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STANDARD FAUNISTICAL WORK ON THE MOLLUSCS OF CODRU-MOMA MOUNTAINS (ROMANIA)

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Abstract. Faunistical data of mollusc fauna of the Codru-Moma Mountains were compiled on the basis of references and collected by the authors. The faunistical investigation was first concentrated on the terrestrial snails of the wooded area of the mountains. There are 12 compilations from references and 36 new collection sampling sites. The mollusc fauna of the studied area consists of 72 terrestrial snails (Gastropoda), 9 freshwater snails (Gastropoda) and 3 mussels (Bivalvia), a total of 84 taxons, 372 new units altogether. The first data of *Helicodiscus singleyanus* from Romania is included.

Introduction

A larger Mollusca Collection from the Codru-Moma Mountains can be found in the Hungarian Natural History Museum (Budapest) and Munkácsy Mihály Museum (Békéscsaba). Previous malacofaunistical data from the area come from Csiki (1906), Soós (1943), Sárkány-Kiss *et al.* (1997), Domokos (2001), Fehér & Gubányi (2001), Domokos & Váncsa (2005), Bába *et al.* (2006) and Váncsa (2006).

The history of malacofaunistical research of Codru-Moma Mountains in view of its extent is easily summarizable (Table 1: A-F columns). The data from the above mentioned collections and papers were included into our paper.

Hydrography, meteorology, petrology, soil conditions and sampling sites of the Codru-Moma Mountains

The Criş river system is situated in the western part of the Apuseni Mountains. The most important rivers of the system are Crişul Negru, Crişul Alb, and Crişul Repede. Crişul Negru drains the waters of Padurea Craiului Mountains, Bihor Mountains, Codru-Moma Mountains, Zarand Mountains; and Crişul Alb those of Bihor Mountains, Codru-Moma Mountains, Zarand Mountains (Andó 1997; Jakab, 1997). The Codru-Moma Mountains are oriented in the direction north-west south-east between Crişul Negru and Crişul Alb.

The region of the Mountains Codru-Moma has circa 1200 km².

The average temperature in January is –2 to –4, in July 18 to 20 °C. The annual average temperature 8 to 10 °C.

The amount of precipitation is 700 - 1000 mm (Bleahu 1978).

From the point of petrology superficial formation, the Codru-Moma Mts are very varied: limestone, dolomite, andezite agglomerate, granitoid, quartz porfire, quartzit, clay shale, phyllite, conglomerate, sand. The third part of our samples comes from calcareous regions.

The following main dominant soil groups have been distinguished: luvisol frequently pseudogleyed, podzol and acid brown soil, redzina. Redzina developed on limestone (Platoul Vaşcău).

The Codru-Moma Mountains are feeding a lot of brooks tributary to the Crişul Negru and the Crişul Alb. The ridge of Codru-Moma (22 kilometres in length and approximately 1000 metres in height) is a typical watershed between two rivers. From the viewpoint of hydrography we set the sampling sites along brooks as forest roads mostly follow them. The height above sea level of the sampling sites is between 200 and 400 m, except the sampling of Izoi, top of which is 1098 m. The Codru Moma Mountains were studied between 4-6 September of 2004, 20-21 August of 2005, 3-4 June and 23-24 September of 2006. Sampling sites are positioned on the sketch map (Fig. 1).

A brief characterization of the sampling sites (Fig. 1.) in chronological order is the following (we can find earlier items even in the Table 1, columns: A-F):

A - Beél/Beliu, Bélavár = Várasfenes/Finiş, Vaskoh/Vaşcău (Csiki 1906).

B - Belényes/Beiuş, Menyháza/Moneasa, Vaskoh/Vaşcău (Soós 1943).

C - On the basis of the catalogue of the Mollusca Collection of the Hungarian Natural History Museum (Budapest) and the Munkácsy Mihály Museum

(Békéscsaba) (Domokos & Váncsa 2005; Bába *et al.* 2006). Also the sites of Borz (1991, leg. Domokos & Csák), Dezna (1984, leg. Domokos & Kovács), Criștioru de Jos (1984, leg. Domokos & Kovács), Moneasa (1984, leg. Domokos & Kovács), Șoimi (1990, leg.: Domokos & Csák), Uileacu de Beiuș (1990, leg.: Domokos & Csák) included.

D - Criștioru de Jos, Izvorul lui Valer. Dead leaves of the hornbeam-forest (1984, leg. Domokos & Kovács).

E - Uileacu de Beiuș. Stony bank of the brook Arman and periphery of the quarry spring. Stinging nettle site (1990, leg. Domokos & Csák).

F - Borz, Rocă (cliff above the spring) and broken fragments (1990, leg. Domokos & Csák).

1 - Șoimi, 5 km S of the settlements. Humid dead leaves (*Alnus*, *Carpinus*) on the stones (permian quartz porfire). The soil is covered by *Rubus*.

Sampling via singling.

September 4, 2004.

2 - Șoimi, 5 km S of the settlements. Alluvial deposit near the bridge of the brook Șoimi. Alnetum with great burdocks.

Sampling via singling.

September 4, 2004.

3 - Botfei, 6 km N-E of the settlements. Nettle stony (granitoid) bank of the brook Botfei. Flora: *Alnus*, *Carpinus*, *Fagus* and *Urtica* sp.

Sampling via singling.

4 September of 2004.

4 - Hășmaș, 4 km N-E of the settlements. Stony (granitoid) bank of the brook Hășmaș. Humid dead leaves (*Fagus*) left and right side of the brook, stones of the brookbed.

Sampling via singling.

September 5, 2004.

5 - Urvișu de Beliu, 3-4 km N-E of the settlements. Stony (triassic dolomite) bank of the brook Urvis covered with great burdock.

Sampling via singling.

September 5, 2004.

6 - Groșeni, 3 km N-E of junction of brooks Alba and Groși. Nettle stony (granitoid) bank of the brook Groși.

Sampling via singling.

September 5, 2004.



Fig. 1. Sketch map of the sampling sites in the Codru-Moma Mts.

7 - Prunișor, 5.5 km N of the settlements, Noua Valley. Humid dead leaves of the forest (*Alnus*, *Carpinus*, *Fraxinus* sp.) on marl substratum.

Sampling via singling.

September 5, 2004.

8 - Sebiș, 2 km N of the settlements. Stony brookbed of the Teuz. The rocks are covered with algae. The brook flows slowly.

Sampling via singling.

September 6, 2004.

9 - Sebiş, 2 km N of the settlements. Forest (*Quercus*) near Teuz. The alluvia covered with very dry dead leaves.

Sampling via singling.

September 6, 2004.

10 - Beliu, 2 km N of the settlements. Dry dead leaves of the forest (*Quercus*) are situated near the road.

Sampling via singling.

September 6, 2004.

11 - Dezna, stony eastern part of the castle hill. Shaded rocks (andesite agglomerate), dead leaves of the forest (*Fagus*, *Carpinus*).

Sampling via singling.

August 20, 2005.

12 - Dezna, Ruin of the castle. Stony (andezite agglomerate) debris, bushes (*Cornus*) and ruderal weeds. Relatively open and warm biotope.

Sampling via singling.

August 20, 2005.

13 - Moneasa, Lunga Valley. Stony (permian formation) and nettle bank of the brook Lunga. The bank relatively is steep and narrow.

Sampling via singling.

August 20, 2005.

14 - Moneasa, Lunga Valley. A small pool on the forest road, about 100 metres S - E of Lodgement Lunga Valley.

Sampling via singling.

August 20, 2005.

15 - Moneasa, Boroaia Valley 4 km N-E of Moneasa. Clay shale complex (presumably permian) on the road cutting.

Sampling via singling.

August 20, 2005.

16 - Moneasa, 500 m N-E from junction of Ruja Valley. Alluvia of the brook Boroaia with great burdocks.

Sampling via singling.

August 20, 2005.

17 - Moneasa, Moneasa Quarry. Calcareous rocks (red jurassic limestone), grassy biotope.

Sampling via singling and mass.

August 21 and 1 October 1, 2005.

18 - Moneasa, 1 km E of the settlements. Limestone rocks in the brookbed at the bridge of the brook Moneasa.

Sampling via singling.

August 21, 2005.

19 - Rănusa, 1 km N of settlements. Scum or float-debris (4 dm³) band on the stony (permian conglomerate, phyllite) bank of the brook Rănusa. Shady sampling site.

Sampling via mass.

August ,21 2005.

20 - Zugău, 7 km E of Dezna. Salicetum, Alnetum with great burdocks near the brook Zugău .

Sampling via singling.

August 1, 2005.

21 - Zugău, 7 km E of Dezna. Tiny andezite rocks in the brook Zugău near the small wood bridge.

Sampling via singling.

August 21, 2005.

22 - Dezna, scum of the brook Moneasa near the bridge at the settlements. The scum was washed and classified. Quantity of the sample: 5 dm³.

Sampling via mass.

October 1, 2005.

23 - Vidra, 7 km W of Vârfurile. Swamps (hardly passable Alnetum) near the brook Tăcășele.

Sampling via singling.

June 3, 2006.

24 - Vidra, N of the settlements. Stony (andezite aglomerate) bank of the brook Tăcășele and its dead leaves periphery (Fig. 19).

Sampling via singling.

June 3, 2006.

25 - Izbuc, Peștera Câmpinească. Carstic calcareous stons (triassic) with grassy redzina. Sampling site exposed to sun (Fig. 18).

Sampling via singling.

June 3, 2006.

26 - Briheni, 1 km E of the settlemens. Hardly passable marshland (Salicetum, Alnetum) at the bridge near the road junction.

Sampling via singling.

June 3, 2006.

27 - Mierag, Mierag gulchs (pliocene, pannonian sand and marl), 2 km S-W of the settlements. Humid dead leaves in forest (Ribinia).

Sampling via singling.

June 4, 2006.

28 - Tărcăița, Mică Valley, 2 km S-W of the settlements. Rocks (triassic dolomite) and dead leaves on the ground.

Sampling via singling.

June 4, 2006.

29 - Finiş, 3 km S-W of the settlements, ruin of castle. Humid dead leaves and horizontal tree trunks in the forest. (The soil on permian quartz porphyries.) (Fig. 20).

Sampling via singling.

June 4, 2006.

30 - Șuncuiș, Mare Valley, 2 km S of the settlements. Scum taken by stranded twigs. Sunny biotope.

Sampling via singling.

June 4, 2006.

31 - Șuncuiș, Valley Mare, 2km of S of the settlements. Sunny rocks (triassic dolomite) and redzina covered by moss.

Sampling via singling.

June 4, 2006.

32 - Moneasa, 5 km N-W, stony mountain peak of the Izoi (1098 m). Dry soil (redzina) and dead leaves of the forest (*Fagus*) on triassic quartzite.

Sampling via singling and mass.

September 24, 2006.

33 - Moneasa, 3 km N of the settlement. Mare Hill (karstic area), doline (triassic limestone-dolomite). Bushes and great burdocks.

Sampling via singling.

September 24, 2006.

34 - Moneasa, Liliecilor Cave. Shady calcareous stones (red jurassic limestone), soil and dead leaves of the forest (*Tilia*, *Fagus*, *Acer*).

Sampling via singling and mass.

September 24, 2006.

35 - Borz, wall rock (grey triassic dolomite). Under the cliff great burdocks, *Urtica* and trees (*Tilia*, *Fagus*, *Acer*) can be found. The karstic spring, Borz is found at the foot of the cliff.

Sampling via singling and mass.

September 24, 2006.

36 - Dumbrăvița de Codru, Dumbrăvița Plateau (karstic area). Dry zone of the slope is covered with grassy rocks (triassic limestone-dolomite)

Sampling via singling and mass.

September 2, 2006.

Methods

The samplings were carried out by using different methods. We took sampling via singling (30 minutes/site), via mass (3-5 dm³) and via scum (float-debris) (3-5 dm³), because we planned the research of the landsnails in the first place (it is a generally known fact that singling increases, but mass decreases the proportion of the species of a larger-size). After cleaning and drying, we selected out and classified the shells coming from malacological material. We refrained the dissections from the anatomical investigations.

In order to identify the species, we used taxonomic books or papers by Soós (1943), Grossu (1981, 1983), Kerney *et al.* (1983), Richnovszky & Pintér (1979) and Kiss & Pintér (1985). Our nomenclature approximately follows Grossu (1993) with some modifications. In the enumeration of the species we reduced the subspecies and various forms.

Results

During the examination (compilation, collection) time, 84 Mollusca taxa and 372 new units were found (Check list, Table 1.). Number of landsnails species is 72. Among the species of large size we found the rare and interesting *Glaciliaria inserta*, *Perforatella bidentata*, *Spelaeodiscus triaria*, *Vitrea subrimata*, *Bulgarica cana*, *Cochlodina orthostoma*, *Helicodiscus singleyanus* and *Orcula jetschini*.

Hygromia cf. *transsylvanica*, *Helicigona banatica*, *Cochlodina laminata*, *Ruthenica filograna*, *Laciniaria plicata*, *Bulgarica vetusta*, *Pseudolinda stabilis* and *Alinda biplicata* are relatively frequent on the territory of Codru-Moma Mountains.

This work is the first report on the distribution of *Helicodiscus singleyanus*

in Romania, as this species is absent from the check list of the Molluscs from Romania (Grossu 1993).

Furthermore, we feel it necessary to examine at length the freshwater Molluscs of Codru-Moma Mountains and its vicinity. It is a well-known fact that freshwater Molluscs are indicator organisms of the water quality.

Check list in systematic order of the Molluscs from Codru-Moma Mountains

Class Gastropoda

Subclass Pulmonata

Family Ellobiidae Adams, 1855

Carychium minimum O. F. Müller, 1774

Carychium tridentatum (Risso, 1826)

Family Physidae Fitzinger, 1833

Physa acuta Draparnaud, 1805

Family Lymnaeidae Rafinesque, 1815

Lymnaea palustris (O. F. Müller, 1774)

Radix auricularia (Linnaeus, 1758)

Radix peregra (O. F. Müller, 1774)

Galba truncatula (O. F. Müller, 1774)

Family Ancyliidae Rafinesque, 1815

Ancylus fluviatilis O. F. Müller, 1774

Family Planorbidae Rafinesque, 1815

Planorbis planorbis (Linnaeus, 1758)

Anisus spirorbis (Linnaeus, 1758)

Armiger crista (Linnaeus, 1758)

Family Succineidae Beck, 1857

Succinea oblonga Draparnaud, 1805

Oxyloma elegans (Risso, 1826)

Family Cochlicopidae Pilsbry, 1900

Cochlicopa lubrica (O. F. Müller, 1774)

Cochlicopa lubricella (Porro, 1838)

Family Orculidae Pilsbry, 1913

Orcula jetschini M. Kimakowicz, 1883

Comments: Only from scum. Unique occurrence from catchment area of the brook Moneasa. Dimensions are relatively small: 5.2/3.3 mm.

Sphyradium doliolum (Bruguière, 1792)

Family Valloniidae, Morse, 1864

Vallonia pulchella (O. F. Müller 1774)

Vallonia costata (O. F. Müller, 1774)

Achanthinula aculeata (O. F. Müller, 1774)

Family Spelaeodiscidae Zilch, 1960

Spelaeodiscus triaria Rossmässler, 1839 (Fig. 14.)

Spelaeodiscus triadis Kimakowicz, 1884

Comments: There are transition forms from *triaria* to *triadis*. In Grossu's opinion *S. triaria* = *S. triadis* (Grossu 1993). All these live only in calcareous regions; collected from Banat, Vârciorova, Herculane, and S – W Transsylvania (Grossu 1993).

Family Vertiginidae Fitzinger, 1833

Vertigo pusilla (O. F. Müller, 1774)

Verigo pygmaea (Draparnaud, 1801)
Vertigo angustior Jeffreys, 1830
Columella edentula (Draparnaud, 1805)
Truncatellina cylindrica (Férussac, 1822)

Family Pupillidae Turton, 1821

Pupilla muscorum (Linnaeus, 1758)

Family Chondrinidae Steenberg, 1925

Granaria frumentum (Draparnaud, 1801)
Chondrina clienta (Westerlund, 1883)
Chondrula tridens (O.F. Müller, 1774)
Ena montana (Draparnaud, 1801)
Merdigera obscura (O. F. Müller, 1774)

Family Clausiliidae Schmidt, 1857

Cochlodina laminata (Montagu, 1803) (Fig. 4.)
Cochlodina orthostoma (Menke, 1830) (Fig. 16.)
Graciliaria inserta A. & G. A. Villa 1841 (Fig. 12.)

Comments: This species is listed in Grossu's catalogue (Grossu 1993) as *Graciliaria concilians* f. *undulata*. Endemic species, collected only from the Retezat Massif from dead and humid leaves (Grossu 1993). In Szekeres's opinion (pers. com.) this species is *Graciliaria inserta*.

Ruthenica filograna (Rossmässler, 1836) (Fig. 5.)
Macrogastra latestriata A. Schmidt, 1857

Comments: This data comes from Csiki 1906. In Szekeres's opinion (pers. com.) it is an incorrect data. It is probable that this sample of Vaskoh/Vaşcău came from the Bihor Mountains.

Laciniaria plicata Draparnaud, 1805 (Fig. 6.)
Alinda biplicata (Montagu, 1803) (Fig. 9.)

Comments: This species appears in Grossu's catalogue (Grossu 1993) as *Balea biplicata*, but in Szekeres's opinion (pers.com.) is *Alinda biplicata*.

Pseudolinda stabilis (L. Pfeiffer, 1847) (Fig. 8.)

Comments: This species is listed in Grossu's catalogue (Grossu 1993) as *Balea stabilis*. In Szekeres's opinion (pers.com.) it is *Pseudolinda stabilis*.

Bulgarica vetusta (Rossmässler, 1836) (Fig. 7.)

Bulgarica cana (Held, 1836)

Comments: Its unique occurrence is in Moneasa (Valea Boraia).

Family Ferussaciidae Bruguière, 1883

Cecilioides acicula (O. F. Müller, 1774)

Family Endodontidae Pilsbry, 1894

Punctum pygmaeum (Draparnaud, 1805)

Helicodiscus singleyanus (Pilsbry, 1890) (Fig. 17)

Comments: According to Grossu (1993), this species is absent from Romania. So this is the first record of *Helicodiscus singleyanus* in Romania.

Family Arionidae Gray, 1841

Arion subfuscus Draparnaud, 1801

Arion circumscriptus Johnston, 1828

Family Vitrinidae Fitzinger, 1883

Phenacolimax pellucida (O. F. Müller, 1774)

Family Zonitidae Mörch 1864

Zonitoides nitidus (O. F. Müller, 1774)

Vitrea diaphana (Studer, 1820)
Vitrea crystallina (O. F. Müller, 1774)
Vitrea subrimata (Reinhardt, 1871) (Fig. 15.)
Nesovitrea hammonis (Ström, 1765)
Aegopinella minor (Stabile, 1864) (= *Retinella nitens* auct.)
Oxychilus draparnaudi (Beck, 1837)
Oxychilus glaber Westerlund, 1881
Oxychilus depressus (Sterki, 1880)
Oxychilus montivagus (M. Kimakowicz, 1890)

Family Daubebardiidae Pilsbry, 1908

Carpathica calophana Westerlund, 1881

Family Limacidae Rafinesque, 1815

Limax maximus Linnaeus, 1758
Limax cinereoniger Wolf, 1803
Limax sp
Deroceras sp.

Family Bradybaenidae Pilsbry, 1939

Bradybaena fruticum (O.F. Müller, 1774)

Family Helicidae, Rafinesque, 1815

Monacha cartusiana (O. F. Müller, 1774)
Perforatella bidentata (Gmelin, 1788) (Fig.13.)
Perforatella dibothrion (M. Kimakowicz, 1890) (Fig. 10.)
Monachoides incarnata (O. F. Müller, 1774)
Zenobiella rubiginosa (A. Schmidt, 1853)
Trichia bielzi (A. Schmidt, 1860)
Trichia hispida (O. F. Müller, 1774)
Tricia filicina (L. Pfeiffer, 1841)

Comments: This species was thought to be absent from Romania (Grossu 1993). Mentioned by Soós (Soós 1943).

Euomphalia strigella (Draparnaud, 1801)

Hygromia cf. *transsylvanica* (Westerlund, 1876) (Fig. 2.)

Comments: Racial affiliation is problematical [*Hygromia transsylvanica* (Westerlund, 1876) or *Kovacsia kovacsi* Varga & Pintér 1972 (Varga & Pintér 1972)]. DNA scientific investigation is in progress. Verbal communication from Z. Fehér.

Isognomostoma isognomostoma (Gmelin, 1788) (Fig. 11.)

Helicigona banatica (Rossmässler, 1838) (Fig. 3.)

Comments: Largest specimen: 20.8/34.7 mm (No.17. Moneasa, Cariera Moneasa. Dat. 1. 10. 2005. Leg. Papp)

Campylea faustina (Rossmässler, 1835)

Cepaea vindobonensis (Férussac, 1821)

Helix pomatia Linnaeus, 1758

Comments: The absence of the *Helix lutescens* Rossmässler, 1837 is interesting.

Class Bivalvia

Subclass Palaeoheterodonta Newell, 1965

Family Unionidae Fleming, 1828

Anodonta cygnaea Linnaeus, 1758

Subclass Heterodonta Newmayer, 1884

Family Pisiidae Gray, 1857

Pisidium casertanum (Poli, 1791)

Pisidium indet.

Table 1./1 (detail): Sampling sites and taxa of the Codru-Moma Mts.

Taxons	Sampling sites														
	A	B	C	D	E	F	1	2	3	4	5	6	7	8	9
<i>Achantinula aculeata</i>					•		•								
<i>Aegopinella minor</i>	•		•		•				•						
<i>Alinda biplicata</i>					•			•			•				
<i>Arion circumscriptus</i>								•							
<i>Arion subfuscus</i>									•						
<i>Bradybaena fruticum</i>	•		•												
<i>Bulgarica cana</i>															
<i>Bulgarica vetusta</i>		•	•			•			•						
<i>Campylea faustina</i>						•									
<i>Carpathica calophana</i>					•					•				•	
<i>Carychium minimum</i>															
<i>Carychium tridentatum</i>					•										
<i>Cecilioides acicula</i>															
<i>Cepaea vindobonensis</i>			•		•						•				
<i>Chondrina clienta</i>															
<i>Chondrula tridens</i>															
<i>Cochlicopa lubrica</i>								•							
<i>Cochlicopa lubricella</i>						•									
<i>Cochlodina laminata</i>	•		•	•		•	•		•	•	•	•	•		
<i>Cochlodina orthostoma</i>									•						
<i>Columella edentula</i>															
<i>Deroceras</i> sp.							•				•	•			
<i>Ena montana</i>					•										
<i>Euomphalia strigella</i>	•							•			•	•	•		
<i>Graciliaria inserta</i>															
<i>Granaria frumentum</i>					•										
<i>Helicigona banatica</i>			•	•	•		•	•	•	•	•	•	•		
<i>Helicodiscus singleyanus</i>															
<i>Helix pomatia</i>	•		•			•	•	•		•	•		•		•
<i>Hygromia</i> cf. <i>transsylvanica</i>			•	•		•	•	•		•	•				
<i>Isognomostoma isognomostoma</i>						•				•	•				
<i>Laciniaria plicata</i>	•		•		•				•						
<i>Limax cinereoniger</i>															
<i>Limax maximus</i>		•													
<i>Limax</i> sp.															
<i>Macrogastra latestriata</i>	•														
<i>Merdigera obscura</i>															
<i>Monacha cartusiana</i>	•														
<i>Monachoides incarnata</i>										•		•	•		

Table 1./1 (detail): Sampling sites and taxis of the Codru-Moma Mts.

Taxons	Sampling sites															
	A	B	C	D	E	F	1	2	3	4	5	6	7	8	9	
<i>Nesovitrea hammonis</i>																
<i>Orcula jetschini</i>																
<i>Oxychilus depressus</i>																
<i>Oxychilus draparnaudi</i>					•											
<i>Oxychilus glaber</i>						•				•						
<i>Oxychilus montivagus</i>			•			•	•			•	•					
<i>Oxyloma elegans</i>			•		•											
<i>Perforatella bidentata</i>				•												
<i>Perforatella dibothrion</i>			•					•		•	•		•			
<i>Phenacolimax pellucida</i>			•			•					•		•			
<i>Pseudalinda stabilis</i>			•	•			•	•	•	•	•					
<i>Punctum pygmaeum</i>						•										
<i>Pupilla muscorum</i>					•											
<i>Pyramidula rupestris</i>																
<i>Ruthenica filigrana</i>			•			•			•	•	•					
<i>Spelaeodiscus triadis</i>		•				•										
<i>Spelaeodiscus triaria</i>																
<i>Sphyradium doliolum</i>						•										
<i>Succinea oblonga</i>			•			•		•	•			•				
<i>Trichia bielzi</i>					•											
<i>Trichia filicina</i>		•														
<i>Trichia hispida</i>		•														
<i>Truncatellina cylindrica</i>					•											
<i>Vallonia costata</i>						•										
<i>Vallonia pulchella</i>						•										
<i>Vertigo angustior</i>																
<i>Vertigo pusilla</i>																
<i>Vertigo pygmaea</i>																
<i>Vitrea crystallina</i>																
<i>Vitrea diaphana</i>			•				•									
<i>Vitrea subrimata</i>																
<i>Zenobiella rubiginosa</i>			•													
<i>Zonitoides nitidus</i>			•					•							•	
<i>Ancylus fluviatilis</i>		•	•									•		•		
<i>Anisus spirorbis</i>			•											•		
<i>Armiger crista</i>																
<i>Galba truncatula</i>			•													
<i>Lymnaea palustris</i>			•													

Table 1./1 (detail): Sampling sites and taxa of the Codru-Moma Mts.

Taxons	Sampling sites															
	A	B	C	D	E	F	1	2	3	4	5	6	7	8	9	
<i>Physa acuta</i>			•													
<i>Planorbis planorbis</i>	•															
<i>Radix auricularia</i>		•	•													
<i>Radix peregra</i>			•											•		
<i>Anodonta cygnaea</i>			•													
<i>Pisidium casertanum</i>			•													
<i>Pisidium</i> sp.			•		•											
Numbers of taxons	9	7	2 9	5	1 6	1 7	9	1	1 0	1 2	1 4	7	8	3	2	

Table 1./2 (detail): Sampling sites and taxa of the Codru-Moma Mts.

Taxons	Sampling sites															
	1 0	1 1	1 2	1 3	1 4	1 5	1 6	1 7	1 8	1 9	2 0	2 1	2 2	2 3	2 4	
<i>Achantinula aculeata</i>								•					•			
<i>Aegopinella minor</i>																
<i>Alinda biplicata</i>				•		•	•						•		•	
<i>Arion circumscriptus</i>														•	•	
<i>Arion subfuscus</i>							•				•		•	•	•	
<i>Bradybaena fruticum</i>				•			•	•			•		•		•	
<i>Bulgarica cana</i>						•										
<i>Bulgarica vetusta</i>		•						•								
<i>Camphylea faustina</i>																
<i>Carpathica calophana</i>		•				•				•					•	
<i>Carychium minimum</i>										•			•			
<i>Carychium tridentatum</i>							•			•			•			
<i>Cecilioides acicula</i>													•			
<i>Cepaea vindobonensis</i>								•					•			
<i>Chondrina clienta</i>																
<i>Chondrula tridens</i>																
<i>Cochlicopa lubrica</i>							•			•						
<i>Cochlicopa lubricella</i>							•						•			
<i>Cochlodina laminata</i>		•						•		•			•			
<i>Cochlodina orthostoma</i>																
<i>Columella edentula</i>													•			
<i>Deroceras</i> sp.								•		•						
<i>Ena montana</i>																
<i>Euomphalia strigella</i>		•	•					•		•						
<i>Graciliaria inserta</i>								•							•	
<i>Granaria frumentum</i>																

Table 1./2 (detail): Sampling sites and taxa of the Codru-Moma Mts.

Taxons	Sampling sites														
	1 0	1 1	1 2	1 3	1 4	1 5	1 6	1 7	1 8	1 9	2 0	2 1	2 2	2 3	2 4
<i>Helicigona banatica</i>				•		•	•	•		•	•				•
<i>Helicodiscus singleyanus</i>													•		
<i>Helix pomatia</i>	•			•											
<i>Hygromia</i> cf. <i>transsylvanica</i>		•	•	•		•		•					•	•	•
<i>Isognomostoma</i> <i>isognomostoma</i>				•			•								
<i>Laciniaria plicata</i>			•					•		•	•				
<i>Limax cinereoniger</i>		•													
<i>Limax maximus</i>		•		•											
<i>Limax</i> sp.										•					
<i>Macrogastra latestriata</i>															
<i>Merdigera obscura</i>								•							
<i>Monacha cartusiana</i>													•		
<i>Monachoides incarnata</i>				•			•				•		•	•	•
<i>Nesovitrea hammonis</i>							•								
<i>Orcula jetschini</i>													•		
<i>Oxychilus depressus</i>								•							
<i>Oxychilus draparnaudi</i>															
<i>Oxychilus glaber</i>						•					•				
<i>Oxychilus montivagus</i>											•				
<i>Oxyloma elegans</i>														•	
<i>Perforatella bidentata</i>														•	
<i>Perforatella dibothrion</i>										•					
<i>Phenacolimax pellucida</i>			•	•			•	•		•	•				
<i>Pseudalinda stabilis</i>				•			•			•					
<i>Punctum pygmaeum</i>													•		
<i>Pupilla muscorum</i>															
<i>Pyramidula rupestris</i>															
<i>Ruthenica filograna</i>		•		•		•	•				•		•	•	•
<i>Spelaeodiscus triadis</i>															
<i>Spelaeodiscus triaria</i>															
<i>Sphyradium doliolum</i>								•							
<i>Succinea oblonga</i>							•						•		
<i>Trichia bielzi</i>															
<i>Trichia filicina</i>															
<i>Trichia hispida</i>															
<i>Truncatellina cylindrica</i>								•							
<i>Vallonia costata</i>										•			•		
<i>Vallonia pulchella</i>							•	•		•			•		

Table 1./2 (detail): Sampling sites and taxa of the Codru-Moma Mts.

Taxons	Sampling sites														
	1 0	1 1	1 2	1 3	1 4	1 5	1 6	1 7	1 8	1 9	2 0	2 1	2 2	2 3	2 4
<i>Vertigo angustior</i>							•						•		
<i>Vertigo pusilla</i>													•		
<i>Vertigo pygmaea</i>													•		
<i>Vitrea crystallina</i>							•	•					•	•	
<i>Vitrea diaphana</i>				•		•					•		•		
<i>Vitrea subrimata</i>								•							
<i>Zenobiella rubiginosa</i>													•		
<i>Zonitoides nitidus</i>				•			•			•	•		•		
<i>Ancylus fluviatilis</i>									•	•		•			
<i>Anisus spirorbis</i>															
<i>Armiger crista</i>													•		
<i>Galba truncatula</i>														•	
<i>Lymnaea palustris</i>															
<i>Physa acuta</i>															
<i>Planorbis planorbis</i>															
<i>Radix auricularia</i>															
<i>Radix peregra</i>					•										
<i>Anodonta cygnaea</i>															
<i>Pisidium casertanum</i>															
<i>Pisidium</i> sp.					•										
Numbers of taxons	1	8	4	13	2	8	18	19	1	17	11	1	30	9	10

Table 1./3 (detail): Sampling sites and taxa of the Codru-Moma Mts.

Taxons	Sampling sites												1-36
	2 5	2 6	2 7	2 8	2 9	3 0	3 1	3 2	3 3	3 4	3 5	3 6	
<i>Achantinula aculeata</i>											•		4
<i>Aegopinella minor</i>											•		2
<i>Alinda biplicata</i>						•							8
<i>Arion circumscriptus</i>				•									4
<i>Arion subfuscus</i>		•		•				•					9
<i>Bradybaena fruticum</i>		•									•		8
<i>Bulgarica cana</i>													1
<i>Bulgarica vetusta</i>	•		•	•	•	•	•			•	•		11
<i>Campylea faustina</i>										•	•		2
<i>Carpathica calophana</i>				•	•			•					9
<i>Carychium minimum</i>						•							3

Table 1./3 (detail): Sampling sites and taxis of the Codru-Moma Mts.

Taxons	Sampling sites												1-36
	2 5	2 6	2 7	2 8	2 9	3 0	3 1	3 2	3 3	3 4	3 5	3 6	
<i>Carychium tridentatum</i>						•					•		5
<i>Ceciloides acicula</i>													1
<i>Cepaea vindobonensis</i>	•	•		•		•	•				•	•	10
<i>Chondrina clienta</i>				•									1
<i>Chondrula tridens</i>	•											•	2
<i>Cochlicopa lubrica</i>		•				•							5
<i>Cochlicopa lubricella</i>	•					•	•				•	•	7
<i>Cochlodina laminata</i>			•		•	•		•		•	•	•	17
<i>Cochlodina orthostoma</i>													1
<i>Columella edentula</i>						•							2
<i>Deroceras</i> sp.					•				•		•		8
<i>Ena montana</i>													0
<i>Euomphalia strigella</i>	•	•							•	•		•	13
<i>Gracilaria inserta</i>													2
<i>Granaria frumentum</i>											•		1
<i>Helicigona banatica</i>		•				•		•	•	•	•		21
<i>Helicodiscus singleyanus</i>													1
<i>Helix pomatia</i>					•	•				•	•		12
<i>Hygromia</i> cf. <i>transsylvanica</i>	•	•	•	•	•	•	•		•	•	•	•	23
<i>Isognomostoma isognomostoma</i>						•							5
<i>Laciniaria plicata</i>			•	•	•	•				•	•		11
<i>Limax cinereoniger</i>													1
<i>Limax maximus</i>				•	•			•					5
<i>Limax</i> sp.										•			2
<i>Macrogastra latestriata</i>													0
<i>Merdigera obscura</i>				•							•		3
<i>Monacha cartusiana</i>													1
<i>Monachoides incarnata</i>													9
<i>Nesovitrea hammonis</i>													1
<i>Orcula jetschini</i>						•							2
<i>Oxychilus depressus</i>								•					2
<i>Oxychilus draparnaudi</i>													0
<i>Oxychilus glaber</i>													3
<i>Oxychilus montivagus</i>											•		5
<i>Oxyloma elegans</i>						•							2
<i>Perforatella bidentata</i>													1
<i>Perforatella dibothrion</i>			•	•									7
<i>Phenacolimax pellucida</i>	•						•		•	•	•		13

Table I./3 (detail): Sampling sites and taxa of the Codru-Moma Mts.

Taxons	Sampling sites												1-36
	2 5	2 6	2 7	2 8	2 9	3 0	3 1	3 2	3 3	3 4	3 5	3 6	
<i>Pseudalinda stabilis</i>								•	•				10
<i>Punctum pygmaeum</i>											•		2
<i>Pupilla muscorum</i>	•					•							2
<i>Pyramidula rupestris</i>	•			•			•						3
<i>Ruthenica filograna</i>		•		•		•			•	•	•		17
<i>Spelaeodiscus triadis</i>													0
<i>Spelaeodiscus triaria</i>				•						•			2
<i>Sphyradium doliolum</i>				•	•	•				•	•		6
<i>Succinea oblonga</i>						•							6
<i>Trichia bielzi</i>											•		1
<i>Trichia filicina</i>													0
<i>Trichia hispida</i>													0
<i>Truncatellina cylindrica</i>	•						•			•	•		5
<i>Vallonia costata</i>	•					•	•				•		6
<i>Vallonia pulchella</i>	•					•	•				•	•	9
<i>Vertigo angustior</i>													2
<i>Vertigo pusilla</i>													1
<i>Vertigo pygmaea</i>													1
<i>Vitrea crystallina</i>							•						5
<i>Vitrea diaphana</i>						•							6
<i>Vitrea subrimata</i>						•							2
<i>Zenobiella rubiginosa</i>													1
<i>Zonitoides nitidus</i>						•							8
<i>Ancylus fluviatilis</i>													5
<i>Anisus spirorbis</i>													1
<i>Armiger crista</i>													1
<i>Galba truncatula</i>													1
<i>Lymnaea palustris</i>													0
<i>Physa acuta</i>													0
<i>Planorbis planorbis</i>													0
<i>Radix auricularia</i>													0
<i>Radix peregra</i>													2
<i>Anodonta cygnaea</i>													0
<i>Pisidium casertanum</i>													0
<i>Pisidium sp.</i>													1
Numbers of taxa	12	8	5	15	9	25	10	7	7	14	25	7	372

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Fig. 2. The distribution of the *Hygromia* cf. *transsylvanica* in the Codru-Moma Mts. (Full circles where *H. cf. t.* was found.)



Fig. 3. The distribution of the *Helicigona* *banatica* in the Codru-Moma Mts. (Full circles where *H. b.* was found.)



Fig. 4. The distribution of the *Cochlodina* *laminata* in the Codru-Moma Mts. (Full circles where *C. l.* was found.)



Fig. 5. The distribution of the *Ruthenica* *filigrana* in the Codru-Moma Mts. (Full circles where *R. f.* was found.)



Fig. 6. The distribution of the *Laciniaria plicata* in the Codru-Moma Mts. (Full circles where *L. p.* was found.)



Fig. 7. The distribution of the *Bulgarica vetusta* in the Codru-Moma Mts. (Full circles where *B. v.* was found.)



Fig. 8. The distribution of the *Pseudalinda stabilis* in the Codru-Moma Mts. (Full circles where *P. s.* was found.)



Fig. 9. The distribution of the *Alinda biplacata* in the Codru-Moma Mts. (Full circles where *A. b.* was found.)



Fig. 10. The distribution of the *Perforatella dibothrion* in the Codru-Moma Mts. (Full circles where *P. d.* was found.)



Fig.11. The distribution of the *Isognomostoma isognomostoma* in the Codru-Moma Mts. (Full circles where *I. i.* was found.)



Fig. 12. The distribution of the *Graciliaria inserta* in the Codru-Moma Mts. (Full circles where *G. i.* was found.)



Fig.13. The distribution of the *Perforatella bidentata* in the Codru-Moma Mts. (Full circles where *P. b.* was found.)



Fig.14. The distribution of the *Spelaeodiscus triaria* in the Codru-Moma Mts. (Full circles where *S. t.* was found.)



Fig.15. The distribution of the *Vitrea subrimata* in the Codru-Moma Mts. (Full circles where *V. s.* was found.)



Fig.16. The distribution of the *Cochlodina orthostoma* in the Codru-Moma Mts. (Full circles where *C. o.* was found.)



Fig.17. The distribution of the *Helicodiscus singleyanus* in the Codru-Moma Mts. (Full circles where *H. s.* was found.)



Fig. 18. View of sampling site 25.: triassic limestones with grassy redzina. Photo by J. Lennert



Fig. 19. View of sampling site 24.: bank of the brook covered with *Alnus*. Photo by J. Lennert



Fig. 20. View of sampling site 29.: The authors during collecting trip near the castle of Feniş. Photo by É. D. Megyesi