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Contribution to the Study of Land Snails
(Gastropoda) of Medvednica Mountain (NW
Croatia, Yugoslavia)

Museologica

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(Gastropoda) gore Medvednice (SZ Hrvaška,
Jugoslavija)

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Contribution to the Study of Land Snails (Gastropoda) of Medvednica Mountain (NW Croatia, Yugoslavia)

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ABSTRACT – Fifty-one land snail species were collected in 80 localities in Medvednica mountain (NW Croatia, Yugoslavia) from 1978 to 1987. Twelve of them were recorded for the first time in the study area. Of the 73 taxa which were reported in the other literature 39 are confirmed in the present paper. The literary data on 12 species listed are considered incorrect.

IZVLEČEK – PRISPEVEK K POZNAVANJU KOPENSKIH POLŽEV (GASTROPODA) GORE MEDVEDNICE (SZ HRVAŠKA, JUGOSLAVIJA) – Od 1978. do 1987. leta je bilo na 80 lokalitetah na območju gore Medvednice (severozahodna Hrvaška, Jugoslavija) zbranih 51 vrst kopenskih polžev. Med njimi je 12 vrst prvič zapisanih na raziskovanem območju. Dosegljivi literarni viri navajajo za to območje 73 taksonov polžev, od tega jih avtorica potrjuje 39, za 12 vrst, ki jih navaja, pa misli, da so podatki v literaturi netočni.

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1. Introduction

The first data relating to land snails in the Medvednica area are to be found in the papers by E. A. BIELZ (1865). The basic knowledge on the malacofauna of this area was established by S. BRUSINA (1867, 1869, 1870, 1870a, 1885, 1907) who listed some fifty taxa. Later data are derived from general accounts on malacofauna in which Medvednica and Zagreb are sporadically mentioned (W. KLEMM, 1974, C. KREGLINGER, 1870, E. MARTENS, 1902, L. PFEIFFER, 1876–1877, H. SIMROTH, 1896–1907), or else treated more amply thanks to a relatively extensive reference to Brusina's data (E. CSIKI, 1906, D. HIRC, 1886, 1910). In other papers based more or less on original researches the number of taxa quoted for Medvednica and Zagreb is no more than 10 (D. HIRC, 1918, G. HORVÁTH, 1887, S. JAECHEL, 1954, W. KLEMM, 1939, V. KOCHANSKY-DEVIDÉ, 1981, T. KORMOS, 1906, 1907, J. NANEVA, 1953, L. PINTÉR, 1972, T. PÓCS & A. KÁROLYI, 1961, A. RIEDEL, 1983, L. SOÓS, 1904, E. STOSSICH, 1907, A. J. WAGNER, 1897, 1912, 1915, 1924, 1925, A. WIKTOR, 1982). An exception is the paper by M. POJE & T. RAĐA (1974/1975) in which 17 species are listed.

This means that the land malacofauna of Medvednica mountain has been investigated both inadequately and unsystematically. Therefore, an attempt was made at a systematic study of land snails, embracing 80 sites on this mountain.

The information available on snail findings with UTM co-ordinates for Croatia and for Yugoslavia is rather scarce (W. J. MAASSEN, 1984, 1985, 1985a, 1985b, 1985c, 1985d, 1987, V. ŠTAMOL, 1986), and the present paper is a contribution to the production of a UTM map of the land malacofauna of Yugoslavia.

2. General Characteristics of the Study Area

Medvednica mountain rises as an independent massif in north-western Croatia (Yugoslavia), with the city of Zagreb situated on its southern slopes (Fig. 1). It runs NE–SW for 42 kms, with a maximum breadth of about 30 kms. The highest point is Sljeme (1035 m a. s. l.).

It is a rugged wooded mountain (crags or horst) (D. MAJER, 1980: 300). Its core is formed by Palaeozoic deposits surrounded like an island by Mesozoic, Tertiary and Diluvial formations. The Palaeozoic period is represented by green schists, black shales and limestones, the Mesozoic consists of fossiliferous craggy limestones and magmatic rocks. In the Tertiary there developed coral reefs, algal limestones, and marls.

On a geological base of this kind there developed brown acid soils, podzolic brown soils, brown carboniferous soils, while rendzinas also occur (Pedologic map of the Socialist Federal Republic of Yugoslavia, Zagreb 1, 1969).

Medvednica belongs to the Central European climatic type, in other words it has a C climate according to W. Köppen's classification (moderately warm and rainy) (T. ŠEGOTA, 1980).

A larger part of Medvednica is densely wooded, while its lower slopes are covered by meadows and settlements.

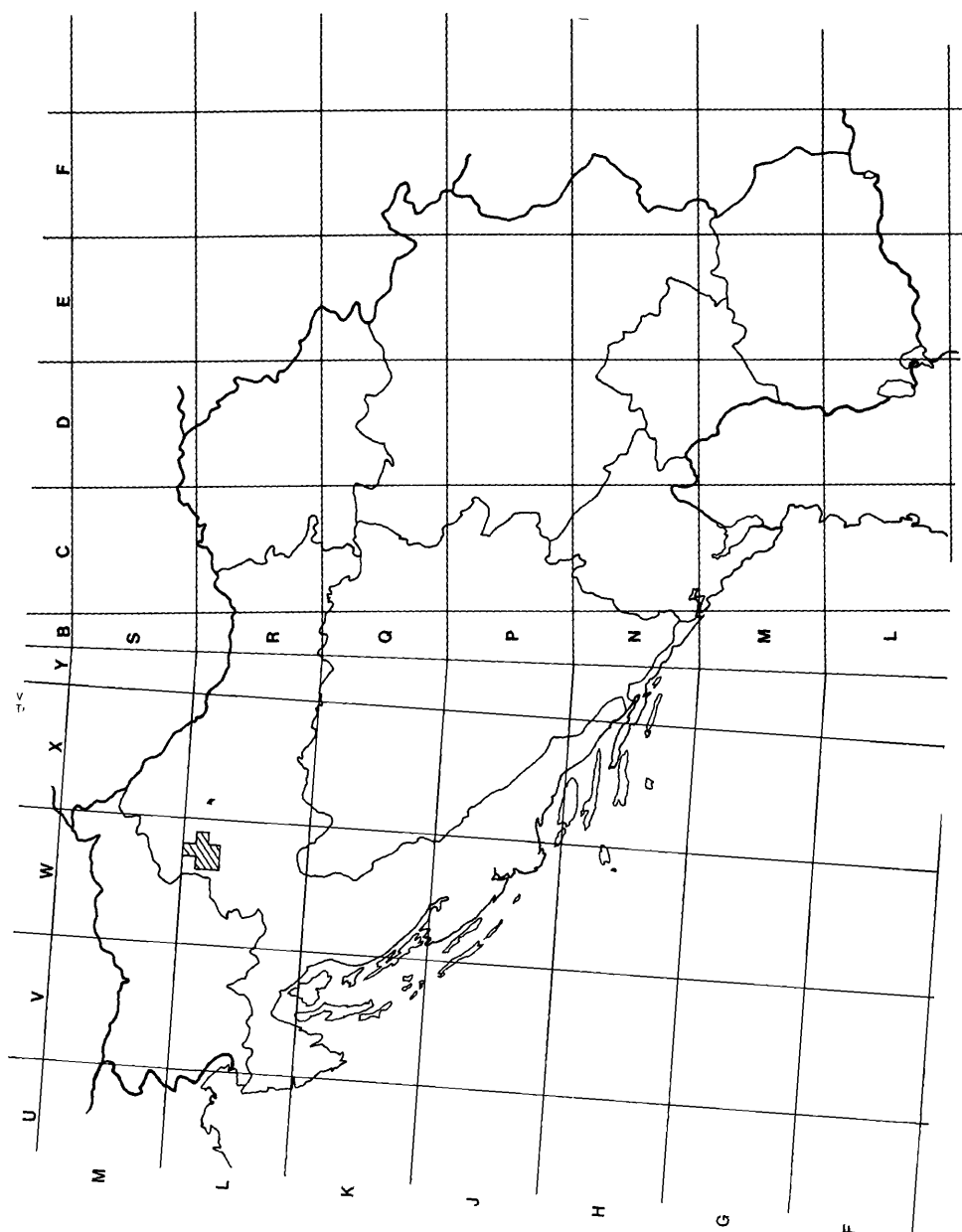


Fig. 1. Map of Yugoslavia with UTM grid. The research area is marked by hatching.

Sl. 1. Zemljevid Jugoslavije z UTM mrežo. Preiskovano območje je označeno črtkasto.

3. List of Localities

In the case of each locality, name of the area is followed by the UTM co-ordinates in brackets, the altitude, slope (degrees) and exposure. The position of the localities is evident from Fig. 2.

1. Lipa (WL88), 620 m, 45°, SW.
2. Rog (WL88), 706 m, 45°, N.
3. Velika Peć (WL88), 660 m, 50°, N.
4. Velika Peć (WL88), 640 m, 50°, W.
5. Rog – Planina (WL88), 500 m, 60°, NW.
6. Marija Snježna (WL88), 540 m, 10°, E.
7. Stražnjec (WL88), 560 m, 40°, S.
8. Stražnjec (WL88), 620 m, 0°
9. Koprivnjak (WL88), 680 m, 15°, SE.
10. Koprivnjak (WL88), 694 m, 10°, SE.
11. Križni Hrast (WL88), 720 m, 10°, SW.
12. Stol (WL78), 860 m, 5°, SW.
13. Tisova Peć (WL78), 760 m, 7°, SW.
14. Tisova Peć (WL78), 640 m, 30°, S.
15. Tisova Peć (WL78), 560 m, 30°, S.
16. Pećinica (WL78), 480 m, 35°, SW.
17. Pečovje (WL88), 540 m, 60°, S.
18. Pečovje (WL78), 663 m, 10°, NW.
19. Pečovje (WL78), 600 m, 10°, SSW.
20. Pečovje (WL88), 620 m, 0°
21. Oštrc (WL88), 740 m, 30°, SW.
22. Pećinica (WL78) 450 m, 50°, S.
23. Pećinica (WL78) 360 m, 0°
24. Varoško Rebrow (WL77), 330 m, 30°, SSE.
25. Varoško Rebrow (WL77), 390 m, 0°
26. Varoško Rebrow (WL78), 450 m, 0°
27. Bliznec (WL77), 320 m, 50°, SSW.
28. Gračec – Brestovac (WL78), 760 m, 0°
29. Brestovac (WL78), 800 m, 45°, S.
30. Nagošnjim Brijeg (WL77), 420 m, 50°, S.
31. Nagošnjim Brijeg (WL77), 480 m, 40°, S.
32. Nagošnjim Brijeg (WL78), 520 m, 30°, E.
33. Nagošnjim Brijeg (WL78), 500 m, 50°, SE.
34. Poljanica (WL68), 360 m, 45°, NW.
35. Poljanica (WL68), 240 m, 0°
36. Poljanica (WL68), 220 m, 10°, W.
37. Zatinice Brijeg – Orjavec Gora (WL67), 300 m, 60°, SSW.
38. Zatinice Brijeg – Orjavec Gora (WL67), 260 m, 0°
39. Ivanec Bistran (WL67), 280 m, 50°, S.
40. Orjavec Gora (WL67), 310 m, 30°, NW.
41. Sv. Jakob (WL78), 800 m, 40°, S.
42. Sv. Jakob (WL78), 650 m, 50°, SW.
43. Sv. Jakob – Medvedgrad (WL78), 560 m, 30°, SW.
44. Sv. Jakob (WL78), 660 m, 10°, S.
45. Pongračeva Lugarnica (WL78), 700 m, 0°
46. Pongračeva Lugarnica (WL78), 540 m, 0°
47. Pongračeva Lugarnica – Mikulići (WL77), 520 m, 0°.
48. Pongračeva Lugarnica – Mikulići (WL77), 480 m, 30°, SW.

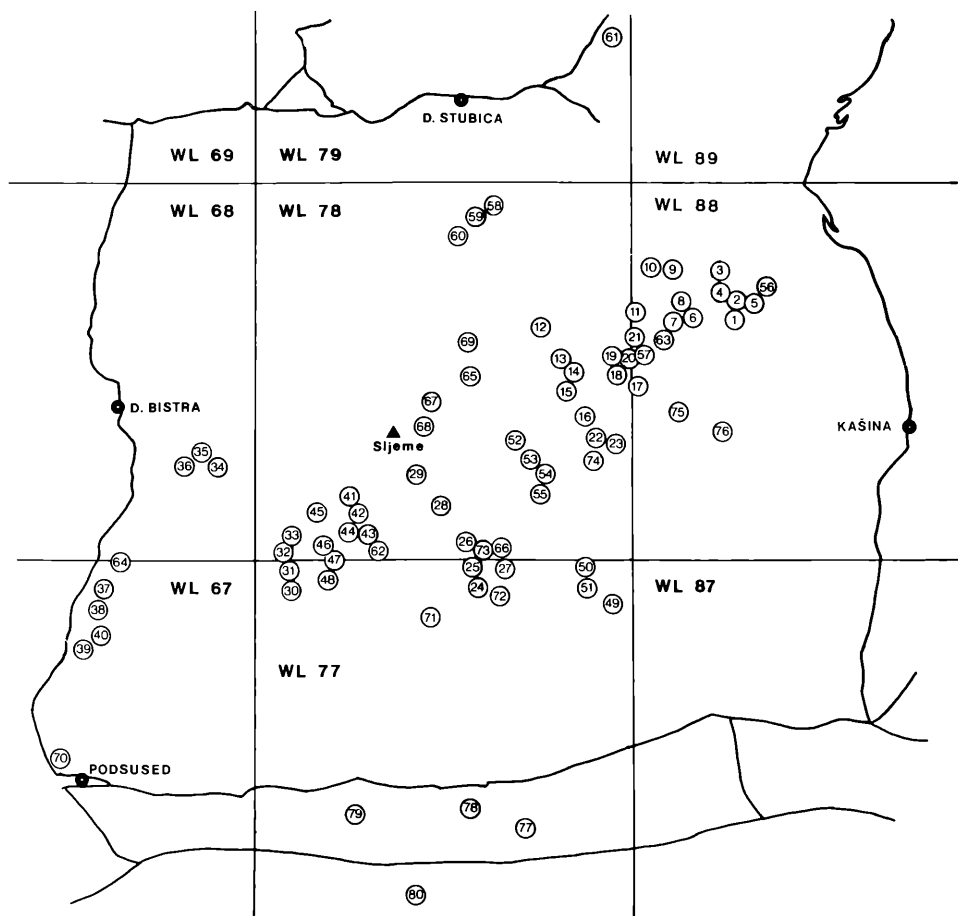


Fig. 2. Sampling points in the UTM grid of the area investigated (squares 10×10 km). Sites 1–76 are on Medvednica mountain, while sites 77–80 are in the city of Zagreb.

Black circles – villages

Black lines – roads

Triangle – summit of Medvednica

Sl. 2. Karta preiskovanega območja z UTM mrežo (10×10 km). Mesta zbiranja materiala označena z 1–76 so na Medvednici, medtem ko so 77–80 v Zagrebu.

temni krogi – vasi

temne črte – ceste

trikotnik – vrh Medvednice

49. Doktorščina (WL77), 240 m, 20°, E.
50. Doktorščina (WL77), 280 m, 10°, E.
51. Doktorščina (WL77), 270 m, 40°, W.
52. Rušovski Brijeg (WL78), 610 m, 10°, S.
53. Rušovski Brijeg (WL78), 560 m, 20°, SW.
54. Deščevcevec (WL78), 560 m, 30°, SW.
55. Deščevcevec (WL78), 460 m, 45°, WSW.
56. Planina (WL88), 400 m, 40°, E.
57. Pečovje – Gorščica (WL88), 500 m, 0°.
58. Puštelica Gora (WL78), 340 m, 20°, N.
59. Puštelica Gora (WL78), 360 m, 45°, W.
60. Puštelica Gora (WL78), 360 m, 30°, SW.
61. Orahova Gorica (WL79), 260 m, 10°, W.
62. Medvedgrad (WL78), 587 m, 0°.
63. Vitelnica (WL88), 560 m, 40°, ESE.
64. Kameni Svati (WL67), 487 m, 50°, W.
65. Rauhova Lugarnica (WL78), 950 m, 0°.
66. Bačunski Brijeg (WL78), 290 m, 30°, WWS.
67. Sljemenska kapelica – Rauhova lugarnica (WL78), 900 m, 50°, NW.
68. Sljemenska kapelica (WL78), 940 m, 0°.
69. Horvatove stube (WL78), 680 m, 60°, NNW.
70. Susedgrad (WL67), 200 m, 30°, W.
71. Gračani (WL77), 273 m, 40°, SE.
72. Gračansko Dolje (WL77), 200 m, 0°.
73. Varoško Rebno (WL78), 360 m, 20°, E.
74. Markuševačka Trnava (WL78), 300 m, 20°, SSE.
75. Vidovec (WL88), 360 m, 30°, S.
76. Čučerje (WL88), 260 m, 20°, W.
77. Zagreb, Držićeva ul. (WL77), 120 m, 0°.
78. Zagreb, Mažuranićev trg (WL77), 120 m, 0°.
79. Zagreb, Ilica 190 (WL77), 120 m, 0°.
80. Zagreb, Savski most (WL77), 110 m, 0°.

4. Methods

The land snails were gathered in the period between 1978 and 1987. Larger specimens were collected individually, while samples of earth and litter were also taken, from which smaller specimens were extracted after selective sifting. Determination was made according to J. BOLE (1969), P. EHRMANN (1933), M. P. KERNEY et al. (1983), H. NORDSIECK (1970), L. PINTÉR (1972), A. J. WAGNER (1897). A large part of the material was revised by Dr. J. Bole to whom I owe my sincere thanks.

5. Results and Discussion

5.1. List of Species

This list includes those species of land snails that the authoress found in the course of research in 80 localities (mainly woodland habitats) in the Medvednica and Zagreb area, together with the species recorded in the literature relating to the same area.

***Acanthinula aculeata* (O. F. MÜLLER, 1774)**

WL67 (37, 38, 39, 64)

WL78 (15, 18, 22, 52, 54, 58, 59, 65)

Acicula gracilis (CLESSIN, 1877)

WL67 (37, 39, 64)

WL78 (18, 19, 22, 44, 52, 54, 55, 62, 66, 73, 74)

Acicula polita (HARTMANN, 1840)

Aegopinella epipedostoma (FAGOT, 1879)

Aegopinella nitens (MICHAUD, 1831)

M. POJE & T. RAĐA (1974/1975:8).

WL68 (35, 36)

WL78 (12, 13, 15, 18, 19, 22, 23, 26, 28, 41, 42, 43, 45, 46, 52, 54, 55, 58, 59, 60, 62, 65, 66, 67, 68, 69, 73, 74)

WL88 (2, 5, 8, 17, 21).

S. BRUSINA (1867:90, 1870:18); E. CSIKI (1906:18); T. KORMOS (1906:79); J. NANEVA (1953:11, 22); M. POJE & T. RAĐA (1974/1975:8).

WL68 (34)

WL77 (24, 27, 30)

WL78 (12, 13, 14, 15, 19, 23, 28, 29, 32, 33, 41, 43, 44, 45, 52, 54, 55, 59, 60, 62, 65, 66, 68, 69, 73)

WL88 (2, 3, 4, 5, 6, 7, 8, 9, 11, 17, 21).

Arianta arbustorum (LINNAEUS,

S. BRUSINA (1870:35, 1870a:190).

Arion ater (LINNAEUS, 1758)

WL77 (71).

Arion subfuscus (DRAPARNAUD, 1805)

WL68 (34)

WL78 (13, 29, 46, 68)

WL88 (56).

Balea biplicata (MONTAGU, 1803)

T. KORMOS (1907:193).

Bradybaena fruticum (O. F. MÜLLER, 1774)

S. BRUSINA (1867:96, 1870:25); L. SOÓS (1904:183); E. STOSSICH (1907:52, 53).

Carpathica stussineri (A. J. WAGNER, 1895)

WL67 (38).

***Carychium minimum* O. F. MÜLLER, 1774**

S. BRUSINA (1870:29); E. CSIKI (1906:34).
WL78 (73, 74).

***Carychium tridentatum* (RISSO, 1826)**

S. BRUSINA (1870:29); E. CSIKI (1906: 34).
WL78 (73, 74).

***Causa holosericum* (STUDER, 1820)**

S. BRUSINA (1867:96, 1970:35).

***Cecilioides acicula* (O. F. MÜLLER, 1774)**

S. BRUSINA (1867:89, 1870:18); D. HIRC (1886:381); E. CSIKI (1906:33).
WL77 (72).

***Cecilioides jani* (DE BETTA et MARTINATI, 1855)**

WL77 (72).

***Cepaea hortensis* (O. F. MÜLLER, 1774)**

S. BRUSINA (1870:29); S. CLESSIN (1879:119); G. HORVÁTH (1887:268; L. SOÓS (1904:162); E. CSIKI (1906:23); T. KORMOS (1907:189).
WL67 (70).

***Cepaea nemoralis* (LINNAEUS, 1758)**

S. BRUSINA (1867:99, 1870:29); S. CLESSIN (1879:119); D. HIRC (1886:379, 1918:144); L. SOÓS (1904:163); E. CSIKI (1906:23); T. KORMOS (1906:143); E. STOSSICH (1907:93); J. NANEVA (1953:11, 22); M. POJE & T. RAĐA (1974/1975:8).
WL67 (38, 70).

***Cepaea vindobonensis* (FÉRUSSAC, 1821)**

S. BRUSINA (1870:28, 1907:94); S. CLESSIN (1879:119); D. HIRC (1886:379); T. KORMOS (1906:142); E. STOSSICH (1907:93).
WL88 (2).

***Cernuella virgata* (DA COSTA, 1778)**

S. JAECKEL (1954:72).

***Charpentieria ornata* (ROSSMÄSSLER, 1836)**

S. BRUSINA (1867:94, 1870:22); C. KREGLINGER (1870:164); E. CSIKI (1906:30); T. KORMOS (1906:150, 1907:193); E. STOSSICH (1907:92); P. S. PAVLOVIĆ (1911:140); A. J. WAGNER (1924:105, 1925:68).
WL67 (37, 39, 64)
WL77 (24, 30, 48)
WL78 (13, 18, 22, 52, 53, 54, 55, 73)
WL88 (2, 3, 5, 8, 17, 21, 63).

***Chilostoma planospirum* (LAMARCK, 1822)**

E. A. BIELZ (1865:224); S. BRUSINA (1867:98, 1869:63, 1870:28); D. HIRC (1886:379); L. SOÓS (1904:170); E. CSIKI (1906:19); T. KORMOS (1906:141); T. PÓCS, Á. KÁROLYI (1961:531); M. POJE & T. RAĐA (1974/1975:8).
WL67 (37, 38, 39, 40, 64)
WL68 (34)
WL77 (47)

WL78 (13, 18, 19, 54, 62, 66, 69, 73)

WL88 (5, 6, 8, 21, 30, 56).

***Chondrina avenacea* (BRUGUIÈRE, 1792)**

S. BRUSINA (1870:20); D. HIRC (1886:379); E. CSIKI (1906:25).

***Chondrina clienta* (WESTERLUND, 1883)**

WL78 (18, 69)
WL88 (8, 17, 63).

***Chondrula tridens* (O. F. MÜLLER, 1774)**

S. BRUSINA (1867:91, 1870:20); E. CSIKI (1906:24).

***Clausilia dubia* (DRAPARNAUD, 1805)**

S. BRUSINA (1870:24); E. CSIKI (1906:31).

***Clausilia pumila* C. PFEIFFER, 1828**

S. BRUSINA (1870:24); L. PFEIFFER (1877:525); E. CSIKI (1906:32); A. J. WAGNER (1912:256)

***Cochlicopa lubrica* (O. F. MÜLLER, 1774)**

S. BRUSINA (1867:89, 1870:17); D. HIRC (1886:379, 1918:144); E. CSIKI (1906:33).

***Cochlicopa lubricella* (PORRO, 1838)**

WL88 (8, 63).

***Cochlodina commutata* (ROSSMÄSSLER, 1836)**

S. BRUSINA (1867:92, 1870:21); E. CSIKI (1906:28).

***Cochlodina laminata* (MONTAGU, 1803)**

S. BRUSINA (1867:92, 1870:21); D. HIRC (1886:379, 1918:144); E. CSIKI (1906:28); T. KORMOS (1907:192); M. POJE & T. RAĐA (1974/1975:8).

WL67 (37, 38, 40)

WL68 (34, 36)

WL77 (24, 27, 30, 31, 48, 49, 50)

WL78 (12, 13, 15, 18, 19, 22, 23, 26, 28, 32, 42, 43, 44, 52, 53, 54, 55, 58, 59, 60, 65, 67, 68, 69, 73, 74)

WL88 (1, 2, 4, 6, 8, 9, 10, 17, 21, 56).

***Cochlostoma scalarinum* (A. et B. VILLA, 1841)**

T. KORMOS (1907:196).

***Cochlostoma septemspirale* (RAZOUNOWSKY, 1789)**

S. BRUSINA (1867:103, 1870:31); M. KIŠPATIĆ (1884:64); H. SIMROTH (1896–1907:793); A. J. WAGNER (1897:581, 582); E. MARTENS (1902:174); E. CSIKI (1906:39); T. KORMOS (1907:196); D. HIRC (1910:51, 58); J. NANEVA (1953:11); V. ILIJANIĆ & M. STOŠIĆ (1972:11, 12); W. KLEMM (1974:68); M. POJE & T. RAĐA (1974/1975:8).

WL67 (37, 38, 39, 64)

WL77 (24, 27, 30, 48)

WL78 (13, 15, 18, 19, 22, 23, 28, 44, 52, 54, 55, 59, 60, 62, 66, 69, 73, 74)

WL88 (1, 2, 3, 4, 5, 7, 8, 17, 21, 63, 75).

***Cochlostoma waldemari* (A. J. WAGNER, 1897)**

V. ILIJANIĆ & M. STOŠIĆ (1972:14).

***Columella edentula* (DRAPARNAUD, 1805)**

S. BRUSINA (1867:92).

***Deroceras* sp.**

WL78 (68).

***Discus perspectivus* (MEGERLE von MÜHLFELD, 1814)**

S. BRUSINA (1870:25); E. CSIKI (1906:18).

WL77 (30, 31)

WL78 (12, 65, 74).

***Ena montana* (DRAPARNAUD, 1801)**

WL78 (68).

***Ena obscura* (O. F. MÜLLER, 1774)**

S. BRUSINA (1867:91, 1870:20); D. HIRC (1886:379); E. CSIKI (1906:24); M. POJE & T. RAĐA (1974/1975:8).

WL78 (15, 54)

WL88 (17).

***Faustina trizona* (ROSSMÄSSLER, 1835)**

E. CSIKI (1906:20).

***Fusulus interruptus* (C. PFEIFFER, 1828)**

S. JAECKEL (1954:57).

WL77 (30, 31, 47)

WL78 (18, 32, 42, 54, 55, 68)

WL79 (61)

WL88 (1, 2, 5, 11, 20).

***Granaria frumentum* (DRAPARNAUD, 1801)**

S. BRUSINA (1870:20); D. HIRC (1886:379); E. CSIKI (1906:25).

***Granaria illyrica* (ROSSMÄSSLER, 1837)**

WL88 (8, 21, 63).

***Helicella obvia* (MENKE, 1828)**

E. A. BIELZ (1865:206); S. BRUSINA (1897:20, 1870:27, 1885:7); D. HIRC (1886:379, 1918:144); E. CSIKI (1906:19); T. KORMOS (1907:184); J. NANEVA (1953:24).
WL88 (75, 76).

***Helix lucorum* LINNAEUS, 1758**

V. KOCHANSKY-DEVIDÉ (1981:47); J. PETRIČIĆ & Z. KALOGJERA (1984:94).
WL77 (77, 78, 79, 80).

***Helix pomatia* LINNAEUS, 1758**

S. BRUSINA (1870:20); M. KIŠPATIĆ (1884:64); T. KORMOS (1906:143); E. STOSSICH (1907:94); J. NANEVA (1953:11, 22); M. POJE & T. RAĐA (1974/1975:8).
WL77 (27)

WL78 (12, 13, 23, 43, 46, 54, 62, 69)

WL88 (2, 3, 7, 8).

***Isognomostoma isognomostoma* (SCHRÖTER, 1784)**

M. POJE & T. RAĐA (1974/1975:8).

WL78 (12, 32, 33, 66, 68).

***Limax cinereoniger* WOLF, 1803**

A. WIKTOR (1982:477).

WL67 (37)

WL68 (34, 35)

WL77 (22, 27)

WL78 (12, 16, 29, 55, 62, 66, 68)

WL88 (56).

***Macrogastra densestriata* (ROSSMÄSSLER, 1836)**

S. BRUSINA (1867:94, 1870:23); E. CSIKI (1906:32).

***Macrogastra lineolata* (HELD, 1836)**

A. J. WAGNER (1912:257).

***Macrogastra plicatula* (DRAPARNAUD, 1801)**

WL67 (38)

WL78 (18, 65, 67, 69).

***Macrogastra ventricosa* (DRAPARNAUD, 1801)**

S. BRUSINA (1867:94, 1870:23); D. HIRC (1886:379); E. CSIKI (1906:32); M. POJE & T. RAĐA (1974/1975:8).

WL67 (38)

WL78 (66).

***Monacha cartusiana* (O. F. MÜLLER, 1774)**

S. BRUSINA (1870:27); D. HIRC (1886:379); E. CSIKI (1906:22); T. KORMOS (1906:140); J. NANEVA (1953:24).

***Orcula conica* (ROSSMÄSSLER, 1837)**

S. BRUSINA (1870:20); D. HIRC (1880:527); E. CSIKI (1906:24).

WL78 (41, 66, 73).

***Oxychilus cellarius* (O. F. MÜLLER, 1774)**

S. BRUSINA (1870:18); E. CSIKI (1906:17).

WL78 (24, 41, 43).

***Oxyloma elegans* (RISSO, 1826)**

S. BRUSINA (1870:19); E. CSIKI (1906:34).

***Pagodulina pagodula* (DES MOULINS, 1830)**

S. BRUSINA (1870:21); D. HIRC (1886:379); E. CSIKI (1906:25); W. KLEMM (1939:210).

WL67 (37, 38, 39, 40, 64)

WL77 (27, 30, 48, 50)

WL78 (16, 18, 19, 22, 23, 52, 54, 59, 66, 69, 73)

WL79 (61)

WL88 (2, 3, 5, 8, 17, 21, 63).

***Perforatella bidentata* (GMELIN, 1788)**

S. BRUSINA (1870:25); L. SOÓS (1904:156); E. CSIKI (1906:21).

***Perforatella incarnata* (O. F. MÜLLER, 1774)**

S. BRUSINA (1867:97); A. J. WAGNER (1915: tab. 22).

WL67 (37, 38, 39, 40, 64)

WL68 (34, 36)

WL77 (24, 25, 27, 30, 31, 48, 49, 50)

WL78 (12, 13, 15, 18, 19, 22, 23, 26, 28, 29, 32, 44, 45, 46, 52, 53, 54, 55, 58, 59, 62, 65, 66, 67, 69, 73, 74)

WL88 (1, 2, 3, 4, 5, 8, 9, 10, 17, 21, 56).

***Perforatella umbrosa* (C. PFEIFFER, 1828)**

S. BRUSINA (1870:26); L. SOÓS (1904:156); E. CSIKI (1906:21).

***Perforatella vicina* (ROSSMÄSSLER, 1842)**

S. BRUSINA (1870:27); D. HIRC (1886:379, 1918:143); E. CSIKI (1906:22); T. KORMOS (1906:80); M. POJE & T. RAĐA (1974/1975:8).

***Pomatias elegans* (O. F. MÜLLER, 1774)**

S. BRUSINA (1870:31); T. KORMOS (1906:151); D. HIRC (1918:145); J. NANEVA (1953:11, 22); M. POJE & T. RAĐA (1974/1975:8).

WL67 (37, 38, 39, 64, 70)

WL77 (24, 27)

WL78 (13, 15, 18, 19, 22, 52, 55, 66, 73, 74)

WL88 (8, 17, 21, 75, 76).

***Punctum pygmaeum* (DRAPARNAUD, 1801)**

WL67 (37, 38, 39, 40, 64)

WL68 (34)

WL77 (24, 25, 27, 31, 48, 49, 50)

WL78 (12, 13, 15, 16, 18, 22, 26, 28, 32, 33, 41, 42, 43, 44, 45, 46, 52, 53, 54, 55, 58, 59, 60, 62, 65, 66, 69, 73)

WL79 (61)

WL88 (1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 17, 20, 21).

***Pupilla muscorum* (LINNAEUS, 1758)**

S. BRUSINA (1867:91, 1870:20); E. CSIKI (1906:25).

WL88(63).

***Pyramidula rupestris* (DRAPARNAUD, 1801)**

S. BRUSINA (1870:25); E. CSIKI (1906:19).

WL67 (39).

***Ruthenica filograna* (ROSSMÄSSLER, 1836)**

S. BRUSINA (1870:23); D. HIRC (1886:379); E. CSIKI (1906:31).

WL78 (18, 19, 52, 54, 74)

WL88 (8, 21).

***Semilimax carinthiacus* (WESTERLUND, 1886)**

WL67 (38, 40)

WL68 (34)

WL78 (12, 13, 15, 16, 19, 22, 26, 28, 29, 33, 43, 44, 52, 54, 58, 60, 62, 66, 67, 68, 69, 73)

WL88 (1, 2, 3, 4, 6, 9, 10, 11, 17, 20, 21, 56).

***Semilimax semilimax* (FÉRUSAC, 1802)**

A. J. WAGNER (1915:475); M. POJE & T. RAĐA (1974/1975:8).

***Sphyradium dolium* (BRUGUIÈRE, 1792)**

S. BRUSINA (1870:20); D. HIRC (1886:379); E. CSIKI (1906:25).

WL77 (27)

WL78 (15, 18, 23, 55, 69)

WL88 (5, 21)

***Succinea globulosa* KUTSCHIG**

S. BRUSINA (1867:91, 1870:19).

***Succinea putris* (LINNAEUS, 1758)**

S. BRUSINA (1867:90, 91, 1870:19); E. CSIKI (1906:33).

WL78 (74).

***Trichia erjavci* (BRUSINA, 1870)**

S. BRUSINA (1870:26, 1870a:188); L. PFEIFFER (1876:223); D. HIRC (1886:379); L. SOÓS

(1904:158); E. CSIKI (1906:21); T. KORMOS (1906:80); A. J. WAGNER (1915:479, 482).

***Trichia filicina* (L. PFEIFFER, 1841)**

T. KORMOS (1906:80).

***Trichia hispida* (LINNAEUS, 1758)**

S. BRUSINA (1867:96, 1970:26); L. SOÓS (1904:152); E. CSIKI (1906:21).

***Trichia leucozona* (C. PFEIFFER, 1828)**

S. BRUSINA (1870:26, 1870a:189); D. HIRC (1886:379, 1910:41); L. SOÓS (1904:154); E. CSIKI (1906:21).

WL67 (37, 38, 39, 40)

WL77 (24, 27, 48)

WL78 (13, 18, 22, 23, 54, 62, 68, 69)

WL88 (2, 3, 5, 8, 17)

***Trichia lurida* (C. PFEIFFER, 1828)**

S. BRUSINA (1867:96, 1870:26, 1870a:188); D. HIRC (1886:379); E. CSIKI (1906:21); A. J. WAGNER (1915:489).

***Truncatellina cylindrica* (FÉRUSSAC, 1807)**

S. BRUSINA (1867:15, 1870:20); D. HIRC (1886:379); E. CSIKI (1906:26); S. JAECKEL (1954:55).

WL67 (64)

WL78 (18, 69)

WL88 (8, 17, 21, 63).

***Vallonia costata* (O. F. MÜLLER, 1774)**

S. BRUSINA (1870:25); E. CSIKI (1906:23).

WL88 (63).

***Vallonia pulchella* (O. F. MÜLLER, 1774)**

S. BRUSINA (1870:25); E. CSIKI (1906:22).

WL78 (72)

WL88 (8).

***Vertigo pygmaea* (DRAPARNAUD, 1801)**

S. BRUSINA (1867:92, 1870:20); E. CSIKI (1906:25); T. KORMOS (1907:192).

***Vitrea crystallina* (O. F. MÜLLER, 1774)**

S. BRUSINA (1870:18); L. PINTÉR (1972:236).

***Vitrea subrimata* (REINHARDT, 1871)**

L. PINTÉR (1972:230); M. POJE & T. RAĐA (1974/1975:8).

WL67 (37, 38, 39, 40, 50, 64)

WL77 (24, 30, 31, 48, 51)

WL78 (12, 13, 15, 16, 18, 22, 26, 28, 44, 52, 54, 59, 60, 62, 65, 67, 68, 69, 73)

WL88 (1, 2, 5, 6, 7, 9, 11, 17, 21).

***Vitrina pellucida* (O. F. MÜLLER, 1774)**

S. BRUSINA (1970:19, 1870a:187); E. CSIKI (1906:16); T. KORMOS (1907:182); D. HIRC (1910:41); M. POJE & T. RAĐA (1974/1975:8).

WL67 (64)

WL77 (30, 47, 48)

WL78 (15, 18, 19, 32, 43, 44, 52, 55, 62, 65, 66, 67, 68, 69)

WL88 (1, 2, 3, 5, 8, 9, 10, 21, 41, 56).

***Zonitoides nitidus* (O. F. MÜLLER, 1774)**

S. BRUSINA (1867:90, 1970:18); E. CSIKI (1906:17).

5.2. Discussion

The present list includes 85 taxa of land snails. Among these as many as 34 species are quoted in the literature for the study area which this authoress could not find in the course of her research. This can be accounted for in different ways:

1) The papers in which such species are first mentioned for the Medvednica area date back to the years when the related species had not been described yet (e. g. the species *Chondrina avenacea* (BRUGUIÈRE, 1792) is quoted by S. BRUSINA in a paper dated 1870, while *Chondrina clienta* (WESTERLUND, 1883), which the present authoress knows to inhabit Medvednica, was not described until 1883). The authoress found these related species which were described only at a later stage. Where later data are present in the literature, they all, without exception, represent the data taken from earlier studies. Apart from *Chondrina avenacea* mentioned above, this is also case with *Acicula polita*.

2) The species which the authoress found had, at the time when studies by the authors who quoted related species were published, the status of their subspecies (e.g. *Cochlicopa lubricella* – *C. lubrica*, *Granaria illyrica* – *G. frumentum*).

3) The authors themselves place a question mark against the existence of some species in the area under research (*Arianta arbustorum* and *Causa holosericum* in S. BRUSINA's work of 1870, and *Aegopinella epipedostoma* in A. RIEDEL's paper from 1983).

4) Other authors doubt the presence of certain taxa in the study area, referred to in the earlier literature (S. JAECKEL et al., 1958:181, item 30 relating to the species *Macrogastra lineolata*).

5) The authoress considers that listings of the following species are based on wrong identification: *Cernuella virgata*, *Cochlodina commutata*, *Cochlostoma scalarinum*, *C. waldemari*, *Faustina trizona*.

6) The current synonyms for the taxon *Succinea globulosa* KUTSCHIG are not known to the authoress.

7) The authoress's researches were confined for the most part to the woodland phytocenosis of dry habitats; on most types of meadow or damp habitats the following species were not found: *Bradybaena fruticum*, *Chondrula tridens*, *Clausilia pumila*, *Columella edentula*, *Monacha cartusiana*, *Oxyloma elegans*, *Vertigo pygmaea*, *Vitrea crystallina*, *Zonitoides nitidus*.

8) It is difficult to find reasons for the absence of the following species: *Balea biplicata*, *Clausilia dubia*, *Macrogastra densestriata*, *Perforatella bidentata*, *P. umbrosa*, *P. vicina*, *Semilimax semilimax*, *Trichia erjavecii*, *T. filicina*, *T. hispida*, *T. lurida*.

In my opinion the species listed under Nos. 1, 2, 3, 4, 5 and 6 (apart from the species *Aegopinella epipedostoma* and *Cochlicopa lubrica*) might be removed from the Medvednica list of malacofauna.

In the course of her research the authoress found 51 species of snails in the Medvednica and Zagreb area. Of these, previous data were confirmed in the case of 39 species, while 12 species are now recorded for the first time, namely: *Arion ater*, *Arion subfuscus*, *Carpathica stussineri*, *Ceciloides jani*, *Chondrina clienta*, *Cochlicopa lubricella*, *Deroceras* sp., *Ena montana*, *Granaria illyrica*, *Macrogastra plicatula*, *Punctum pygmaeum* and *Semilimax carinthiacus*.

6. Conclusions

A review of the literature available confirms that the malacofauna of Medvednica mountain and the city of Zagreb has hitherto been investigated in an unsystematic fashion, and that most data are taken from papers written in the nineteenth or the first half of the twentieth century.

In the course of the authoress's research in this area in the period between 1978–1987, 51 species were found, 12 of which were recorded for the first time in Medvednica and Zagreb.

The literature refers to 73 species in the territory in question, of which 39 taxa were confirmed. In the case of 12 species, the authoress considers that they do not, in fact, inhabit the Medvednica and Zagreb area. Further research, especially into meadow and waterlogged habitats will result in a more complete list of the land snails in this area.

7. Summary

The land malacofauna of Medvednica mountain (NW Croatia, Yugoslavia) (Fig. 1) was researched during the period from 1978 to 1987. Snails were collected in 80 localities within 6 UTM squares (Fig. 2). Larger snails were collected individually, while samples of litter and earth of $\pm 3 \text{ dm}^3$ were taken. From these samples smaller specimens were taken by selective sifting. 51 species were found, 12 of them being recorded for the first time in the area under research: *Arion ater* (LINNAEUS, 1758), *Arion subfuscus* (DRAPARNAUD, 1805), *Carpatica stussineri* (A. J. WAGNER, 1895), *Cecilioides jani* (DE BETTA et MARTINATI, 1855), *Chondrina clienta* (WESTERLUND, 1883), *Cochlicopa lubricella* (PORRO, 1838) *Deroceras* sp., *Ena montana* (DRAPARNAUD, 1801), *Granaria illyrica* (ROSSMÄSSLER, 1837), *Macrogastra plicatula* (DRAPARNAUD, 1801), *Punctum pygmaeum* (DRAPARNAUD, 1801) and *Semilimax carinthiacus* (WESTERLUND, 1886).

A review of the literature as available reveals references to 73 taxa for the area researched (cf. 0–00).

The authoress's research confirmed findings in the case of 39 species, while data referring to the existence of the following species on Medvednica or in Zagreb may be considered erroneous: *Acicula polita* (HARTMANN, 1840), *Arianta arbustorum* (LINNAEUS, 1758), *Causa holosericum* (STUDER, 1820), *Ceriuella virgata* (DA COSTA, 1778), *Chondrina avenacea* (BRUGUIÈRE, 1792), *Cochlodina commutata* (ROSSMÄSSLER, 1836), *Cochlostoma scalarinum* (A. B. VILLA, 1841), *C. waldemari* (A. J. WAGNER, 1897), *Faustina trizona* (ROSSMÄSSLER, 1835), *Granaria frumentum* (DRAPARNAUD, 1801), *Macrogastra lineolata* (HELD, 1836), *Succinea globulosa* KUTSCHIG.

Further research involving a greater variety of habitats would provide a more complete and more accurate picture of the land malacofauna of Medvednica and Zagreb.

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POVZETEK

Favno kopenskih polžev gore Medvednice (severozahodna Hrvaška, Jugoslavija) (sl. 1) sem raziskovala v obdobju od 1978. do 1987. leta. Polže sem nabirala na 80 lokalitetah, razporejenih znotraj 6 UTM kvadratov (sl 2.). Večje polože sem nabirala posamezno, poleg tega pa sem jemala vzorce stelje in tal v obsegu 3 dm³, iz katerih sem po selektivnem presejevanju izdvojila drobne primerke. Našla sem 51 vrst, od katerih je 12 prvič zapisanih za raziskovano območje: *Arion ater* (LINNAEUS, 1758), *Arion subfuscus* (DRAPARNAUD, 1805), *Carpathica stussineri* (A. J. WAGNER, 1895), *Cecilioides jani* (DE BETTA et MARTINATI, 1855), *Chondrina clienta* (WESTERLUND, 1883), *Cochlicopa lubricella* (PORRO, 1838), *Deroceras* sp., *Ena montana* (DRAPARNAUD, 1801), *Granaria illyrica* (ROSSMÄSSLER, 1837), *Macrogastra plicatula* (DRAPARNAUD, 1801), *Punctum pygmaeum* (DRAPARNAUD, 1801) in *Semilimax carinthiacus* (WESTERLUND, 1886).

Razpoložljiva literatura navaja za raziskovano območje 73 taksonov polžev. V svojih raziskavah potrjujem obstoj 39 vrst, medtem ko so podatki o prisotnosti naslednjih vrst, po mojem mišljenju, netočni: *Aculica polita* (HARTMANN, 1840), *Arianta arbustorum* (LINNAEUS, 1758), *Causa holosericum* (STUDER, 1820), *Cernuella virgata* (DA COSTA, 1778), *Chondrina avenacea* (BRUGUIÈRE, 1792), *Cochlodina commutata* (ROSSMÄSSLER, 1836), *Cochlostoma scalarium* (A. B. VILLA, 1841), *C. Waldemari* (A. J. WAGNER, 1897), *Faustina trizona* (ROSSMÄSSLER, 1835), *Granaria frumentum* (DRAPARNAUD, 1801), *Macrogastra lineolata* (HELD, 1836), *Succinea globulosa* KUTSCHIG.

Z nadaljnjimi raziskavami, ki bi zajemale različne habitate, bi dobili popolnejšo in točnejšo sliko kopenske malakofavne Medvednice in Zagreba.

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