

***Helix lucorum lucorum* Linnaeus, 1758 (Pulmonata, Helicidae) in the city of Moscow**

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An isolated but numerous population of *Helix lucorum lucorum* has been found in a small area of the south-western part of Moscow City, in the central part of European Russia for the first time. This is the northernmost known colony of the species.

Key words: non-indigenous species, urban fauna, Gastropoda, Russia

Introduction

Helix lucorum is one of the largest and widely distributed species of the genus, with a wide range extending from north-western Iran and Turkey in the east up to Italy in the west (SCHILEYKO 1978, SYSOEV & SCHILEYKO 2005, KORÁBEK et al. 2014). The species has been widely introduced to many places beyond its natural distribution, among others to England, France, Spain, Czechia, Slovakia, southeastern part of Ukraine and central Russia (PALMER 2010, MIENIS & RITTNER 2010, QUIÑONERO SALGADO et al. 2010, PELTANOVÁ et al. 2012, ČEJKA & ČAČANÝ 2014, BALASHOV et al. 2013, BULAVKINA & STOYKO 2007). In Russia, native populations of the species live in Krasnodarskiy Krai [Краснодарский Край], Aдыгhea [Адыгhea], and Rostov Region [Ростовская область] (SCHILEYKO 1978; pers. obs.). Except this natural range, species was introduced to Penza Region [Пензенская область] (BULAVKINA & STOYKO 2007, 2009; STOYKO & BULAVKINA 2010). In Penza [Пенза], it occupies limited areas within the city (the stations of young naturalists, zoo, overgrown vacant lots, etc.). According to BULAVKINA & STOYKO (2007), ten years ago, the number of these snails was quite large there. The recent findings of introduced populations demonstrate potential of this snail to colonize new areas, located far from its natural range.

Locality and habitat description

A new population in Moscow, which is the northernmost of the species, is reported here for the first time. This population is located in south-western part of Moscow along the Sevastopolskiy Avenue [Севастопольский проспект] on the property of the Institute of Theoretical and Experimental Physics (ИТЕП; 55°40'35"N 37°35'16"E; Figs 1, 2A). From there, snails periodically crawl out on the lawns along the fence of ИТЕП, where they have been discovered for the first time (Figs 2B–H). The area of ИТЕП occupies a part of the former area “Cheryomushki-Znamenskoye” [Черемушки-Знаменское] and is defined by Nakhimovskiy Avenue [Нахимовский проспект] in the south,

Sevastopolskiy Avenue [Севастопольский проспект] in the east, Bolshaya Cheryomushkinskaya street [Большая Черемушкинская улица] in the west and Dmitri Ulyanov street [Дмитрия Ульянова улица] in the north. The total area occupied by the institute is 37.5 hectares. The property of the Institute is not publicly accessible and snails were observed only on the lawn along the fence by Sevastopolskiy Avenue [Севастопольский проспект].

A main part of the territory of the Institute holds the eighteenth century “Cheryomushki” [Черемушки] manor – a monument of architecture and landscape art. There are about 6000 trees and shrubs in the park area, including linden, maple, pine, larch, oak, and arborvitae, some several hundred years old (BELFOR et al. 2015). The lawn located along the fence on the Sevastopolskiy Avenue [Севастопольский проспект] is planted with linden trees; behind the fence, there are linden and maple trees and wild grape bushes. The bulk of *H. lucorum* specimens was observed on the fence and the adjacent lawn in front of the institute buildings 25/113 and 25/101. The distribution of the snails within the ИТЕП area is unknown, but according to institute employees the highest concentration of snails was also observed around those buildings. On the other sites of the ИТЕП property, the snails did not occur (Bolshaya Cheryomushkinskaya [Большая Черемушкинская улица] and Dmitri Ulyanov [Дмитрия Ульянова улица] streets). Thus, the population occupies an area which probably does not exceed the length of 300–350 metres along the fence of the ИТЕП from the Sevastopolskiy Avenue [Севастопольский проспект] (Fig. 1). In the centre of the colony, the density reached up to seven specimens/m² (observations made in September 2015 and 2016). In the outskirts of the colony, the density did not exceed 2–3 specimens/m².

According to the Moscow naturalist Alexey Shudra, who informed me about the existence of the colony for the first time, the colony is present for at least 30 years. Accord-

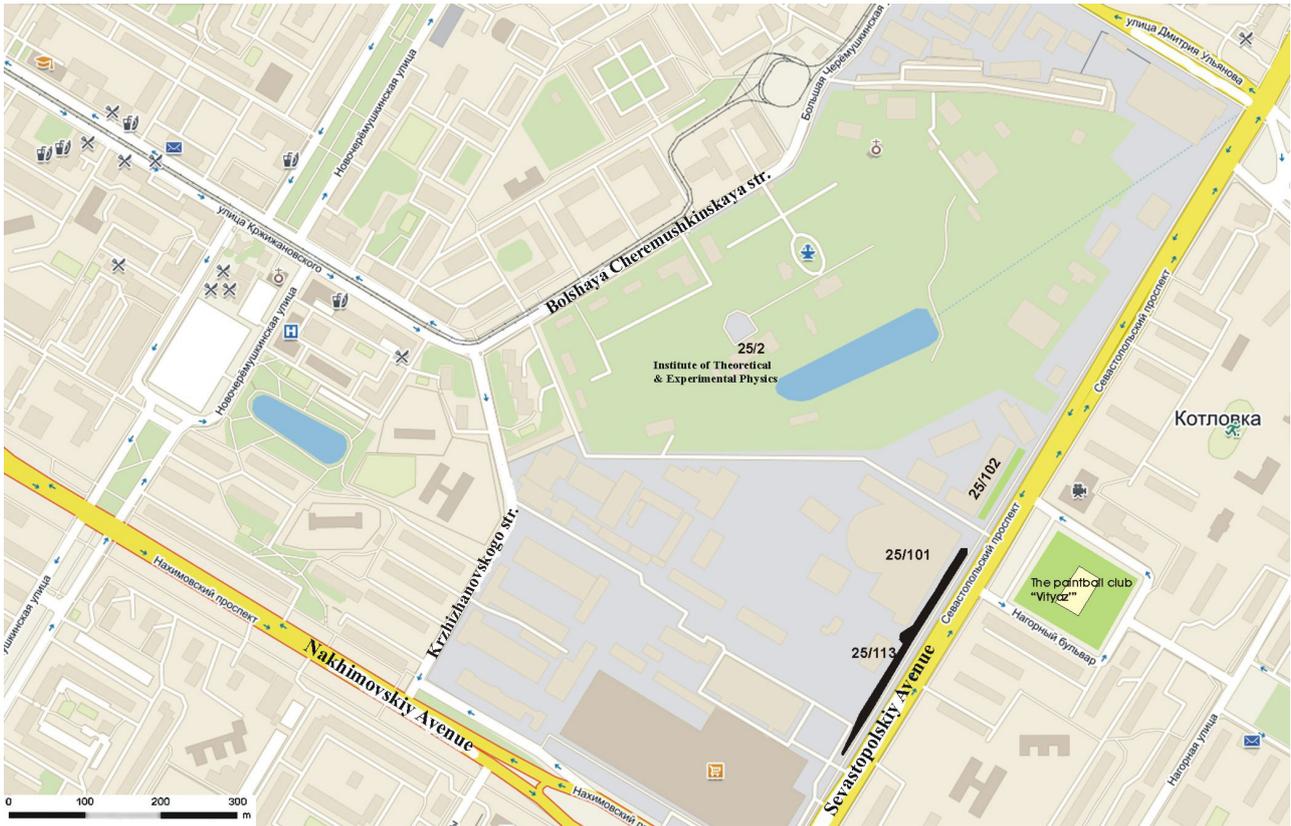


Fig. 1. Scheme of the *Helix l. lucorum* location in the city of Moscow (black filling). Background map: **MAPY.CZ**, © Seznam.cz, a.s., © OpenStreetMap, © NASA.

ing to the ITEP staff, the colony appeared in the mid-late 1960s. It is possible that snails were used as laboratory animals for experiments and were accidentally or intentionally released into the park.

With high probability it can be possible to establish the geographic origin of the colony on the basis of molecular data, kindly provided by Ondřej Korábek (Prague). The analysed individual yielded a 16S haplotype that appears characteristic for Georgia and adjacent north-eastern Turkey. The observed colony consists of typical *Helix lucorum lucorum* (Fig. 3), which is a common form in the Caucasus and Transcaucasus, thus the Caucasian origin is likely.

It is interesting to note that live specimens of *H. lucorum lucorum* have already been found in Moscow previously (EGOROV 2015, SCHIKOV 2016), but in these cases no stable population were formed. However, I have received information from Yuri Kantor (pers. obs.) about the probable existence of another population of this species also in the south-west of Moscow City. He informed me that *H. l. lucorum* overwinters in Moscow since the 1980s, when employees of the Institute of Higher Nervous Activity and Neurophysiology of RAS (IHNA RAS) [Институт Высшей Нервной Деятельности и Нейрофизиологии

РАН] released some individuals collected in the Caucasus *H. l. lucorum* that have been kept in a vivarium into the bushes of the institutional garden. He collected them in 1987–1988. The IHNA RAS is located in the South-West Administrative District of Moscow, Kon'kovo [Коньково] municipal district, between streets of Butlerova [Бутлерова улица], Academician Volgin [Академика Волгина улица], Obruchev [Обручева улица], and Profsoyuznaya [Профсоюзная улица]. Territory of the Institute, according to Yuri Kantor, is rich in shrubs and trees, which can be confirmed also by a Google satellite photo of the area (GOOGLE 2017) and photo from the Institutional site (IHNA RAS 2017). However, the current existence of this colony is not known.

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Fig. 2. A: Landscape of Sevastopolskiy Avenue adjacent to the fence of ITEP, September 14, 2015; B: Live specimen of *H. l. lucorum* on the base of the fence of ITEP from street side, September 14, 2015; C: Area behind the fence of the territory of the ITEP between 24/101 and 25/113 buildings, September 14, 2015; D: Live snails on the ITEP fence from street side opposite 25/113 building, September 14, 2015; E: Live specimen of *H. l. lucorum* on a trunk of linden-tree in the alley along Sevastopolskiy Avenue, September 14, 2015; F: Live snail on the ITEP fence from street side opposite 25/113 building, September 14, 2015; G: Live specimen of *H. l. lucorum* on the cement section of ITEP fence along Sevastopolskiy Avenue, September 14, 2015; H: Live specimen of *H. l. lucorum* on the base of the ITEP fence from street side, May 11, 2016. All photos by Roman Egorov.



Fig. 2. See previous page.

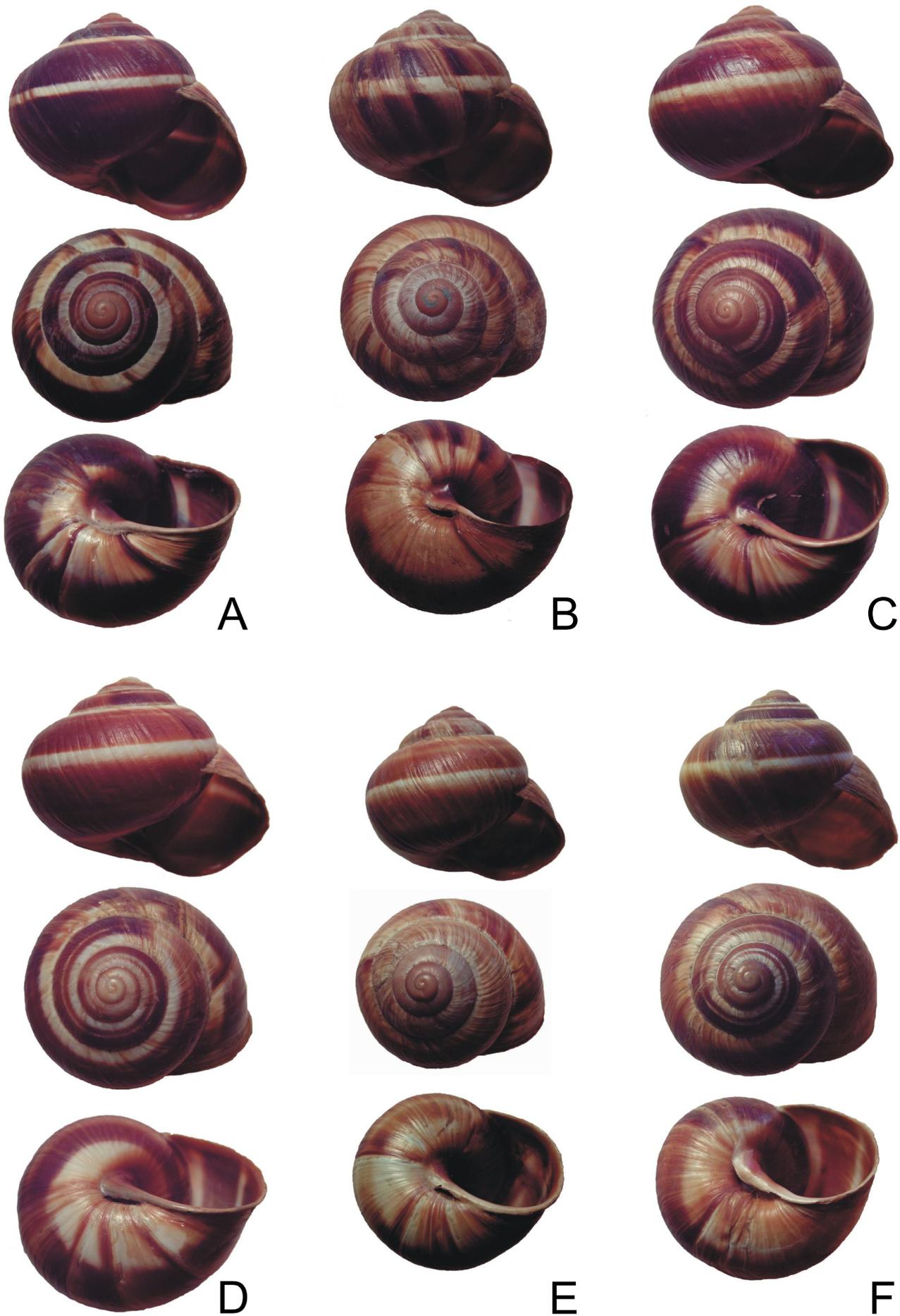


Fig. 3. See next page.

Fig. 3. *Helix l. lucorum*. A-B: Shells of specimens in different ages, the linden alley along the ITEP fence on Sevastopolskiy Avenue, September 14, 2015, coll. R. Egorov, collection of the Zoological Museum of Moscow State University (ZMMU), Lc-40374, A: H 39.0 mm, D 43.0, B: H 35.0 mm, D 39.0 mm (juvenile), C: East of Moscow City, Izmailovskii forest park, about 10 m to east from Glavnaya Alleya road, August 9, 2014, coll. R. Egorov, H 40.8 mm, D 47.0 mm, collection of the ZMMU, Lc-40373; D: South Russia, Krasnodarskiy Krai, Gelendzhik, on the territory of the station of the Institute of Oceanology, October 5, 1995, H 36.1 mm, D 44.1 mm, coll. R. Egorov; E: Georgia, Tbilisi, on the territory of the Botanical Garden, H 39.5 mm, D 41.0 mm, coll. A. Kuznetsov; F: Georgia, Mtskheta, Santavro monastery, H 34.4 mm, D 39.3 mm, coll. A. Kuznetsov.

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