

Badenian gastropods from the collections of the Mureş County Museum

Mirela Violetta Popa¹, Anca Duma¹, Angela Săplăcan²

¹ Babeş-Bolyai University, Faculty of Biology and Geology, Department of Geology, 1 Kogalniceanu St., 400084 Cluj-Napoca, Romania

² Mureş County Museum, 24 Horea St., 540036 Târgu-Mureş, Romania

Abstract

The present paper focuses on the systematic presentation of the gastropods from the collections of Lăpuş de Sus and Nemeşeti (Făget Basin) located in the Mureş County Museum. The large diversity of the species characterized the mollusc fauna from the famous occurrences of the Făget Basin (Lăpuş de Sus, Nemeşeti, Coştei). The assemblage from Lăpuş de Sus represents one of the richest European Badenian fossil fauna. The collected gastropods (190 specimens) have been determined, systematically arranged and illustrated. The 54 species recorded belong to 20 families (Neritopsidae, Cerithiidae, Turritellidae, Cypraeidae, Pediculariidae, Ficidae, Naticidae, Aporrhaidae, Tonnidae, Buccinidae, Columbellidae, Fasciolariidae, Nassariidae, Muricidae, Mitridae, Volutidae, Olividae, Conidae, Terebridae and Turridae).

Keywords: gastropods, taxonomy, Badenian, Lăpuş de Sus, Nemeşeti, Romania.

Introduction

The Mureş County Museum (Natural Sciences) from Târgu Mureş houses the paleontological collections with 3937 registered items. They contain molluscs, corals, echinids, fish and mammals.

The material was gathered by donations, purchase, transfer from other institutions and collections during fieldworks. The oldest donation dates from 1912. The donors were the citizens or former professional geologists (e.g. prof. dr. Ioan Bedelean and prof. dr. Vlad Codrea from the Babeş-Bolyai University).

The most important sellers were the citizens of Târgu Mureş (e.g. Ede Bujánovich and Károly Frunda), or citizens of the neighborhoods (like Gyula Adamesik from Cristeşti). Some pieces were transferred from the Teleki Castle at Gorneşti. However, the most important part of the paleontological collection comes from the collection field trips organized by the museum. Among the first collectors were József Fikk (1931-1951), followed between 1960-1967 by a biologist, István Kónya, and lately by the historian Andrei Zriny.

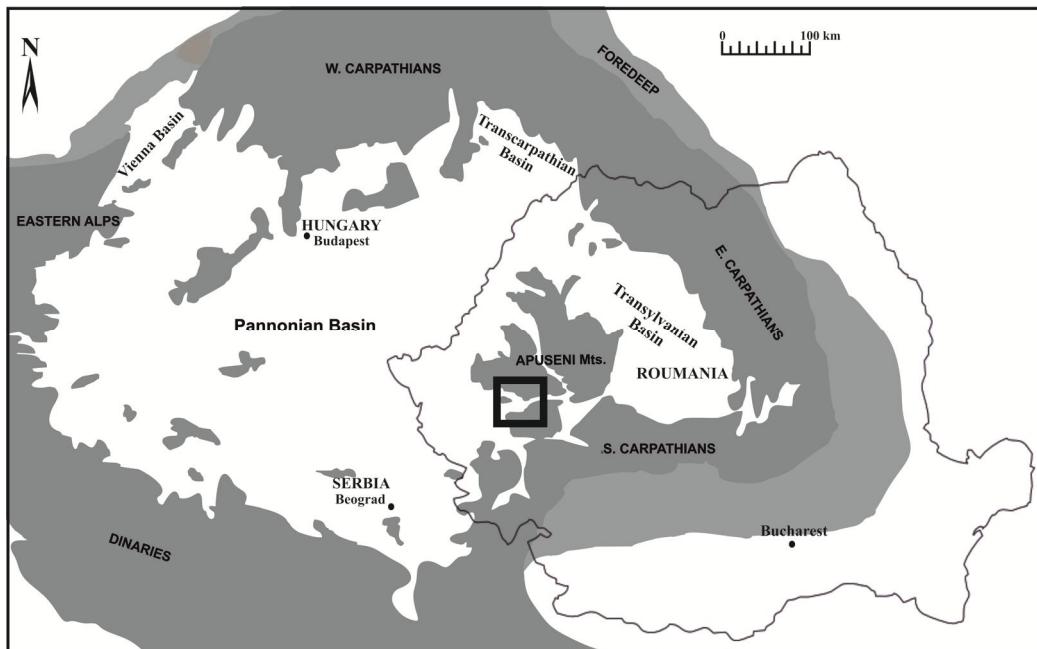


Fig. 1 Location map of the Făget basin

Lăpușiu de Sus and Nemeșești are situated in the Făget basin (north-western part of the Poiana Ruscă Mountains) (Fig. 1), representing one of the eastern extensions of the Pannonian Basin. Lăpușiu de Sus fossiliferous site is famous due to its Badenian fauna richness and diversity (molluscs, corals, bryozoans, foraminifera, brachiopods etc.). The mollusc fauna was mentioned in the papers from the last a hundred and fifty years (Halaváts, 1876; Koch, 1898; Nițulescu, 1930; Moisescu, 1955a; Petrescu et al., 1990; Șuraru and Papp, 1993; Chira and Voia, 2001). From the molluscs, the gastropods are the most represented. New occurrences of species described by Hörnes (1851-1856), Hoernes and Auinger (1879-1891), Boettger (1902-1907) have been described from Lăpușiu.

Material

The gastropods (190 specimens) have been collected in 1995 from Lăpușiu de Sus and Nemeșești by Angela Săplăcan, curator of Mureș County Museum.

The studied gastropods are very diverse. Thirty-eight gastropods genera with fifty-four species have been recorded. They belong to twenty families (Neritopsidae, Cerithiidae, Turritellidae, Cypraeidae, Pediculariidae, Ficidae, Naticidae, Aporrhaidae, Tonnidae, Buccinidae, Columbellidae, Fasciolariidae, Nassariidae, Muricidae, Mitridae, Volutidae, Olividae, Conidae, Terebridae and Turridae) and eleven superfamilies (Neritopoidea, Cerithioidea, Cypraeoidea, Ficoidea, Naticoidea, Stromboidea, Tonoidea, Buccinoidea, Muricoidea, Olivoidea, Conoidea).

Abbreviations: Mureș County Museum = MCM

Systematic palaeontology

The systematic classification has been used according to Bouchet and Rocroi (2005). According to Landau et al. (2004), the Pediculariidae are treated as a family of Cypraeoidea superfamily.

Class **GASTROPODA** CUVIER, 1797
Superfamily **Neritopoidea** GRAY, 1847
Family **Neritopsidae** GRAY, 1847
Genus *Neritopsis* GRATELOUP, 1832

***Neritopsis (Neritopsis) radula* (LINNAEUS, 1758)**
Pl. 1, Fig. 1

1856 *Neritopsis radula* LINN. – Hörnes, pp. 528–529, Pl. 47, Fig. 8
1998 *Neritopsis (Neritopsis) radula* (LINNÉ) – Schultz, Pl. 20, Fig. 9

Material: Two specimens (inv. MCM 423), Nemeşesti

Dimensions: Height 20.0–15.1 mm, width 18.7–14.5 mm.

Superfamily **Cerithioidea** FLEMING, 1822
Family **Cerithiidae** FLEMING, 1822
Genus *Cerithium* BRUGUIÈRE, 1879

***Cerithium vulgatum europaeum* MAYER, 1878**
Pl. 1, Fig. 2

1954 *Cerithium europaeum* MAYER – Friedberg, pp. 249, Pl. 16, Figs. 3, 4
1966 *Cerithium vulgatum europaeum* MAYER – Strausz, pp. 130, Pl. 9, Figs. 19–26
1975 *Cerithium (Thericium) vulgatum europaeum* MAYER – Bałuk, pp. 144, Pl. 17, Figs. 1–3
2002 *Cerithium vulgatum europaeum* MAYER – Harzhauser, pp. 72, Pl. 2, Figs. 3–4

Material: twelve specimens (inv. MCM 424), Lăpuș de Sus

Dimensions: Height 28–10 mm, width 10.8–5.0 mm.

Subgenus *Tiaracerithium* SACCO, 1895

***Cerithium (Tiaracerithium) zeuschneri* PUSCH, 1837**
Pl. 1, Fig. 3

1954 *Cerithium zejszneri* PUSCH – Friedberg, pp. 252, Pl. 16, Fig. 6
1960 *Cerithium (Vulgocerithium) zeuschneri* PUSCH – Kojumdjieva & Strachimirov, pp. 105, Pl. 31,
Figs. 6, 7
1966 *Cerithium zeuschneri* PUSCH – Strausz, pp. 134, Pl. 10, Fig. 3, Pl. 11, Fig. 2
1975 *Cerithium (Tiaracerithium) zeuschneri* PUSCH – Bałuk, pp. 150, Pl. 18, Figs. 6–9

Material: two specimens (inv. MCM 425), Lăpuș de Sus

Dimensions: Height 31.1–22.3 mm, width 12.3–9.4 mm.

Subgenus *Thericium* MONTEROSATO, 1890

***Cerithium (Thericium) michelotti* HÖRNES, 1855**
Pl. 1, Fig. 4

1855 *Cerithium michelotti* HÖRN. – Hörnes, pp. 389, Pl. 41, Fig. 7
1954 *Cerithium michelotti* HÖRN. – Friedberg, pp. 606, Pl. 38, Fig. 7 a, b
1960 *Cerithium (Vulgocerithium) michelotti* HÖRNES – Kojumdjieva & Strachimirov, pp. 105, Pl. 31,
Fig. 5

1966 *Cerithium michelotti* HÖRNES – Strausz, pp. 134, Pl. 9, Fig. 29

1975 *Cerithium (Thericium) michelotti* HÖRNES – Bałuk, pp. 146, Pl. 17, Figs. 6–8

Material: five specimens (inv. MCM 426), Lăpugiu de Sus

Dimensions: Height 19.8–10.1 mm, width 9.1–5.1 mm.

***Cerithium crenatum* (BROCCHI, 1814)**

Pl. 1, Fig. 5

1966 *Cerithium crenatum* BROCCHI – Strausz, pp. 135. Pl. 9, Fig. 10

1968 *Cerithium (Ptychocerithium) crenatum crenatum* BROCCHI – Hânculov, pp. 131, Pl. 31, Fig. 5 a, b

2004 *Cerithium (Thericium) crenatum* (BROCCHI) – Landau et al., pp. 5, Pl. 1, Fig. 8

2006 *Cerithium crenatum* (BROCCHI) – Chirli, pp. 83, Pl. 34, Figs. 1–5

Material: one specimen (inv. MCM 427), Lăpugiu de Sus

Dimensions: Height 33.2 mm, width 9.1 mm.

Family **Turritellidae** LOVÉN, 1847

Genus *Turritella* LAMARCK, 1799

***Turritella spirata* (BROCCHI, 1814)**

Pl. 1, Fig. 6

1966 *Turritella subangulata spirata* BROCCHI – Strausz, pp. 84, Pl. 2, Fig. 4

1968 *Turritella (Zaria) subangulata spirata* BROCCHI – Hânculov, pp. 134, Pl. 32, Fig. 7

1975 *Turritella (Zaria) spirata* (BROCCHI) – Bałuk, pp. 104, Pl. 13, Fig. 14

2004 *Turritella spirata* (BROCCHI) – Landau et al., pp. 17, Pl. 2, Fig. 11, Pl. 3, Fig. 7

Material: eight specimens incomplete preserved (inv. MCM 428), Lăpugiu de Sus

Dimensions: Height 21.3–18.2 mm, width 7.2–6.4 mm.

***Turritella erronea* COSSMANN in FRIEDBERG, 1914**

Pl. 1, Fig. 7

1955b *Turritella (Torculoidella) erronea* COSSMANN – Moisescu, pp. 127, Pl. 10, Figs. 13, 16, 17

1960 *Turritella (Torculoidella) erronea* COSSMANN – Kojumdgieva & Strachimirov, pp. 115, Pl. 32, Figs. 16, 17

1975 *Turritella (Archimediella) erronea erronea* COSSMANN – Bałuk, pp. 111, Pl. 12, Figs. 17, 18

2004 *Turritella erronea* COSSMAN in FRIEDBERG – Landau et al., pp. 15, Pl. 2, Figs. 9–10, Pl. 3, Fig. 5

Material: six specimens (the largest specimens preserved without the protoconch and the last whorls) (inv. MCM 429), Nemeșești

Dimensions: Height 41–20.3 mm, width 9.2–5.5 mm.

Subgenus *Haustator* MONTFORT, 1810

***Turritella (Haustator) badensis* SACCO, 1895**

Pl. 1, Fig. 8

1895 *Turritella turris* cf. var. *badensis* SACC. – Sacco, pp. 3

1960 *Turritella (Archimediella) turris* var. *badensis* SACCO – Kojumdgieva & Strachimirov, pp. 113, Pl. 32, Fig. 8

partim 1966 *Turritella turris badensis* SACCO – Strausz, pp. 99, Pl. 3, Figs. 13–14, 16–17, Pl. 78, Fig. 4
1975 *Turritella (Haustator) badensis* SACCO – Bałuk, pp. 105, Pl. 12, Figs. 22–27
1996 *Turritella (Haustator) badensis* SACCO – Jakubowski, pp. 706, Pl. 217, Figs. 11, 12

Material: thirty-seven incomplete specimens (inv. MCM 430), Lăpușiu de Sus (25) and Nemeșești (12)

Dimensions: Height 50.4–16 mm, width 12–5 mm.

Subgenus *Eichwaldiella* FRIEDBERG, 1933

***Turritella (Eichwaldiella) bicarinata* (EICHWALD, 1830)**
Pl. 1, Fig. 9

1966 *Turritella bicarinata* EICHWALD – Strausz, pp. 86, Pl. 2, Fig. 13
1975 *Turritella (Eichwaldiella) bicarinata* EICHWALD – Bałuk, pp. 109, Pl. 12, Figs. 1–6
2002 *Turritella (Eichwaldiella) bicarinata* (EICHWALD) – Harzhauser, pp. 78, Pl. 2, Figs. 17–19

Material: twenty- three specimens (the largest without initial or last whorls) (inv. MCM 431), Lăpușiu de Sus

Dimensions: Height 47.6–20 mm, width 14.2–8 mm.

Superfamily **Cypraeoidea** RAFINESQUE, 1815

Family **Cypraeidae** RAFINESQUE, 1815

Genus *Schilderia* TOMLIN, 1930

***Schilderia semidenticulata* (SACCO, 1894)**
Pl. 1, Fig. 10

1852 *Cypraea sanguinolenta* GMELIN – Hörnes, pp. 70, Pl. 8, Figs. 9–12
1894 *Cypraea sanguinolenta* var. *semidenticulata* SACC. – Sacco, pp. 30
1995 *Schilderia semidenticulata* (SACCO) – Bałuk, pp. 184–185, Pl. 9, Figs. 1–3

Material: one specimen (inv. MCM 432), Lăpușiu de Sus

Dimensions: Height 17.5 mm, width 10.6 mm.

Genus *Monetaria* TROSCHEL, 1863

***Monetaria brocchii* (DESHAYES, 1844)**
Pl. 2, Fig. 1

1852 *Cypraea pyrum* GMELIN – Hörnes, pp. 66–67, Pl. 8, Figs. 2–5
1924 *Cypraea Brocchii* GRATELOUP – Cossmann & Peyrot, pp. 363–364, Pl. 10, Figs. 15–17
1995 *Monetaria brocchii* DESHAYES – Bałuk, pp. 186, Pl. 8, Fig. 3, Pl. 9, Figs. 4–5, Pl. 10, Figs. 1–2

Material: four specimens (inv. MCM 433), Lăpușiu de Sus

Dimensions: Height 24–21.2 mm, width 16–15.3 mm.

Genus *Apocypraea* SCHILDER, 1927

***Apocypraea subamygdalum* (D'ORBIGNY, 1852)**
Pl. 2, Fig. 2

1852 *Cypraea amygdalum* BROCC. – Hörnes, pp. 67–68, Pl. 8, Figs. 6–8

- 1924 *Cypraea (Adusta) subamygdalum* D'ORBIGNY – Cossmann & Peyrot, pp. 357–359, Pl. 9, Figs. 22–23, Pl. 10, Fig. 5
 1995 *Apocypraea subamygdalum* (D'ORBIGNY) – Bałuk, pp. 187, Pl. 11, Fig. 4

Material: one specimen (inv. MCM 434), Lăpugiu de Sus

Dimensions: Height 32.3 mm, width 19.4 mm.

Family **Pediculariidae** GRAY, 1853

Genus *Projenneria* DOLIN, 1997

***Projenneria lapugensis* (SACCO, 1894)**

Pl. 2, Fig. 3

1894 *Jenneria duclosiana* var. *lapugensis* SACC. – Sacco, pp. 57

1960 *Pustularia duclosiana* BASTEROT – Kojumdgieva & Strachimirov, pp. 127, Pl. 34, Fig. 11

2008 *Projenneria lapugensis* (SACCO) – Fehse & Vicián, Pl 1, Figs. 4–7

Material: three specimens (inv. MCM 435), Lăpugiu de Sus

Dimensions: Height 18.2–12.3 mm, width 13–8.4 mm.

Superfamily **Ficoidea** MEEK, 1864

Family **Ficidae** MEEK, 1864

Genus *Ficus* RÖDING, 1798

***Ficus (Ficus) condita* (BRONGNIART, 1823)**

Pl. 2, Fig. 4

1960 *Ficus (Fulguroficus) conditus* (BRONGNIART) – Kojumdgieva & Strachimirov, pp. 132, Pl. 36, Fig. 3

1968 *Ficus (Fulguroficus) conditus* (BRONGNIART) – Hínculov, pp. 139, Pl. 34, Fig. 4a, b

1995 *Ficus (Ficus) condita* (BRONGNIART) – Bałuk, pp. 204, Pl. 17, Figs. 7–9

Material: one incomplete specimen (inv. MCM 436), Lăpugiu de Sus

Dimensions: Height 33 mm, width 23.2 mm.

Superfamily **Naticoidea** GUILDFING, 1834

Family **Naticidae** GUILDFING, 1834

Genus *Natica* SCOPOLI, 1777

***Natica tigrina* RÖDING, 1798**

Pl. 2, Fig. 5

1952 *Natica tigrina* DEFRENCE – Glibert, Pl. 2, Fig. 3

1954 *Natica millepunctata* LAMARCK – Friedberg, pp. 428, Pl. 26, Figs. 2, 3

1995 *Natica tigrina* RÖDING – Bałuk, pp. 194, Pl. 15, Figs. 10–14

2006 *Natica tigrina* RÖDING – Bałuk, pp. 206, Pl. 3, Fig. 6

Material: two specimens (inv. MCM 437), Lăpugiu de Sus

Dimensions: Height 14–11.40 mm, width 13.1–10 mm.

Genus *Polinices* MONFORT, 1810

***Polinices protractus* (EICHWALD, 1853)**
Pl. 2, Fig. 6

1960 *Polinices (Euspira) catena* var. *protracta* (EICHWALD) – Kojumdgieva & Strachimirov, pp. 121, Pl. 33,
Figs. 12, 13

1984 *Euspira helicina protracta* (Von EICHWALD) – Janssen, pp. 197, Pl. 55, Figs. 6a-b, 7, 8
1995 *Polinices protractus* (EICHWALD) – Bałuk, pp. 196, Pl. 15, Figs. 2, 3

Material: one specimen (inv. MCM 438), Lăpugiu de Sus

Dimensions: Height 13.6 mm, width 11 mm.

***Polinices redemptus* (MICHELOTTI, 1847)**
Pl. 2, Fig. 7

1856 *Natica redempta* MICHT. – Hörmes, pp. 522–523, Pl. 47, Fig. 3

1995 *Polinices redemptus* (MICHELOTTI) – Bałuk, pp. 198, Pl. 15, Figs. 7, 8

2002 *Polinices redemptus* (MICHELOTTI) – Harzhauser, pp. 88, Pl. 5, Figs. 5, 6

Material: two specimens (inv. MCM 439), Lăpugiu de Sus

Dimensions: Height 13–11.6 mm, width 13.1–11.3 mm.

Genus *Euspira* AGASSIZ, 1839

***Euspira helicina* (BROCCHI, 1814)**
Pl. 2, Fig. 8

1966 *Natica (Lunatia) catena helicina* BROCCHEI – Strausz, pp. 228, Pl. 48, Figs. 13–16

1981 *Natica (Lunatia) helicina* BROCCHEI – Krach, pp. 64, Pl. 24, Fig. 4

2002 *Euspira helicina* (BROCCHI) – Harzhauser, pp. 89, Pl. 5, Figs. 7–9

Material: two specimens (inv. MCM 440), Lăpugiu de Sus

Dimensions: Height 18.6–11.6 mm, width 12.5–11 mm.

Genus *Neverita* RISSO, 1826

***Neverita josephinia* RISSO, 1826**
Pl. 2, Fig. 9

1856 *Natica Josephinia* RISSO – Hörmes, pp. 523, Pl. 47, Figs. 4, 5

1995 *Neverita josephinia* RISSO – Bałuk, pp. 199, Pl. 15, Figs. 4, 5

2002 *Neverita josephinia* (RISSO) – Harzhauser, pp. 88–89, Pl. 5, Figs. 12, 13

Material: one incomplete specimen (inv. MCM 441), Lăpugiu de Sus

Superfamily **Stromoidea** RAFINESQUE, 1815

Family **Aporrhaidae** GRAY, 1850

Genus *Aporrhais* DA COSTA, 1778

***Aporrhais pespelecani* (LINNAEUS, 1766)**
Pl. 3, Fig. 1

1955b *Aporrhais pes pelecani* LINNAEUS var. *alata* EICHWALD – Moisescu, pp. 137, Pl. 11, Fig. 20

- 1960 *Aporrhais pes pelecani* var. *alata* (EICHWALD) – Kojumdgieva & Strachimirov, pp. 131, Pl. 35, Fig. 7, Pl. 36, Fig. 2
 1966 *Aporrhais pespelecani* LINNÉ – Strausz, pp. 215–216, Pl. 22, Fig. 17
 1995 *Aporrhais pespelecani* (LINNAEUS) – Bałuk, pp. 177, Pl. 7, Figs. 4–11

Material : twenty specimens (inv. MCM 442), Lăpugiu de Sus (17), Nemeşesti (3)

Dimensions: Height 24.3–18.5 mm, width 18.4–14.5 mm.

Superfamily **Tonoidea** SUTER, 1913

Family **Tonnidae** SUTER, 1913

Genus *Cypraecassis* SUTCHBURY, 1837

***Cypraecassis cypraeiformis* (BORSON, 1820)**

Pl. 3, Fig. 2

- 1820 *Cassis cypraeiformis* BORSON, pp. 229, Pl. 1, Fig. 20
 1956 *Cypraecassis cypraeiformis* (BORSON) – Csepreghy-Meznerics, pp. 396, Pl. 4, Figs. 17–18
 1966 *Cypraecassis crumena cypraeiformis* BORSON – Strausz, pp. 246, Pl. 64, Figs. 10, 11
 1995 *Cypraecassis cypraeiformis* (BORSON) – Bałuk, pp. 202, Pl. 16, Figs. 5, 6
 2004 *Cypraecassis cypraeiformis* (BORSON) – Landau et al., pp. 40–43, Pl. 1, Figs. 3–6, Pl. 2, Fig. 1

Material: one specimen (inv. MCM 443), Lăpugiu de Sus

Dimensions: Height 41 mm, width 28 mm.

Subgenus *Semicassis* MÖRCH, 1852

***Semicassis laevigata* (DEFRANCE, 1817)**

Pl. 3, Fig. 3

- 1960 *Phalium (Semicassis) miolaevigata* (SACCO) – Kojumdgieva & Strachimirov, pp. 134, Pl. 37, Figs. 2, 3
 1966 *Phalium (Semicassis) saburon miolaevigatum* SACCO, 1890 – Strausz, pp. 244, Pl. 64, Fig. 4, Pl. 72, Figs. 15–17, Pl. 73, Figs. 1–5
 1984 *Semicassis miolaevigata* SACCO – Ferrero Mortara et al., pp. 13, Pl. 1, Fig. 6
 1995 *Phalium (Semicassis) miolaevigata* SACCO – Bałuk, pp. 203, Pl. 16, Figs. 1–4
 2004 *Semicassis laevigata* (DEFRANCE) – Landau et al., pp. 47–49, Pl. 3, Figs. 1, 2

Material: one specimen (inv. MCM 444), Nemeşesti

Dimensions: Height 45.3 mm, width 39 mm.

Superfamily **Buccinoidea** RAFINESQUE, 1815

Family **Buccinidae** RAFINESQUE, 1815

Genus *Euthria* (GRAY, 1850)

***Euthria puschi* (ANDRZEJOWSKI, 1830)**

Pl. 3, Fig. 4

- 1960 *Euthria (Euthria) puschi* (ANDRZEJOWSKI) – Kojumdgieva & Strachimirov, pp. 170, Pl. 43, Fig. 8
 1966 *Euthria puschi* ANDRZEJOWSKI – Strausz, pp. 304, Pl. 34, Figs. 6, 7, 10
 1996 *Euthria puschi* (ANDRZEJOWSKI) – Jakubowski, pp. 713, Pl. 219, Fig. 3

Material: one specimen (inv. MCM 445), Lăpugiu de Sus

Dimensions: Height 40.4 mm, width 19.8 mm.

Genus *Cantharus* RÖDING, 1798

***Cantharus multicostatus transsylvanicus* (HOERNES & AUINGER, 1890)**

Pl. 3, Fig. 5

1890 *Pollia multicostata* BELL. var. *transsylvanica* – Hoernes & Auinger, pp. 237, Pl. 28, Figs. 1–3

1960 *Cantharus (Pollia) multicostatus* var. *transsylvanicus* HOERNES und AUINGER – Kojumdgieva & Strachimirov, pp. 173, Pl. 43, Fig. 17

Material: three specimens (two incomplete) (inv. MCM 446), Lăpugiu de Sus

Dimensions: Height 26.9 mm, width 13.5 mm.

Family **Columbellidae** SWAINSON, 1840

Genus *Pyrene* RÖDING, 1798

Subgenus *Macrurella* SACCO, 1889

***Pyrene (Macrurella) nassoides* (GRATELOUP, 1840)**

Pl. 3, Fig. 6

1960 *Mitrella (Macrurella) nassoides* GRATELOUP – Kojumdgieva & Strachimirov, pp. 185, Pl. 45, Fig. 10

1966 *Columbella (Macrurella) nassoides* GRATELOUP – Strausz, pp. 294, Pl. 42, Figs. 6, 7

1995 *Pyrene (Macrurella) nassoides* (GRATELOUP) – Bałuk, pp. 237, Pl. 31, Fig. 4

Material: two specimens (inv. MCM 448), Lăpugiu de Sus

Dimensions: Height 25.5–24.6 mm, width 9–8.8 mm.

Family **Fasciolariidae** GRAY, 1853

Genus *Fusinus* RAFINESQUE, 1815

***Fusinus lamellosus* (BORSON, 1821)**

Pl. 3, Fig. 7

1821 *Fusus lamellosus* BORSON, pp. 317, Pl. 1, Fig. 14

1960 *Fusus (Aptyxis) lamellosus* BORSON – Kojumdgieva & Strachimirov, pp. 190, Pl. 46, Fig. 13

1966 *Fusus (Aptyxis) lamellosus* BORSON – Strausz, pp. 344, Pl. 26, Fig. 19

2000 *Fusinus lamellosus* (BORSON) – Chirli, pp. 119, Pl. 48, Figs. 1–9

Material: one specimen (inv. MCM 449), Nemeşesti

Dimensions: Height 22 mm, width 7 mm.

Genus *Latirus* MONTFORT, 1810

***Latirus bilineatus* (PARTSCH in HAUER, 1837)**

Pl. 4, Fig. 1

1960 *Latirus (Dolicholatirus) bilineatus* PARTSCH – Kojumdgieva & Strachimirov, pp. 188, Pl. 46, Fig. 2

1966 *Latirus (Dolicholatirus) bilineatus* PARTSCH – Strausz, pp. 350, Pl. 28, Figs. 4–13

1998 *Latirus (Pseudolatirus) bilineatus* (PARTSCH) – Schultz, pp. 68, Pl. 27, Fig. 5

Material: two specimens (inv. MCM 450), Lăpugiu de Sus

Dimensions: Height 31–24.5 mm, width 10–8 mm.

Family **Nassariidae** IREDALE, 1916

Genus *Nassarius* DUMÉRIL, 1806

***Nassarius coloratus* (EICHWALD, 1830)**

Pl. 4, Fig. 2

1960 *Nassa (Phrontis) colorata* var. *vindobonensis* (MAYER) – Kojumdgieva & Strachimirov, pp. 181, Pl. 45, Fig. 1

1966 *Nassa (Phrontis) vindobonensis* MAYER – Strausz, pp. 324, Pl. 39, Figs. 1–5

1981 *Nassa colorata* (EICHWALD) – Krach, pp. 70, Pl. 20, Figs 9–12

1998 *Hinia (Hinia) colorata vindobonensis* (MAYER) – Schultz, Pl. 26, Fig. 14

2004 *Nassarius coloratus* (EICHWALD) – Harzhauser & Kowalke, pp. 17–18, Pl. 2, Fig. 5

Material: one specimen (inv. MCM 451), Nemeşesti

Dimensions: Height 11 mm, width 6 mm.

Genus *Nassarius* DUMÉRIL, 1806

Subgenus *Amyclina* IRENDALE, 1919

***Nassarius banaticus* BOETTGER, 1902**

Pl. 4, Fig. 3

partim 1852 *Buccinum semistriatum* BROCC. – Hörnes, pp. 144–145, Pl. 12, Fig. 9

1902 *Nassa (Zeuxis) banatica* n. sp – Boettger, pp. 20–21

1934 *Nassa (Zeuxis) banatica* BOETTGER – Zilch, pp. 257, Pl. 16, Fig. 7

2004 *Nassarius banaticus* (BOETTGER) – Harzhauser & Kowalke, pp. 20, Pl. 2, Figs. 15–16

Material: one specimen (inv. MCM 452), Lăpușiu de Sus

Dimensions: Height 14.8 mm, width 7.6 mm.

Superfamily **Muricoidea** RAFINESQUE, 1815

Family **Muricidae** RAFINESQUE, 1815

Genus *Chicoreus* MONTFORT, 1810

***Chicoreus (Chicoreus) borni* (HÖRNES, 1853)**

Pl. 4, Fig. 4

1853 *Murex Borni* HÖRNES – Hörnes, pp. 253, Pl. 25, Fig. 18

1998 *Chicoreus (Chicoreus) borni* (HOERNES) – Schultz, pp. 64, Pl. 25, Fig. 2

Material: one specimen (inv. MCM 454), Lăpușiu de Sus

Dimensions: Height 51 mm, width 27 mm.

Genus *Thais* RÖDING, 1798

Subgenus *Stramonita* SCHUMACHER, 1817

***Thais (Stramonita) exilis* (PARTSCH in HÖRNES, 1852)**

Pl. 4, Fig. 5

1852 *Purpura exilis* PARTSCH – Hörnes, pp. 169, Pl. 13, Figs. 20–23

- 1960 *Thais (Stramonita) exilis* (PARTSCH in HÖRNES) – Kojumdgieva & Strachimirov, pp. 153, Pl. 41, Fig. 2
 1995 *Thais (Stramonita) exilis* (PARTSCH in HÖRNES) – Bałuk, pp. 222–223, Pl. 27, Figs. 1–4
 2006 *Thais (Stramonita) exilis* (PARTSCH in HÖRNES) – Bałuk, pp. 208, Pl. 12, Figs. 3–6

Material: one incomplete specimen (outer lip destroyed) (inv. MCM 455), Lăpugiu de Sus

Dimensions: Height 23.7 mm

Family **Mitridae** SWAINSON, 1829

Genus *Mitraria* RAFINESQE, 1815

***Mitraria (Mitraria) friedbergi* (COSSMANN, 1912)**

Pl. 4, Fig. 6

- 1960 *Mitraria (Mitraria) friedbergi* (COSSMANN) – Kojumdgieva & Strachimirov, pp. 158, Pl. 42, Fig. 5
 1997 *Mitraria (Mitraria) friedbergi* (COSSMANN) – Bałuk, pp. 30, Pl. 8, Figs. 1–2

Material: one specimen (inv. MCM 456), Lăpugiu de Sus

Dimensions: Height 24 mm, width 10 mm.

Genus *Mitra* MARTYN, 1784

Subgenus *Tiara* SWAINSON, 1831

***Mitra (Tiara) scrobiculata* (BROCCHI, 1814)**

Pl. 4, Fig. 7

- 1966 *Mitra (Nebularia) scrobiculata* BROCCHI – Strausz, pp. 365, Pl. 26, Figs. 6–10
 1973 *Mitra (Tiara) scrobiculata* BROCCHI – Bohn-Havas, pp. 1059, Pl. 6, Fig. 6, Pl. 10, Fig. 2
 1997 *Mitra (Tiara) scrobiculata* (BROCCHI) – Bałuk, pp. 28–29, Pl. 7, Fig. 9

Material: one specimen (inv. MCM 457), Lăpugiu de Sus

Dimensions: Height 29 mm, width 8 mm.

Family **Volutidae** RAFINESQUE, 1815

Genus *Athleta* CONRAD, 1853

***Athleta (Athleta) rarispina* (LAMARCK, 1811)**

Pl. 4, Fig. 8

- 1960 *Athleta (Athleta) ficalina* var. *rarispina* (LAMARCK) – Kojumdgieva & Strachimirov, pp. 154, Pl. 41, Fig. 6
 1966 *Voluta (Athleta) ficalina rarispina* LAMARCK – Strausz, pp. 372, Pl. 64, Figs. 12–14, Pl. 65, Figs. 1–9, Pl. 66, Figs. 1, 2
 1997 *Athleta (Athleta) rarispina* (LAMARCK) – Bałuk, pp. 41, Pl. 13, Figs. 10–11

Material: one specimen (inv. MCM 458), Lăpugiu de Sus

Dimensions: Height 21.4 mm, width 14.3 mm.

Superfamily **Olivoidea** LATREILLE, 1825
 Family **Olividae** LATREILLE, 1825
 Genus *Ancilla* LAMARCK, 1799
 Subgenus *Baryspira* FISCHER, 1883

Ancilla (Baryspira) glandiformis (LAMARCK, 1810)
 Pl. 5, Fig. 1

- 1960 *Ancilla (Baryspira) glandiformis* (LAMARCK) – Kojumdgieva & Strachimirov, pp. 168, Pl. 43. Figs. 3, 4
 1966 *Ancilla (Baryspira) glandiformis* LAMARCK – Strausz, pp. 357–358, Pl. 40, Figs. 16–23, Pl. 41, Figs. 1, 2, Pl. 73, Figs. 13–14, Pl. 74, Figs. 1–2
 1968 *Ancilla (Baryspira) glandiformis* (LAMARCK) – Hínculov, pp. 146, Pl. 36, Figs. 6, 7
 1972 *Ancilla (Baryspira) glandiformis* LAMARCK – Nicorici, pp. 141, Pl. 16, Figs. 7, 8
 1997 *Ancilla (Baryspira) glandiformis* (LAMARCK) – Bałuk, pp. 24, Pl. 6, Figs. 1–11

Material: five specimens (four incomplete specimens) (inv. MCM 459), Lăpugiu de Sus
Dimensions: Height 33 mm, width 17 mm.

Ancilla (Baryspira) obsoleta (BROCCHI, 1814)
 Pl. 5, Fig. 2

- 1882 *Ancillaria obsoleta* BROCC. – Bellardi, pp. 222, Pl. 12, Fig. 44
 1960 *Ancilla (Ancilla) obsoleta* (BROCCHI) – Kojumdgieva & Strachimirov, pp. 167, Pl. 43, Fig. 2
 1966 *Ancilla obsoleta* BROCCHI – Strausz, pp. 356, Pl. 40, Figs. 12–15
 1997 *Ancilla (Baryspira) obsoleta* (BROCCHI) – Bałuk, pp. 26, Pl. 7, Figs. 7, 8

Material: one specimen (inv. MCM 460), Lăpugiu de Sus
Dimensions: Height 21 mm, width 9 mm.

Superfamily **Conoidea** FLEMING, 1822
 Family **Conidae** FLEMING, 1822
 Genus *Conus* LINNÉ, 1758
 Subgenus *Conolithus* HERRMANNSEN, 1847

Conus (Conolithus) dujardini DESHAYES, 1845
 Pl. 5, Fig. 3

- 1955b *Conus (Conuspira) dujardini* DESHAYES – Moisescu, pp. 159–161, Pl. 14, Figs. 15–18
 1960 *Conus (Conolithus) dujardini* DESHAYES – Kojumdgieva & Strachimirov, pp. 209, Pl. 49, Fig. 4
 1964 *Conus dujardini* DESHAYES – Hall, pp. 143, Pl. 24, Fig. 3
 1966 *Conus (Conolithus) dujardini* DESHAYES – Strausz, pp. 451–452, Pl. 67, Figs. 2–5, 7
 1997 *Conus (Conolithus) dujardini* DESHAYES – Bałuk, pp. 55–56, Pl. 19, Figs. 1–4
 2002 *Conus (Lithoconus) berghausi* MICHELOTTI – Harzhauser, pp. 112–113, Pl. 9, Fig. 12

Material: six specimens (inv. MCM 461), Lăpugiu de Sus (3), Nemeșești (3)
Dimensions: Height 25.6–10.8 mm, width 11.2–4.8 mm.

Subgenus *Lithoconus* MÖRCH, 1852

Conus (Lithoconus) berghausi MICHELOTTI, 1847
 Pl. 5, Fig. 4

- 1960 *Conus (Dendroconus) berghausi* MICHELOTTI – Kojumdgieva & Strachimirov, pp. 215, Pl. 51, Fig. 3

- 1964 *Conus berghausi* MICHELOTTI – Hall, pp. 134, Pl. 23, Figs. 11, 18, 22, 23, 28
 1968 *Conus (Dendroconus) berghausi* MICHELOTTI – Hínculov, pp. 151, Pl. 38, Fig. 8a, b
 1997 *Conus (Lithoconus) berghausi* MICHELOTTI – Bałuk, pp. 58–60, Pl. 21, Figs. 1–4
 1997 *Conus (Dendroconus) berghausi* MICHELOTTI – Chirlı, pp. 14, Pl. 4, Figs. 1, 2
 2002 *Conus (Lithoconus) berghausi* MICHELOTTI – Harzhauser, pp. 113–114, Pl. 10, Figs. 4–6

Material: two specimens (inv. MCM 462), Lăpugiu de Sus

Dimensions: Height 21.9–19 mm, width 15.9–13.2 mm.

Subgenus *Chelyconus* MÖRCH, 1852

Conus (Chelyconus) ponderosus BROCHI, 1814
 Pl. 5, Fig. 5

- 1851 *Conus ponderosus* BROCC. – Hörnes, pp. 26, Pl. 2, Fig. 6a, b
 1964 *Conus ponderosus* BROCCHI – Hall, pp. 156, Pl. 28, Figs. 1–21
 1997 *Conus (Chelyconus) ponderosus* BROCCHI – Chirlı, pp. 7, Pl. 2, Figs. 6–11

Material: one specimen (inv. MCM 463), Lăpugiu de Sus

Dimensions: Height 38.2 mm, width 22.1 mm.

Conus (Chelyconus) rotundus HOERNES & AUINGER, 1879
 Pl. 5, Fig. 6

- 1966 *Conus rotundus* HOERNES & AUINGER – Strausz, pp. 458–459, Pl. 69, Figs. 9, 10
 1997 *Conus (Chelyconus) rotundus* HOERNES & AUINGER – Bałuk, pp. 64–65, Pl. 22, Figs. 4–8

Material: four specimens (inv. MCM 480), Lăpugiu de Sus (3), Nemeșești (one specimen incomplete preserved)

Dimensions: Height 31.7–27 mm, width 19.5–16.1 mm.

Conus cf. pseudoponderosus GLIBERT, 1952
 Pl. 5, Fig. 7

- 1952 *Conus pseudoponderosus* n. sp. – Glibert, Pl. 13, Fig. 4a-c
 1966 *Conus (Chelyconus) pseudoponderosus* DOLLFUS & DAUTZENBERG (in GLIBERT) – Strausz, pp. 463, Pl. 68, Figs. 6, 7
 1973 *Conus (Chelyconus) pseudoponderosus* GLIBERT – Bohn-Havas, pp. 1067–1068, Pl. 7, Fig. 4, Pl. 9, Fig. 12

Material: one specimen (inv. MCM 481), Lăpugiu de Sus

Dimensions: Height 38.3 mm, width 22.2 mm.

Conus (Chelyconus) raristriatus BELLARDI & MICHELOTTI, 1840
 Pl. 5, Fig. 8

- 1964 *Conus raristriatus* BELLARDI & MICHELOTTI – Hall, pp. 158, Pl. 26, Figs. 23–25
 1984 *Chelyconus raristriatus* (BELLARDI & MICHELOTTI) – Ferrero Mortara et al., pp. 125, Pl. 19, Fig. 3a, b

Material: one specimen (inv. MCM 464), Lăpugiu de Sus

Dimensions: Height 25.1 mm, width 13.7 mm.

Genus *Mangelia* RISSO, 1826

***Mangelia subvellicata* (BOETTGER, 1902)**

Pl. 5, Fig. 9

1902 *Rhaphitoma subvellicata* n. sp. – Boettger, pp. 78, nr. 248

1934 *Cyphara (Mangelia) subvellicata* (BOETTGER) – Zilch, pp. 267, Pl. 20, Fig. 65

Material: one specimen (inv. MCM 465), Lăpugiu de Sus

Dimensions: Height 9.3 mm, width 3.8 mm.

Genus *Bela* LEACH in GRAY, 1847

***Bela cf. pseudobrachystoma* (BOETTGER, 1902)**

Pl. 5, Fig. 10

1902 *Rhaphitoma pseudobrachystoma* n. sp. – Boettger, pp. 77, nr. 245

1934 *Cyphara (Mangelia) pseudobrachystoma* (BOETTGER) – Zilch, pp. 267, Pl. 19, Fig. 64

Material: one specimen (inv. MCM 466), Lăpugiu de Sus

Dimensions: Height 6.5 mm, width 3.1 mm.

Family **Terebridae** MÖRCH, 1852

Genus *Strioterebrum* SACCO, 1891

***Strioterebrum basteroti* (NYST, 1843)**

Pl. 5, Fig. 11

1955b *Terebra basteroti* NYST – Moisescu, pp. 173, Pl. 15, Fig. 6

1960 *Terebra (Strioterebrum) basteroti* NYST – Kojumdgieva & Strachimirov, pp. 217, Pl. 51, Fig. 9

1966 *Terebra basteroti* NYST – Strausz, pp. 389–390, Pl. 4, Figs. 32, 33

1968 *Terebra (Strioterebrum) basteroti* NYST – Hínculov, pp. 153, Pl. 39, Figs. 1a, b, 2a, b

1997 *Strioterebrum (Strioterebrum) basteroti* (NYST) – Bałuk, pp. 66, Pl. 25, Figs. 1–3

2001 *Strioterebrum basteroti* (NYST) – Lozouet et al., pp. 71, Pl. 31, Fig. 11

Material: one specimen (inv. MCM 467), Lăpugiu de Sus

Dimensions: Height 31.4 mm, width 5.8 mm.

Genus *Terebra* BRUGUIÈRE, 1789

***Terebra acuminata* BORSON, 1820**

Pl. 6, Fig. 1

1820 *Terebra acuminata* BORSON, pp. 224, Pl. 1, Fig. 7

1960 *Terebra (Terebra) acuminata* BORSON – Kojumdgieva & Strachimirov, pp. 216, Pl. 51, Fig. 5

1997 *Terebra (Myurella) acuminata* BORSON – Bałuk, pp. 69–70, Pl. 24, Figs. 1–5

1997 *Terebra acuminata* BORSON – Chirli, pp. 19, Pl. 6, Figs. 1–4

Material: one specimen (inv. MCM 469), Lăpugiu de Sus

Dimensions: Height 19.8 mm, width 5.7 mm.

Genus *Subula* SCHUMACHER, 1817

***Subula (Subula) fuscata plicaria* (BASTEROT, 1825)**
Pl. 6, Fig. 2

1966 *Terebra (Subula) fuscata plicaria* BASTEROT – Strausz, pp. 394, Pl. 5, Fig. 8–10

1997 *Subula (Oxymeris) plicaria* (BASTEROT) – Bałuk, pp. 68–69, Pl. 24, Figs. 6–12

1998 *Subula (Subula) fuscata plicaria* (BASTEROT) – Schultz, Pl. 29, Fig. 14

Material: one specimen (inv. MCM 468), Lăpușiu de Sus

Dimensions: Height 43.5 mm, width 10.2 mm.

Family **Turridae** H. & A. Adams, 1853

Genus *Clavatula* LAMARCK, 1801

***Clavatula laevigata* (EICHWALD, 1853)**
Pl. 6, Fig. 3

1853 *Pleur. laevigata* m. – Eichwald, pp. 183–184, Pl. 8, Fig. 3

1960 *Clavatula (Clavatula) laevigata* EICHWALD – Kojumdgieva & Strachimirov, pp. 197–198, Pl. 47, Figs. 7, 8

2002 *Clavatula laevigata* (EICHWALD) – Harzhauser, pp. 118, Pl. 10, Fig. 17, Pl. 11, Fig. 1

2003 *Clavatula laevigata* (EICHWALD) – Bałuk, pp. 35, Pl. 7, Figs. 7–10

Material: one specimen (inv. MCM 470), Nemeşești

Dimensions: Height 33 mm, width 14.5 mm.

***Clavatula camillae* (HOERNES & AUINGER, 1891)**
Pl. 6, Fig. 4

1891 *Pleurotoma (Clavatula) Camillae* nov.form – Hoernes & Auinger, pp. 340, Pl. 43, Figs. 12–13

1973 *Clavatula (Clavatula) camillae* (HOERNES & AUINGER) – Bohn-Havas, pp. 1065, Pl. 6, Fig. 8

1998 *Clavatula (Clavatula) camillae* (HOERNES & AUINGER) – Mikuž, pp. 70, Pl. 2, Fig. 2

2003 *Clavatula camillae* (HOERNES & AUINGER) – Bałuk, pp. 33, Pl. 1, Figs. 1–3

Material: one specimen (inv. MCM 472), Lăpușiu de Sus

Dimensions: Height 18.4 mm, width 7.5 mm.

***Clavatula sophiae* (HOERNES & AUINGER, 1891)**
Pl. 6, Fig. 5

1891 *Pleurotoma (Clavatula) sophiae* nov.form – Hoernes & Auinger, pp. 340, Pl. 43, Fig. 8

1998 *Clavatula (Clavatula) sophiae* (HOERNES & AUINGER) – Mikuž, pp. 75, Pl. 4, Fig. 5

2003 *Clavatula sophiae* (HOERNES & AUINGER) – Bałuk, pp. 38, Pl. 3, Figs. 10–11

Material: one specimen (inv. MCM 473), Lăpușiu de Sus

Dimensions: Height 23.5 mm, width 9.8 mm.

Subgenus *Perrona* SCHUMACHER, 1817

***Perrona (Perrona) descendens* (HILBER, 1879)**
Pl. 6, Fig. 6

- 1879 *Pleurotoma (Clavatula) descendens* – Hilber, pp. 19, Pl. 3, Fig. 5
 1966 *Clavatula jouanneti descendens* (HILBER) – Strausz, pp. 401, Pl. 14, Figs. 15–16
 1973 *Clavatula (Perrona) jouanneti descendens* (HILBER) – Bohn-Havas, pp. 1062, Pl. 6, Fig. 10
 1998 *Clavatula (Perrona) sabinae* (HOERNES & AUINGER) – Mikuž, pp. 81, Pl. 6, Fig. 3
 2003 *Perrona (Perrona) descendens* (HILBER) – Bałuk, pp. 40–41, Pl. 9, Figs. 1–7

Material: one specimen (inv. MCM 471), Lăpugiu de Sus

Dimensions: Height 26 mm, width 9.2 mm.

***Gemmula annae* (HOERNES & AUINGER, 1891)**
Pl. 6, Fig. 7

- 1891 *Pleurotoma annae* nov. Form. – Hoernes & Auinger, pp. 296, Pl. 37, Figs. 17–25
 1960 *Pleurotoma (Hemipleurotoma) annae* HOERNES & AUINGER – Kojumdgieva & Strachimirov, pp. 195,
 Pl. 46, Fig. 15
 1966 *Pleurotoma annae* HOERNES & AUINGER – Strausz, pp. 421, Pl. 18, Figs. 3–5
 2003 *Gemmula annae* (HOERNES & AUINGER) – Bałuk, pp. 45–46, Pl. 12, Figs. 5–9

Material: four specimens (inv. MCM 474), Lăpugiu de Sus

Dimensions: Height 28.4–17.9 mm, width 7.2–5.8 mm.

Genus *Genota* ADAMS& ADAMS, 1853

***Genota (Genota) elisae* (HOERNES & AUINGER, 1891)**
Pl. 6, Fig. 8

- 1891 *Pleurotoma (Genota) Elisae* – Hoernes & Auinger, pp. 310–311
 1960 *Genota ramosa* var. *elisae* (HOERNES & AUINGER) – Kojumdgieva & Strachimirov, pp. 196, Pl. 47,
 Fig. 3a, b
 1966 *Genota ramosa elisae* HOERNES & AUINGER – Strausz, pp. 448, Pl. 22, Figs. 8–15
 1998 *Genota ramosa elisae* (HOERNES & AUINGER) – Mikuž, pp. 68, Pl. 1, Fig. 2
 2002 *Genota ramosa elisae* (HOERNES & AUINGER) – Harzhauser, pp. 121, Pl. 11, Fig. 10
 2003 *Genota (Genota) elisae* (HOERNES & AUINGER) – Bałuk, pp. 54, Pl. 18, Figs. 7–9

Material: one specimen (inv. MCM 475), Lăpugiu de Sus

Dimensions: Height 30.2 mm, width 10 mm.

Genus *Stenodrillia* KOROBKOV, 1955

***Stenodrillia allionii* (BELLARDI in SEGUENZA, 1875)**
Pl. 6, Fig. 9

- 1960 *Drillia (Stenodrillia) allionii* BELLARDI – Kojumdgieva & Strachimirov, pp. 201, Pl. 48, Fig. 6
 1966 *Drillia allionii* BELLARDI – Strausz, pp. 422, Pl. 11, Figs. 6–10
 2003 *Stenodrillia allionii* (BELLARDI in SEGUENZA) – Scarponi & Della Bella, pp. 40, Pl. 7, Figs. 42–44,
 Pl. 9, Fig. 56

Material: three specimens (inv. MCM 476), Lăpugiu de Sus (1), Nemeșești (2)

Dimensions: Height 24–14 mm, width 7–4.9 mm.

Acknowledgements

Many thanks are addressed to Tămaş Dan for the preparation of the plates, and to Lóránd Silye for the help with some translations.

Sincere thanks to the reviewers, especially to Mathias Harzhauser (Museum of Natural History Vienna), for the helpful comments.

References

- Bałuk, W., 1975. Lower Tortonian gastropods from Korytnica, Poland, Part I. *Palaeontologia Polonica*, **32**, 1–186.
- Bałuk, W., 1995. Middle Miocene (Badenian) gastropods from Korytnica Poland, Part II. *Acta Geologica Polonica*, **45**, 3–4, 1–255.
- Bałuk, W., 1997. Middle Miocene (Badenian) gastropods from Korytnica Poland, Part III. *Acta Geologica Polonica*, **47**, 1–2, 1–75.
- Bałuk, W., 2003. Middle Miocene (Badenian) gastropods from Korytnica Poland, Part IV, Turridae. *Acta Geologica Polonica*, **53**, 1, 29–78.
- Bałuk, W., 2006. Middle Miocene (Badenian) gastropods from Korytnica, Poland. Part V, Addenda et Corrigenda ad Prosobranchia. *Acta Geologica Polonica*, **56**, 2, 177–220.
- Bellardi, L., 1882. The molluscs of Tertiary deposits from Piemonte and Liguria. Part III, Gastropods (Buccinidae, Cyclopidae, Purpuridae, Coralliophilidae, Olividae). Memorie della Reale Accademia delle Scienze di Torino, **34**, 1–253. (In Italian).
- Boettger, O., 1902. Contributions to the knowledge of the fauna from the Middle Miocene strata at Coștei in Krassó-Szörényer county. Verhandlungen und Mitteilungen des Siebenbürgischen Vereins für Naturwissenschaften zu Hermannstadt, **51**, 1–200. (In German).
- Boettger, O., 1906. Contributions to the knowledge of the fauna from the Middle Miocene strata at Coștei in Krassó-Szörényer county. Verhandlungen und Mitteilungen des Siebenbürgischen Vereins für Naturwissenschaften zu Hermannstadt, **54**, 1–99. (In German).
- Boettger, O., 1907. Contributions to the knowledge of the fauna from the Middle Miocene strata at Coștei in Krassó-Szörényer county. Verhandlungen und Mitteilungen des Siebenbürgischen Vereins für Naturwissenschaften zu Hermannstadt, **55**, 101–244. (In German).
- Bohn-Havas, M., 1973. Tortonian molluscs from eastern Mecsek Mountains. A Magyar Áll. Föld, **LIII**, 4, 948–1161. (In German).
- Borson, S., 1820. Essay ornitographic of the Piedmont. Memoire della Reale, **25**, 180–299.
- Borson, S., 1821. Essay ornitographic of the Piedmont. Memoire della Reale, **26**, 297–364.
- Bouchet, Ph., Rocroi, J.-P., 2005. Classification and Nomenclator of Gastropod Families. *Malacologia*, **47**, 1–2, 1–397.
- Chira, C., Voia, I., 2001. Middle Miocene (Badenian) conidae from Lăpuşiu de Sus, Romania: systematical and paleontological data. *Studia Universitatis Babeş-Bolyai, Geologia*, **46**, 2, 151–160.
- Chirli, C., 1997. The Pliocene malacofauna from Toscana; 1, Conoidea Superfamily. Firenze, 129p. (In Italian).
- Chirli, C., 2000. The Pliocene malacofauna from Toscana; 2, Muricoidea Superfamily. Stamperia e Legatoria Pisana-Agnano, Pisa, 137p. (In Italian).
- Chirli, C., 2006. The Pliocene malacofauna from Toscana; 5, Caenogastropoda. Firenze, 135p. (In Italian).
- Cossmann, M., Peyrot, A., 1924. Neogene Conchology from Aquitaine. Actes de la Soc. Linnéenne de Bordeaux, **IV**, 1–608. (In French).
- Csereghy-Meznerics, I., 1956. The molluscs fauna from Szob and Letkés. A Magyar Áll. Föld., **XLV**, 2, 1–448. (In German).
- Eichwald, E., 1853. *Lethaea Rossica or Paleontology of Russia*; 3, last period. Librairie et imprimerie de E. Schweizerbart, Stuttgart, 533p. (In French).
- Fehse, D., Vicián, Z., 2008. On the identity of *Projennenia neumayri* (HILBER, 1879) with the description of a new species of the genus *Projennenia* DOLIN, 1997 from the Badenian of the Central Paratethys (Mollusca:Gastropoda:Cypreoidea). Föld. Közl., **138**, 4, 355–259.
- Ferrero Mortara, E., Montefameglio, L., Novelli, M., Opesso, G., Pavia, G., Tampieri, R., 1984. Catalogue of types, and figured specimens of the Bellardi and Sacco collection. VII, Part II. Museo Regionale di Scienze Naturali, 1–484. (In Italian).
- Friedberg, W., 1954. The Miocene molluscs from Poland and surroundings; Part I, Gastropoda et Scaphopoda. Polskie Towarzystwo Geologiczne, **2**, 3, 235–628, (In Latin).
- Glibert, M., 1952. The Middle Miocene gastropods from Loire Basin. Part 2. Mém. Inst. Royal Sc. Nat. Belgique, **46**. (In French).
- Halaváts, G., 1876. The Mediterranean fauna of Lăpuşiu de Sus. Földtani Közlöny, **6**, 229–240. (In Hungarian).
- Hall, A.C. Jr., 1964. Middle Miocene *Conus* (Class Gastropoda) from Piedmont, northern Italy. Boll. della Soc. Pal. Italiana, **3**, 2, 111–171.
- Harzhauser, M., 2002. Marine and brachyhaline Karpatian gastropods from Korneuburger Basin and Kreuzstettener Bay (Austria, Lower Miocene). Beitr. Paläont., **27**, 61–159. (In German).
- Harzhauser, M., Kowalke, T., 2004. Survey of the Nassariid Gastropods in the Neogene Paratethys. Arch. Molluskenkunde, **133**, 1/2, 1–63.
- Hilber, V., 1879. New Conchology from the Central Styrian Mediterranean strata. Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften der Mathematisch-Naturwissenschaftlichen Classe, **79**, 1, 416–464. (In German).
- Hînculov, L., 1968. Miocene fauna from Mehadia Basin. Memoriile Inst. Geol., **IX**, 75–201. (In Romanian).
- Hörnes, M., 1851–1856. The fossil molluscs from the Tertiary of the Vienna Basin. Abhandlungen der K. K. Geologischen Reichsanstalt, **3**, 1–42, pl. I–IV (1851), 43–208, pl. VI–XX (1852), 209–296, pl. XXI–XXXII (1853), 297–384, pl. XXXIII–XL (1854), 385–460, pl. XLI–XLV (1855), 461–736, pl. XLVI–LII (1856). (In German).

- Hoernes, R., Auinger, M., 1879-1891. Early and Middle Miocene Mediterranean gastropods from marine deposits of the Austro-Hungarian Monarchy. A. Hoelder K.U.K. Hof- und Universitäts – Buchhändler, **6**, 7, 233–330. (In German).
- Jakubowski, G., 1996. Class Gastropoda Cuvier, 1797. In: Malinowska, L., (Ed.) (1996). Atlas and characteristic fossils, Neogene. Budowa geologiczna Polski, **III**, 500–1074. (In Polish).
- Janssen, A.W., 1984. Molluscs from the Miocene of Winterswijk-Miste. Nederlandse Geol. Vereniging, Leiden, 430p. (In Dutch).
- Koch, A., 1898. New observations and collection in Lăpuș de Sus. Földtani Közlöny, **28**, 209–226. (In Hungarian).
- Kojumdgieva, Em., Strachimirov, B., 1960. The fossils of Bulgaria, VII, Tortonian. Acad. des Sciences de Bulgarie, Sofia, 312p. (In French).
- Krach, W., 1981. The Baden reef formations in Roztocze Lubelskie. Prace Geologiczne, **121**, 1–91. (In Polish).
- Landau, B., Marquet, R., Grigis, M., 2004. The early pliocene gastropoda (Mollusca) of Estepona, southern Spain, part. 2: Orthogastropoda, Neotaenioglossa. Palaeontos, **4**, 1–99. (In French).
- Lozouet, P., Lesport, J.-F., Renard, Ph., 2001. Revision of Gastropoda (Mollusca) from the Aquitanian stratotype (Lower Miocene): Saucats “Lariey” occurrence, Gironde, France. Cossmanniana, **3**, 1–189. (In French).
- Mikuž, V., 1998. Turrids (Neogastropoda) from Middle Miocene Badenian beds of Slovenia. Geologija, **40**, 65–101.
- Moisescu, G., 1955a. New data about the molluscs and brachiopods from Lăpuș de Sus. Rev. Univ. «C. I. Parhon», **8**, 255–286. (In Romanian).
- Moisescu, G., 1955b. Stratigraphy and molluscs fauna of Tortonian and Sarmatian deposits from Buituri and surroundings. Edit. Acad. R.S.R., București, 218p. (In Romanian).
- Nicorici, E., 1972. The Neogene Stratigraphy of the southern Șimleu Basin. Edit. Acad. R.S.R., București, 159p. (In Romanian).
- Nitușescu, O., 1930. Contributions to the geological data about Lăpuș de Sus (Hunedoara county). Rev. Muz. Geol.-Min., **IV**, I, 27–46. (In Romanian).
- Petrescu, I., Mészáros, N., Chira, C., Filipescu, S., 1990. Lower Badenian paleoclimate at Lăpuș de Sus (Hunedoara Country), on accounts of paleontological investigations. Studia Universitatis Babeș-Bolyai, Geologia, **35**, 2, 13–22.
- Strausz, L., 1966. Miocene – Mediterranean Gastropods from Hungary. Akad. Kiadó, Budapest, 535p. (In German).
- Sacco, F., 1894. Molluscs of the Tertiary deposits from Piemonte and Liguria. Memorie della Reale Accademia delle Scienze, C. Clausen, **15** (Cypraeidae e Amphiperasidae), 1–74. (In Italian).
- Sacco, F., 1895. Molluscs of the Tertiary deposits from Piemonte and Liguria. Memorie della Reale Accademia delle Scienze, C. Clausen, **19** (Turritellidae e Mathildidae), 1–46. (In Italian).
- Scarpioni, D., Della Bella, G., 2003. The Plio-Pleistocene marine molluscs from Emilia-Romagna and Toscana. Conoidea, 1-Drilliidae e Turridae. In: Ceregato, A., Raffi, S. (Eds.) (2003). University of Bologna, Biological, Geological and Environmental Sciences Department, Editografica Rastignano Bologna, 89p. (In Italian).
- Schultz, O., 1998. Tertiary fossils from Austria. Goldschneck-Verlag, Weinstadt, 159p. (In German).
- Şuraru, N., Papp C., 1993. A few data on microfossil content of Badenian deposits from Lăpuș de Sus (Hunedoara County). Studia Universitatis Babeș Bolyai, Geologia, **38**, 2, 27–37. (In German).
- Zilch, A., 1934. The Middle Miocene fauna from Coștei (Banat). Types and plates of the materials described by Boettger. Senckenbergiana, **16**, 4/6, 193–302. (In German).

PLATE CAPTIONS

Plate I

1. *Neritopsis (Neritopsis) radula* (LINNAEUS, 1758), Nemeşeti, height 15.1 mm
2. *Cerithium vulgatum europaeum* MAYER, 1878, Lăpugiu de Sus, height 21.6 mm
3. *Cerithium (Tiaracerithium) zeuschneri* PUSCH, 1837, Lăpugiu de Sus, height 31.1 mm
4. *Cerithium (Thericium) michelotti* HÖRNES, 1856, Lăpugiu de Sus, height 19 mm
5. *Cerithium crenatum* (BROCCHI, 1814), Lăpugiu de Sus, height 33.2 mm
6. *Turritella spirata* (BROCCHI, 1814), Lăpugiu de Sus, height 19.8 mm
7. *Turritella erronea* COSSMANN in FRIEDBERG, 1914, Nemeşeti, height 38.8 mm
8. *Turritella (Haustator) badensis* SACCO, 1895, Lăpugiu de Sus, height 50.4 mm
9. *Turritella (Eichwaldiella) bicarinata* (EICHWALD, 1830), Lăpugiu de Sus, height 43.2 mm
10. *Schilderia semidenticulata* (SACCO, 1894), Lăpugiu de Sus, height 17.5 mm

Plate II

1. *Monetaria brocchii* (DESHAYES, 1844), Lăpugiu de Sus, height 24 mm
2. *Apiocypraea subamygdalum* (d'ORBIGNY, 1852), Lăpugiu de Sus, height 32.3mm
3. *Projenneria lapugensis* (SACCO, 1894), Lăpugiu de Sus, height 18.2 mm
4. *Ficus (Ficus) condita* (BRONGNIART, 1823), Lăpugiu de Sus, height 33mm
5. *Natica tigrina* RÖDING, 1798, Lăpugiu de Sus, height 14 mm
6. *Polinices protractus* (EICHWALD, 1853), Lăpugiu de Sus, height 13.6 mm
7. *Polinices redemptus* (MICHELOTTI, 1847), Lăpugiu de Sus, height 11.6mm
8. *Euspira helicina* (BROCCHI, 1814), Lăpugiu de Sus, height 18.6mm
9. *Neverita josephinia* RISSO, 1826, Lăpugiu de Sus, width 12.4mm

Plate III

1. *Aporrhais pespelecani* (LINNAEUS, 1766), Lăpugiu de Sus, height 23.8mm
2. *Cypraeacassis cypraeiformis* (BORSON, 1820), Lăpugiu de Sus, height 41 mm
3. *Semicassis laevigata* (DEFRANCE, 1817), Nemeşeti, height 45.3 mm
4. *Euthria puschi* (ANDRZEJOWSKI, 1830), Lăpugiu de Sus, height 40.4 mm
5. *Cantharus multicostatus transsylvaniaicus* (HOERNES & AUINGER, 1890), Lăpugiu de Sus, height 26.9 mm
6. *Pyrene (Macrurella) nassoides* (GRATELOUP, 1840), Lăpugiu de Sus, height 25.5 mm
7. *Fusinus lamellosus* (BORSON, 1821), Nemeşeti, height 22 mm

Plate IV

1. *Latirus bilineatus* (PARTSCH in HAUER, 1837), Lăpugiu de Sus, height 24.5 mm
2. *Nassa (Phrontis) vindobonensis* (MAYER, 1860), Nemeşeti height 11 mm
3. *Nassarius (Amyclina) semistriatus* (BROCCHI, 1814), Lăpugiu de Sus, height 14.8 mm
4. *Chicoreus (Chicoreus) borni* (HÖRNES, 1853), Lăpugiu de Sus, height 51 mm
5. *Thais (Stramonita) exilis* (PARTSCH in HÖRNES, 1853), Lăpugiu de Sus, height 23.7 mm
6. *Mitraria (Mitraria) friedbergi* (COSSMANN, 1912), Lăpugiu de Sus, height 24 mm
7. *Mitra (Tiara) scrobiculata* (BROCCHI, 1814), Lăpugiu de Sus, height 29 mm
8. *Athleta (Athleta) rarispina* (LAMARCK, 1811), Lăpugiu de Sus, height 21.4 mm

Plate V

1. *Ancilla (Baryspira) glandiformis* (LAMARCK, 1810), Lăpugiu de Sus, height 33 mm
2. *Ancilla (Baryspira) obsoleta* (BROCCHI, 1814), Lăpugiu de Sus, height 21 mm
3. *Conus (Conolithus) dujardini* DESHAYES, 1845, Nemeşeti, height 25.6 mm

4. *Conus (Lithoconus) berghausi* MICHELOTTI, 1847, Lăpugiu de Sus, height 21.9 mm
5. *Conus (Chelyconus) ponderosus* BROCHI, 1814, Lăpugiu de Sus, height 38.2 mm
6. *Conus (Chelyconus) rotundus* HOERNES & AUINGER, 1879, Lăpugiu de Sus, height 27 mm
7. *Conus cf. pseudoponderosus* GLIBERT, 1952, Lăpugiu de Sus, height 38.3 mm
8. *Conus (Chelyconus) raristriatus* BELLARDI & MICHELOTTI, 1840, Lăpugiu de Sus, height 25.1 mm
9. *Mangelia subvellicata* (BOETTGER, 1902), Lăpugiu de Sus, height 9.3 mm
10. *Bela cf. pseudobrachystoma* (BOETTGER, 1902), Lăpugiu de Sus, height 6.5 mm
11. *Strioterebrum basteroti* (NYST, 1845), Lăpugiu de Sus, height 31.4 mm

Plate VI

1. *Terebra acuminata* BORSON, 1820, Lăpugiu de Sus, height 19.8 mm
2. *Subula (Subula) fuscata plicaria* (BASTEROT, 1825), Lăpugiu de Sus, height 43.5 mm
3. *Clavatula laevigata* (EICHWALD, 1853), Nemeşeti, height 33 mm
4. *Clavatula camillae* (HOERNES & AUINGER, 1891), Lăpugiu de Sus, height 18.4 mm
5. *Clavatula sophiae* (HOERNES & AUINGER, 1891), Lăpugiu de Sus, height 23.5 mm
6. *Perrona (Perrona) descendens* (HILBER, 1879), Lăpugiu de Sus, height 26 mm
7. *Gemmula annae* (HOERNES & AUINGER, 1891), Lăpugiu de Sus, height 21.2 mm
8. *Genota (Genota) elisae* (HOERNES & AUINGER, 1891), Lăpugiu de Sus, height 30.2 mm
9. *Stenodrillia allionii* (BELLARDI in SEGUENZA, 1875), Nemeşeti, height 22 mm

