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**Contributions to the knowledge of the slugs of Yugoslavia (*Arionidae*,  
*Milacidae*, *Limacidae*, *Agriolimacidae* – *Gastropoda*, *Pulmonata*)**

[With 20 figures]

**Abstract.** The following names are newly synonymized: *Amalia adelpha* Soós, 1924 and *Milax clerxi* RÄHLE, 1977 = *Tandonia albanica* (Soós, 1924) (the last name is valid); *Limax pestaniensis* RÄHLE, 1977 = *Limax conemenosi* BOETTGER, 1882; *Limax macedonicus leucopus* HESSE, 1928 = *Limax graecus* SIMROTH, 1889; *Lehmannia galiciciensis* RÄHLE, 1977, *Lehmannia ohridiana ohridiana* RÄHLE, 1977, *Lehmania ohridiana bigorskii* RÄHLE, 1977 = *Lehmannia szigethyae* WIKTOR, 1975. *Limax maximus* var. *carbonaria* BOETTGER, 1885 and *Limax macedonicus* HESSE, 1928 are probably identical with *Limax graecus* SIMROTH, 1889.

Numerous new Yugoslavian records are given, and many taxonomically important structures are described.

In Yugoslavia a particularly rich slug fauna is found, many of the slug species being considered endemic to this area. Although the relevant literature is fairly extensive, it still contains many obscurities as regards the taxonomy, and the range of distribution of many species is not known. Having a fairly large material at my disposal, I have been able to clarify some of the problems and provide some useful zoogeographic information, this being the subject of this paper.

In the case of species that are better known I have omitted synonyms and descriptions, because these can easily be found in the literature. I have used them only where new data could be added, or where there are taxonomic doubts.

Most of the material was collected on my request, or was originally intended for my investigations. I wish to express my cordial thanks to all the collectors, whose names can be found in the text, for their thoughtfulness and effort in doing me this great favour.

The evidential materials used in the present study can be found in different collections. In the text the following abbreviations of their names have been used:

JU – a private collection of J. URBAŃSKI, Poznań (Poland),

MCB – Museo Civico di Scienze Naturali „Enrico Caffi”, Bergamo (Italy),

TMB – Természettudományi Múzeum Allattára (Hungarian Nat. Hist. Mus.), Budapest (Hungary),

- NHMW — Naturhistorisches Museum Wien (Austria),  
 IZPAN — Instytut Zoologii PAN (Institute of Zoology, Polish Academy of Sciences), Warszawa (Poland),  
 RNL — Rijksmuseum van Natuurlijke Historie, Leiden (Holland),  
 SMF — Senckenbergisches Museum, Frankfurt a/M. (Federal Republic of Germany),  
 TR — A private collection of T. RADJA, Zagreb (Yugoslavia),  
 WM — A private collection of W. J. M. MAASSEN, Duivendrecht (Holland).

### Arionidae

#### *Arion (Mesarion) subfuscus* (DRAPARNAUD, 1805)

Material: Soriška Planina Pass (1280 m), SE of Bohinjska Bistrica (Slovenija), leg. A. RIEDEL, 24 May, 1976, 2 + 2 juv. spec. (IZPAN); 2 km NWW of Leskova Dolina (Slovenija), at the foot of the Snežnik Mt., leg. A. RIEDEL, 20 May, 1976, 2 spec. (IZPAN); Plitvice (Hrvatska), on lakes, leg. ?, 11 May, 1956, 2 spec. (IZPAN); Zvezda near Sarajevo (Hercegovina), leg. ?, date ?, 4 spec. (IZPAN); on a dammed lake near Mavrovo (Makedonija), leg. W. MAASSEN, May, 1975, 1 spec. (WM).

The limit of the southern range of distribution of this species probably runs across Yugoslavia. Its course is not, however, known yet.

### Milacidae

#### *Milax nigricans* (SCHULTZ, 1836)

*Parmacella nigricans* SCHULTZ (in PHILIPPI), 1836: 125, Pl. 8, Fig. 1. Terra typica: Sicilia.  
*Amalia insularis* LESSONA et POLLONERA, 1882: 57, Pl. 1, Figs. 32-33. Terra typica: Sardegna and Sicilia.  
*Amalia gagates*: LESSONA et POLLONERA 1882: Pl. 2, Figs. 1, 2.

Material: Split (Dalmacija), leg. T. RADJA, 12 June, 1976, 1 + 1 juv. spec. (TR).

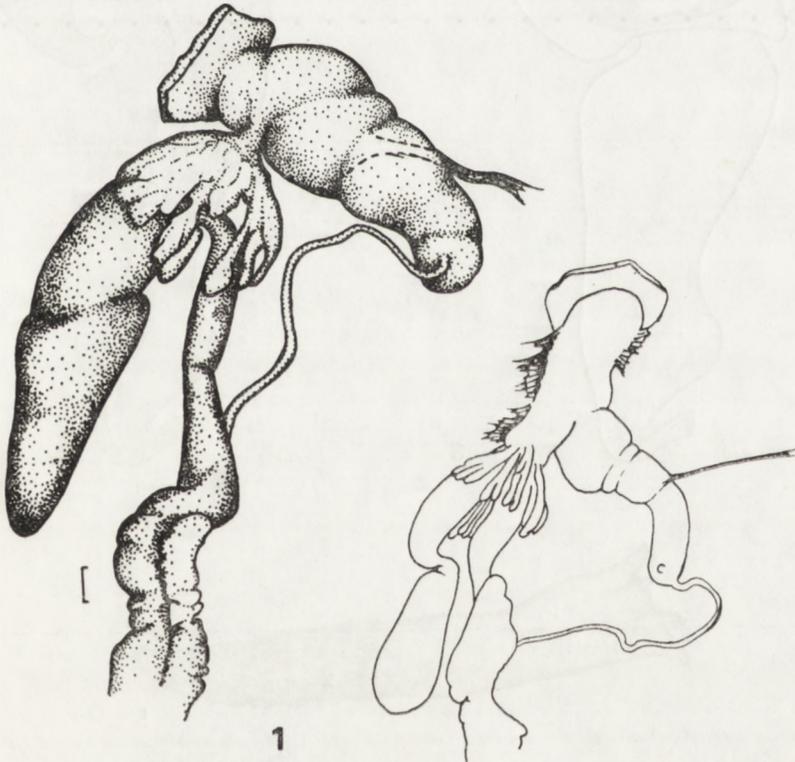
Not reported from Yugoslavia before. Many, especially the earlier authors mistook it for *Milax gagates* (DRAPARNAUD, 1801). A similar mistake was probably made by reporting *M. gagates* from Yugoslavia. A diagnostic feature of *M. nigricans* is the presence of papillae, or spines on the stimulator.

#### *Tandonia albanica* (Soós, 1924)

*Amalia (Malinastrum) albanica* Soós, 1924: 191, Figs. 10-12. Terra typica: Albania. The syntypes got destroyed.  
*Amalia (Malinastrum) adelpha* Soós, 1924: 192, Fig. 13. Terra typica: Albania. The syntypes got destroyed. **Syn. n.**  
*Milax clerxi* RÄHLE, 1977a: 275, Fig. 1a-g. Terra typica: in the environs of Lake Ohrid (Yugoslavia, Makedonija). Holotype: RNL (Moll. alc. 9030). **Syn. n.**  
*Milax (Subamalia) albanicus*: WAGNER 1931a: 65, Fig. 12.  
*Milax (Subamalia) adelphus*: WAGNER 1931a: 66, Fig. 13.

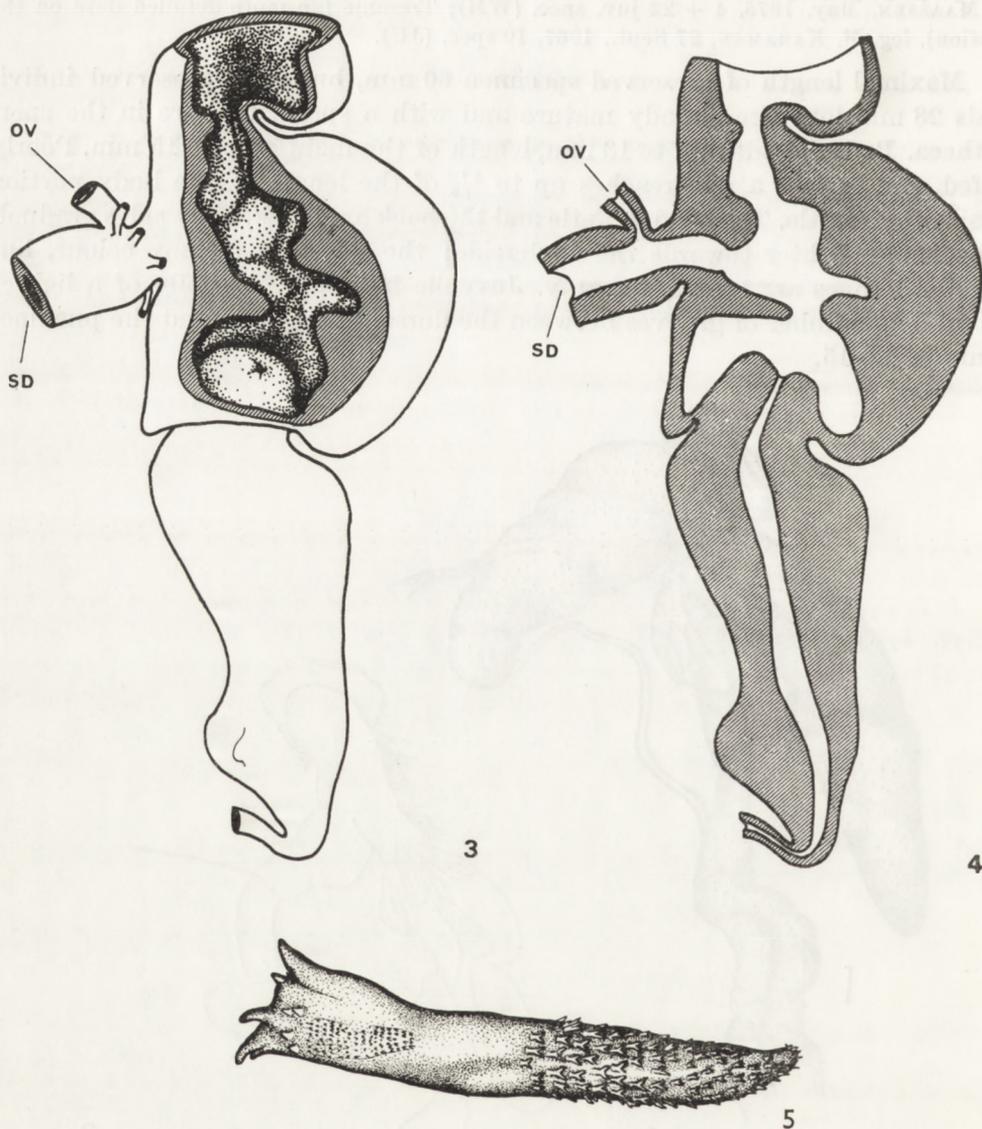
Material: Environs of the spring of Ljuta near Dobrota (Črna Gora), leg. L. PINTÉR, E. and P. SUBAI, A. SZIGETHY, 22 July, 1972, 1 spec. (TMB); 3 km before Mavrovi Hanovi near the road to Debar (Makedonija), the shore of Radika, leg. L. PINTÉR, E. and P. SUBAI, A. SZIGETHY, 18 July, 1972, 1 + 4 juv. spec. (TMB); 6 km before Trnica near the road to Debar (Makedonija), leg. L. PINTÉR, E. and P. SUBAI, A. SZIGETHY, 17 July, 1972, 1 + 3 spec. (TMB); Sv. Jovan Bigorski monastery near Debar (Makedonija), in the woods and near a waterfall, leg. MIKUSKA, SIPOS, TOPÁL, SZIGETHY, 3 Oct., 1975, 3 spec. (TMB); 3 km N of Lukovo, along the river Drim, N of Ohrid (Makedonija), on rocks and under stones, leg. W. MAASSEN, May, 1975, 4 + 22 juv. spec. (WM); Tresanic (no more detailed data on the location), leg. M. KARAMAN, 27 Sept., 1967, 10 spec. (JU).

Maximal length of preserved specimen 60 mm, but some preserved individuals 28 mm long are already mature and with a spermatophore in the spermatheca. Body breadth up to 13 mm, length of the mantle up to 15 mm. Poorly roofed, the keel as a rule reaches up to  $\frac{1}{3}$  of the length of the body portion outside the mantle. The head, mantle and the back are black, body sides gradually becoming lighter towards the underside; the sole of a creamy colour, but its lateral zones are sometimes gray. Juvenile individuals usually of a lighter colour. The number of grooves between the dorsal medial line and the pneumostome is 12–15.



Figs. 1–2. Genital organs of *Tandonia albanica*: 1 – specimen from Trnica; 2 – young specimen from Lukovo.

Genitalia (Figs. 1-4). Relative to the body size, these are small. Glandula hermaphroditica, of an elongate shape, is found behind the last loop of the intestine. The hermaphrodite duct very thin and more or less of the same length as the spermooviductus. Vas deferens thin, slightly longer than the penis along



Figs. 3-5. *Tandonia albanica*: 3 - penial papilla, specimen from Sv. Jovan Bigorski; 4 - longitudinal section through penis and epiphallus, specimen from Sv. Jovan Bigorski; 5 - spermatophore, specimen from Mavrovi Hanovi. OV - oviduct, SD - spermatheca duct.

with the epiphallus. It opens apically, somewhat asymmetrically. The epiphallus separated from the penis by a small narrowing in which the retractor muscle has its insertion. Being somewhat thinner than the penis, the epiphallus slightly tapers towards the back. On its posterior end two distinct nodules are usually found (Figs. 2-3). Variable in shape, the penis a little inflated. The papilla found inside the penis is of a hemispherical shape. Inside the penis several swellings can be found (Figs. 3-4). The oviduct, in form of a simple tube, is about the same length as the penis together with the epiphallus. The spermatheca duct thick and fleshy. The spermatheca itself is thin-walled, membranous. In young individuals it is oval in shape (Fig. 2), and when filled with spermatophore it assumes the shape of a cone. The lobate accessory glands envelope a very short vagina. The atrium represents an extension of the penis, whereas the female duct opens laterally.

About 15 mm long, the spermatophore (Fig. 5) possesses an envelope of a copper-golden colour. The anterior, narrowed end is covered with bifurcate spines. On its posterior end strong hooks and short spines are found. A characteristic feature is that the spermatophore is not divided into a thin hair-like part and a widened receptacle, as it often is in *Milacidae*.

Distribution: so far it is known from a small area between Őrna Gora (near Kotor) and S-Makedonija (Šar Planina and the environs of Lake Ohrid), and so far as S-Albania in the south.

Remarks. The species is difficult to distinguish, on the basis of outer appearance, from several other black slugs occurring in this area, especially from *T. macedonica* (RÄHLE). During ontogenesis parts of the copulatory organs, especially the spermatheca, undergo considerable changes of shape. The specimens I had at my disposal conformed to the descriptions of the appearance and structure of genitalia given by Soós (1924). The identification was proved by the appearance of the spermatophore which I found in several specimens. The characteristic features of this structure are of considerable taxonomical value. After examining a large series of specimens I came to the conclusion that *Amalia adelpha* Soós had been described on the basis of juvenile individuals of *Tandonia albanica*. I have also examined the material from Albania used by WAGNER (1931a), and then preserved at the Naturhistorisches Museum in Vienna. WAGNER distinguished between *Milax albanicus* and *M. adelphus*, although to my mind he was dealing only with one species, the small differences being the results of differences in development stage, or preservation methods. WAGNER's material contains specimens derived from the Korab Mountains (Terra typica) and identified as *M. adelphus*. Apart from this, WAGNER mentions (p. 66) that he compared his material with the holotypes still existing at that time.

After having studied a paratype of *Milax clerxi* RÄHLE and a large number of individuals collected in the Ohrid region, I came to the conclusion that *M. clerxi* is a junior synonym of *T. albanica*. It should also be pointed that there

is a certain similarity between *T. albanica* and *T. reuleauxi* (CLESSIN, 1887), found in the region of Kotor. A redescription of this species has recently been given by ALTENA (1975). I have also been able to do a detailed study of this slug (WIKTOR 1979). *T. reuleauxi* is slightly larger, and its accessory glands are much smaller, whereas its spermatophore (this being most important) is of a different shape. Its anterior part is narrow, and its surface covered with multi-ramified spines (WIKTOR 1979).

### *Tandonia budapestensis* (HAZAY, 1881)

Material: at the entrance to the Sv. Jovan Bigorski monastery near Debar (Makedonija), leg. L. PINTÉR, E. and P. SUBAI, A. SZIGETHY, 17 July, 1972, 2 juv. spec. (TMB).

So far reported from Yugoslavia only from Istra and Hrvatska. It probably occurs over a much larger area, especially in synanthropic environments.

### *Tandonia cavicola* (SIMROTH, 1916)

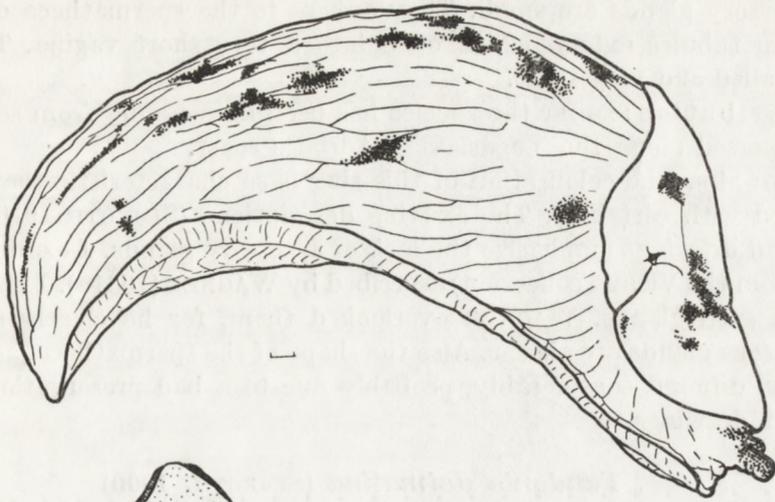
*Amalia cavicola* SIMROTH, 1916: 4, Figs. 1-2. Locus typicus: Jama na Visokoj in caves (? Dalmacija, Yugoslavia). No information about preserved syntypes.

*Milax (Milax) cavicola*: WAGNER 1931a: 65, Fig. 11.

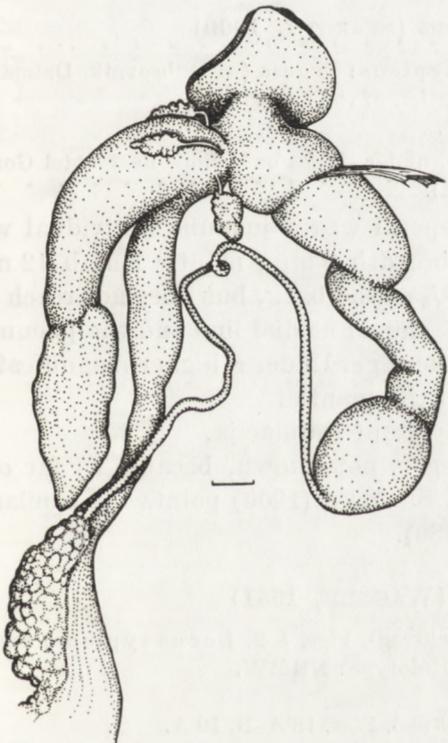
Material: Šipán Island (Hrvatska) to the left from the port of Šipanska Luka, leg. SIPOS, SZIGETHY, TOPÁL, 22 Sept., 1975, 1 + 1 juv. spec. (TMB); Zavala (Hercegovina), in rock crevices, leg. A. RIEDEL, 1 Aug., 1959, 1 juv. spec. (IZ PAN).

The largest specimen I had was 65 mm long, about 12 mm in breadth and 12 mm in mantle length. According to SIMROTH (1916), it attains as much as 72 mm. The keel, poorly roofed, of one specimen extends as far as the mantle, and that of another is limited to the posterior body end. Between the dorsal medial line and the pneumostome 14 grooves are found. Body colour is creamy-white with black patches (Fig. 6), as though blotted with China ink, on the mantle as well as on the back and sides of the body. The dark pigment does not spread along the furrows on the skin. Head and tentacles are of a slightly gray colour. There is no dark pigment in the keel, or on the line that forms its extension. The sole is creamy-white in colour.

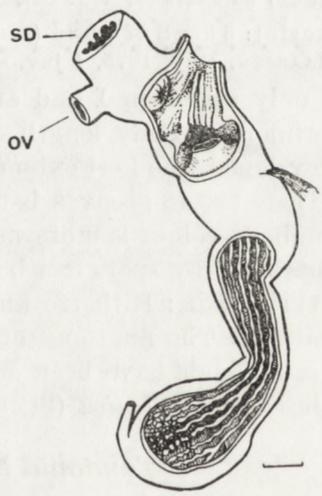
Genitalia (Fig. 7). SIMROTH presents three different drawings of the genitals of this slug. The specimens I have examined are most similar to Figure 2B in SIMROTH's paper (1916). Vas deferens is long, longer than the penis together with the epiphallus. It opens apically and slightly at an angle in relation to the spherical epiphallus. The penis is short; its retractor muscle is poorly developed and attached in a small narrowing. Inside the penis (Fig. 8) a small papilla of a simple structure is found, and in the epiphallus numerous longitudinal folds are seen. The oviduct is of the form of a thick straight tube. The thin-walled spermatheca tapers at its posterior end. In the thick, fleshy spermatheca duct longitudinal folds are present. It opens into the atrium by a fleshy, spherical papilla (Fig. 8).



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Figs. 6-8. *Tandonia cavicola*: 6 - external view, specimen from Zavala, 7 - genital organs, specimen from Šipan Island; 8 - open penis and epiphallus (penial papilla and vaginal papilla visible), specimen from Šipan Island. OV - oviduct, SD - spermatheca duct.

The accessory glands are small. They adhere to the spermatheca duct. From them thin tubules extend which open into a very short vagina. The atrium is thin-walled and very short.

**Distribution:** so far the species has been known only from several localities dispersed along the Yugoslavian Adriatic coast.

**Remarks.** The colouration of this slug is so characteristic that it can be recognized with certainty. The existing descriptions (SIMROTH 1916, WAGNER 1931a) and drawings emphasize the lack of accessory glands. I examined a specimen (from the Vienna collection) described by WAGNER (1931a). I have found it possesses such glands. WAGNER overlooked them, for he clearly states that the accessory glands are absent. Also the shape of the spermatheca, as presented in figures, differed considerably, probably due to a bad preservation, or inaccuracy of drawings.

? *Tandonia dalmatina* (SIMROTH, 1900)

*Amalia dalmatina* SIMROTH, 1900: 106. Locus typicus: Ragusa (= Dubrovnik, Dalmacija, Yugoslavia). No information on the preservation of the syntypes.

*Milax (Milax) dalmatinus*: WAGNER 1931a: 62.

**Material:** 5 km S of Ohrid (Makedonija), under stones on a slope near hotel Gorica, leg. W. MAASSEN, May, 1975, 1 juv. spec. (WM).

The only specimen I had at my disposal was a juvenile individual with genital primordia. Body length 43 mm, breadth 9 mm, mantle length 12 mm. Poorly developed, the keel extends over  $\frac{2}{3}$  of the back, but does not reach the mantle. There are 13 grooves between the dorsal medial line and the pneumostome. The body colour is uniformly ochre-orange. Under a higher magnification slightly darker gray spots can be seen on the mantle.

**Distribution:** Hitherto known only from Dalmacija.

**Remarks.** The anatomy of this slug is not known, because so far only juvenile individuals have been described. SIMROTH (1900) points the similarity of this slug to *T. hellenica* (SIMROTH, 1886).

*Tandonia kusceri* (WAGNER, 1931)

*Milax (Milax) Kusceri* WAGNER, 1931a: 72 (Nachtrag), Figs. 1–2. Locus typicus: Svetka Petka (= Svetog Petka) near Niš (Srbija). Holotype: NHMW.

*Milax (Milax) Kusceri*: WAGNER 1931b: 200.

*Milax (Milax) kusceri*: URBAŃSKI et WIKTOR 1968: 86, Figs. 18 A–B, 19 A.

**Material:** Dubrovnik (Dalmacija), Lapad, a garden, leg. L. PINTÉR, E. and P. SUBAI, A. SZIGETHY, 26 July, 1972, 2 juv. spec. (TMB); Ohrid (Makedonija), a park east of the town, under stones in brushwood, leg. J. URBAŃSKI, 7 Nov., 1970, 1 juv. spec. (JU).

This slug is found in large numbers throughout Bulgaria and partially in Roumania. Its range is not known yet, but it does not seem to extend far beyond north-eastern Balkans. It often occurs in synanthropic environments, and is most probably easily imported. I know it from Odessa (LIKHAREV and WIKTOR 1980) and Turkey, but it may have been introduced there.

***Tandonia macedonica* (RÄHLE, 1974)**

*Milax (Subamalia) macedonicus* RÄHLE, 1974: 51, Figs. 1a-f, 2a, b. Locus typicus: northern slope of Galičica Mountains, south of Peštani (Makedonija). Holotype: SMF 230842.

Material: Galičica Mts<sup>1</sup>, near Lake Prespansko (Makedonija), 1200 m a.s.l., leg. W. MAASSEN, 8 May, 1976, 1 + 3 juv. spec. (WM); Galičica Mts<sup>1</sup> (Makedonija), 1200 m a.s.l., 11 km from a road bifurcation near Trepka at the road to Otesevo, leg. W. MAASSEN, 13 and 19 May, 1976, 10 spec. (WM); 1 km N of the port of Trepka, S of Ohrid (Makedonija), leg. W. MAASSEN, 11 May, 1976, 19 + 23 juv. spec. (WM); the environs of Lake Ohrid, Peštani (Makedonija), leg. W. MAASSEN, 5 + 11 juv. spec. (WM); S of Ohrid (Makedonija), Sv. Stefan, 1000 m a.s.l., under stones, leg. W. MAASSEN, May, 1975, 1 spec. (WM).

In the description of the species RÄHLE (1974) included a number of drawings showing also the variability of structure of the genitals. Little can be added to the description except one thing, namely that the organ which RÄHLE named the „Reizkörper” or stimulator, is in fact the papilla. The organ is so specific that it represents a feature on the basis of which this slug can most easily be recognized. To complete the picture, I refer to Figure 9.

Distribution: hitherto known only from the environs of Lake Ohrid in S-Makedonija.

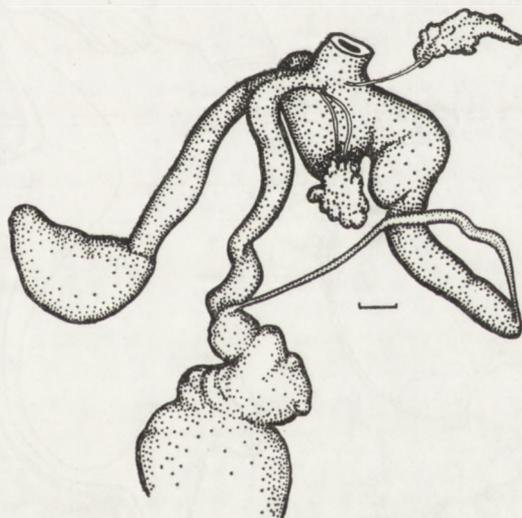
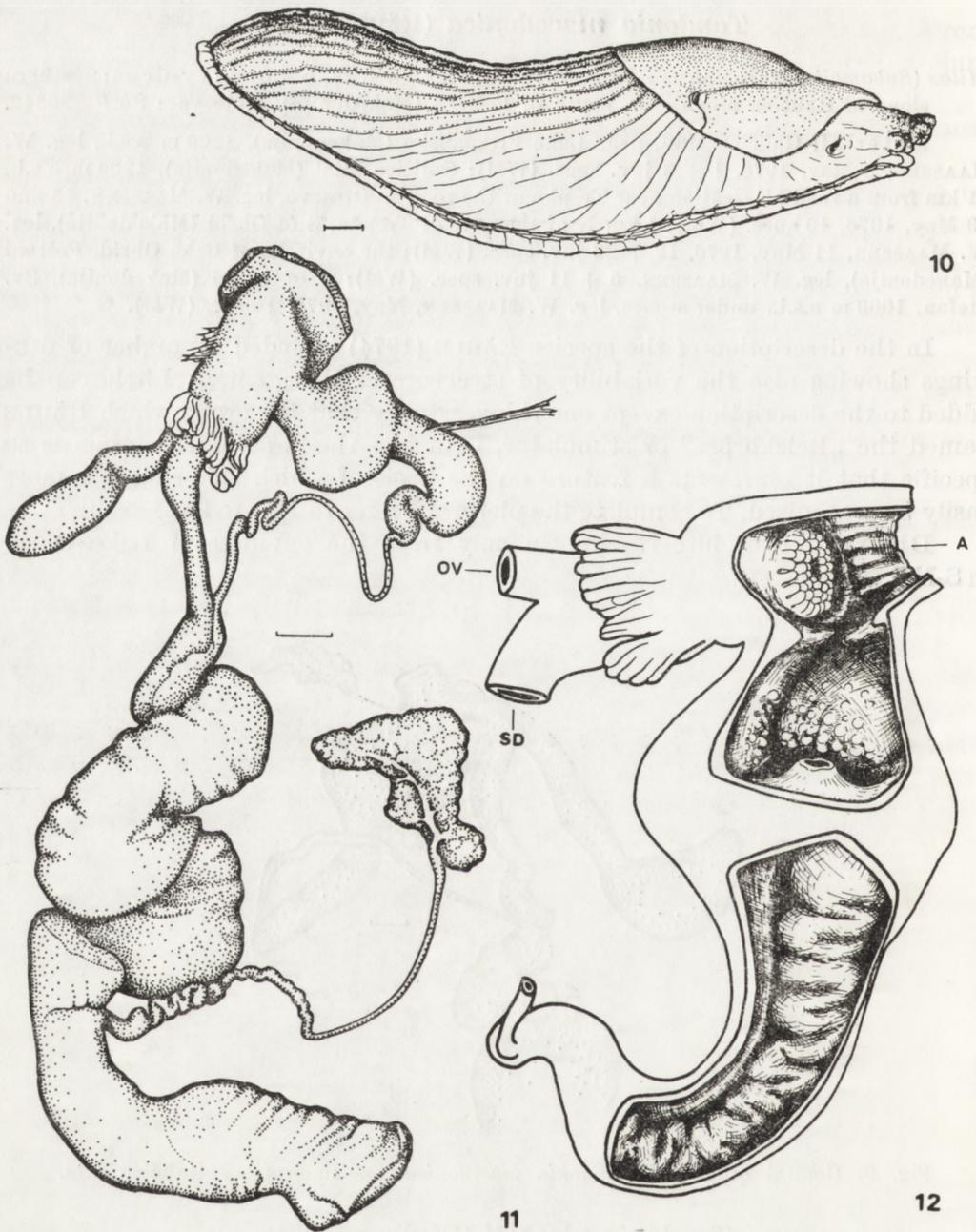


Fig. 9. Genital organs of *Tandonia macedonica*, specimen from Galičica Mts.

***Tandonia ploebsti* (WAGNER, 1931)**

*Milax (Milax) ploebsti* WAGNER, 1931c: 47, Pl. 4, Fig. 1. Locus typicus: Volosca (= Volosko, Istra, Yugoslavia). No information about the preservation of the syntypes.

<sup>1</sup> The original label "Galicja Gebirge" is probably a misspelling for Galičica Gebirge = Galičica Mts.



Figs. 10–12. *Tandonia ploebsti*, specimen from Soriška: 10 – external view; 11 – genital organs; 12 – longitudinal section through penis and epiphallus. A – atrium, OV – oviduct, SD – spermatheca duct.

**Material:** the Soriška Planina Pass, SE of Bohinjska Bistrica (Slovenija, Julijskie Alpy), 1280 m a.s.l., small calcareous rocks in a fir-beech wood, leg. A. RIEDEL, 24 May, 1976, 4 spec. (IZ PAN).

The largest preserved specimen is 22 mm long, 6 mm broad, its mantle being 7 mm long. Poorly roofed, the keel reaches the posterior edge of the mantle. There are 7 grooves between the keel and the pneumostome. The mantle and the back together with the keel are uniformly light-gray-brown; the body sides become lighter and lighter downwards to become creamy; the head and tentacles are blackish (Fig. 10), whereas the sole is creamy.

**Genitalia** (Figs. 11–12). The vas deferens is thin and longer than the penis and epiphallus together. After being straightened the epiphallus appears to be cylindrical, gradually tapering towards the posterior end; it is 1.5 times as long as the penis. The vas deferens opens at the top, at acute angle to the epiphallus. The penis is claviform and with a very short handle. In its broadened posterior portion it contains a little papilla of the shape of a cone cut at the top (Fig. 12), and further to the front there are swellings covered with papillae. The oviduct is of the form of a straight tube, slightly widened in its anterior part. The spermatheca is strongly elongate, almost tube-shaped, whereas the spermatheca duct forms its continuation, and there is no clear narrowing at the junction of these two parts. Covered, almost completely, with small, compact accessory glands, the vagina is very short. The atrium, very short and cylindrical, is in line with the female duct, so the penis opens into it laterally. Inside the atrium a very complex vaginal papilla, covered with finger-like processes, is found (Fig. 12). In another specimen the papilla was ill-defined and the corresponding area was tuberculate, strongly roofed. The formation of the vaginal papilla, shown in the figure, is probably the result of a partial evagination of the vagina into the atrium. In the anterior portion of the atrium longitudinal folds are found.

**Distribution:** So far the species has only been known from locus typicus.

**Remarks.** It is quite probable that *T. ploebsti* is a junior synonym of *Amalia baldensis* SIMROTH, 1910 (p. 334, Fig. 11; terra typica: Monte Baldo, "Agordoschlucht?" N-Italy). An explanation is required, because the description is very concise and contains a clear statement that the accessory glands are absent. SIMROTH's description (1910) is accompanied by a drawing with the caption "*Am. Hessei*", although this name does not appear in the text. HESSE (1928), who had collected the slug described by SIMROTH, says the caption under the drawing is a printing error (!).

### ? *Tandonia schleschi* (WAGNER, 1930)

*Milax (Milax) Schleschi* WAGNER, 1930a: 48, Figs. 4–5. Terra typica: Krain (S-Slovenija).

The syntypes got destroyed.

*Milax (Milax) Schleschi*: WAGNER 1930b: 106, Figs. 3–4, Pl. 1, Fig. 1.

Material: Makarska (Dalmacija), leg. A. JANKOWSKI, 3 July, 1929, 2 + 3 juv. spec. (IZ PAN); Kamniška Alpe (Slovenija, Julijskie Alpy), 1550 m a.s.l., leg. A. and E. GITTENBERGER, 29 Aug., 1971, 3 juv. spec. (RNL).

Specimens, strongly contracted due to preservation, are 32 mm long, 7 mm broad and 12 mm in mantle length. Posterior body end wedge-like, tapering. The keel reaches the posterior edge of the mantle. There are 12 grooves between the keel and the pneumostome. The specimens from Makarska are discoloured, brown; originally, the back was probably black, and the sides lighter and lighter downwards. This is the colouration of the remainder of the specimens. The sole is creamy in colour.

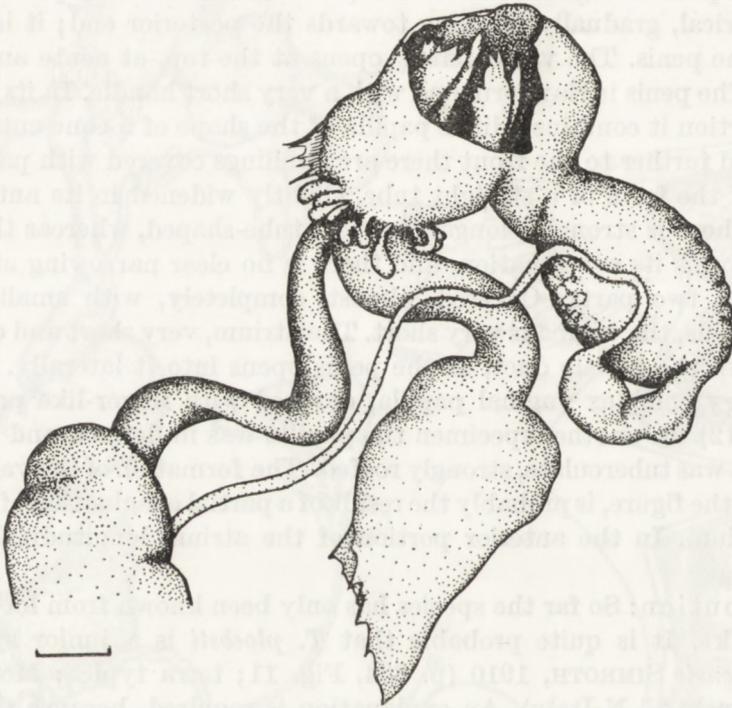


Fig. 13. Genital organs of *Tandonia schleschi*, specimen from Makarska.

Genitalia (Fig. 13). Adult specimens were badly preserved and partially damaged. The vas deferens is thin and almost twice as long as the penis together with the epiphallus, the latter being short and slightly narrowed in the anterior portion. In each of the two adult specimens the penis was barrel-like due to inflation and contained a partially formed spermatophore which distended the whole organ, while its spines, pressing against the penis walls, led to the formation of papillae on their surface. It was impossible to establish the place of attachment of the thin retractor muscle. In the adult individuals the spermatheca was found to be damaged. The spermatheca duct was fleshy, thick and

slightly broadened in the anterior part. The oviduct was tube-like, about as long as the spermatheca together with the spermatheca duct. The vagina is very short and surrounded by accessory glands in form of short unbranched outgrowths. A long atrium represents an extension of the female duct, so the penis opens laterally. Inside the atrium 5 flattened structures can be seen whose free sharp-pointed ends are directed towards the sex orifice. They are hard as if impregnated with calcium salts.

**Distribution:** not known. Locus typicus has not been established exactly, because the label said only „Krain”.

**Remarks.** As the preserved specimens I examined were in bad condition and similar to several other black species from Yugoslavia, WAGNER's description (1930a) being too concise, I have been unable to establish exactly whether the slugs examined by me belong to *T. schleschi*. The specimens from Kamiška Alpe were accompanied by a label attached by ALTENA. The label reads. "*Milax* cf. *adensameri* WAGNER, 1931". I have had the chance to examine the syntypes of *M. adensameri* (preserved in NHMW). Their atrium does not possess the very characteristic structures, and there are other differences in the structure of the genitals.

### *Tandonia serbica* (WAGNER, 1931)

*Milax (Milax) serbicus* WAGNER, 1931a: 63, Figs. 8–10. Locus typicus: Svetka Petka (= Svetog Petka) near Niš (Srbija). Syntypes in NHMW.

*Milax (Milax) serbicus*: URBAŃSKI et WIKTOR 1968: 82, Figs. 17, 18 C–D, 19 B.

**Material:** Dubrovnik (Dalmacija), Lapad, a garden, leg. L. PINTÉR, E. and P. SUBAI, A. SZIGETHY, 26 July, 1972, 2 juv. spec. (TMB).

The specimens did not differ from those found in Bulgaria. The locality in Dubrovnik may be a synanthropic environment (a garden).

**Distribution:** Srbija and south-western Bulgaria.

### *Tandonia sowerbii* (FÉRUSAC, 1823)

**Material:** Ohrid (Makedonija) near a wayside shrine of Sv. Joven Kaneo, a steep rock on a lake, limestone, leg. J. URBAŃSKI, 7 Nov., 1970, 1 spec. (JU); S of Ohrid (Makedonija), Sv. Naum, 1100 m a.s.l., under stones, leg. W. MAASSEN, May, 1976, 1 spec. (WM); Split (Dalmacija), leg. T. RADJA, 12 June, 1976, 1 spec. (TR).

The species is spread in the Mediterranean region; known, for instance, from Istra, Dalmacija, Makedonija.

## *Limacidae*

### *Limax (Limax) cinereoniger* WOLF, 1803

**Material:** Leskova Valley at the foot of the Snežnik Mt., east of Ilirska Bistrica (Slovenija), a beech-fir wood, leg. A. RIEDEL, 20 May, 1976, 1 spec. (IZ PAN); Zagabria (Zagreb), leg. VALLE et MORETTI, 13 Aug., 1971, 1 juv. spec. (MCB); Sarajevo (Bosna), near the road

to Vasin Han, leg. A. RIEDEL, 22 July, 1959, 1 spec. (IZ PAN); Han Stjenice, Rabar Mts. (Bosna), leg. W. H. NEUTEBOOM, 16 July, 1979, 1 spec. (RNL); Dživarsko Polje near Trebinje (Hercegovina), at the entrance to the cave Pećina Zazubak Velki, leg. A. RIEDEL, 29 July, 1959, 1 juv. spec. (IZ PAN); Čakor pass (Kosovo, Srbija), leg. W. H. NEUTEBOOM, 17 July, 1979, 1 spec. (RNL); Avala Mt. near Beograd (Srbija), a deciduous wood, leg. A. RIEDEL, 13 July, 1959, 2 spec. (IZ PAN); Galičica Mts<sup>1</sup> (Makedonija), 1600 m a.s.l., 12 km from a road bifurcation near Trepka to Ohrid, leg. W. MAASSEN, 13 May, 1976, 1 spec. (WM); Senožeće (†Dalmacija), leg. VALLE, 10 June, 1964, 1 juv. spec. (MCB).

A species found over a vast area of Europe, including probably whole Yugoslavia.

### *Limax (Limax) maximus* LINNAEUS, 1758

Material: S of Lukovo on the river Drim N of Ohrid (Makedonija), leg. W. MAASSEN, May, 1975, 1 spec. (WM); Galičica Mts<sup>1</sup> (Makedonija), 1600 m a.s.l., 11 km from a road bifurcation near Trepka towards Otesevo, leg. W. MAASSEN, 13 May, 1976, 1 spec. (WM).

Distribution: mainly south-western Europe. It probably occurs throughout Yugoslavia; it is easily imported and often inhabits synanthropic environments.

### *Limax (Limax) conemenosi* BOETTGER, 1882

*Limax conemenosi* BOETTGER, 1882: 100. Locus typicus: Prevesa (Greece). There is no information on the preservation of the syntypes.

*Limax (Heynemannia) conemenosi* var. *multipunctata* BOETTGER, 1885: 158, Figs. 1-3.

Locus typicus: Hagios Demetrios, Ossa Mts (Greece).

*Limax pestaniensis* RÄHLE, 1977b: 228, Figs. 2b, 3b, 4b. Locus typicus: Peštani, the environs of Lake Ohrid (Makedonija). Holotype SMF 245001. **Syn. nov.**

*Limax (Limax) conemenosi*: URBAŃSKI et WIKTOR 1968: 58, Fig. 3.

*Limax conemenosi*: RÄHLE 1977b: 227, Figs. 2a, 3a, 4a.

Material: 6 km S of Ohrid (Makedonija), under stones and pieces of wood near Orce Nikolov, leg. W. MAASSEN, May, 1975, 1 spec. (WM).

Distribution: northern Greece, Kerkira, Kefalonia, Kiklades. In Bulgaria it shows an island-type of distribution, being known as a synanthropic species. The localities of its occurrence in Makedonija are probably natural.

### *Limax (Limax) graecus* SIMROTH, 1889

? *Limax maximus* var. *carbonaria* BOETTGER, 1885: 159, Pl. 4, Fig. 6. Terra typica: Tessalia, Greece. No information on the syntypes.

*Limax graecus* SIMROTH, 1889: 7, Figs. 1, 9, 10. Terra typica: Korax Mts (Greece). No information on the holotype.

? *Limax macedonicus* HESSE, 1928: 10, Pl. 2, Fig. 10. Terra typica: Golešnica Planina (Makedonija). No information on the syntypes. **Syn. nov.**

*Limax macedonicus leucopus* HESSE, 1928: 12, Pl. 1, Fig. 8. Locus typicus: Peristeri (Baba Mts, Makedonija). There is no information on the preservation of the syntypes. **Syn. nov.**

<sup>1</sup> see p. 473.

*Limax macedonicus leucopus*: JAECKEL 1954: 68.

*Limax carbonarius graecus*: JAECKEL 1954: 68.

*Limax macedonicus*: URBAŃSKI et WIKTOR 1968: 58, Fig. 4.

*Limax carbonarius*: RÄHLE 1977b: 230, Fig. 5.

Material: A ravine near Peštani (Makedonija), 7 km S of Ohrid, leg. W. MAASSEN, May, 1975, 1 spec. (WM); 1 km S of the port of Trepka (Makedonija), S of Ohrid, leg. W. MAASSEN, 11 May, 1976, 1 spec. (WM); Galičica Mts<sup>1</sup> (Makedonija), 1600 m a.s.l., S of Ohrid, leg. W. MAASSEN, 13 May, 1976, 1 juv. spec. (WM); Galičica Mts<sup>1</sup> (Makedonija), 11 km from a road bifurcation near Trepka towards Otesevo, 1600 m a.s.l., leg. W. MAASSEN, 13 May, 1976, 1 juv. spec. (WM); Tresania (geographical position not established), leg. M. KARAMAN, 27 Sept., 1967, 2 spec. (JU); Marina Kutina (Srbija), between Gadžik Han and Gornji Dušnik, 545 m a.s.l., leg. W. H. NEUTEBOOM, 15 July, 1975, 1 spec. (RNL).

The Yugoslavian material which I studied largely consisted of not fully grown individuals. I have examined large series of this slug from Bulgaria and Greece and I can state that they do not differ from those from Yugoslavia. Body length up to 78 mm, breadth 18 mm, mantle length 22 mm. The body is strongly elongated, almost cylindrical, narrowed only in the posterior end. A very short keel, up to 1 cm. Between the medial dorsal line and the pneumostome 19–25 grooves are found. Body colouration variable. Specimens from Yugoslavia are gray-coffee-coloured with slightly darker spots on the mantle and back. Some of them have a small number of black spots mainly on the posterior part of the body. The keel is of the same colour as the back.

Genitalia: these organs conform to the descriptions found in the above-quoted literature.

Distribution: Makedonija (Yugoslavian and Greek), Tessalia (Greece), Bulgaria.

Remarks. A synonymization of *L. graecus* and *L. macedonicus leucopus* is no doubt right. The distinctive characters of *L. maximus* var. *carbonaria* and *L. macedonicus* forma typica are dark lateral zones on the sole. These forms probably represent one species, but I have never seen a slug which simultaneously has genitalia of *L. graecus* and such a sole coloration. If it is found that this coloration of the sole is within the range of variation of one species, then priority should be given to the name of *Limax carbonarius* BTGG. BOETTGER's description (1885) of the var. *carbonaria* does not contain drawings of the genitalia, it is not, therefore, certain if it does not belong to a different group of species, for example those without a coecum at the end of the penis.

The slug which LUPU (1970) identified as *Limax macedonicus* probably does not belong to this species, as indicated by the penis size and shape. *Limax carbonarius albanicus* JAECKEL, 1954, does not belong to the above-described species either. I found this out when I examined a syntype from the collection at Humboldt University Museum in Berlin. According to its anatomy, it belongs to *L. maximus*, or a related form.

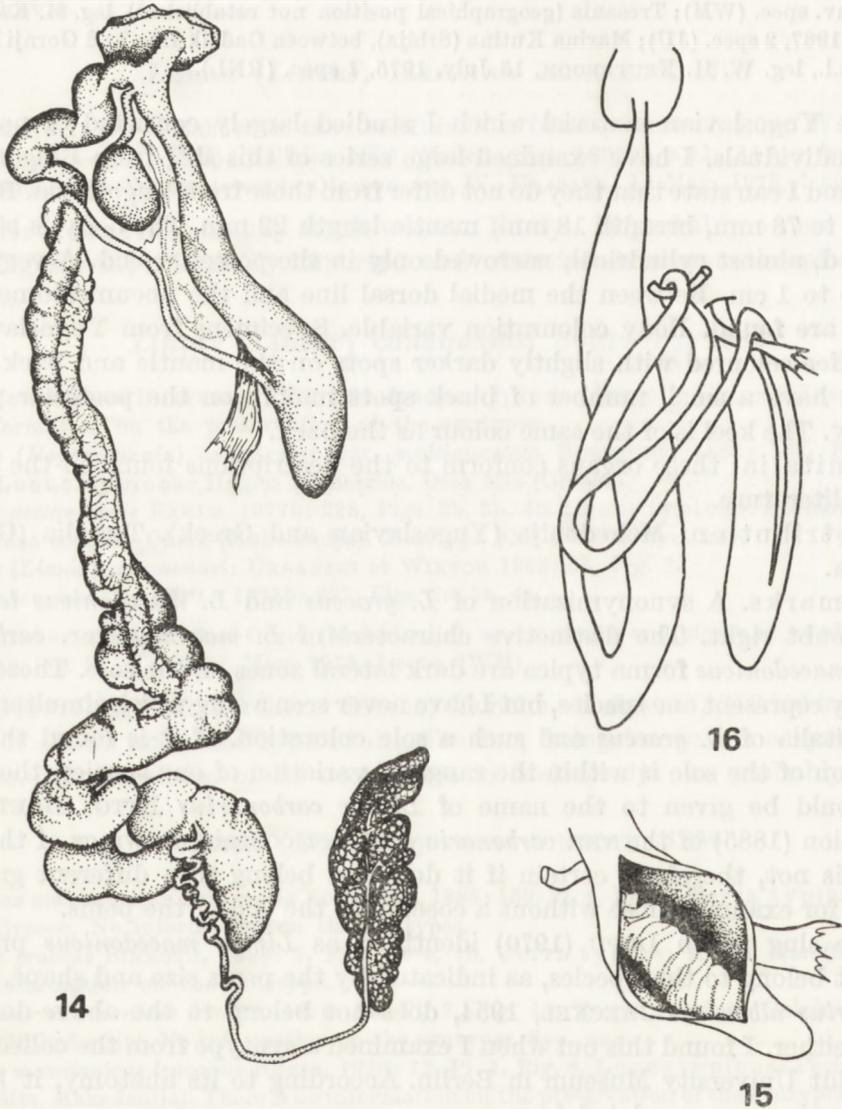
<sup>1</sup> see p. 473.

*Limax (Limax) scupicus* WAGNER, 1931

*Limax (Limax) scupicus* WAGNER, 1931b: 194. Locus typicus: the gorge of the river Tre-ska, west of Ūszkōb (amend. Ūskup = Skopje, Makedonija, Yugoslavia). Holotype: NHMW No. 52370.

*Limax scupicus* WAGNER 1937: 377, Pl. 27, Fig. 3.

Material: Galičica Mts (Makedonija), near the road Carina-Sv. Naum, 10 km from a road bifurcation, leg. L. PINTÉR, E. and P. SUBAI, A. SZIGETHY, 14 July, 1972, 1 spec. (TMB).



Figs. 14-16. *Limax (L.) scupicus*, specimen from Galičica Mts: 14 — genital organs; 15 — open posterior end of penis with visible fold; 16 — digestive tract.

Body length 29 mm, breadth 6 mm, mantle length 12 mm. The keel, poorly formed, attains about  $\frac{1}{5}$  of the body length. Between the medial dorsal line and the pneumostome 31 grooves are found (in holotype 28). The back is dark-creamy in colour, with blackish spots, more or less uniformly distributed and making up a complex pattern. There is no dark pigment on the medial line that forms an extension of the keel, but there is much pigment on either side of the latter. The distribution of pigment on the back more or less agrees with the relief of the skin, that is to say, the grooves are either blackish, or creamy. There is no distinct pattern on the mantle, where there is slightly less dark pigment than elsewhere. The head and tentacles are of a blackish-brown colour, and the sole is creamy.

Genitalia (Figs. 14–15). Glandula hermaphroditica is flattened and elongated. The hermaphrodite duct thin, with a more or less even section. Glandula albuminalis is found to be small. The spermoviduct is clearly long and possesses a large number of glands. Vas deferens a little shorter than the penis, the latter being club-shaped, broadened at the back. Vas deferens opens at the side, consequently the posterior end of the penis forms a coecum with a clear fold inside (Fig. 15). The retractor muscle which is strong is attached at the side, further to the front than the opening of vas deferens. The free segment of the oviduct consists of two parts — the posterior part, short and thin, and the anterior part which is longer and thicker. The spermatheca is oval and possesses a thin spermatheca duct. In the holotype the spermatheca is very long and there is no distinct spermatheca duct. However, as can be seen from the figure, in the specimen concerned, the glandula albuminalis is small, it is, therefore, a young individual, probably before copulation.

Alimentary tract, as in Figure 16.

Distribution: so far only known from Yugoslavian Makedonija.

Remarks. The specimen from Galičica Mts differs from the holotype by: the pattern on its body, smaller body size, and by the shape of the spermatheca. I think, however, that we are dealing with the same species.

### *Limax (Limacus) flavus* LINNAEUS, 1758

Material: Split (Dalmacija), leg. T. RADJA, 12 June, 1976, 1 juv. sp. (TP).

In Yugoslavia, a very similar species, *Limax maculatus* (KALENICZENKO, 1851) may be expected, but it has not so far been found in that country.

### *Malacolimax kostalii* BABOR, 1900

*Malacolimax* n. sp.: BABOR and KOŠTAL 1894: 4, Pl. 20, Figs. 5 – 12.

*Malacolimax Kostalii* BABOR, 1900: 149. Terra typica: E-Alps, Karst, Czechoslovakia.

Syntypes: no information.

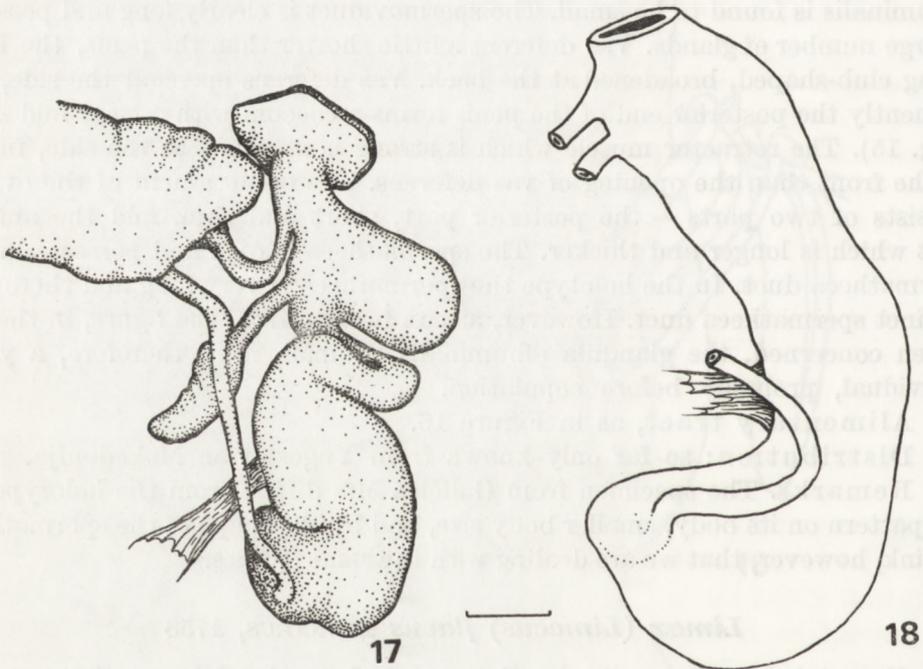
*Limax (Malacolimax) Kostáli*: WAGNER 1934: 27.

*Limax (Malacolimax) Kostáli*: WAGNER 1937: 378.

*Limax (Malacolimax) kostali*: REISCHÜTZ 1973: 372, Fig. 2.

Material: 2 km NWW of Leskova Valley at the foot of the Snežnik Mt., E of Ilirska Bistrica (Slovenija), a beech-fir wood, limestone, leg. A. RIEDEL, 20 May, 1976, 2 juv. spec. (IZ PAN); environs of Plitvice Lakes (Hrvatska), on the slopes of Vilni Dvor hills, leg. J. and T. WOLSKI, 24 Aug., 1938, 1 juv. spec. (IZ PAN); eastern slope on Lake Koziač and other Plitvice Lakes (Hrvatska), leg. J. and T. WOLSKI, 27 Aug., 1938, 1 juv. spec. (IZ PAN); Avala Mt. near Beograd, a deciduous forest, leg. A. RIEDEL, 19 July, 1959 (IZ PAN); Zvezda near Sarajevo (Hercegovina), leg. ♀, 3 spec. (IZ PAN).

Body length 36 mm, breadth 7 mm, mantle length 11 mm. There are 15 grooves between the medial line and the pneumostome. The colour of alcohol-preserved specimens is creamy, with two darker, brown-gray bands on the mantle and on either side of the back. The bands are clearly visible against the creamy-coloured keel and the medial line forming its extension. The head and tentacles are blackish.



Figs. 17-18. Genital organs of *Malacolimax kostalii*: 17 - specimen from Trieste; 18 - specimen from Zvezda.

Genitalia (Figs. 17, 18). The vas deferens, short and thick, opens asymmetrically near the apex of the penis, the latter is club-shaped, sometimes narrowed in the middle, and curved (Fig. 17). The retractor penis muscle is attached laterally. Within the penis a series of folds can be seen. The oviduct represents a straight, short tube. In all the specimens examined the spermatheca was found to be small and empty. It is of an oval shape, elongate and about the same length as the spermatheca duct.

Distribution: eastern Alps, Carpathians, W-Yugoslavia, as far as Hercegovina.

Remarks. A slug very similar in its appearance to *Malacolimax tenellus* (MÜLLER, 1774); its identity as a separate species is not quite certain. I have never collected living individuals of this species, and those specimens which I examined were always badly preserved. Preserved specimens of *M. kostalii* differ from *M. tenellus* by their much darker bands on the back and mantle. A distinctive anatomical feature is the penis which is clearly longer, often curved, and apart from this, it does not possess the semilunar swelling, peculiar to *M. tenellus*, at its apex where the vas deferens opens. Little is known about the range of variation of the structure of the genitals of *M. kostalii*.

***Lehmannia janetscheki* FORCART, 1966**

*Lehmannia janetscheki* FORCART, 1966: 230, Figs. 3, 7. Locus typicus: southern piedmont of Zillertaler Alps, Trotter Alm (S-Tyrol). Holotype: Naturhistorisches Museum Basel (9616-b).

*Lehmannia (Lehmannia) janetscheki*: MILDER 1976: 393.

Material: a pass between Karlobag and Gospić (Hrvatska), 900 m a.s.l., leg. VALLE and BIANCHI, 10 Aug., 1970, 1 spec. (MCB).

Body length 35 mm, breadth 10 mm, mantle length 11 mm. The outer appearance of the specimen I examined agrees with the description of the species, being only a little bigger. In the structure of its genitalia (Fig. 19) it differs by its penial gland which is slightly smaller. Its very short oviduct and strongly widened and swollen prostate gland indicate that it belongs to this species.

Distribution: south-western Alps. So far not reported from Yugoslavia.

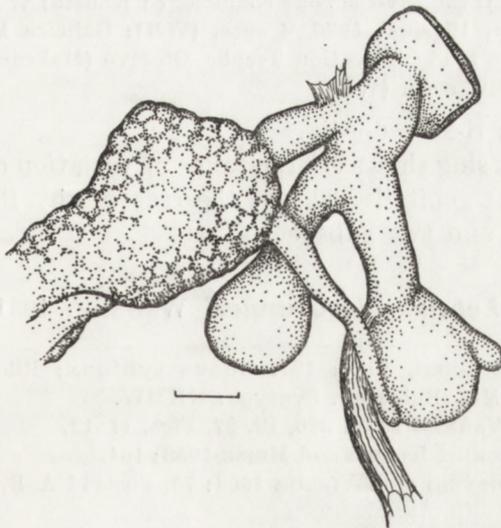


Fig. 19. Genital organs of *Lehmannia janetscheki*, specimen from Karlobag.

***Lehmannia nyctelia* (BOURGUIGNAT, 1861)**

*Limax nyctelius* BOURGUIGNAT, 1861: 305, Pl. 2, Figs. 3, 4. Terra typica: Algeria. Syntypes probably do not exist.

*Agriolimax (Malacolimax) kervillei* GERMAIN, 1907: 154, Pl. 22, Figs. 1–7. Terra typica: Khroumirie (Tunisia).

Material: Avala Mt. near Beograd, leg. A. RIEDEL, 19 July, 1959, 8 juv. spec. (IZ PAN).

Distribution: so far known from Bulgaria, Roumania, Hungary, Poland and Elba Island. It most likely occurs over vast areas in the Balkans. Easily imported, the species is known to occur in synanthropic environments in North and South Africa, USA and Great Britain. The nature of its habitats in terra typica is not known, it is supposed to have been imported there.

Remarks. Its appearance does not differ from that of other similar *Lehmannia* species, and is no doubt often confused.

***Lehmannia szigethyae* WIKTOR, 1975**

*Lehmannia szigethyae* WIKTOR, 1975: 87, Figs. 13–20. Locus typicus: Galičica Mts, between Carina and Sv. Naum, Makedonija, Yugoslavia (due to a printing error the spelling of the geographical names is incorrect – Galačica and Carino). Holotype: TMB.

*Lehmannia galiciensis* RÄHLE, 1977b: 236, Figs. 8, 9d. Terra typica: Galičica Mts (Makedonija, Yugoslavia). Holotype: SMF (244997). **Syn. nov.**

*Lehmannia ohridiana ohridiana* RÄHLE, 1977b: 239, Figs. 10, 11, 13a–b. Locus typicus: Peštani on Lake Ohrid (Makedonija, Yugoslavia). Holotype: SMF (244990). **Syn. nov.**

*Lehmannia ohridiana bigorskii* RÄHLE, 1977b: 243, Fig. 13b. Locus typicus: Sv. Jovan Bigorski monastery between Gostivar and Debar (Makedonija, Yugoslavia). Holotype: SMF (244994). **Syn. nov.**

Material: Sv. Naum, S of Lake Ohrid (Makedonija), under stones, leg. W. MAASSEN, May, 1975, 1 spec. (WM); the environs of “Kallista” (? Kališta) W of Lake Ohrid (Makedonija), leg. W. MAASSEN, 12 May, 1976, 4 spec. (WM); Galičica Mts<sup>1</sup> (Makedonija), 1600 m a.s.l., 11 km from the road bifurcation Trepka–Otesevo (Makedonija), leg. W. MAASSEN, 13 May, 1976, 8 + 2 juv. spec. (WM).

Distribution: S-Makedonija.

Remarks. This slug shows a large range of variation of both body colouration and structure of genitalia. This is the reason why RÄHLE (1977b) distinguished two species and two subspecies.

***Lehmannia brunneri* WAGNER, 1931**

*Agriolimax Brunneri* WAGNER, 1931: 197. Locus typicus: Rilo-Vr Mt., 2700 m a.s.l. (Rila Vrh, Rila Mts, Bulgaria). Syntype: NHMW.

*Agriolimax Brunneri*: WAGNER 1937: 386, Pl. 27, Figs. 11–12.

*Deroceras brunneri*: JAECKEL, KLEMM and MEISE 1958: 161.

*Deroceras brunneri*: URBAŃSKI and WIKTOR 1968: 75, Figs. 11 A–B, 12.

<sup>1</sup> see p. 473.

*Gigantomilax occidentalis*: URBAŃSKI and WIKTOR 1968: 79, Fig. 13 (misidentification).

*Lehmannia brunneri*: RÄHLE 1977: 232, Figs. 6a-b.

♀ *Lehmannia* sp.: RÄHLE 1977: 234, Figs. 7a-b.

Material: Maglič Mt., 250 m (Srbija), leg. W. H. NEUTEBOOM, 3 spec. (RNL).

The specimens studied by me were melanistic: almost black, lacking lateral bands, but with cream-coloured sole. Like many other montane *Lehmannia*, *L. brunneri* is represented by both all black individuals and banded specimens with various colour patterns. All black specimens are particularly common above the timberline. The specimens from Maglič Mt. (fig. 20) have the genitalia seemingly identical as the syntypes and the specimens collected in Bulgaria by me. Unlike other *Lehmannia*, *L. brunneri* has: 1. spermatheca very small, half-length of penis, 2. penial gland short, usually reflexed towards posterior body end. ]

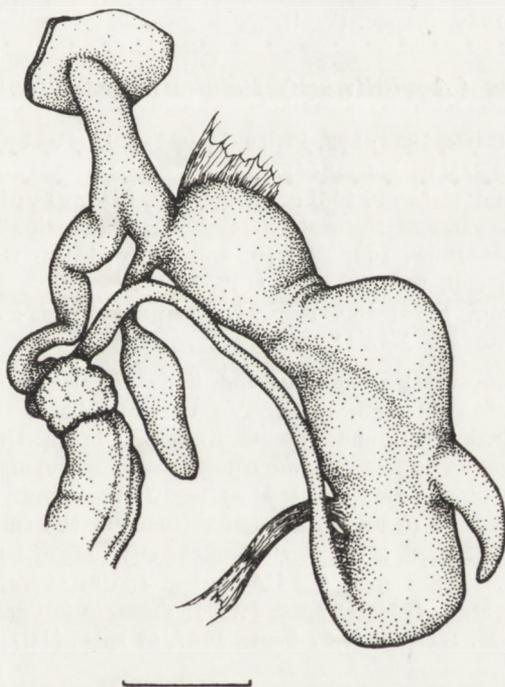


Fig. 20. Genital organs of *Lehmannia brunneri*, specimen from Maglič.

Judging from my observations in Bulgaria, this species is a rockdweller. The slugs appear when the rocks are wet, e. g. during rains; otherwise they hide in crevices and under stones where they are very difficult to find.

Distribution: known from Yugoslavia (Ńrna Gora, Srbija) and Bulgaria, probably widely distributed in Balkans.

Remarks. This species was described by WAGNER (1931) in *Agriolimax* (= *Deroceras*) and synonymized with *Lehmannia marginata* (MÜLLER, 1774)

by URBAŃSKI and WIKTOR (1968) who studied a syntype. Lateral investigations (FORCART 1966) revealed that a few species were mixed up under the name of *L. marginata*. As demonstrated by RÄHLE (1977), *L. brunneri* is a distinct species.

### *Agriolimacidae*

#### *Deroceras (Deroceras) laeve* (MÜLLER, 1774)

Material: 5 km S of Lukovo in the Drim Valley (Makedonija), leg. W. MAASSEN, May, 1975, 6 spec. (WM).

#### *Deroceras (Deroceras) sturanyi* (SIMROTH, 1894)

Material: Kallista (? Kališta), W of Lake Ohrid (terra typica) (Makedonija), leg. W. MAASSEN, 12 May, 1976, 3 spec. (WM).

#### *Deroceras (Agriolimacæ) turcicum* (SIMROTH, 1894)

*Agriolimacæ turcicum* SIMROTH, 1894: 392, Pl. 19, Figs. 2-5. Locus typicus: Ohrid (Makedonija). Lectotype: NHMW No. 19491.

† *Deroceras forcarti* GROSSU et LUPU, 1961: 21, Figs. 1, 2. Locus typicus: Babadag (Roumania). Holotype: Museum of Natural History "Grigori Antipa", Bucurest, No. 13119.

*Deroceras wiktori* GROSSU, 1969: 168, Fig. 10. Locus typicus: Orşova - Eşalniţa (Roumania). Holotype: coll. GROSSU, No. 1147.

*Deroceras waldeni* GROSSU, 1969: 169, Fig. 11. Locus typicus: Jurilovica (Roumania). Holotype: coll. GROSSU, No. 1148.

Material: Lož (Slovenija), edge of a wood, limestone, leg. A. RIEDEL, 20 May, 1976, 2 spec. (IZ PAN); Porožna (Slovenija), leg. T. RADJA, 11 April, 1971, 1 spec. (TE); Haj Nehaj near Sutomore (Črna Gora), under stones, limestone, leg. J. URBAŃSKI, 21 June, 1970, 4 spec. (JU); Titograd, on walls near the mouth of the river Rybnica discharging into Morača (Črna Gora), under stones (pudding stones), leg. J. URBAŃSKI, 20 Nov., 1970, 4 spec. (JU); Nikšić NW of Titograd (Črna Gora), under stones in the ruins of a fortress, leg. J. URBAŃSKI, 20 Nov., 1970, 2 spec. (JU); Ohrid and the environs of Lake Ohrid (Makedonija), leg. T. WOLSKI, 3 Sept., 1934, 1 spec. (IZ PAN); leg. J. URBAŃSKI, 7 Nov., 1970, 11 spec. (JU); leg. W. MAASSEN, May, 1975, 15 spec. (WM); Tresanie (no exact information on geographical position), leg. M. KARAMAN, 27 Sept., 1967, 67 spec. (JU).

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#### STRESZCZENIE

[Tytuł: Materiały do znajomości ślimaków nagich Jugosławii (*Arionidae*, *Milacidae*, *Limacidae*, *Agriolimacidae* — *Gastropoda*, *Pulmonata*)]

W pracy omówiono 25 gatunków, w większości mało zbadanych, podając dla nich liczne nowe stanowiska oraz informacje dotyczące ważnych dla systematyki cech morfologicznych. Autor synonimizuje następujące gatunki nominalne: *Amalia adelpha* SOÓS, 1924 i *Milax clerxi* RÄHLE, 1977 = *Tandonia albanica* (SOÓS, 1924), przy czym ta ostatnia nazwa jest obowiązująca; *Limax pestaniensis* RÄHLE, 1977 = *Limax conemenosi* BOETTGER, 1882; *Limax macedonicus leucopus* HESSE, 1928 = *Limax graecus* SIMROTH, 1889; *Lehmannia galiciensis* RÄHLE, 1977, *Lehmannia ohridiana ohridiana* RÄHLE, 1977, *Lehmannia ohridiana bigorskii* RÄHLE, 1977 = *Lehmannia szigethyae* WIKTOR, 1975. Prawdopodobnie *Limax maximus* var. *carbonaria* BOETTGER, 1885 i *Limax macedonicus* HESSE, 1928 są identyczne z *Limax graecus* SIMROTH, 1889.

## РЕЗЮМЕ

[Заглавие: Материалы к познанию слизней Югославии (*Arionidae*, *Milacidae*, *Limacidae*, *Agriolimacidae* — *Gastropoda*, *Pulmonata*)]

В работе рассмотрено 25 видов слизней, в большинстве мало известных, находя для них важные таксономически, морфологические признаки. Автор синонимизирует следующие номинальные виды: *Amalia adelpha* SOÓS, 1924 и *Milax clerxi* RÄHLE, 1977 = *Tandonia albanica* (SOÓS, 1924) — и это последнее название обязывает; *Limax pestaniensis* RÄHLE, 1977 = *Limax conemenosi* BOETTGER, 1882; *Limax macedonicus leucopus* HESSE, 1928 = *Limax graecus* SIMROTH, 1889; *Lehmannia galiciensis* RÄHLE, 1977, *Lehmannia ohridiana ohridiana* RÄHLE, 1977, *Lehmannia ohridiana bigorski* RÄHLE, 1977 = *Lehmannia szigethyae* WIKTOR, 1975. *Limax maximus* var. *carbonaria* BOETTGER, 1885 и *Limax macedonicus* HESSE, 1928 вероятно идентичны с *Limax graecus* SIMROTH, 1889.

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