispersal. Due to their considerable mobility, they penetrate a variety of food sources, including agricultural and horticultural crops, stores of vegetables or fruit, hot-houses etc. This seems to be the main reason for the fact that such a high proportion of slug species, of quite different evolutionary affiliation, distribution, bionomics, their only character in common being the absence of shell, occur outside their original, native distribution ranges. Numerous European species have been introduced almost world-wide, and especially in North America and Australia. The same phenomenon is observed in Europe, including Poland. In the latter country introduced slug species are: *Arion distinctus* Mabille, 1868, *A. fasciatus* (Nilsson, 1823), *A. lusitanicus* Mabille, 1868, *Limax (Limax) maximus* Linnaeus, 1758, *L. (Limacus) flavus* Linnaeus, 1758, *Lehmannia valentiana* (Férussac, 1823), *Tandonia budapestensis* (Hazay, 1881) and *Boettgerilla pallens* Simroth, 1912 (WIKTOR 1973, RIEDEL & WIKTOR 1974, WIKTOR 1989, KOZŁOWSKI & KORNOBIS 1995, WIKTOR 2000). Below I discuss another introduced species.

Our malacofauna comprises a total of 29 slug species (including the new arrival), nine of them, i.e. 1/3, being foreign and introduced. Some of them have already penetrated even habitats of very limited human impact, e.g. *Boettgerilla pallens*. Some native species also increase their range, e.g. *Arion rufus* (Linnaeus, 1758) which has very recently appeared at new, insular localities outside its original distribution range (KOZŁOWSKI & KORNOBIS 1995, WIKTOR 1996). All these introduced species except *Boettgerilla* are more or less important pests. The phenomenon is characteristic and dangerous. Contrary to slugs, introduced snails constitute only a negligible proportion of the fauna and none of them, except perhaps *Cepaea nemoralis* (Linnaeus, 1758), causes any damage.

All the slugs introduced in Poland originate from the west or south-west, the only exception being *Boettgerilla* of Trans-Caucasian origin. Another Caucasian immigrant in Europe, recorded a year ago from

the south of Germany, is *Krynickillus (Krynickillus) melanocephalus* Kaleniczenko, 1851 (MENG & BÖSSNECK 1999). This species may succeed in spreading all over Europe as it was the case with *Boettgerilla pallens*.

The newly recorded *Deroceras panormitanum* (Lessona et Pollonera, 1882) causes damage to agricultural and horticultural crops in various parts of Europe; it may be expected to become a pest also in Poland. Below I give some information on this slug.

DESCRIPTION

Deroceras (Deroceras) panormitanum (Lessona et Pollonera, 1882)

Deroceras panormitanum Lessona et Pollonera, 1882: 52, Pl. 1: Fig. 5, Pl. 2: Fig. 12. Locus typicus: Palermo (Italy).

Synonyms: *Agriolimax Pollonerae* [=*Pollonerai*] Simroth, 1889; *Agriolimax Caruanae* Pollonera, 1891; *Agriolimax Cecconii* Pollonera, 1896; ?*Agriolimax Scharffi* Simroth, 1910; *Deroceras meridionale* Reygrobellet, 1963.

In its external appearance the slug does not depart from most of its congeners (Fig. 1). Live specimens strikingly resemble *Deroceras sturanyi* (Simroth, 1894) or large individuals of *Deroceras laeve* (O. F. Müller, 1774). Its body length reaches up to 35 mm, usually however it is smaller. Its coloration is much variable – various hues of creamy-brown, brown, to almost black. Some individuals are unicoloured, some have darker, blackish, fine spots on the mantle, back and sides. The mantle is proportionately large, its posterior margin reaching almost half the body length. The skin is thin, partly translucent so that the internal organs shine through. The mucus is watery and colourless, also in irritated individuals. The rectum bears at most a shallow pocket – a vestigial caecum. The Polish specimens bear no such pocket, only an abrupt widening of rectum (Fig. 2). An unambiguous diagnostic character is the appearance of penis (Fig. 3). It is slightly elongated, and in its posterior part there are two appendices directed posteriorly (!), with a bundle of finger-like processes between them (!), the latter being the penial gland. Inside the penis, in its anterior part, there is a

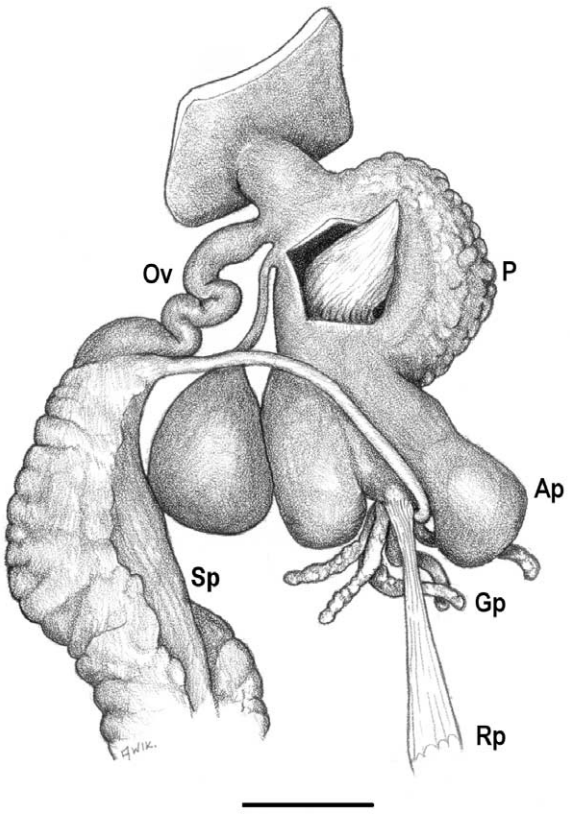
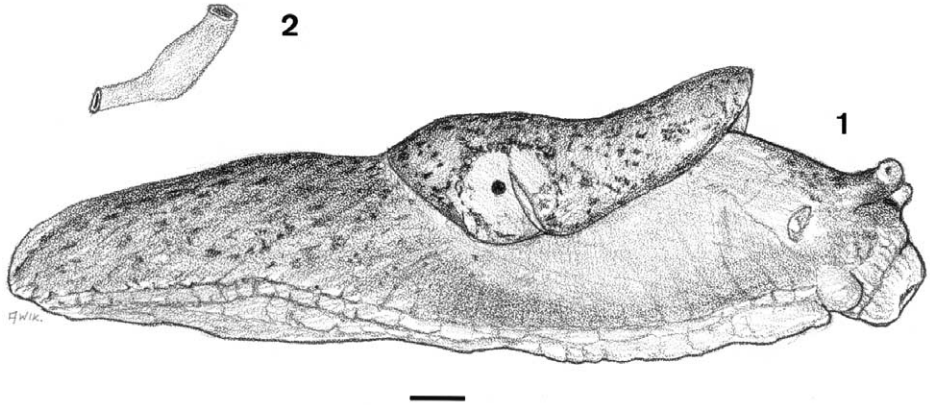


Fig. 3. *Deroceras panormitanum* (Lessona et Pollonera, 1882). Copulatory organs of a specimen from Wrocław: Ap – appendix, Gp – penial gland, Ov – oviduct, P – penis, Rp – penial retractor, Sp – spermoviduct; scale bar – 1 mm



Figs. 1–2. *Deroceras panormitanum* (Lessona et Pollonera, 1882): 1. External appearance of a preserved specimen from Wrocław; scale bar – 1 mm; 2. Terminal section of the intestine

small conical stimulator. The above-described situation is found in typical specimens, which category includes also all the individuals collected hitherto in Poland. However, it follows from the literature that in some specimens or whole populations at least one of the appendices undergoes a partial or complete reduction, which makes the structure asymmetrical. In spite of this, the penis of *D. panormitanum* is always clearly different from that of *D. laeve*. There are also clear differences in the penis appearance compared to *D. sturanyi*. In the latter species the posterior end of penis is hammer-like, i.e. the pockets on the penis are directed laterally (transversely) and there is no penial gland between them (!) (WIKTOR 2000).

DISTRIBUTION

It is difficult to ascertain the original distribution range of the species. It probably included the Mediterranean area, both continental and insular. At present the species is in expansion and spreads as a synanthrope over extensive areas of Europe. Its range extends from Greece and Bulgaria to Spain, Ireland, England, France, Germany. It was recorded from Hungary, Austria, Switzerland and Scandinavia (Sweden, Finland) (WIKTOR 2000). As a synanthrope, it may be expected to occur in entire Europe and northern Africa. In Poland it was found in the Botanical Garden and adjacent areas in the city of Wrocław. Most probably it is present also in other sites but has as yet remained undiscovered.

ECOLOGY

The ecological requirements and bionomics of the species are not known in detail. It seems to display a wide ecological tolerance. It lives mainly in open habitats, ruderal environments, in rubble heaps, gardens and cemeteries. It shelters under stones and pieces of wood in moderately humid places. In Central Europe, and thus also in Poland, it is accompanied among others by *Deroceras reticulatum, Arion fasciatus, Arion distinctus, Boettgerilla pallens, Trichia hispida, Cepaea nemoralis* and other obviously synanthropic species. At present there is no information on any damage caused by this slug in our climatic conditions, although it can be expected to become a horticultural pest.

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