

Contributions to the knowledge of the Albanian *Cochlostoma* fauna (Gastropoda: Cyclophoridae).

by

by ZOLTÁN FEHÉR, ZOLTÁN ERÖSS and ANDRÁS VARGA
Giessen.

Abstract: Authors present the *Cochlostoma* data collected during their field trips to Albania and the neighbouring areas. New zoogeographical data on *C. gracile* (L.PFEIFFER 1849), *C. tessellatum* (ROSMÄSSLER 1837), *C. roseoli* (A.J.WAGNER 1901) are given and the first Albanian records of *C. scalarinum* (VILLA 1841) are reported. A new subspecies, *Cochlostoma tessellatum tepelenum* n. ssp. is described from Tepelenë.

(Keywords: *Cochlostoma*, zoogeography, Albania, Balkans)

Introduction: Compared to other countries, Albania has the least explored mollusc fauna in the Balkans, due to its long political isolation. Most of the studies dealing with its *Cochlostoma* fauna, including the descriptions of seven endemic taxa, were published before 1925 (WAGNER 1906, WOHLBEREDT 1909, STURANY & WAGNER 1914, POLINSKI 1922, 1924). Investigations of the Albanian malaco-fauna have restarted after a long pause since 90's, yielding interesting, new zoogeographical data (WELTER-SCHULTES 1996).

Our aim is to report our findings regarding the *Cochlostoma* material collected during the five field trips, carried out between 1992 and 1996 in Albania and in the neighbouring areas - especially those, which are new from zoogeographical point of view -, and to describe a new form from Tepelenë.

Material: The list contains all Albanian *Cochlostoma* lots in the collection of the Hungarian Natural History Museum which have been collected before 1996. Materials from Greece or Montenegro are listed, if they are mentioned in the discussion. Only one datum is listed from the partly unelaborated material of a field trip in 2001.

Albania:

4 km SE of Barmësh (07.07.1996, leg. Eröss & Fehér): *C. scalarinum*

Butrint (16.08.1993, leg. Eröss Z.): *C. tessellatum tessellatum*

"Byshek Quelle, SO Elbassan" (1936, leg. Fuchs (ex.coll Schlesch)): *C. tessellatum excisum* ("Auritus bischoffi")

Dhërmi (06.07.1996, leg. Eröss & Fehér): *C. tessellatum excisum*

Vjosë river valley, Dragot, 6 km E of Tepelenë (14.08.1993, leg. Eröss Z.): *C. tessellatum excisum*

Gjirokastrë, castle (14.08.1993, leg. Eröss Z. and 19.09.1994, leg. Fehér Z.): *C. tessellatum excisum*

Vjosë river valley, 7 km W of Kelcyrë (06.07.1996, leg. Eröss & Fehér): *C. tessellatum excisum*

Libohovo, S of Gjirokastrë (14.08.1993, leg. Eröss Z.): *C. tessellatum excisum*

"Logara" (05.1936, leg. Fuchs (ex.coll Schlesch)): *C. tessellatum excisum*

Malësia Lungarë, Dukat (05.07.1996, leg. Eröss & Fehér): *C. tessellatum excisum*

Malësia Madhe, Xhajë, S of Ducaj (30.06.1996, leg. Eröss & Fehér): *C. roseoli roseoli* ?

Malësia Madhe, a pass 2 km N of Raps-Starjë (30.06.1996, leg. Eröss & Fehér): *C. roseoli roseoli* ?, *C. gracile gracile-martensianum*

Malësia Madhe, 8 km N of Hani i Hoti (30.06.1996, leg. Eröss & Fehér): *C. roseoli roseoli* ?

Malësia Madhe, 8 km E of Bogë (01.07.1996, leg. Eröss & Fehér): *C. scalarinum*

Mal i Çikës, 3 km SE of Llogara-pass (05.07.1996, leg. Eröss & Fehér): *C. tessellatum excisum*

Mal i Çikës, 2 km NW of Llogara-pass (05.07.1996, leg. Eröss & Fehér): *C. tessellatum excisum*

Mal i Dajtit, 1 km E of Linzë (27.07.1993, and 18.09.1994, leg. Fehér Z.): *C. scalarinum*

Mal i Dajtit E of Tiranë, 1000 m a.s.l. (04.07.1996, leg. Eröss & Fehér): *C. gracile ssp.*

Mal i Gjerë, 3 km W of Jorgucat (16.08.1993, leg. Eröss Z. and 06.07.1996, leg. Eröss & Fehér): *C. tessellatum excisum*

Mal i Gjerë, Bistricë river valley, 2 km E of Mesopotam, (06.07.1996, leg. Eröss & Fehér): *C. tessellatum excisum*

Mal i Krujës, 800 -1000 m a.s.l. over Krujë (13.09.1992., 14.09.1994, leg. Fehér Z. and 03.07.1996, leg. Eröss & Fehér): *C. hoyeri*

Mal i Suhës, Between Suhë and Poliçan (15.08.1993, leg. Eröss Z.): *C. tessellatum excisum*

Fangul-pass, 7 km E of Ibë (03.07.1996, leg. Eröss & Fehér): *C. gracile gracile*, *C. auritum ssp.*

Mes, bank of Kiri river (22.09.1994, leg. Fehér Z.): *C. roseoli kiritense*

Petran, at the confluence of Lengaricë and Vjosë rivers (07.07.1996. leg. Eröss & Fehér): *C. tessellatum excisum*

Sarandë (16.08.1993. leg. Eröss Z.): *C. tessellatum tessellatum*

4 km S of Sarandë (16.08.1993. leg. Eröss Z.): *C. tessellatum tessellatum*

Shkodër, castle (22.09.1994. leg. Fehér Z. and 01.07.1996. leg. Eröss & Fehér): *C. roseoli scutariense*

Tepelenë, 1st World War monument (17.08.1993. leg. Eröss Z. and 14.04.2001. leg. Eröss, Fehér & Kovács): *C. tessellatum tepelenum n. ssp.*

Ujë i Ftohtë waterfall, 7 km S of Tepelenë (26.07.1993. leg. Fehér Z.): *C. tessellatum excisum*

Torovicë (S of the village) (02.07.1996. leg. Eröss & Fehér): *C. gracile gracile*

Vau i Dejës, 20 km SE of Shkoder (02.07.1996. leg. Eröss & Fehér): *C. roseoli prekalense*

Montenegro:

2 km W of Božaj (30.06.1996. leg. Eröss & Fehér): *C. roseoli roseoli*

Morača valley, 22,7 km N of Bioče (22.07.1973. leg. F.Seidl): *C. roseoli roseoli*

Morača valley, 10 km N of Bioče (25.02.1970. leg. F.Seidl): *C. roseoli roseoli*

Morača valley, Monastir Morača (05.04.1969. leg. W.Fauer): *C. roseoli roseoli*

Tuzi (30.06.1996. leg. Eröss & Fehér): *C. roseoli roseoli*

Greece:

Korfu, Nissaki (05.08.1996. leg. Eröss & Fehér): *C. tessellatum tessellatum*

Korfu, Katsouri cave at Barbatì (04.08.1996. leg. Eröss & Fehér): *C. tessellatum tessellatum*

Korfu, 2 km N of Skipero (07.08.1996. leg. Eröss & Fehér): *C. tessellatum tessellatum*

Korfu, 3 km N of Sokraki (06.08.1996. leg. Eröss & Fehér): *C. tessellatum tessellatum*

Discussion:

Cochlostoma scalarinum (VILLA 1841) is distributed southward of the Istria and Krain, is common in Dalmatia, but occurs only sporadically south of that. Although this species was reported from Korfu, from the Peloponnesos (WAGNER 1897, SCHÜTT 1977), and from the eastern side of Lake Ohrid (Macedonia) (MAASSEN 1980), until now there were not any concrete data from Albania (DHORA & WELTER-SCHULTES 1996).

We have found *C. scalarinum* in the northern, central and southern parts of Albania as well, but only a few specimens were collected everywhere. Compared to those of Hvar Island, these specimens do not show any remarkable difference. This occurrence denotes that although this species is rare and sporadic south of Dalmatia, it occurs in Albania as well (Fig. 1).

A few decades ago the distribution area of *Cochlostoma gracile* (L.PFEIFFER 1849) was known to range from the south-eastern Alps to Montenegro and north-east Albania (POLINSKI 1924), but in the last few decades this species was discovered at several sites of Epirus (SCHÜTT 1977, SATTMANN & REISCHÜTZ 1988, 1994, REISCHÜTZ & SATTMANN 1990), and in Albania (WELTER-SCHULTES 1996) too.

Populations in Torovicë and at the Fangul-pass certainly belong to the nominate form, although a part of the specimens in Torovicë are extremely widely-spaced (laticostate), and some from the Fangul-pass area are extraordinarily tall and slenderly-built. The population at Raps-Starjë is a transitional form between the nominate subspecies and *C. gracile martensianum* (MOELLENDORF 1873).

A different form was found in the Mal i Dajtit. Compared to the nominate form (Omìš in Dalmatia) and to *martensianum* (Krnovo in Montenegro) its ribbing - regarding the rib height as well as the density - is between them, but the shells are normally larger (height: 6,5 - 8 mm). Rib density increases in the last whorl, peristome can either be single or double, but the outer edge is never as broad as that of the *martensianum*.

It is also notable, that *gracile* and *scalarinum* are not syntopic in the Mal i Dajtit (Fig. 2).

Cochlostoma roseoli (A.J.WAGNER 1901) is distributed from east Hercegovina to north Albania. According to the data of WAGNER (1906, 1914), WOHLBEREDT (1909) and POLINSKI (1924), the nominate subspecies inhabits the northern part of the distribution area, while *C. roseoli scutariense* (A.J.WAGNER 1906) can mainly be found in the southern part of that. According to WOHLBEREDT (1909), both forms live in the Morača valley (Morača Monastir, Podgorica). Other three subspecies, *Cochlostoma roseoli kiriense* (A.J.WAGNER 1906), *Cochlostoma roseoli rioliense* (A.J.WAGNER 1914) and *Cochlostoma roseoli prekalense* (POLINSKI 1924), live in some restricted localities, without having separate, easily recognizable areas (Fig. 3).

Although *prekalense* was reported from "Rapša, Mont Mala Hoti" by POLINSKI (1924), the specimens we collected at Hani i Hotit and Raps-Starjë belong probably to the nominate form. These shells are similar to those found at Tuzi, at Božaj, and in the Morača-valley: they lack any band of spots; their ribbing is regular, ribs are sharp and lamelliform in the upper whorls, and slightly lower and denser in the last one.

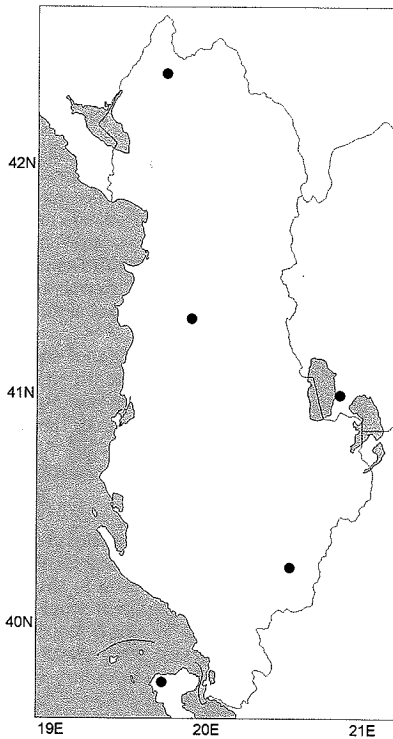


Fig. 1. Distribution of *Cochlostoma scalarinum* (VILLA 1841) in Albania and in the neighbouring areas. In addition to our data, the map indicates literature data too (WAGNER 1897, MAASSEN 1980).

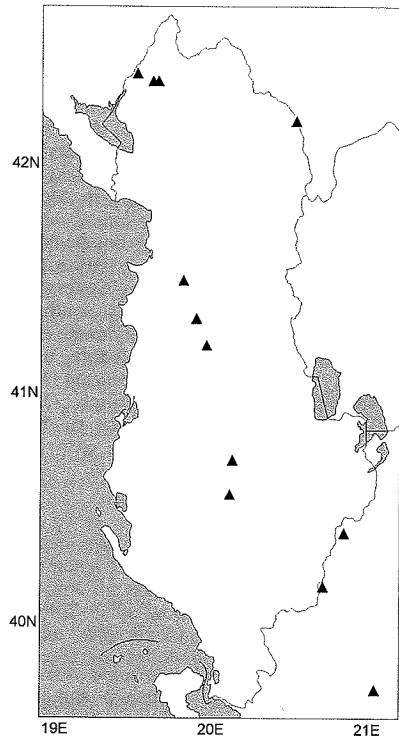
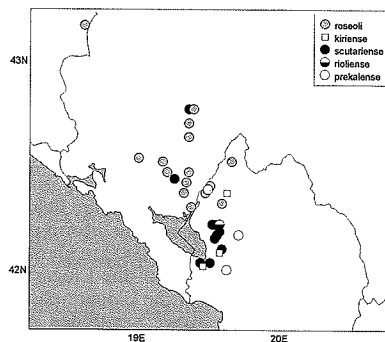


Fig. 2. Distribution of *Cochlostoma gracile* (L.PFEIFFER 1849) in Albania and in the neighbouring areas. In addition to our data, the map indicates literature data too (POLINSKI 1924, SCHÜTT 1977, SATTMANN & REISCHÜTZ 1988, 1994, REISCHÜTZ & SATTMANN 1990, WELTER-SCHULTES 1996).

Fig. 3. Distribution of *Cochlostoma roseoli* (A.J.WAGNER 1901) in Albania and in the neighbouring areas. In addition to our data, the map indicates literature data too (WAGNER 1906, WOHLBEREDT 1909, POLINSKI 1924).



On the contrary, almost every characters of the population at Vau i Dejës conform to the original description of the *prekalense* (POLINSKI 1924). It is remarkable not only because this locality is quite

far from the known sites of the subspecies (Raps, Prekal), but probably this is the southernmost locality of this species too (Fig. 3).

Cochlostoma tessellatum (ROSSMÄSSLER 1837) inhabits the Ionic islands and the continent from central Greece to central Albania. According to SCHÜTT's (1977) revision, the nominate form lives in Korfu, Paxos and Lefkas, *C. tessellatum densestriatum* (HESSE 1882) lives in Meganisi, Lefkas and Zakynthos, *C. tessellatum moussoni* (O. BOETTGER 1883) can only be found in a restricted area of Korfu. A fifty - sixty kilometer wide coastal stripe is inhabited by *C. tessellatum griseum* (MOUSSON 1859) (Aetolie, south of the Arta Bay), and by *C. tessellatum excisum* (MOUSSON 1859) (Epirus and Albania, north of the Arta Bay). *C. tessellatum platanusae* (KLEMM 1962) and *C. tessellatum nordsiecki* (SCHÜTT 1977) live in Thessalie, east of the distribution area of *excisum* (Fig. 4).

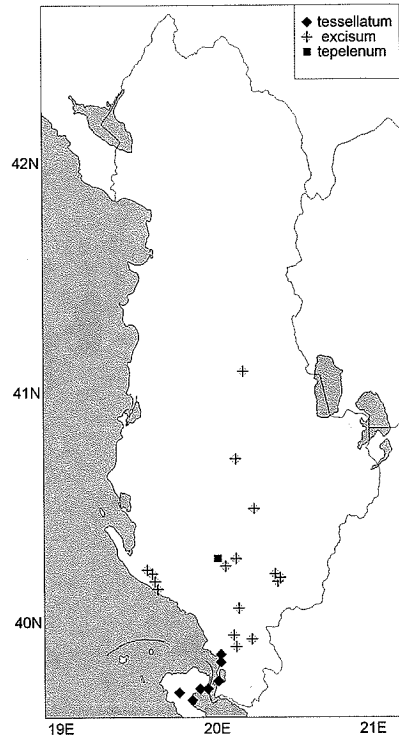


Fig. 4. Distribution of *Cochlostoma tessellatum* (ROSSMÄSSLER 1837) in Albania and in the neighbouring areas. In addition to our data, the map indicates literature data too (WAGNER 1906, WAGNER 1907, POLINSKI 1922, SCHÜTT 1977, WELTER-SCHULTES 1996).

Examining Albanian *Cochlostoma tessellatum* lots, most of them seem to belong to *excisum*.

Deep suture, very convex whorls, and three bands of brown spots are constant characters for *excisum*, while size, shape, and ribbing show considerable inter- and sometimes intra populational variance. In most of the cases, ribs are straight, and compared to the nominate form, they are finer and denser (Fig.5).

Relatively larger specimens were found in the Mal i Gjerë (Mesopotam, Jorgucat) and in Gjirokastër, smaller ones in some sites of the Mal i Çikes (Dukat, Llogara-pass). Usually shells are regularly ribbed (Jorgucat, Dhërmi, Mesopotam, Llogara-pass, Dukat), but sometimes a part, or all of the specimens are densely ribbed in the last, or in the last two whorls (Ujë i Ftohtë, Petran, Kelcyrë, Gjirokastër).

Notable variance in shell morphology can be observed within a range of 10 kilometers in the Mal i Çikes (Fig.6): shells are small, tumid-conic and regularly ribbed in Dukat, small, slenderly-conic with particularly lamelliform and widely-spaced ribs in the northern side of the Llogara-pass, tumid-conic, with less convex whorls and curved ribs in the other side of the Llogara-pass and in Dhërmi. Besides, the Hungarian Natural History Museum has some other specimens from this site ("Logara"), which are small and tumid-conic, having lamelliform ribs.

We collected at about 900-1000 m above sea level at the Llogara-pass, and close to the sea level in Dhërmi. On the northern side of the Llogara pass, shells were found on small shady rocks in a forest, while in the southern side of the Llogara-pass, they were found on large, exposed rocks.

In our opinion, the above mentioned morphological variance is a response to different habitats (ecological variance) and has no taxonomical significance.

Three populations in the proximity of Sarandë were found to be identical with the nominal form, which live in Korfu (Nissaki, Barbat, Skipero, Sokraki): they have relatively large and convex shells, flat whorls, low suture, strong, thick and widely-spaced ribs.

One population seemed to differ from any other known subspecies:

Cochlostoma tessellatum tepelenum n. ssp.

(Fig. 7-8.)

Diagnosis: A new subspecies of the *Cochlostoma (Holcopoma) tessellatum* (ROSSMÄSSLER 1837), which is characterised by the reduction of the ribbing in the last whorls. The last 2 whorls seem to be almost smooth to the naked eyes, under the microscope transversal lines (rudimentary ribs) and spiral lines can also be seen.

The form is essentially characterized by its pale whitish colour, the almost smooth surface and the spiral lines of the last two whorls. In contrast with the nominate subspecies, the shell is less convex, the suture is deeper, and the whorls are more convex. In contrast with *excisum* the shell is generally larger, the suture is less deep and the whorls are less convex.

Type locality: South Albania, Tepelenë, near the 1st World War monument (Lavdi Deshmorëvë), in a single limestone rock (cca. 260 m a.s.l., 40°18' N. 20°01' E.).

Type material: Holotype: Hungarian Natural History Museum, Budapest 76745 (17.08.1993. leg. Z. ERŐSS) Paratypes: Hungarian Natural History Museum, Budapest 86505/1 (14.04.2001. leg. ERŐSS, FEHÉR & KOVÁCS), Mátra Museum, Gyöngyös 47470/1 (17.08.1993. leg. Z. ERŐSS), and further 4 specimens are in the collections of Z. ERŐSS and K. KOVÁCS.

Description: The shell is narrowly conical, whitish - fawn-coloured, with a silky lustre. In the case of the fresh specimens, upper whorls can be dark as the retracted animal shows through the shell. The two bands of horn-coloured spots are usually very pale and dim, the upper one - close to the suture - is a little more distinguishable, the other one, in the lower third of the whorl is mostly melted into the background. Spots of the two bands in the same whorl can sometimes be fused. The initial 2-2 $\frac{1}{3}$ whorls of the protoconch are transparent and lighter in colour, the following $\frac{1}{3}$ whorl is opaque and turns the colour of the adult shell.

The 7 $\frac{1}{2}$ - 8 $\frac{1}{2}$ convex whorls are separated by a deep suture. Whorls grow evenly to the middle of the spire, thereafter they begin to grow rapidly. In a lateral view, the peristome (the last whorl at the aperture) has a trumpet-like widening, the aperture is either perpendicular or its inferior part slightly protrudes.

The initial 1 $\frac{1}{2}$ whorls are smooth, the following part of the protoconch is covered by fine and low ribs. The following 4-5 whorls are covered by widely-spaced, slightly inclined and uniform ribs. They turn lower, and their density slightly - almost imperceptibly - decreases towards the aperture. Ribs are whitish, differ from the shell in colour. The last two whorls are striate only, seem to be almost smooth to the naked eye. Under the microscope not only the rudimentary ribs can be seen, but fine spiral lines as well. They form a reticulate structure, which similar to that of the *Monacha cartusiana*, however it is more intense. The umbilicus is covered, the aperture is round-shaped and protracted slightly in the angular part, the peristoma is single and broad, especially at the collumellar and sometimes at the outer (angular) lip. The collumellar lip is far from the penultimate whorl, its angle varies between the sharp- and the obtuse-angle. The aperture is horn-coloured inside, the mouth-edge is white.

The operculum has only a few concentric rings, and a smooth nucleus. The external ring has a reticulate (net-like) surface with radial ribs and lines perpendicular to them.

Measurements: holotype height: 10 mm, width: 5 mm, paratypes height: 8,9 - 10,5 mm, width: 5 - 5,1 mm.

The new form has been found in one single rock in the hillside, over the town. For these obligate petrophil snails the nearest potential habitat was the old castle in the town, about a few hundred meters far from that rock, but not any *Cochlostoma* specimens were found there.

The type locality of *tepelenum* ssp. n. is surrounded by the area of *excisum*, the nearest known locality of *excisum* is at Ujë i Ptohtë, 7 km S of Tepelenë. The two forms are not syntopic, and not any transitional forms were found up to the present. This new form was probably developed by drift. Since its reproductive isolation can reasonable be supposed, it is considered as a separate subspecies.

Acknowledgements: We are grateful to A. GUBÁNYI for making the photos, to W. MAASSEN for the loan of material, and to our Albanian friends, E. PINGULI and M. QIRJO in the Regional Environmental Center (REC) for their help in organization of the field trips. Maps were created by DMAP 7.0.

Literature:

- DHORA, D. & WELTER-SCHULTES, F. W. (1996): List of species and atlas of the non-marine molluscs of Albania. -- *Schriften zur Malakozoologie*, 9: 90-197. Cismar.
- MAASSEN, W. J. M. (1980): Die landmollusken uit de omgeving van het Ohridmeer/Joegoslavie. -- *Die Kreukel* 15: 45-48.
- POLINSKI, W. (1922): *Auritus hoyeri* n. sp. nebst Beiträgen zur Kenntnis des Subgenus *Titanopoma* A. J. WAGN. -- *Annales Zoologici Musei Polonici Historiae Naturalis* 1: 153-165. Warszawa.
- POLINSKI, W. (1924): Contributions à l'étude systématique et zoogéographique des mollusques de l'Albanie et des régions limitrophes. -- *Annales Zoologici Musei Polonici Historiae Naturalis* 3: 127-150. Warszawa.
- REISCHÜTZ, P. L. & SATTMANN, H. (1990): Beiträge zur Molluskenfauna des Epirus, II. -- *Annalen des Naturhistorischen Museums in Wien* 91B: 253-272. Vienna.
- SATTMANN, H. & REISCHÜTZ, P. L. (1988): Beiträge zur Molluskenfauna Nordgriechenlands. -- *Annalen des Naturhistorischen Museums in Wien* 90B: 203-214. Vienna.
- SATTMANN, H. & REISCHÜTZ, P. L. (1994): Notes on land snail of Epirus. -- *Annalen des Naturhistorischen Museums in Wien* 96B: 39-48.
- SCHÜTT, H. (1977): Revision der griechischen *Cochlostoma*. -- *Archiv für Molluskenkunde* 108: 17-35. Frankfurt a. M.
- STURANY, R. & WAGNER, A.J. (1915): Über schalentragende Landmollusken aus Albanien und Nachbargebieten -- *Denkschriften der kaiserlichen Akademie der Wissenschaften, mathematisch-naturwissenschaftliche Klasse* 91: 19-138. Vienna.
- WAGNER, A.J. (1897): Monographie der Gattung *Pomatias* STUDER -- *Denkschriften der kaiserlichen Akademie der Wissenschaften, mathematisch-naturwissenschaftliche Klasse* 64: 565-632. Vienna.
- WAGNER, A. J. (1906): Neue Formen und Fundorte der Genera *Pomatias* STUDER und *Auritus* WESTERLUND. -- *Nachrichtenblatt der Deutschen Malakozoologischen Gesellschaft* 38: 121-140. Frankfurt a. M.
- WAGNER, A. J. (1907): Ein Beitrag zur Kenntnis der *Pomatias*- und *Auritus*-Formen Griechenlands. -- *Nachrichtenblatt der Deutschen Malakozoologischen Gesellschaft* 39: 1-4. Frankfurt a. M.
- WELTER-SCHULTES, F. W. (1996): Non-marine molluscs recently collected in Albania. -- *Schriften zur Malakozoologie* 9: 21-31. Cismar.
- WOHLBEREDT, O. (1909): Zur Fauna Montenegros und Nordalbaniens (Mollusken, Käfer, Isopoden, Chilopoden, Diplophen) -- *Wissenschaftliche Mitteilungen aus Bosnien und der Herzegowina* 11: 585-722. Vienna.

Addresses of the authors:

- Dr. ZOLTÁN FEHÉR (corresponding author), Hungarian Natural History Museum, H-1088 Budapest, Baross u. 13. e-mail: feher@zoo.zoo.nhmus.hu
- ZOLTÁN ERŐSS, H-1151 Budapest, Bem u. 36. e-mail: eross peter@hotmail.com
- ANDRÁS VARGA, Mátra Museum, H-3200 Gyöngyös, Kossuth u. 40. e-mail: avarga.2@dpg.hu

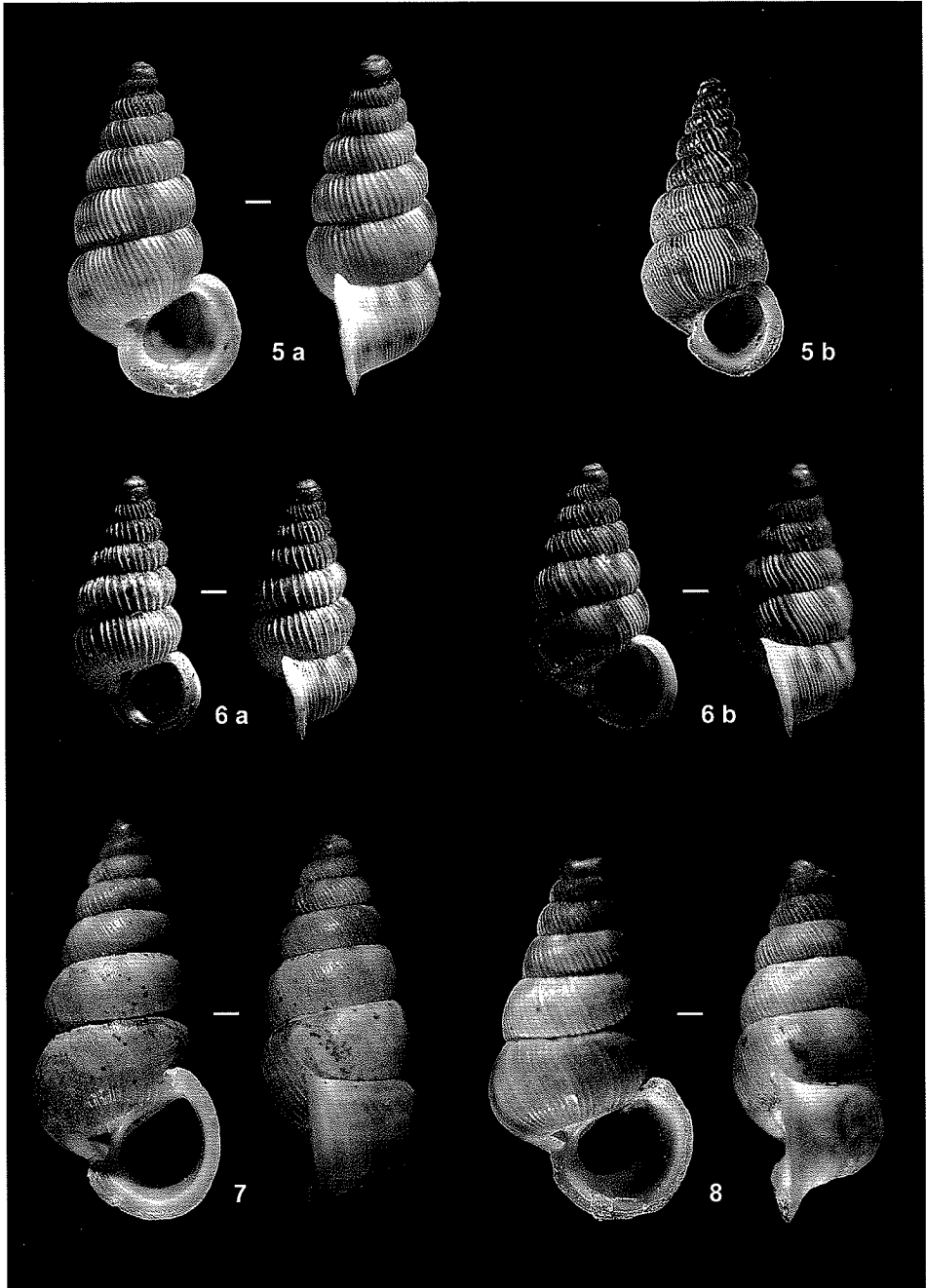
Explanations of Plate 1:
(enlarged 5 x)

Fig. 5. a) A 'typical' specimen of *Cochlostoma tessellatum excisum* (MOUSSON 1859) from Ujë i Ftohtë, 7 km S of Tepelenë, b) same locality, HNC 40238.

Fig. 6. Ecological variants of *Cochlostoma tessellatum excisum* (MOUSSON 1859) from the Llogara-pass area: a.) 3 km SE of Llogara-pass b.) 2 km NW of Llogara-pass.

Fig. 7. *Cochlostoma tessellatum tepelenum* ssp. n., holotype (NHMB 76745).

Fig. 8. *Cochlostoma tessellatum tepelenum* ssp. n., paratype (Mátra Museum, Gyöngyös).



Z. FEHÉR, Z. ERŐSS & A. VARGA: Contributions to the knowledge of the Albanian *Cochlostoma*.