

Rapid Communication**First record of the Turkish snail *Helix lucorum* Linnaeus, 1758 (Stylommatophora, Helicidae) in Poland**

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OPEN ACCESS**Abstract**

Helix lucorum L. (Stylommatophora, Helicidae) is one of the few European species of land snails that are currently being recorded in new localities outside their natural range. For several years there have been reports of this species being found in new localities within large European cities. In 2020, *H. lucorum* was found in the center of Warsaw – this is the first recorded occurrence of this species in Poland. The area of Warsaw in which the snail was discovered covers about 1.2 ha. To date, no increase in this population's range has been detected.

Key words: non-indigenous species, urban fauna, new record, Warsaw

Introduction

Helix lucorum Linnaeus, 1758 (Stylommatophora, Helicidae) is one of the widespread species of its genus. Its natural range stretches in a wide band from the eastern part of the Mediterranean Sea (Italy), through the middle Balkans and the eastern part of the Black Sea, to Iran (Yildirim et al. 2004; Korábek et al. 2018). It is one of several European species of terrestrial snails that now appear in new areas outside their natural range. The presence of *H. lucorum* has been noted in eastern, central, and western parts of Europe (Spain, England, Czech Republic, Slovakia, Hungary, Ukraine, and Russia) (Palmer 2010; Quiñonero Salgado et al. 2010; Peltanová et al. 2012; Balashov et al. 2013; Čejka and Čačaný 2014; Páll-Gergely et al. 2019). The spread of *H. lucorum* in a northerly direction is associated with an intensification in international trade and climate warming (Peltanová et al. 2012). Most of these new, isolated sites are situated in man-made habitats like city centers, which provide warmer conditions compared to regional climates. The species probably also spread north-west of its continuous range, which is now much broader than it was 110 years ago, as confirmed by its presence in south-eastern Serbia (Korábek et al. 2018).

The form of the *H. lucorum* shell recalls its Central European relatives, however, what distinguishes it from similar species is the shell's color pattern.

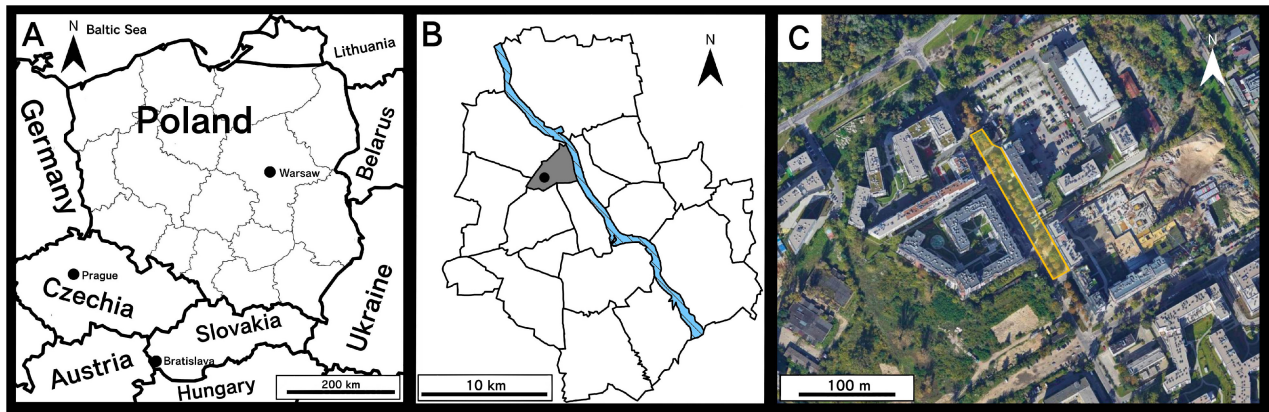


Figure 1. (A) Location of the newly recorded occurrence of *Helix lucorum* in Poland (Warsaw) and records from surrounding countries (by Artur Szpalek, MediBang Paint) (B) Scheme of the *Helix lucorum* location in the city of Warsaw (black dot); (C) Section of the housing estate surrounding Przasnyka Street in the district of Żoliborz. The boundaries of the range of *Helix lucorum* are marked in yellow. Background map: https://earth.google.com/earth/d/1Q42VoYVYyqVRyJTFVCPaPq605tZ_nlhf?usp=sharing

The shell of *Helix lucorum* is usually distinctly striped or banded. Several broad red-brown longitudinal bands can even be merged into broader bands, so little remains visible of the original lighter shell color. *Helix lucorum* has a compressed, spherical shell with a broadly rounded spire, while the apex is small, blunt, and distinct. The shell has a thick wall and is striped irregularly. The apertural rim is small, slightly flattened and laterally oblique, and folded back over the small umbilicus in the columellar area (Čejka and Čačaný 2014; Korábek et al. 2018; Nordsieck 2023).

Materials and methods

The *H. lucorum* population was found in Warsaw in the district of Żoliborz, next to Przasnyka street (52°15'36.148"N; 20°58'9.556"E) (Figures 1B, C, 2). The site is surrounded by a residential buildings and shops. The first observation was made in July 2020; and subsequent surveys (July–August 2021; June–July 2022) have since confirmed the presence of the species. The snail is typically found on pavements and under coniferous shrubs. The vegetation at the location was dominated by *Juniperus* spp. and *Thuja* spp., while other plant species (*Aesculus hippocastanum* L., *Acer negundo* L., *Morus alba* L., *Taxus baccata* L., *Urtica dioica* L., and *Trifolium pratense* L.) were less frequent.

Results and discussion

The snail's presence was noted in an area of 1.2 ha. In July 2022, the shells of 13 randomly selected individuals were measured, with the mean width and height of the shells being 38.25 mm (min. 32.70 mm, max. 42.37 mm) and 33.51 mm (min. 29.66, max. 39.98 mm), respectively. In terms of shell coloration, the described population was not very diverse. On the white-yellowish background of the shell there were dark brownish or red-brown colored stripes (Figure 3).

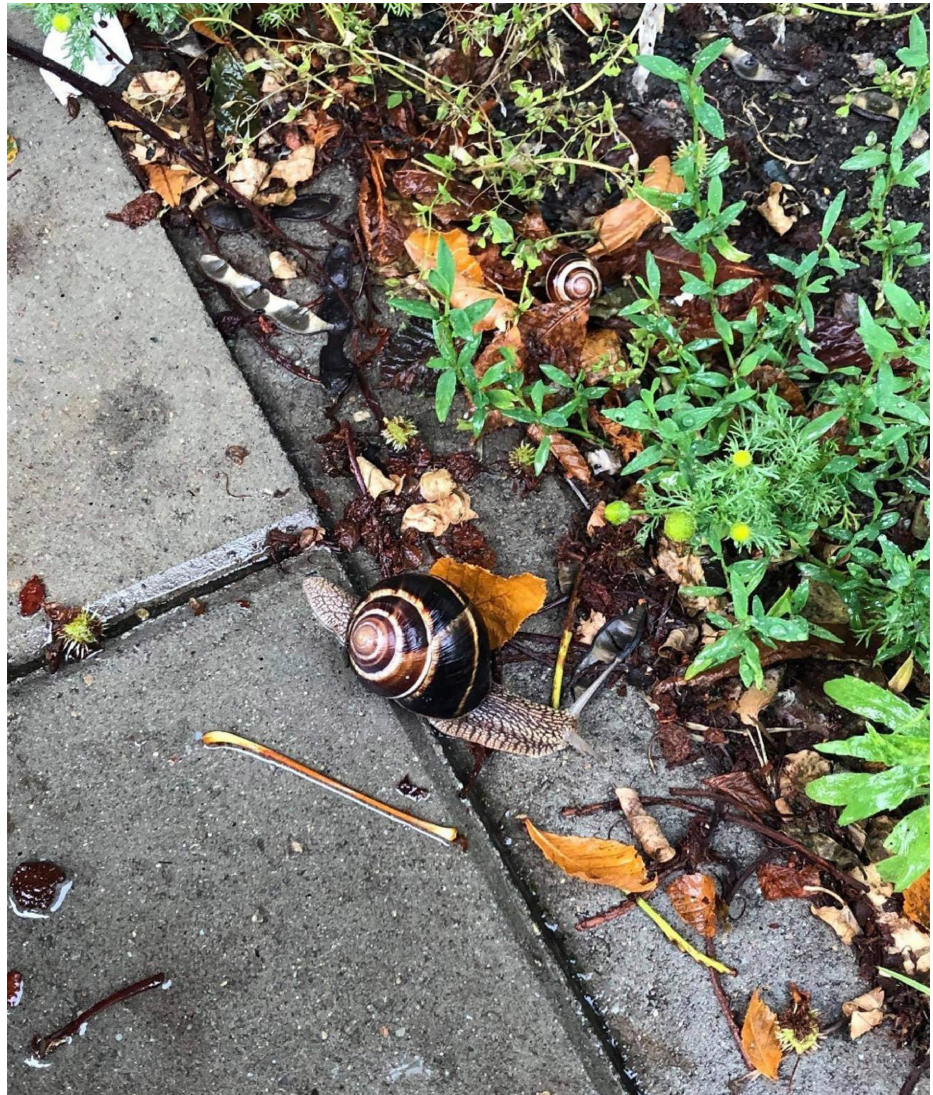


Figure 2. Specimens of *Helix lucorum*, on the lawn along the sidewalk (June 19, 2022) (Photo by Artur Szpalek).



Figure 3. An original shell from the *Helix lucorum* population from the city of Warsaw (Photo by Aleksander Borowiec).

The studied species was accompanied by two natives species of the genus *Cepaea* Held, 1838: *C. nemoralis* Linnaeus, 1758 and *C. hortensis* (Müller, 1774); however, the presence of *H. pomatia* Linnaeus, 1758 was not documented on the site.

This confirmed location for *H. lucorum* is remote from the closest known habitation sites, which unambiguously indicates an anthropogenic origin (Figure 1A). Similar, insular occurrences that were restricted only to towns were also noted in Bratislava and Prague (Čejka and Čačaný 2014; Doležal 2021). Observations made in Prague have shown that the population has maintained itself for fifteen or so years, but has not enlarged its range. Our three-year observations has also not shown any enlargement of the range of the Warsaw population.

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Authors' contribution

Research conceptualization – Anna Mazurkiewicz, Dorota Tumialis; sample design and methodology – Artur Szpalek, Franciszek Mika; investigation and data collection – Artur Szpalek, Franciszek Mika; data analysis and interpretation – Dorota Tumialis, Anna Mazurkiewicz; roles/writing – original draft; writing – review and editing – Anna Mazurkiewicz, Dorota Tumialis.

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