

<i>Travaux du Muséum National d'Histoire Naturelle</i> «Grigore Antipa»	Vol. LII	pp. 17–30	© Octobre 2009
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THE MOLLUSCA FAUNA OF THE RETEZAT NATIONAL PARK (ROMANIA)

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Abstract. The molluscs fauna of the Retezat National Park is analyzed, based on literature and field work done by the authors and their supporting team, beginning with the year 2000. Up to the present, 93 species of molluscs are known from this area, belonging to 29 families and four orders. These taxa belong to 15 zoogeographical elements, prevailing the European species (44.1%), followed with a much lower ratio by Endemic (9.7%), Holarctic (9.7%), and Balkanic (6.5%) species, all the rest representing less than 5% each. Regarding the ecological preferences, the species were found only on limestone (33.3%), on non-limestone (24.7%), or on both substrata (42%). Considering moisture preferences, the whole range from xerophilous to aquatic species was encountered, most frequent being the mesohygrophilous category (44.1%). This rich fauna and its high zoogeographical and ecological diversity are explained by the heterogeneity of habitats, size of the protected area and its position.

Résumé. La malacofaune du Parc National Retezat est analysée sur la base de la littérature et des recherches sur le terrain entreprises par les auteurs et leur équipe à partir de l'année 2000. Jusqu'à présent on connaît 93 espèces de mollusques de cette zone, appartenant à 29 familles et quatre ordres. Ces taxons appartiennent aux 15 éléments zoogéographiques, les espèces Européennes prédominant (44,1%), suivies par les espèces Endémiques (9,7%), Holarctiques (9,7%) et Balkaniques (6,5%), toutes les autres espèces ne représentant que 5%. En ce qui concerne les préférences écologiques, les espèces ont été rencontrées seulement sur le calcaire (33,3%), sur d'autres substrats (24,7%) ou sur les deux substrats (42%). Considérant les préférences pour l'humidité, on a rencontré tous les types d'espèces, à partir de celles xérophytes jusqu'à celles aquatiques. La plus fréquente est la catégorie des mésohygrophytes (44,1%). Cette faune riche et sa diversité zoogéographique et écologique sont les effets de la structure hétérogène des habitats, de la grande superficie de l'aire protégée ainsi que de sa position géographique.

Key words: malacology, snails, clams, systematics, zoogeography, ecological preferences.

INTRODUCTION

The aim of the present paper is to establish a faunistical and chorological list of the molluscs from the Retezat National Park, and to show some of their ecological features. Compared to other mountain regions from Romania, the Retezat National Park is one of the most quoted in the malacological literature, although many taxa and areas were not researched until the beginning of this study. There are some faunistical data from this area published by A. E. Bielz (1867), M. v. Kimakowicz (1883, 1884, 1890, 1894), Al. V. Grossu (published between 1955 and 1993) and some added by L. Soós (1943) and A. Negrea (1966). Recently, a few information regarding freshwater mollusc species were published by I. Sirbu (2006), and Sirbu & Benedek (2004). The authors started the study as volunteers in the frame of a biodiversity inventory project, lead by the Retezat Park Administration. The research reports written in the last years represent the basis of the present paper.

STUDY AREA AND METHODS

The authors together with their supporting team, started the malacological inventory in the summer of 2000, and carried it on during several other field trips in the next years, up to the present. The research area stretches between the following extreme points: in North - Cârnic Chalet (45°25'49.90" N, 22°53'42.40" E), in East - Cheile Buții (45°18'08.56" N, 22°58'18.65" E), in South - Câmpușel Forest Range (45°15'43.25" N, 22°52'14.49" E), and in West - Gura Apei Lake shore (45°18'56.86" N, 22°40'25.60" E).

The systematical catalogue is given according to Al. Grossu (1993), Glöer & Meier-Brook (2003), I. Sîrbu (2006), and - especially for superspecific taxa - according to „Fauna Europaea”, namely the lists compiled by R. Bank (2007) for gastropods, and by R. Araujo (2007) for bivalves. However, the data for Romanian Mollusca given in the „Fauna Europaea” are corresponding to the „Checklist of Romanian Fauna (terrestrial and freshwater species)”, 2007, editor in chief O. T. Moldovan, which contains many errors. This publication was written by a group of specialists in the frame of a research project, but no malacologist was invited to join the team, thus the molluscs' checklist (pages 40-48) has no author and no cited literature, making it highly unreliable. Thus, the systematical list is critically discussed according to the several quoted sources.

The quoted data are mainly from: E. A. Bielz (1867), M. v. Kimakowicz (papers published in 1883, 1884, 1890 and 1894), Al. V. Grossu (1955, 1956, 1981, 1983, 1986, 1987, 1993). In the distribution catalogue these sources are quoted by the authors' surnames. Some other sources are quoted by surname and year of publication. The mollusc species' distribution on geological substratum was classified as follows: Limestone - meaning limestone areas (basic soils); Non-limestone - metamorphic, crystalline, etc. or acid soils areas; Both substrata - on both types of substratum, in acid as well as in basic soil areas. Their preferences concerning humidity were coded as follows: X - xerophylous; MX - meso-xerophylous; M - meso-hygrophylous; H - hygrophylous; Hid - hydrophylous (aquatic). The zoogeographical categories analysis was also performed. In the systematical and chorological catalogue the toponimes were given mostly according to their native, original terminology, in order to facilitate their recognition for further researches. Thus, words like „scoc(ul), chei(le)“ meaning gorges, „valea“ meaning valley, „câmpu“ - field, etc., were left in original spelling.

RESULTS

Up to the present, 93 mollusc species are known from the Retezat National Park, belonging to 29 families and four orders. Among them, 33 species are firstly quoted from this area. The systematical and distributional catalogue is given below.

Classis Gastropoda Cuvier, 1798
Ordo Haller, 1890
Familia Aciculidae Gray, 1850

1. *Platyla polita* (W. Hartmann, 1840)
Original data: Cheile Scocului. European; Limestone; M.
2. *Platyla banatica* (Rossmässler, 1842)
Original data: Cheile Scocului. Balkanic; Limestone; M.

Ordo Neotaenioglossa Haller, 1882

Familia Bythinellidae Radoman, 1976

(in „Fauna Europaea”, it is still considered Fam. Hydrobiidae)

3. *Bythinella dacica* Grossu, 1946 - in „Fauna Europaea”, as well as in the „Checklist of Romanian Fauna” (2007) it is presented as *B. dacida*, which is an error of spelling! It was firstly quoted by Grossu from these mountains.

Original data: spring at 500 m from Buta chalet, springs at Scorota, brooks in Buta Valley at Beci, spring in Cheile Buții. Endemic; Both substrata; Hid.

Ordo Pulmonata Cuvier, 1814

Familia Carychiidae Jeffreys, 1830

4. *Carychium tridentatum* (Risso, 1826)

Original data: Gura Zlata and Cheile Scocului. European; Both substrata; H.

Familia Lymnaeidae Rafinesque, 1815

5. *Radix labiata* (Rossmässler, 1835)

(Bielz): Câmpu lui Neag; Original data: puddles and brooks in Valea Mării (Lazăr). European; Non-limestone; Hid.

6. *Galba truncatula* (O. F. Müller, 1774)

Al. Negrea (1966) quoted it from the Retezat Mountains; Original data: puddles and brooks in Buta Valley, puddle close to Buta Lake, brooks upstream Buta chalet. Palaeartic; Non-limestone; Hid.

Familia Planorbidae Gray, 1840

7. *Ancylus fluviatilis* O. F. Müller, 1774

(Grossu): Gemenele Lake; Original data: Cheile Buții, rivulet at Gura Zlata. European; Both substrata; Hid.

Familia Cochlicopidae Pilsbry, 1900

8. *Cochlicopa lubrica* (O. F. Müller, 1774)

Original data: Câmpu Mielului, Câmpu lui Neag. Holarctic; Both substrata; H.

9. *Cochlicopa lubricella* (Rossmässler, 1834)

Original data: Piatra Iorgovanului (at 1470 m a.s.l.), below Dâlma Mare Peak (1270 m), Pleșa Peak, Cheile Buții, Cheile Scocului. European; Limestone; M.

Familia Orculidae Pilsbry, 1913

10. *Sphyradium doliolum* (Bruguière, 1792)

(Bielz): Câmpu Mielului; Original data: Cheile Scocului. Central-South European; Limestone; M.

Familia Pyramidulidae Kennard & B. B. Woodward, 1914

11. *Pyramidula rupestris* (Draparnaud, 1801)

(Bielz): Pleșa; Original data: Piatra Iorgovanului, Scocul Drăgșanu, Paltina sheepfold, Scorota sheepfold, Avenul lui Kiss, Câmpușel I, Câmpușel II, Piatra Iorgovanului, Cheile Buții, Buta Valley, northern slope of Piule, Șaua Paltina, Pleșa Peak. European; Both substrata; MX.

12. *Pyramidula pusilla* (Vallot, 1801)

Original data: Cheile Scorota, Câmpușel II, Cheile Scocului. Central-South European; Limestone; X.

Familia Valloniidae Morse, 1864

13. *Vallonia costata* (O. F. Müller, 1774)

Original data: Cheile Scocului. Holarctic; Limestone; MH.

14. *Acanthinula aculeata* (O. F. Müller, 1774)

Original data: Cheile Buții, Cheile Scocului. European; Limestone; M.

Familia Strobilopsidae Pilsbry, 1918 (1911)

15. *Spelaeodiscus triarius trinodis* (M. von Kimakowicz, 1883)

(Bielz and Kimakowicz): Câmpu Mielului, Câmpu Siriului, Scocu Mare (Cheile Scocului), southern slope of Pleșa Mountain, Dâlma Mare; (Grossu): Lăpușnicul Mic; Original data: Piatra Iorgovanului, Cheile Scorota, Avenul lui Kiss, Câmpușel I, Câmpușel II, Cheile Buții, Buta Valley, Piule peak and the northern slope; Dâlma Mare Peak, Pleșa Peak, rocks at Soarbele, Cheile Scocului. Endemic; Both substrata; M.

Familia Vertiginidae Fitzinger, 1833

16. *Columella edentula* (Draparnaud, 1805)

Original data: Piatra Iorgovanului. Holarctic; Limestone; M.

17. *Truncatellina cylindrica* (A. Férussac, 1807)

Original data: Paltina sheepfold, Cheile Buții. European; Limestone; M.

18. *Vertigo pusilla* O. F. Müller, 1774

Original data: Cheile Scocului. European; Limestone; MH.

19. *Vertigo alpestris* Adler, 1838

Original data: Cheile Scocului. European; Limestone; M.

Familia Pupillidae Turton, 1821

20. *Pupilla sterrii* (Voith, 1840)

Quoted as *Pupilla sterrii carpathica* (Kimakowicz, 1890), by the same author, from Lăpușnicul Mic Valley; Original data: Avenul lui Kiss, northern slope and peak of Piule, Piatra Iorgovanului, Șaua Scorotei. Alpine-Carpathic; Limestone; X.

Familia Chondrinidae Steenberg, 1925

21. *Granaria frumentum* (Draparnaud, 1801)

(Bielz): Dâlma Mare, Câmpu Mielului, Scocu Mare (Cheile Scocului); Original data: Cheile Buții. Alpine-Carpathic; Limestone; X.

22. *Chondrina avenacea* (Bruguière, 1792)

(Bielz): Pleșa, Dâlma Mare, Câmpu Mielului; Original data: Cheile Scorota, Câmpușel I, Câmpușel II, Piatra Iorgovanului, Cheile Buții. European; Limestone; X.

23. *Chondrina arcadica clienta* Westerlund, 1883

Original data: Scorota Gorges, Câmpușel I, Câmpușel II, Cheile Buții. European; Limestone; X.

Familia Enidae Woodward, 1903

24. *Ena montana* (Draparnaud, 1801)

(Grossu): Gura Apei, Lăpușnicul Mic, Gura Zlata; Original data: Scocul Drăgșanu, Piatra Iorgovanului, Paltina sheepfold, Cheile Scorota, Avenul lui Kiss, Albele Peak, Buta Valley in mixed forest, Piule Mountain, Scocul Drăgșanu, coniferous forest towards Lunca Berhina, Lăpușnicul Mare Valley at Paltina. European; Both substrata; MH.

25. *Merdigera obscura* (O. F. Müller, 1774)

Original data: Câmpușel II, Dâlma Mare Peak, Cheile Scocului. European; Limestone; MH.

26. *Mastus venerabilis* (L. Pfeiffer, 1855)

(Kimakowicz): „In the Retezat Mountains“. Balkanic; Both substrata; MH.

Familia Punctidae Morse, 1864

27. *Punctum pygmaeum* Draparnaud, 1801

(Grossu): Lăpușnicul Mic; Original data: Cheile Buții and Cheile Scocului. European; Both substrata; M.

Familia Clausiliidae A. Schmidt, 1857

28. *Alopia subcosticollis* (A. Schmidt, 1868)

(Bielz and Kimakowicz): from valleys in the Retezat Mountains, on the left side of the Jiu River, like Câmpu Siriului, Câmpu Mielului, Scocul Mare (Cheile Scocului), westwards from Câmpu lui Neag; Original data: near Piule Peak and on the northern slope, Cheile Buții, Piatra Iorgovanului, Câmpușel II, Cheile Scocului, Cheile Scorota. Endemic; Limestone; M.

29. *Macedonica marginata* (Rossmässler, 1835)

(Grossu): Retezat Mountains; Original data: Buta Gorges. Balkanic; Both substrata; M.

30. *Cochlodina laminata* (Montagu, 1803)

(Bielz): Câmpu lui Neag, Dâlma Mare, Câmpu Mielului, Scocu Mare (Cheile Scocului), Câmpu Siriului; Original data: Cheile Buții, near Dâlma Mare Peak, Câmpușel II, mixed forest at Soarbele and towards Piatra Iorgovanului, Câmpușel I, Cheile Scorota, Gura Zlata, Lăpușnicul Mare Valley at Paltina. European; Both substrata; MH.

31. *Cochlodina orthostoma* (Menke, 1828)

(Bielz): Dâlma Mare, Câmpu Mielului, Scocu Mare (Cheile Scocului), Câmpu Siriului; Original data: Paltina sheepfold, Scocul Drăgșanu, Albele Peak, Cheile Buții, northern slope and peak of Piule, Dâlma Mare Peak, mixed forest at Câmpușel II, close to Piatra Iorgovanului Peak and its south-eastern slope, Câmpușel I, Cheile Scocului, Râul Mare Valley at Gura Apei and Gura Zlata. European; Both substrata; MH.

32. *Graciliaria inserta* (A. & J. B. Villa, 1841)

(Bielz) „in Retezat Mountains surroundings“; (Grossu): Câmpu Mielului, Câmpu Siriului, Câmpu lui Neag, Lăpușnicu Mare, Scocul Mare (Cheile Scocului); Original data: Câmpușel II, Cheile Scorota, Paltina sheepfold, Râul Mare – Gura Apei, Gura Zlata.

In „Fauna Europaea” it is considered synonym with *Graciliaria concilians* E. A. Bielz, 1853, while Grossu recognized two distinct species. Both were found in the Retezat Mountains. Endemic; Both substrata; MH.

33. *Clausilia dubia* Draparnaud, 1805

(Bielz): Câmpu Mielului, Scocul Mare (Cheile Scocului), Dâlma Mare, Câmpu Siriului; (Grossu): quoted as „*ssp. alpicola* Clessin, 1887” on Lăpușnicul Mare Valley; Original data: Piatra Iorgovanului, Albele Peak, Cheile Buții, northern slope and peak of Piule, Piatra Iorgovanului, Șaua Scorota, Cheile Scocului and Scorota, Câmpușel II, Râul Mare – Gura Apei, Gura Zlata. European; Both substrata; MH.

34. *Laciniaria plicata* (Draparnaud, 1801)

Original data: below Dâlma Mare Peak. European; Limestone; MH.

35. *Alinda (Pseudalinda) viridana* (Rossmässler, 1836)

Original data: Scocul Drăgșanu, Câmpușel II, Cheile Scorota, Cheile Scocului, forest towards Piatra Iorgovanului, Râul Mare Valley at Gura Apei, Gura Zlata, Lăpușnicul Mare Valley at Lunca Berhina. Endemic; Both substrata; MH.

36. *Alinda (Pseudalinda) stabilis* (L. Pfeiffer, 1847)

(Grossu): „at the feet of Retezat Mountains”; Original data: Câmpușel II, Cheile Scocului. Carpathic, Limestone; MH.

37. *Alinda biplicata* (Montagu, 1803)

(Bielz): The feet of the mountains at Câmpu Mielului and Scocu Mare (Cheile Scocului). European; Limestone; MH.

38. *Alinda (Pseudalinda) fallax* (Rossmässler, 1836)

(Grossu): Câmpu Mielului, Scocu Mare (Cheile Scocului), Lăpușnicul Mic, Gemenele. Carpathic; Both substrata; MH.

39. *Vestia elata* (Rossmässler, 1836)

(Bielz): Câmpu lui Neag, Câmpu Mielului, Scocu Mare (Cheile Scocului); Original data: Câmpușel II at 1200 m in mixed forest. Carpathic; Both substrata; M.

40. *Bulgarica (Strigilecula) vetusta* (Rossmässler, 1836)

(Bielz): Dâlma Mare, Câmpu Mielului, Scocul Mare (Cheile Scocului), Câmpu Siriului, Lăpușnicul Mic, Pleșa; Original data: Cheile Buții, Câmpușel II, Cheile Scocului, Cheile Scorota, Câmpușel II towards Piatra Iorgovanului. Central-South-East European; Both substrata; M.

41. *Bulgarica (Strigilecula) cana* (Held, 1836)

(Bielz): Câmpu lui Neag, Câmpu Mielului; (Grossu): Râu Mare; Original data: Râul Mare Valley - Gura Zlata, Gura Apei. Central-North European; Both substrata; M.

Familia Patulidae Tryon, 1866

42. *Discus ruderatus* (W. Hartmann, 1821)

(Grossu): Râu Mare, Gura Apei, Lăpușnicul Mare; Original data: Piatra Iorgovanului. European; Both substrata; M.

Familia Arionidae Gray, 1841

43. *Arion subfuscus* (Draparnaud, 1805)

(Bielz): Pleșa; (Grossu): Gura Apei, Gura Zlata, Gemenele, Lăpușnicul Mic; Original data: Zănoaga Lake Glacial Circus, near Florica, Galeș and Tăul Agățat glacial lakes, close to Pietrele chalet, Paltina sheepfold. European, Both substrata; MH.

44. *Arion hortensis* Férussac, 1819
(Grossu): Gura Apei, Lăpușnicul Mic. European; Non-limestone; MH.
45. *Arion circumscriptus* Johnston, 1828
Original data: Pietrele Valley. European; Non-limestone; MH.

Familia Vitrinidae Fitzinger, 1833

46. *Vitrina pellucida* (O. F. Müller, 1774)
(Bielz): Scocul Mare (Cheile Scocului); (Grossu): Pietrele chalet, Gura Zlata, Râul Mare, Lăpușnicul Mare; quoted as *Phenacolimax bielzi* Kimakowicz, 1890 from Cheile Buții; Original data: Câmpușel II, below Dâlma Mare Peak (1270 m), Cheile Buții. Holarctic; Both substrata; M.
47. *Oligolimax annularis* (S. Studer, 1820)
Original data: Piatra Iorgovanului, below Albele Peak. European; Limestone; MH.
48. *Semilimacella carniolica* (O. Boettger, 1884)
(Grossu): Râul Mare; Original data: close to Zănoaga Lake, Paltina sheepfold. Central-South-East European; Both substrata; H.
49. *Semilimacella bonellii reitteri* (O. Boettger, 1880)
(Grossu): Râul Mare, Gura Apei, Lăpușnicul Mic, Lăpușnicul Mare; Original data: Stânișoara Valley, Pietrele chalet, Paltina sheepfold. Balkanic; Both substrata; H.
50. *Semilimax carinthiacus* (Westerlund, 1886)
(Grossu): Lăpușnicul Mare; Original data: Valea Rea. Central-South-East European; Non-limestone; H.

Familia Gastrodontiidae Tryon, 1866

51. *Zonitoides nitidus* (O. F. Müller, 1774)
(Kimakowicz): Scocu Mare (Cheile Scocului), Câmpu Siriului. Holarctic; Limestone; H.

Familia Pristilomatidae Cockerell, 1891

52. *Vitrea transsylvanica* (Clessin, 1877)
Original data: Avenul lui Kiss, Cheile Scocului. Central-East European; Limestone; MH.
53. *Vitrea diaphana* (Studer, 1820)
Original data: Cheile Scocului, Piatra Iorgovanului, below Dâlma Mare Peak. European; Limestone; MH.
54. *Vitrea crystallina* (O. F. Müller, 1774)
(Kimakowicz, Grossu): Gura Apei; Original data: Paltina sheepfold. European; Both substrata; MH.
55. *Vitrea densigirata* (M. von Kimakowicz, 1890)
(Kimakowicz, Grossu): Lăpușnicul Mic, Gura Apei. Endemic; Non-limestone; MH.
56. *Vitrea subcarinata* (Clessin, 1877)
(Grossu): Lăpușnicul Mic, Gura Apei. Endemic; Non-limestone; MH.
57. *Vitrea contracta* (Westerlund, 1871)
Original data: Piatra Iorgovanului, below Dâlma Mare Peak (1270 m), Cheile Buții. European; Limestone; MH.
58. *Vitrea subrimata* (Reinhardt, 1871)
Original data: Cheile Buții and Cheile Scocului. European; Limestone; M.

Familia Oxychilidae Hesse, 1927 (1879)

59. *Nesovitrea petronella* (L. Pfeiffer, 1853)
Original data: Cheile Scorota, Câmpușel II, Piatra Iorgovanului, mixed forest in Buta Valley. European; Both substrata; M.
60. *Nesovitrea hammonis* (Ström, 1765)
Original data: Pietrele Valley, Piatra Iorgovanului, Cheile Scorota, rocks below Șaua Paltina, below Dâlma Mare Peak (1270 m), Cheile Scocului. Palaeartic; Both substrata; MX.
61. *Aegopinella pura* (Alder, 1830)
(Bielz): Dâlma Mare; Original data: Pietrele chalet, Cheile Buții, Cheile Scocului. European; Both substrata; M.
62. *Aegopinella minor* (Stabile, 1864)
Original data: Cheile Buții. Central-South European; Limestone; MX.
63. *Morlina glabra* syn. *Oxychilus glaber* (Rossmässler, 1835)
(Bielz): Nucșoara at Stâna de Râu, Dâlma Mare, Câmpu Siriului. European; Both substrata; MH.
64. *Mediterranea depressa* syn. *Oxychilus depressus* (Sterki, 1880)
Original data: Piatra Iorgovanului, below Dâlma Mare Peak (1270 m). Central-South European; Limestone; MH.
65. *Mediterranea montivaga* syn. *Oxychilus montivagus* (M. von Kimakowicz, 1890)
(Grossu): Gura Zlata; Original data: Avenul lui Kiss, Câmpușel II, Valea Rea, Paltina sheepfold, Cheile Buții. Endemic; Both substrata; MH.

Familia Limacidae Rafinesque, 1815

66. *Limax cinereoniger* Wolf, 1803
(Grossu): Gura Zlata; Original data: Stânișoara Valley, Pietrele chalet, Buta chalet. European; Non-limestone; MH.
67. *Malacolimax tenellus* Nilsson, 1822
(Grossu): Gura Zlata, Lăpușnicul Mare, Râu Mare. Original data: near Florica and Galeș glacial lakes and in Valea Rea. European; Non-limestone; MH.
„Fauna Europaea” (Bank, 2007), as well as D. Lupu (ap. Grossu, 1983), considers *Limax tigvenius* Grossu, 1969 synonym with the present species, although Grossu stands for the validity of the latter species, quoted by him at Gura Apei (ibidem).
68. *Lehmannia nyctelia* (Bourguignat, 1861)
Original data: Pietrele Valley. Central-South-East European; Non-limestone; MH.
69. *Lehmania marginata* (O.F. Müller, 1774)
Original data: Pietrele Valley, Valea Rea. European; Non-limestone; H.
70. *Lehmannia sarmizegetusae* Grossu, 1970
(Grossu): Lăpușnicul Mic, Gura Zlata, Gura Apei. Endemic; Non-limestone; H.
71. *Bielzia coeruleans* (M. Bielz, 1851)
(Grossu): Gura Zlata. Central-East European; Non-limestone; MH.

Familia Agriolimacidae H. Wagner, 1935

72. *Deroceras laeve* (O. F. Müller, 1774)
(Grossu): Gura Zlata, Gura Apei. Holarctic; Non-limestone; MH.

73. *Deroceras reticulatum* (O. F. Müller, 1774)

(Grossu): Gura Zlata, Gura Apei, Lăpușnicul Mare, Pietrele chalet. European; Non-limestone; MH.

74. *Deroceras caucasicum* (Simroth, 1901)

(Grossu): Valea Zlata, Lăpușnicul Mare, Gura Apei; Original data: Pietrele chalet. East-European; Non-limestone; MH.

75. *Deroceras subagrestis* H. Simroth, 1893.

It is not mentioned in „Fauna Europaea” (2007), Grossu (1983) considered it a valid species, related to the former taxa. It was quoted from Pietrele Valley, Gura Zlata and Lăpușnicul Mare. East-European, Non-limestone; MH.

76. *Deroceras bureschi* (H. Wagner, 1934)

In „Fauna Europaea” (Bank, 2007) it is considered the valid name for both *Deroceras* (syn. *Lytopenelte*) *suboccidentalis* Grossu et D. Grossu, 1965, described from the Retezat Mountains, from Lăpușnicul Mic Valley, Gura Zlata, Zlătuia Valley, Pietrele chalet (ap. Grossu, 1983), and *Lytopenelte herculana* Grossu, 1964, quoted from Gura Zlata, Râul Mare, Gura Apei, Lăpușnicul Mare, Lăpușnicul Mic (idem). Other two species, belonging to the same group, are considered synonyms with *D. bureschi* by „Fauna Europaea” (Bank, 2007). We highlight the possibility that these species are still valid. If „Fauna Europaea” is right, then the group of endemic species recognized by Grossu are gathered in one taxa, being a northern Balkanic species. Balkanic; Non-limestone; MH.

Familia Euconulidae H. B. Baker, 1928

77. *Euconulus fulvus* (O. F. Müller, 1774)

(Grossu): Retezat Mountains; Original data: Piatra Iorgovanului, Cheile Scorota, Scocul Drăgșanu. Holarctic; Limestone; MH.

Familia Bradybaenidae Pilsbry, 1939

78. *Fruticicola fruticum* (O. F. Müller, 1774)

(Bielz): Scocul Mare (Cheile Scocului); (Grossu): Retezat Mountains; Original data: Câmpușel I, Câmpușel II, Cheile Buții, Cheile Scocului, Gura Zlata. Palearctic; Both substrata; MH.

Familia Hygromiidae Tryon, 1866

79. *Euomphalia strigella* Draparnaud, 1801

(Bielz): Câmpu lui Neag, Dâlma Mare, Pleșa Mountain, Scocul Mare (Cheile Scocului); Original data: Paltina sheepfold, Câmpușel II, Cheile Buții. European; Both substrata; M.

80. *Lozekia transsylvanica* syn. *Hygromia transsylvanica* (Westerlund, 1876)

Original data: Cheile Scocului. Central-European; Limestone; MH.

81. *Perforatella dibothrion* (M. von Kimakowicz, 1884)

(Bielz): Dâlma Mare; (Grossu): Gura Zlata; Original data: Cheile Buții. Carpathic; Both substrata; MH.

82. *Monachoides vicinus* (Rossmässler, 1842)

(Grossu): Lăpușnicul Mare; Original data: below Dâlma Mare Peak (1270 m). Central-European; Both substrata; M.

83. *Monachoides incarnatus* (O. F. Müller, 1774)
(Grossu): Gura Zlata, Râul Mare; Original data: mixed forest in Buta Valley. European; Non-limestone; M.
84. *Trichia sericea* (Draparnaud, 1801)
(Bielz): Câmpu lui Neag. Central-West European; Non-limestone; MH.

Familia Helicidae Rafinesque, 1815

85. *Isognomostoma isognomostomos* (Schröter, 1784)
(Bielz): Dâlma Mare; Original data: Cheile Scorota, Câmpușel II, Piatra Iorgovanului, Cheile Buții, mixed forest in Buta Valley, northern slope of Piule, Soarbele. European; Both substrata; M.
86. *Arianta arbustorum* (Linnaeus, 1758)
(Bielz): Stâna de Râu; (Kimakowicz): „Retezat Mountains“; Original data: Paltina sheepfold, Piatra Iorgovanului, Scocul Drăgșanu, Avenul lui Kiss, Câmpușel I, Câmpușel II, Cheile Scocului, northern slope and peak of Piule, rocks below Șaua Paltina, Șaua Scorota, Lăpușnicul Mare Valley from Berhina towards Gura Apei damlake, Pietrele chalet. European; Both substrata; M.
87. *Drobacia banatica* (Rossmässler, 1838)
(Bielz): Dâlma Mare; Original data: mixed forest in Buta Valley, Valea Mării Valley, Gura Zlata, Câmpușel II, Cheile Buții and Cheile Scocului. Central-East European; Both substrata; M.
88. *Faustina faustina* (Rossmässler, 1835)
(Bielz): Dâlma Mare, Câmpu Mielului, Scocu Mare; (Kimakowicz, Grossu): Câmpu Siriului, Câmpu Mielului; Original data: Cheile Scorota, Câmpușel I, Câmpușel II, below Albele Peak, Piatra Iorgovanului, Cheile Buții, mixed forest in Buta Valley, below Dâlma Mare Peak (1270 m), rocks at Soarbele, Cheile Scocului, Gura Zlata. Central-East European; Both substrata; M.
89. *Chilostoma trizona* (Rossmässler, 1835)
Original data: Câmpușel I, Câmpușel II. Balkanic; Limestone; M.
90. *Helix pomatia* Linnaeus, 1758
Original data: Scorota Gorges, Câmpușel I, Câmpușel II, Valea Mării, Buta Valley, including Cheile Buții. European; Both substrata; M.

Classis Bivalvia Linnaeus, 1758

Ordo Veneroidea H. & A. Adams, 1856

Familia Sphaeriidae Jeffreys, 1862

91. *Pisidium casertanum* (Poli, 1791)
(Bielz): above of Câmpu lui Neag locality; (Soós, 1943): Zănoaga lake (sampled from 15 m depth, leg. Gebhardt Antal, ap. idem); Original data: the glacial lakes Viorica, Lia, Zănoaga, Zănoaga, Galeșu, Pietrele, lakes from Stânișoara Valley and Valea Rea (Mare and Mutu lakes), Tăul dintre Brazi Lake, Buta Lake (det. P. Glöer); brooks in Buta Valley at Beci; brooks above Buta chalet; puddles and helokrenic springs at Câmpușel II; ditch close to Gura Apei Lake. Cosmopolite; Both substrata; Hid.
92. *Pisidium personatum* Malm, 1855
Original data: Buta Lake (det. P. Glöer). Holarctic; Non-limestone; Hid.
93. *Pisidium nitidum* Jenyns, 1832
Original data: puddles in Buta Valley, pond in Șaua Plaiu Mic, Tăul Buta Lake, Tău Țapulului Lake, ponds in Bucura Valley in spruce forest, lakes from Valea Rea and Pietrele valleys, glacial lakes Ana, Lia, Zănoaga, Tău dintre Brazi and Galeșu. Holarctic; Non-limestone; Hid.

DISCUSSION

Except the 93 species listed above, there are still some uncertain mollusc taxa in this area. The following species were quoted from „the feet of Retezat Mountains“ or in their close vicinity, being not found, up to present, within the park's borders: *Agardhiella parreyssi parreyssi* L. Pfeiffer, 1848 and *Ruthenica filograna* (Rossmässler, 1836). The quotation of *Arianta aethiops aethiops* (M. Bielz, 1851) from the Retezat Mountains by Grossu (1983) is a possible error. As the original paper (Bielz, 1867) does not mention any locality from Retezat Mountains and the species was not found by any other author, we consider it as a probable error of translation of the toponyms.

Among the 93 species of molluscs identified in the area of reference, 33 are first quoted by the authors, while 17 species are mentioned in the references, but they were not found again during the last 10 years.

The species belong to 15 zoogeographical categories (Fig. 1). The European elements are prevailing (44.1%), followed with a much lower ratio by the Endemic and Holarctic (both with 9.7%), then the Balkanic species (6.5%), while the rest represents less than 5% each. The high number of elements can be explained by the heterogeneity of habitats (ranging from hilly up to alpine levels, sheltering all types

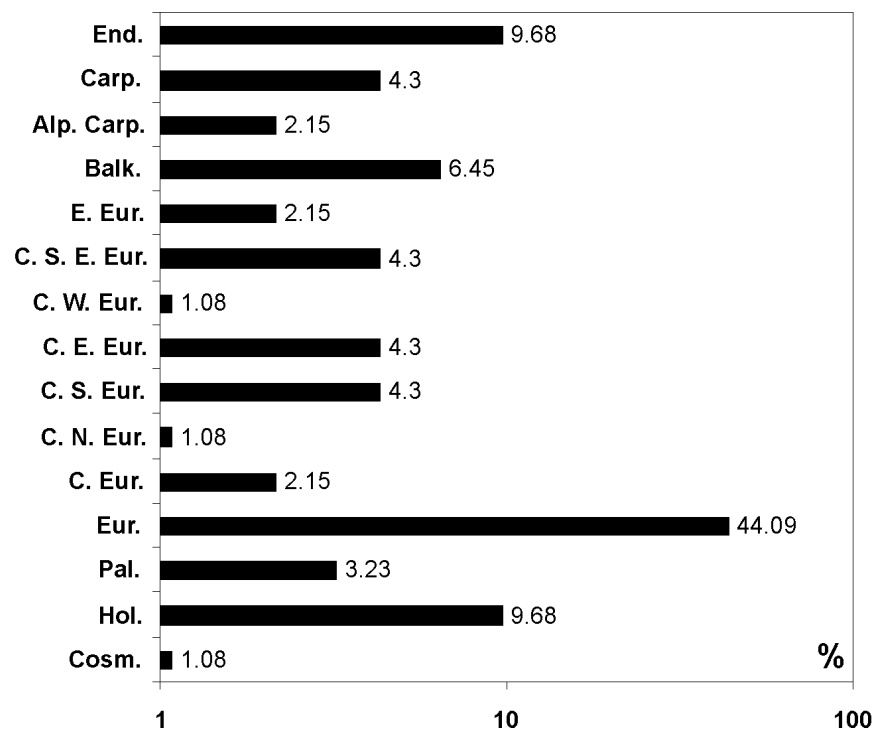


Fig. 1 – Zoogeographical spectrum (in terms of species percent, on logarithmic scale) of the molluscan fauna from Retezat National Park. The categories are coded as follows: Cosm. - Cosmopolite, Hol. - Holarctic, Pal. - Palaearctic, Eur - European, C. Eur. - Central - European, C. N. Eur. - Central - North - European, C. S. Eur. - Central - South - European, C. E. Eur. - Central - East - European, C. W. Eur. - Central - West - European, C. S. E. Eur. - Central - South - East European, E. Eur. - East European, Balk. - Balkanic, Alp. - Carp. - Alpine - Carpathic, Carp. - Carpathic, End. - Endemic.

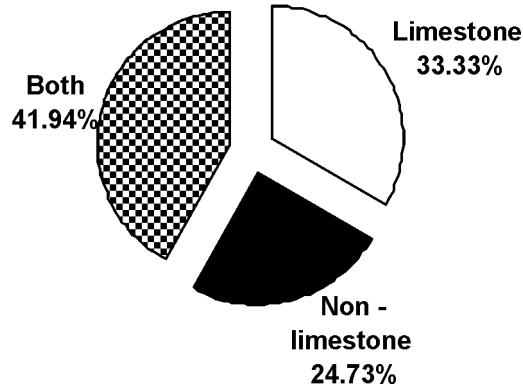


Fig. 2 – The distribution of mollusc species from Retezat National Park on geological substrata. The categories signify: Limestone - limestone areas (basic soils), Non-limestone – magmatic, metamorphic, crystalline etc. or acid soils areas, Both - on both types of substrata, on acid as well as on basic soils areas.

of mountain vegetation), history of the area, and its position, at the intersection of several biogeographical provinces and climatic zones.

Considering the species' habitat preferences classified according to the geological substratum (Fig. 2), about one third of the species were identified only in limestone areas (33.33%), namely from basic soils. Less than one quarter (24.73%) were sampled from non-limestone areas, characterized by acid soils, while the rest (41.94%) were inhabiting both categories of areas. The presence of both acid and basic rocks and soils, as well as the corresponding vegetation, is another reason for this remarkable species diversity.

The humidity preferences of Mollusca species is analysed in figure 3. Due to the presence of both limestone and acid rocks, variable altitudes, ranging from inferior mountain up to alpine level and variety of vegetation, as well as the presence

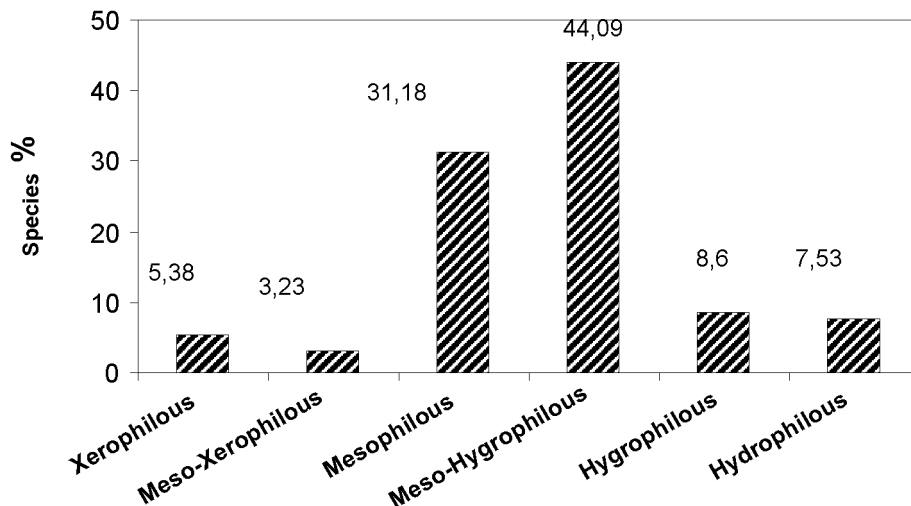


Fig. 3 – The humidity preferences spectrum of Mollusca species from Retezat National Park.

of many glacial lakes, springs, rivulets and mountain rivers, the whole range from xerophilous to aquatic species was encountered. Most species (44.1%) belong to the meso-hygrophilous, followed by the mesophilous category (31.18%).

Conclusions

In the Retezat National Park, 93 species of molluscs were identified up to the present, among them 33 being quoted for the first time by the authors, while 17 species mentioned in the literature have not been found again. They belong to 29 families, 4 orders and two classes, namely Gastropoda and Bivalvia, the last being represented by three clam species from glacial lakes and mountain flowing waters.

At least other four species could inhabit this protected area, being identified by other authors close to the area of reference. Five species were recognized by Al. V. Grossu, but they are not included in „Fauna Europaea”, demanding a future status validation. Concerning the last source, it is highly important to establish a sound revision for the checklist of the molluscs species and their status in Romania. The „Checklist of Romanian Fauna (terrestrial and freshwater species)”, published in 2007, editor in chief O. T. Moldovan, which stood as basis for the status of Romanian molluscs included in „Fauna Europaea”, was established by a team without a malacologist, and its chapter dedicated to molluscs has neither an author, nor cited literature, containing many mistakes.

There are 15 zoogeographical elements represented in the Mollusca fauna of Retezat National Park, prevailing the European, followed by the Endemic and Holarctic species. One third of the species were found in limestone areas, about one quarter on acid rocks substratum, while the rest inhabits both types of areas. Considering the tolerance and preferences for moisture conditions, a unimodal frequency distribution was proved, prevailing the meso-hygrophilous, followed by mesophilous species. The rich fauna, as well as the diverse zoogeographical and ecological elements, are explained by the heterogeneity of habitats, especially linked to limestone and acid substrata, the balanced representation of all the mountain levels and vegetation, but also to the protected area's size and geographical position, at the intersection, and under the influence of several climatic and zoogeographical provinces.

ACKNOWLEDGEMENTS

The opportunity of these field investigations was offered by the Retezat National Park Administration, and especially by the former park's biologists, Atilla Sándor and - later - Călin Hodor, the latter supporting our research team beyond his regular duties, as well as the former Project Director Mrs. Erika Stanciu. Between 2000 and 2003 the authors worked in the frame of a biodiversity assessment project led by the former mentioned administration, afterwards the research being continued by volunteering. The field investigations were accomplished with the indispensable help of some colleagues and students: Cătălina Bogdan (Trif), Cosmin Bogdan, Marius Bereș, Marius Drugă, Mihai Soricu, Ana Maria Gurzău, Mihai Vasile, Ionuț Bordea, Alexandru Nicoară. Several scientists have kindly supported our efforts and substantially helped this work. We highlight Dr. Miklos Szekeres, Dr. Peter Subai and Prof. Peter Glöer. To all those mentioned the authors owe sincere gratitude.

MALACOFAUNA PARCULUI NAȚIONAL RETEZAT (ROMÂNIA)

REZUMAT

Lucrarea prezintă o analiză a faunei de moluște din Parcul Național Retezat, pe baza literaturii de specialitate și a cercetărilor de teren efectuate de autori și echipa de asistență a acestora, începând cu anul 2000. Până în prezent sunt cunoscute 93 specii de moluște din această arie, aparținând la 29 de familii și patru ordine. Taxonii aparțin la 15 elemente zoogeografice, dintre care predomină cele europene (44,1%), urmate cu o pondere mai scăzută cele endemice (9,7%), holarctice (9,7%) și

balcanice (6,5%), celelalte fiind reprezentate sub 5%. În ceea ce privește preferințele ecologice, speciile au fost identificate numai pe substrat calcaros (33,3%), acid (24,7%), sau pe ambele (42%). Considerând preferințele pentru umiditate, a fost întâlnită întreaga gamă de specii, de la cele xerofile până la hidrofile (acvatice), cea mai mare frecvență fiind înregistrată de speciile mezo-higrofile (44,1%). Bogăția faunistică și diversitatea elementelor zoogeografice și ecologice ale acestora sunt explicate prin heterogenitatea habitatelor, dimensiunea ariei protejate și poziția geografică a acestora.

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Received: April 27, 2009

Accepted: June 2, 2009

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