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New records of *Lymnaea (Stagnicola)* species in the West Ukraine (Gastropoda: Basommatophora: Lymnaeidae)

With 3 figures

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Abstract. *Lymnaea occulta* (JACKIEWICZ, 1959) is reported from the new locality in Transcarpathian region of Ukraine. *L. palustris* (MÜLLER, 1774) is the only species of this subgenus found in Volyn region (northwest Ukraine), some specimens are reported to have unusually long penis sheath. The published data for East Europe are analysed and geographic separation of *L. palustris* and *L. turricula* (HELD, 1836) is discussed.

Kurzfassung. Neue Nachweise von Arten des Subgenus *Lymnaea (Stagnicola)* aus der West-Ukraine (Gastropoda: Stylommatophora: Lymnaeidae). – *Lymnaea occulta* (JACKIEWICZ, 1959) wird von einem neuen Fundort in der Transkarpaten-Region der Ukraine nachgewiesen. *L. palustris* (MÜLLER, 1774) ist die einzige Art des Subgenus in der Wolhynischen Region (Nordwest-Ukraine), einige dieser Exemplare weisen eine lange Penisscheide auf. Die für Ost-Europa publizierten Daten werden analysiert, die geographische Trennung von *L. palustris* und *L. turricula* (HELD, 1836) wird diskutiert.

Introduction

Since the profound revision carried out by JACKIEWICZ (1959, 1962, 1988), several forms of freshwater lymnaeid snails earlier considered intraspecific varieties of *Lymnaea palustris* (MÜLLER, 1774) are regarded as distinct species. While anatomical grounds for this division are more or less clear, the names of particular species and their subgeneric and/or generic placement are disputable. For example, GLÖER & MEIER-BROOK (1994) distinguish the genus *Stagnicola* JEFFREYS, 1830 with six species: alongside species of the "*Lymnaea palustris*" complex: *S. corvus* (GMELIN, 1791), *S. palustris* (MÜLLER, 1774), *S. turricula* (HELD, 1836), *S. occultus* (JACKIEWICZ, 1959) and *S. fuscus* (C. PFEIFFER, 1821), he includes here also *Lymnaea glabra* (MÜLLER, 1774). In the latest review of JACKIEWICZ (1998), *Stagnicola* is considered as a subgenus of *Lymnaea* and includes only three species (*L. palustris*, *L. turricula* and *L. occulta*). *Lymnaea corvus* and *L. vulnerata* KÜSTER, 1862 (the latter corresponds to *S. fusca* in the sense of GLÖER & MEIER-BROOK) are placed in the subgenus *Lymnaea* s. str.; *L. glabra* is included in the genus *Omphiscola* RAFINESQUE, 1819.

Species splitting in *Stagnicola* was criticized by KILIAS (1992), who studied variability of anatomical characters in some Hungarian populations of these snails. Answering to the critics, JACKIEWICZ (1996) provided new arguments supporting her point of view. Even more profound splitting was suggested by KRUGLOV & STAROBOGATOV (1986, 1993). In the latest publications of these authors, more than 20 species of the group *Stagnicola* (also regarded as a subgenus of *Lymnaea*) are distributed between four sections: *Stagnicola* s. str., *Fen-*

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Fig. 1: Localities mentioned in this paper: 1 – locality of *Lymnaea occulta* (Khust, Transcarpathian region); 2,3 – records of *L. palustris* characterized by long penis sheath (2 – Zalesye, Shatsk National Park; 3 – Lake Turskoye); 4 – typical *L. palustris* (river Turia, north of Kovel).

ziana SERVAIN, 1881, *Ladislavella* B. DYBOWSKI, 1913 and *Berlaniana* KRUGLOV & STAROBOGATOV, 1986.

Despite the taxonomic discrepancies mentioned above, variation of morphological characters and distribution of the forms assigned to *Stagnicola* in Western and Central Europe are relatively well studied. At the same time, the data for Ukraine remain fragmentary. The first records of *L. occulta* confirmed by anatomical characters were published by STADNICHENKO (1968). However, later on Ukrainian authors (STADNICHENKO & STADNICHENKO 1984, MISECHKO 1987) were influenced by the ideas of species splitting and their results are hardly compatible to those of the West European investigators.

In the course of the field work in West Ukraine carried out in summer 1998, some new collections of species of "*Lymnaea palustris*" complex were made. Investigation of these materials contributes to the better understanding of their distribution in East Europe. The original data were compared to those provided by KRUGLOV & STAROBOGATOV (1993) and re-interpreted in the framework of the taxonomic concept of JACKIEWICZ (1959–1998) accepted in most of the European countries.

Material and methods

This investigation is based on personal collections. Major part of the material was obtained in the course of international expedition "Prypat Marshes of Ukraine" in July and August 1998. The study area included Turia and upper Prypat drainages, as well as Shatsk National Park (Volyn region, Ukraine). Transcarpathian region (Zakarpatsye) was visited in June 1998.

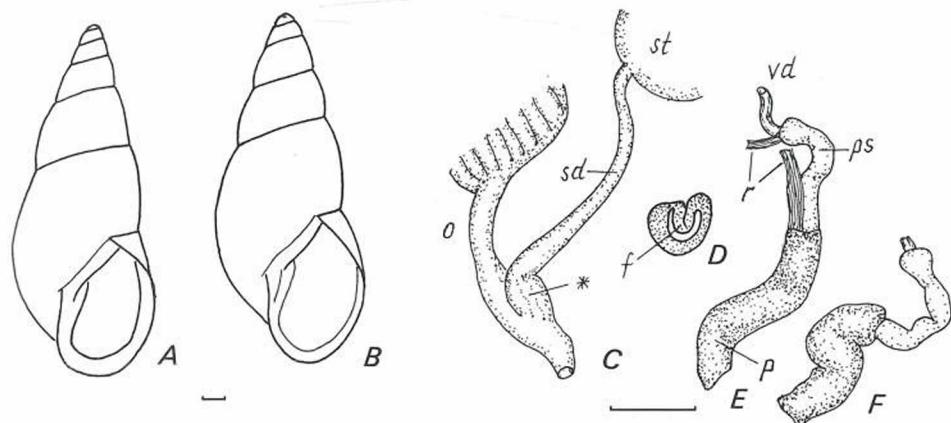


Fig. 2: *Lymnaea occulta* (JACKIEWIECZ) from Khust: A, B – shells; C – distal part of female genitalia; D – cross section of prostata; E, F – distal parts of male genitalia; f – fold of prostata, o – oviduct, p – preputium, ps – penis sheath, r – retractor muscles, sd – spermathecal duct, st – spermatheca, vd – vas deferens, * – swollen basal part of the spermathecal duct. Scale bar = 1 mm.

Voucher specimens are to be placed at the Museum of Natural History (Museum für Naturkunde) in Berlin and in the Staatliches Museum für Tierkunde Dresden.

Different types of water bodies (rivers, ponds, small lakes, marshes and wet meadows) were surveyed. The snails were collected by hand and fixed in 70 % ethanol. Dissections, measurements and drawings were made by using stereomicroscope MBS-1 with a camera lucida. Species identifications and taxonomy are based on JACKIEWICZ (1998).

Results

The numerous population of *Lymnaea occulta* was found in artificial pond near Khust, Transcarpathian region, Ukraine (Fig. 1). A lot of 16 specimens was collected on 14th June 1998. The shells (Fig. 2, A–B) were characterized by the medium size (height up to 16.8 mm, width up to 7.0 mm), with relatively high spire (height/width index 2.25 to 2.8, aperture height 0.40 to 0.47 of the shell height). The aperture in adult specimens had a thickened whitish edge, which is a characteristic feature of the species (JACKIEWICZ 1998). Belonging of the collected specimens to *L. occulta* is confirmed by the characters of genitalia: equal length of preputium and penis sheath, prostata with one internal fold and swollen basal part of the spermathecal duct (Fig. 2, C–F).

Lymnaea palustris was found in 15 localities of Volyn region. While shell form and genital characters (inner structure of prostata and form of spermathecal duct) of the collected specimens corresponded in general to the published descriptions (GLÖER & MEIER-BROOK 1994, JACKIEWICZ 1998), the notable variation in proportions of the male genitalia was observed. The longest penis sheath (ratio of the penis sheath length to the preputium length varied between 1.2 : 1 and 1.65 : 1) was reported for the populations from Lake Turskoye near Zabolotye and a ditch near Zalesye in Shatsk National Park (both in Volyn region) (Fig. 3, A–D). Such specimens were not typical for *L. palustris* (ratio of penis sheath length to preputium length about 1 : 1), but still markedly different from *L. turricula* (penis sheath at least twice as long as preputium). The shells in these populations were rather large (height up to 18 mm, width up to 7.7 mm), height/width index varied between 2.15 and 2.5, aperture height was 0.41 to 0.45 of the shell height, aperture edge thin.

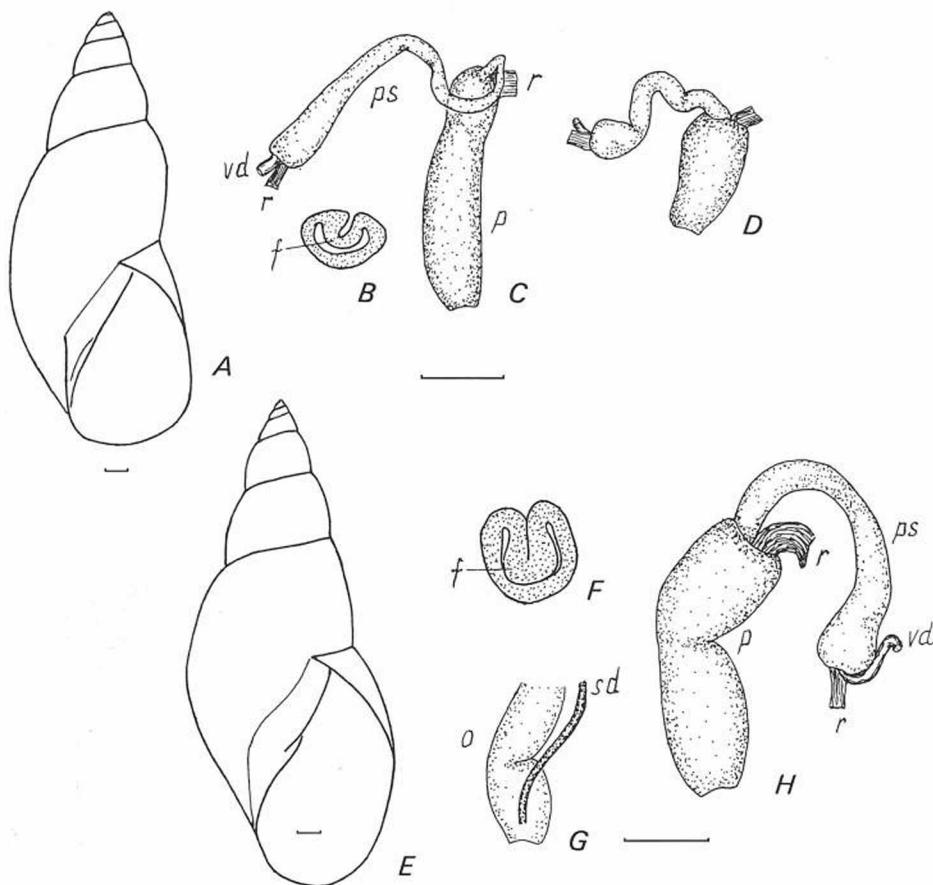


Fig. 3: *Lymnaea palustris* (MÜLLER) from Volyn region: A-D. Specimens from Zalesye (A - shell, B - cross section of prostata, C, D - distal parts of male genitalia). E-H. Specimens from the Turia river (E - shell, F - cross section of prostata, G - distal parts of female genitalia, H - the same of male genitalia). Abbreviations the same as in the Fig. 2. Scale bar = 1 mm.

Specimens of *L. palustris* with typical male genitalia were collected in river Turya to the North from Kovel, Volyn region (Fig. 3, E-H).

Alongside *L. (Stagnicola) palustris*, *L. (Lymnaea) corvus* (GMELIN, 1791) were collected in many localities. No deviations from the published descriptions of this species were observed and no intermediates between *L. corvus* and *L. palustris* were found.

Discussion

The new locality of *L. occulta* fills the gap between the Central European localities (JACKIEWICZ 1998) and the localities in Lviv and Ivano-Frankivsk regions published by STADNICHENKO (1968). It means that continuous distribution area of this species includes at least the western part of Ukraine.

Presence of *L. palustris* in the study area and absence of *L. turricula* are also consistent with distribution of these species in other European countries. It follows from the published data (GLÖER & MEIER-BROOK 1994, JACKIEWICZ 1998) that the former of the two mentioned species is rare in Central and Southern Europe, while the latter does not occur in the North. It is notable that the study area lies near the probable south boundary of the *L. palustris* main distribution area. That is why intermediate state of genital characters in some of the sampled populations is not surprising. Specimens with similar intermediate characters but much more affiliated to *L. turricula* were found by KILIAS (1992) in Hungary. Probably, the two species are not absolutely separated and some genetic exchange between them may take place in the contact area.

Figures of the male genitalia published by KRUGLOV & STAROBOGATOV (1993) make possible to find correspondence between the taxonomic names used by the Russian authors and those accepted by JACKIEWICZ (1998). Sections *Stagnicola* and *Fenziana* are characterized by relatively short penis sheath (approximately of the same length as preputium) and correspond to *L. palustris* sensu JACKIEWICZ. General distribution area of these sections is Euro-Siberian. Southern limit of distribution in east Europe is not clear from the cited publication, but presence of *L. palustris* (*L. palustris syriacus* (MOUSSON, 1861)) in Armenia and Middle east is confirmed anatomically. It is notable that that interpretation of *L. turricula* by KRUGLOV & STAROBOGATOV (1993) is totally different from that of JACKIEWICZ (1998): the Russian authors characterize this species by relatively short penis sheath and therefore include in the section *Fenziana*. *Lymnaea occulta* (JACKIEWICZ, 1959) is synonymized by KRUGLOV & STAROBOGATOV (1993) with *L. vulnerata* (KÜSTER, 1962) and included in the section *Ladislavella* DYBOWSKI, 1913 alongside two other species from Siberia and Amur basin with the similarly swollen basal part of spermathecal duct. The latter are probably conspecific to the Siberian populations of *L. occulta* mentioned by JACKIEWICZ (1998). The forms with long penis sheath treated by JACKIEWICZ (1998) as *L. turricula* are included in the section *Berlaniata* KRUGLOV & STAROBOGATOV, 1986; their presence in South Europe, Transcaucasia, South-West Siberia and Kazakhstan is confirmed by the published figures of male genitalia (KRUGLOV & STAROBOGATOV 1993). Two species of this group: *L. berlani* (BOURGUIGNAT, 1870) and *L. danubialis* (SCHRANK, 1803) are found by Ukrainian authors (STADNICHENKO & STADNICHENKO 1984, MISECHKO 1987) in the south of the Polessie area (Zhitomyr and Chernigiv regions). It means that *L. turricula* sensu JACKIEWICZ (1959) is distributed to the south of the area covered by this investigation.

Geographical trend in variation of the penis sheath length within the "Lymnaea palustris" complex and a certain extent of geographic separation between *L. palustris* and *L. turricula* may be supposed from the data provided here. The first species seems to have mainly North-Palaearctic distribution, with sporadic records in the southern areas: central and south-east Europe, Transcaucasia, etc.; the second species has clear South-Palaearctic distribution. However, these preliminary conclusions should be checked by revision of the available museum collections from the territory of the former USSR and critical analysis of the data published by Russian authors. The new collecting in the area seems to be also important. While separation between *L. corvus* and *L. palustris* is confirmed by their sympatric distribution and absence of any intermediate forms, relations between *L. palustris* and *L. turricula* seem to be more intricate and need more careful investigation by genetic methods.

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