

A new species of the genus *Limax* in Romania

(Gasteropoda, Limacidae).

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The fauna of Romania still offers many surprises as regards the identification of certain rare or new species, as only few observations and investigations have been made on the spot, and these quite sporadically for certain groups of animals. Extensive, isolated regions remained, which enjoyed a lesser attention as far as collecting is concerned. The geographical position of Romania being known, it being at a crossroad of climatic influences and with a particular geomorphological structure and a very heterogeneous geological substratum, it is to be expected that species should appear, different from those known in Central Europe; as here a series of specific influences exist, which are conditioned by certain local factors.

In a previous work (GROSSU & LUPU 1960) we motivated the description of certain new species of *Limax* in the Dobrudja, under the influence of the Balkan climate and the resemblance of the fauna of this province with the species of the Caucasian mountains. Also recently (GROSSU 1964), in a study of the molluscs from the north of the province of Oltenia, attention was drawn on certain Balkan-Dalmatian influences and on the existence of some vestigial elements, endemic or new species in this portion of Romania. The species of the genus *Limax*, which we describe below, belongs to the category of these surprises, found in a region little or not at all studied from the malacological point of view, comprised in hilly region of the western portion to the south of the Carpathian mountains: Oltenia and Arges.

Limax tigvenius n. sp.

Externally, the animal has the aspect of *Limax* and less that of *Deroceras*, the adult forms are of a dark-grey colour on the back and particularly on the mantle and gradually of a lighter colour on the sides towards the sole. There are no stains or spots of another colour on the body. In the youthful stage it resembles to the species of genus *Deroceras*, its colour being slightly yellowish or light gray with slight traces of some darker stripes, disposed latero-laterally. Towards the end of the tail, there is a short, little evident keel. The uniformly coloured sole has three longitudinal fields, the middle one smoother, and the lateral ones more striated. The rugosities of the tegument have shallow, almost uniform, evident, much elongated furrows, directed almost horizontally. The mantle covers the fore third part of the body, with its hind margin widely curved (fig. 1).



Fig. 1. *Limax tigvenius* n. sp.

The animal is 38 mm long (in alcohol) and 14 mm high and thick. Alive, elongated, it exceeds 60-65 mm, thus belonging to the category of small and medium sized limacidae. The young specimens collected in autumn, 15 mm long, have sometimes their reproductive system already well-outlined and this may serve to the identification of the species.

The tegument is relatively thick, resistant, and the animal's body kept in alcohol is sufficiently rigid, even in young specimens. The shell (limacella) is resistant, of an oval shape, without evident concentric striae, in exchange with some radiary striae, formed of discontinued, opaque, rectangular spots, which lend it a particular ornamentation. The edge of this shell presents a thin, unequally wide membrane. The dimensions of the shell are 6-8 mm long and 4-5 mm wide (fig. 2 b). The intestine has 6 branches cecumless.

The reproductive system is particularly conspicuous, as against the known species, by a strong, cylindrical, thick penis. The ovotestis is of moderate dimensions, with acinis of relatively small dimensions, it is externally well-outlined, with a straight, thin duct, or with only a few slight coils. The albumigenous gland is comparatively small, while the spermovi duct is thick with a few coils; at the surface it is gelatinous, white, almost transparent, without the prostate being discernible on its entire length. The narrow oviduct has in its middle part an oval dilatation, which narrows gradually down towards its discharge into the atrium. The ovaly elongated seminal receptacle has a narrow channel which runs between the penis and the oviduct — in a parallel way with the latter and discharges into the atrium, beside the penis. In exchange, the penis is much dilated having the aspect of an irregularly cylindrical, extended leather bottle, at whose subterminal end, the ductus deferens discharging itself; here the genital retractor muscle is likewise attached. This muscle is

short and much developed. The ductus deferens is comparatively short, uniformly thick along its entire length, and does not thicken at neither end (fig. 2, A). In an subadult specimen of smaller dimensions, the proportion between the penis and the other organs of the sexual apparatus is still greater (fig. 3), merely the spermoviduct is not so much developed and coiled as in adult forms, while the oviduct has an uniform thickness. Within the penis there are some longitudinal folds, unevenly thickened, which diminish much its lumen.

Material, habitat, variation. For the first time I found a single semiadult individual of this species, which drew particularly my attention, in a lot of numerous specimens of *Deroceras*, gathered on 28. IX. 1965, close to the Tigveni commune, on the Topolog river (Argeş region). The animal, whose reproductive apparatus was altogether peculiar, is 17 mm long (in alcohol), of a brown-greyish colour, with two darker, very little evident stripes, on its sides. At first, I considered it as a variation of *Limax tenellus* NILSSON, though

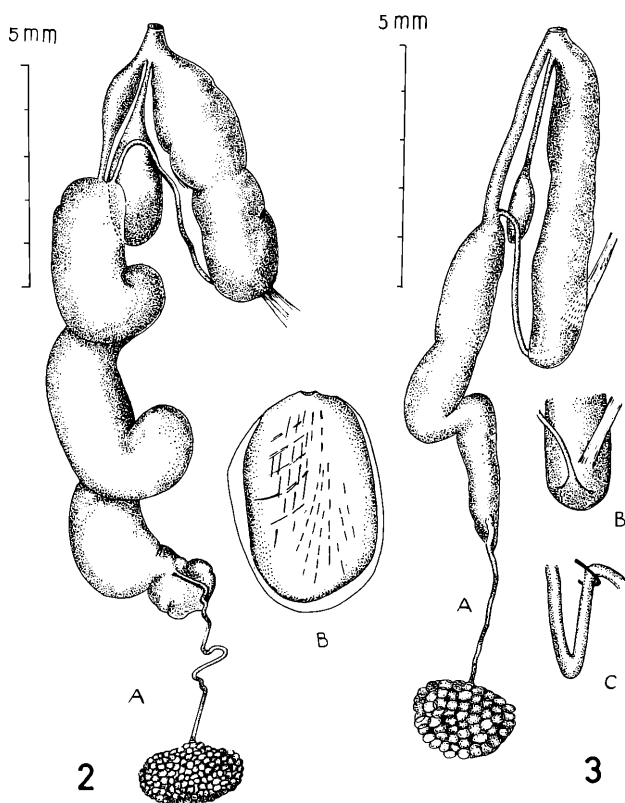


Fig. 2-3. *Limax tigvenius* n. sp. — 2) A = reproductive system; B = shell. — 3) A = reproductive system in an adult specimen; B = terminal portion of the penis, with the retractor muscle and the insertion of the ductus deferens; C = terminal portion of the coecum intestine.

the ductus deferens did not present any dilatation. In the spring of 1966, I checked up the existence of this species in the same locality, and collected 10 specimens, besides other species of the genus *Deroceras*. Though the largest specimens were 20 mm long (in alcohol). I established that all were young forms. These were, however, likewise of a grey colour, more intense on the back and with two darker stripes on the sides. In spite of prolonged and insistent investigations, no adult specimens were found. In the autumn of the same year, I searched personally the collecting region in the neighbourhood of the Tigveni commune and only found two adult specimens. In another lot of limacidae, collected in the month of November of the same year (19. XI. 1966) by LOTUS MESTER, a preparator at the chair of zoology, I identified again one single adult specimen of *Limax tigvenius*, found in the Oltet valley (Lesca forest) in the north-eastern part of Oltenia. Both collecting localities are situated in the region of sub-Carpathian hills, in places with logs of wood, in cut down forest or in clearings, near the forest. The adult specimens no longer present any trace of lateral stripes, and are of an exclusively grey colour. Though the weather was very favourable for collecting, and though many species of *Deroceras reticulatus* were mainly found, the new species of *Limax* was very seldom met with. In spring we likewise met with only young forms, while in autumn exclusively with adult forms. From these findings it may be concluded that the *Limax tigvenius* only lives one year, and that in autumn the adults lay the eggs, after which they die; during the winter the young remain in the ground, under the snow, in order that in spring they should continue their life at the surface, when young forms were exclusively met with. A similar case was likewise met with in *Limax tenellus*, to which we think that it is very closely connected.

Holotypus: Inv. 1075, Tigveni-Argeş, 4. XI. 1966, coll. GROSSU; paratypes: collection of the Senckenberg Museum, Frankfurt 1 adult specimen (SMF 186843a); Inv. 1076/1, Tigveni, 28. IX. 1965, leg. LOTUS MESTER; Inv. 1077/10, juv. Tigveni, 24. VI. 1966, leg. FL. TUDORESCU; coll. Senckenberg Museum, Frankfurt a. M. 2 juv. (SMF 186843b); Inv. 1078/1, Lesca forest, Oltet valley, Oltenia, 19. XI. 1966, leg. LOTUS MESTER, coll. GROSSU.

Discussions. The young specimens of this newly described species are very similar to *L. tenellus*, nevertheless, at the same dimension they not always of a brown-yellowish colour. The reproductive apparatus has likewise some similarities with *tenellus* a fact which determined me to examine attentively the difference between these two closely related species of the genus *Limax*. In the collection, as comparison material, we had specimen of *tenellus*, collected in Romania, from the Semenici-Banat mountains; I likewise have material from Holland (received from dr. REGTEREN ALTENA) and from Czechoslovakia (received from JAROSLAV BRABANIC). I take this opportunity to offer him my heartiest thanks for his great spirit of collaboration. By studying very attentively their external description and the anatomy of the genitalia (reproductive system), we find that all these specimens correspond for *tenellus* to the classic description in the consulted literature (shape, colour, dimension and widening of ductus deferens at its discharge into the penis). In the available literature-regarding the description of *tenellus* (EHRMANN, HESSE, GERMAIN, ADAM, QUICK, SIMROTH, a. o.), we ascertained that no concordance always existed, particularly regarding the dimension of the animal, but the anatomical cha-

racter of the ductus deferens is constantly met with in all these descriptions. It may be concluded that *L. tenellus* is of smaller dimensions (35 mm long, extended alive, and the shell 3.5×2 mm), its yellow-brown colouring, with two darker stripes on the sides, and the penis with a glandular appendix, into which the ductus deferens is discharged, according to certain authors, even the ductus deferens would end with this glandiform dilatation at its discharge into the penis. Comparatively with this species, *limax tigenius* is of larger dimensions, the colour of the adult is grey-blackish, the shell (limacella) has another form and is much larger (6.8×10.5 mm), and as far as its anatomy is concerned, the ductus deferens has a uniform thickness, without any special dilatation, with the aspect of a gland observed at its discharge into the penis, which appears so characteristic in *tenellus*. The size of the penis is, in comparison with the other organs of the reproductive apparatus, exaggeratedly large in the new species described.

There are likewise some resemblances with *L. tenellus*, which lead us to the conclusion that they belong to the same subgenus *Malacolimax* MALM. The fact is interesting that most species which belong to this subgenus are to be found in the countries around the Mediterranean Sea (Algeria, Tunisia, Balearian Islands, Jerusalem-Israel) and only three of them penetrate deeper into Europe: *L. mrazeki* SIMROTH, Bosnia, *L. kostali* BABOR in Bohemia and *L. tenellus* widely spread throughout Central Europe.

As regards *Limax nictelius* BOURGUIGNAT, likewise known especially in the north of Africa, it was recently found only in the south-western part of Romania and in Bulgaria (GROSSU & LUPU 1963, 1965). This species differs completely from *L. tigenius* by many characters. So far, we failed to find these three species of the subgenus *Malacolimax* together in the same localities.

We consider that the presence of *L. tenellus*, *nyctelius* and *tigenius* n. sp. in the south-west of Romania is not accidental, as in this part there are to be found, even among gastropods, numerous other endemic and rare species. It is very probable that certain geomorphological and paleontological (historical) conditions determine a certain specific climate which has permitted here the existence and survival of these Balkan and Mediterranean elements.

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