

PRÍRODNÉ VEDY

AMMONITE FAUNA OF FAMILY *LIPAROCERATIDAE* HYATT, 1867 FROM ADNET FORMATION IN VELKÁ FATRA MTS. (CENTRAL SLOVAKIA)

ANDREJ BENDÍK

Slovak National Museum, Martin – Andrej Kmet' Museum, A. Kmet' 20, 036 01 Martin
Slovenské národné múzeum v Martine – Múzeum Andreja Kmeťa, Ul. A. Kmeťa 20,
036 01 Martin; andrej.bendik@snm.sk

Bendík, A., 2014: Ammonite fauna of family Liparoceratidae HYATT, 1867 from Adnet formation in the Veľká Fatra Mts. (Central Slovakia).

Abstract: the article discusses abundant ammonite fauna from collection of the Slovak National Museum, Martin – Andrej Kmet' Museum from the Veľká Fatra Mts., separately subfamily Liparoceratidae. Stone core of ammonites comes from Adnet formation of Liassic sequence of Krížna nape. Out of finds *Becheiceras* (*Liparoceras*) *bechei* (SOWERBY), *Liparoceras* (*Becheiceras*) *gallicum* SPATH, *Androgynoceras maculatum* (YOUNG, BIRD), *Androgynoceras capricornus* (SCHLOTHEIM), *Androgynoceras cf. capricornus* (SCHLOTHEIM), *Vicininodicerus sp.* and *Oistoceras sp.* were determined. They represented Lower Pliensbachian.

Keywords: Veľká Fatra Mts., ammonites, Pliensbachian, Liparoceratidae.

Abstrakt: príspevok pojednáva o nálezoch amonitov z čelade Liparoceratidae z adnetského súvrstvia krížňanského príkrovu vo Veľkej Fatre, ktoré sa nachádzajú v zbierkach Slovenského národného múzea v Martine – Múzea Andreja Kmeťa. Z nálezov boli opísané *Becheiceras* (*Liparoceras*) *bechei* (SOWERBY), *Liparoceras* (*Becheiceras*) *gallicum* SPATH, *Androgynoceras maculatum* (YOUNG, BIRD), *Androgynoceras capricornus* (SCHLOTHEIM), *Androgynoceras cf. capricornus* (SCHLOTHEIM), *Vicininodicerus sp.* a *Oistoceras sp.*, ktoré reprezentujú spodný pliensbach.

Kľúčové slová: Veľká Fatra Mts., ammonites, Pliensbachian, Liparoceratidae.

Introduction

One of the rich ammonite fauna in Slovakia come from Adnet formation (the AF) of Krížna nape. Ammonites from the AF in these mountains were found in the mid-19th to 20th century (Štúr, 1859; Štúr 1868; Andrusov, 1931; Rakús, 1964; Peržel, 1967). Last results from research come from Bendík (2000, 2001, 2004a, b, 2005a,b, 2008, 2010, 2011, 2012) and Kováč & Bendík (2002). The AF in the Veľká Fatra Mts. represented micritic pink/red limestone (in lowermost part), light red brick red massive nodular limestone with layers of micritic and marly limestones (middle part) and dark red marly limestones and marls (in upper part), generally ending by a 2-cm thick condensed layer with small stromatolites. Stratigraphic range of the AF in the Veľká Fatra Mts. is Upper Sinemurian

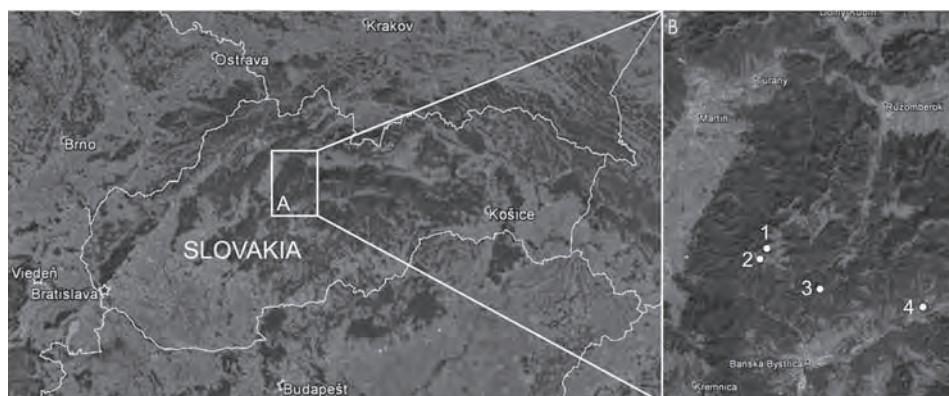


Fig. 1. Localities of study profiles: 1 – Úplaz, 2 – Rovné, 3 – Veľká Ramžiná – Turecká, 4 – Motyčky
 Obr. 1. Lokalizácia študovaných profilov: 1 – Úplaz, 2 – Rovné, 3 – Veľká Ramžiná – Turecká, 4 – Motyčky

– Upper Toarcian. All ammonites described herein are deposited in the Slovak National Museum, Martin – Andrej Kmet’ Museum. Some of ammonites come from acquisition of Miloš Rakús.

Localities, faunistic composition, stratigraphy

Collection of ammonite fauna of family *Liparoceratidae* comes from the localities of Rovné, Úplaz, Veľká Ramžiná – Turecká and Motyčky in the Veľká Fatra Mts. (fig. 1). Ammonites come mainly from *ex situ* position, *in situ* only from the locality of Úplaz (fig. 8). Faunistic composition of family *Liparoceratidae* yield species *Liparoceras (Becheiceras) bechei* (SOWERBY), *Liparoceras (Becheiceras) gallicum* SPATH, *Androgynoceras maculatum* (YOUNG & BIRD), *Androgynoceras capricornus* (SCHLOTHEIM), *Androgynoceras cf. capricornus* (SCHLOTHEIM) and some undeterminable genus *Vicininodicerias* sp. and *Oistoceras* sp. Stratigraphical age of family *Liparoceratidae* in the Veľká Fatra Mts. is Lower Pliensbachian.

Systematic part

Ammonitina HYATT, 1889

Liparoceratidae HYATT, 1867

Liparoceras HYATT, 1867

Becheiceras TRUEMAN, 1918

Liparoceras (Becheiceras) bechei (SOWERBY, 1821)

Fig. 2 a – c.

1821 *Ammonites bechei* SOWERBY, The Mineral Conchology etc., p. 143, tab. 280, ex Kollárová-Andrusovová, 1966, p. 57.

1957 *Becheiceras bechei* (SOWERBY) – Arkell, Kummel & Wright, p. 250, fig. 277 – 2.

1966 *Liparoceras (Becheiceras) cf. bechei* (SOWERBY) – Kollárová-Andrusovová, p. 57, tab. 5, fig. 7.

1973 *Liparoceras (Becheiceras) bechei* (SOWERBY) – Donovan, Forsey, p. 13, tab. 2, fig. 4a – c.

- 1976 *Liparoceras* (*Liparoceras*) *bechei* (SOWERBY) – Schlegelmilch, p. 66, pl. 31, fig. 5.
 1976 *Liparoceras* (*Becheiceras*) *bechei* (SOWERBY) – Géczy, tab. XIX, fig. 2 – 3.
 1977 *Liparoceras* (*Becheiceras*) *bechei* (SOWERBY) – Wiedenmayer, p. 70, tab. 15, fig. 5, 6.
 1986 *Liparoceras* (*Becheiceras*) *bechei* (SOWERBY) – Meister, pl. XIII, fig. 4.
 1991 *Becheiceras* gr. *bechei* (SOWERBY) – Blau, Meister, p. 179, pl. 4, fig. 5.
 1994 *Liparoceras* (*Becheiceras*) *bechei* (SOWERBY) – Faraoni, Marini & Pallini, tab. 2, fig. 1.
 1995 *Becheiceras* aff. *bechei* (SOWERBY) – Alkaya, Meister, p. 162, pl. 14, fig. 1, 2.
 1996 *Liparoceras* (*Becheiceras*) *bechei* (SOWERBY) – Smith, Tipper, p. 52, pl. 19, fig. 2 a, b, pl. 20, fig. 1 a, b.
 2002 *Liparoceras* (*Becheiceras*) cf. *bechei* (SOWERBY) – Rakús, Guex, p. 130, pl. 20, fig. 7.
 2003 *Liparoceras* (*Becheiceras*) *bechei* (SOWERBY) – Meister, Friebe, pl. 16, fig. 4.
 2007 *Liparoceras* (*Becheiceras*) *bechei* (SOWERBY) – Géczy, Meister, pl. XLI, fig. 10.
 2011 *Liparoceras* (*Becheiceras*) *bechei* (SOWERBY) – Meister, Dommergues, Dommergues, Lachkar, EL Hariri, fig. 17/1.

Material: four well-preserved stone cores (one of them strongly deformed, compressed) and one partly damaged by solution. Preserved are coiling and umbilicus. Well-preserved is ribbing; fine ribbing is partly damaged. Lateral tubercles are visible, but lightly dominant.

Description: involute, spherococone shell with rounded umbilical wall, flanks and venter. Coiling is rapid; the last whorl is growing faster on two times the height of the previous whorl. Cross-section is oval, partly oblate. Ribbing is relatively fine, weak, dense, quite close, simple, radiate crossing ventral side. Small two rows lateral tubercles between two ribs forming series space in ventrolateral part. Umbilicus is narrow and deep.

Locality: two specimens come from the Velká Ramžiná – Turecká, other ones from the localities of Úplaz and Rovné, all *ex situ*.

Stratigraphic range: Lower Pliensbachian, Upper Carixian, biozone Davoei (subzone Capricornus – Figulinum).

Museum number: acc. n. 145 – 146/2005 (sig. PZ-238 – PZ-239), acc. n. 247 – 248/2005 (sig. PZ-341 – PZ-342), acc. n. 60/2007 (sig. PZ-659).

***Liparoceras* (*Becheiceras*) *gallicum* SPATH, 1936**

Fig. 3 a, b.

1844 *Ammonites Bechei* SOWERBY – D'ORBIGNY, p. 278, pl. 82.

1976 *Liparoceras* (*Becheiceras*) *gallicum* SPATH – Schlegelmilch, pl. 32, fig. 1.

1976 *Liparoceras* (*Becheiceras*) *gallicum* SPATH – Géczy, pl. XIX, fig. 4, 5.

1977 *Liparoceras* (*Becheiceras*) *gallicum* SPATH – Wiedenmayer, taf. 15, fig. 10, 11.

1986 *Liparoceras* (*Becheiceras*) *gallicum* (SPATH) – Meister, pl. XIII, fig. 6, pl. XV, fig. 1, pl. XVI, fig. 5.

1998 *Liparoceras* (*Becheiceras*) *gallicum* SPATH – Géczy, Meister, pl. VI, fig. 4.

Material: one preserved stone core, damaged by solution. Preserved are coiling and umbilicus. Ribbing is weakly preserved. Tubercles ornamentation is not preserved on this specimen.

Description: involute, spherococone shell with rounded umbilical wall. Coiling is rapid; the last whorl is growing faster on two times the height of the previous whorl. Cross-section

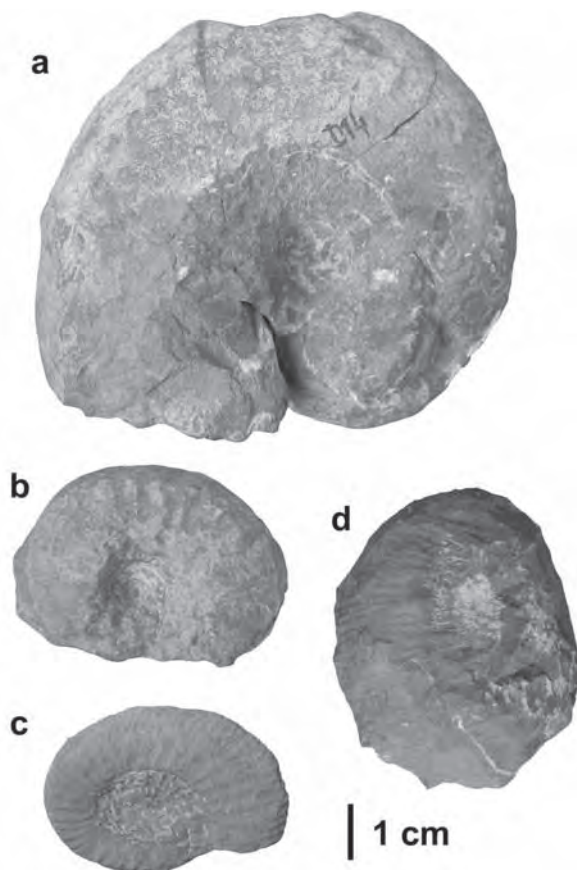


Fig. 2. *Liparoceras (Liparoceras) bechei* (SOWERBY), lateral view, sig. PZ-341 (a), sig. PZ-238 (b), sig. PZ-342 (c); *Vicinodicerias* sp., ventrolateral view, sig. PZ-113 (d)
 Obr. 2. *Liparoceras (Liparoceras) bechei* (SOWERBY), laterálny pohľad, evid. č. PZ-341 (a), evid. č. PZ-238 (b), evid. č. PZ-342 (c); *Vicinodicerias* sp., ventrolaterálny pohľad, evid. č. PZ-113 (d)

is oval. Ribbing is coarser, radiate crossing ventral side. Rounded lateral tubercles between two ribs form series in ventrolateral part of last whorl. Umbilicus is narrow and deep. Specimen is determined by M. Rakús.

Locality: specimen comes from the locality Rovné, *ex situ*.

Stratigraphic range: Lower Pliensbachian, Upper Carixian – Lower Domerian, biozone Davoei – Margaritatus.

Museum number: acc. n. 61/2006 (sig. PZ-466).

Vicinodicerias TRUEEMAN, 1918

Vicinodicerias sp.

Fig. 2 d.

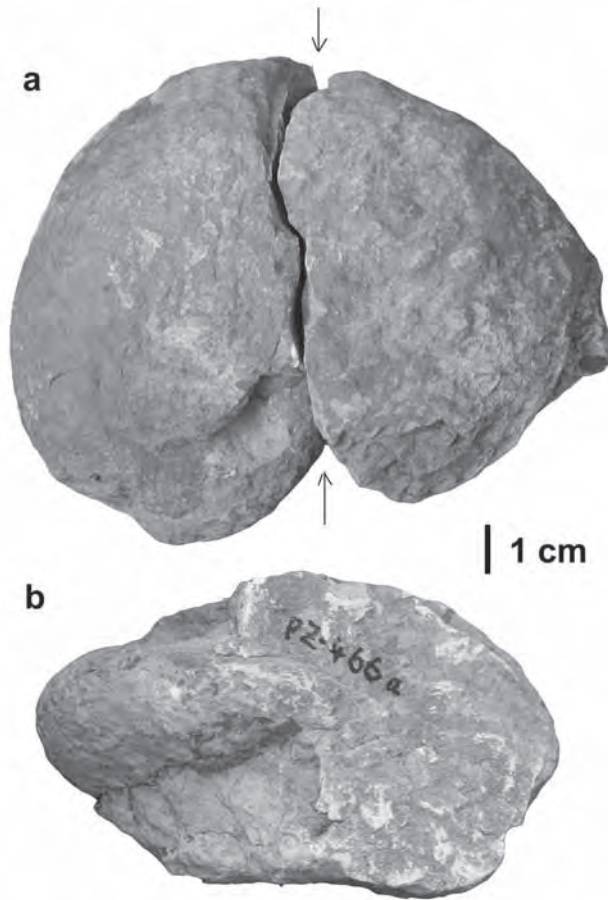


Fig. 3. *Liparoceras (Becheiceras) gallicum* SPATH, lateral (a) and ventral (b) view, sig. PZ-466
 Obr. 3. *Liparoceras (Becheiceras) gallicum* SPATH, laterálny (a) a ventrálny (b) pohľad, evid. č. PZ-466

Material: one damaged stone core. Ribbing is obscure but visible. Restricted coiling is preserved. Tubercles ornamentation is preserved only partially.

Description: involute shell. Coiling is rapid; the last whorl is growing faster on two times the height and width of the previous whorl. Last whorl overlaps previous whorl. Cross-section of whorl is circular. Ribbing is fine, radiate, crossing ventral side. On lateral side there are tubercles, traversed by ribbing. Tubercles are significant; they dominate over the surface of the stone core. Umbilicus is narrow and deep.

Locality: specimen comes from the locality of Úplaz, layer n. 35.

Stratigraphic range: Lower Pliensbachian, Middle Carixian, biozone Ibex, zone with *Acanthopleuroceras valdani* (D'ORBIGNY).

Museum number: acc. n. 20/2005 (sig. PZ-113).

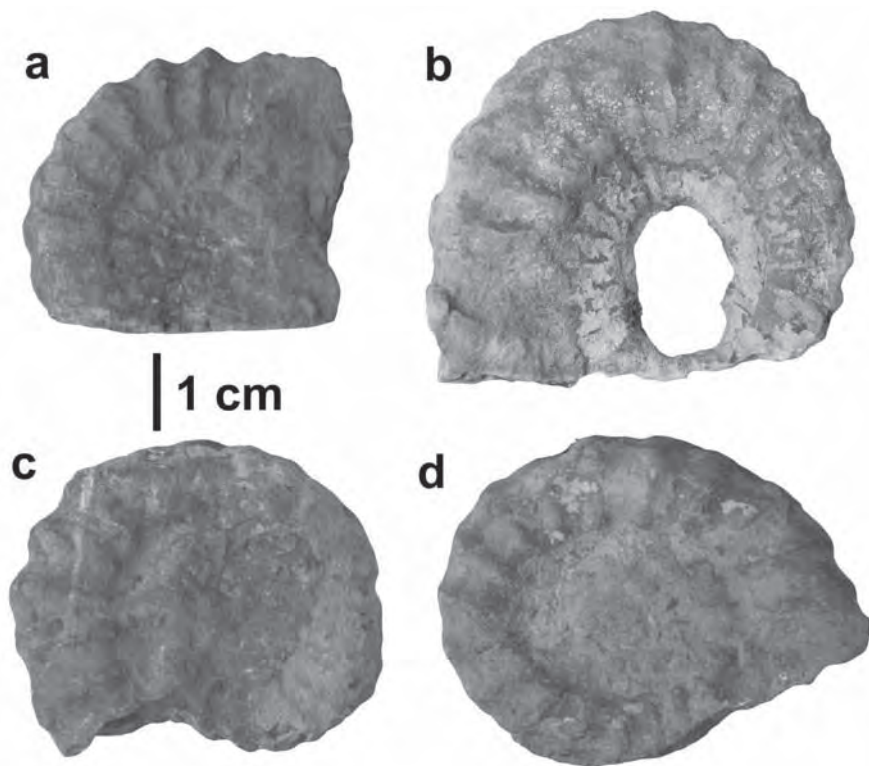


Fig. 4. *Androgynoceras maculatum* (YOUNG & BIRD), lateral view, sig. PZ-337 (a), sig. PZ-411 (b), sig. PZ-338 (c), sig. PZ-339 (d)
 Obr. 4. *Androgynoceras maculatum* (YOUNG & BIRD), laterálny pohľad, evid. č. PZ-337 (a), evid. č. PZ-411 (b), evid. č. PZ-338 (c), evid. č. PZ-339 (d)

Androgynoceras HYATT, 1867

Androgynoceras maculatum (YOUNG & BIRD, 1822)

Fig. 4 a – d, 5 a – d.

1822 *Ammonites maculates* YOUNG & BIRD, A Geological Survey of the Yorkshire Coast, p. 248, 327, tab. 14, fig. 12, ex Kollárová-Andrusovová, p. 58.

1912 *Androgynoceras maculatum* (YOUNG & BIRD) – Buckman, p. 45b, tab. 45, fig. A, B.

1966 *Androgynoceras maculatum* (YOUNG & BIRD) – Kollárová-Andrusovová, p. 58, tab. 5, fig. 3, 11.

1976 *Androgynoceras maculatum* (YOUNG & BIRD) – Schlegelmilch, p. 68, pl. 33, fig. 9.

1977 *Androgynoceras maculatum* (YOUNG & BIRD) – Schlatter, tab. 4, fig. 5.

1982 *Androgynoceras maculatum* (YOUNG & BIRD) – Hoffmann, p. 243, tab. 35, fig. 6 a, b, tab. 36, fig. 2 a, b.

1985 *Androgynoceras (Aegoceras) maculatum* (YOUNG & BIRD) – Phelps, tab. 1, fig. 2.

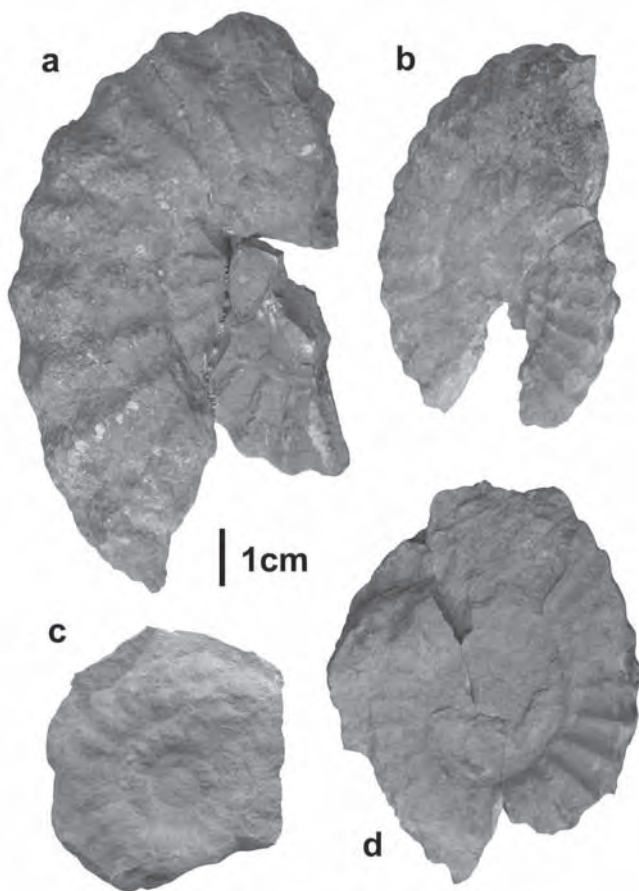


Fig. 5. *Androgynoceras maculatum* (YOUNG & BIRD), lateral view, sig. PZ-340 (a), sig. PZ-410 (b), sig. PZ-661 (c), sig. PZ-409 (d)
 Obr. 5. *Androgynoceras maculatum* (YOUNG & BIRD), laterálny pohľad, evid. č. PZ-340 (a), evid. č. PZ-410 (b), evid. č. PZ-661 (c), evid. č. PZ-409 (d)

Material: eleven specimens; eight well-preserved, two partly preserved and one fragment of stone core. Ribbing, coiling, umbilicus are well visible, partly damaged by corrosion.

Description: serpenticone, evolute shell. Coiling growing slowly and regularly, last whorl grows one – one and half time the height of the previous whorl. Cross-section is oval. Ribbing is single, massive, radiate – prorsiradiate, cross venter. Ribs on the middle and outer whorls are sharp, radial, or prorsiradiate. The average number of ribs is 11. Umbilicus is relatively wide and shallow, constitutes 48 percent of the total shell average.

Locality: nine specimens come from the locality of Rovné (all *ex situ*), one from the locality of Úplaz (*ex situ*) and one from the locality of Motyčky (layer n. 11/12).

Stratigraphic range: Lower Pliensbachian, Upper Carixian, biozone Davoei, subzone Maculatum.

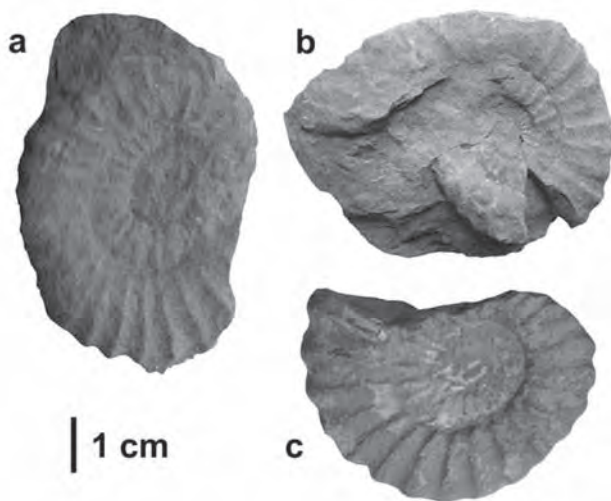


Fig. 6. *Androgynoceras capricornus* (SCHLOTHEIM), lateral view, sig. PZ-414 (a), sig. PZ-413 (b), sig. PZ-231 (c)
 Obr. 6. *Androgynoceras capricornus* (SCHLOTHEIM), laterálny pohľad, evid. č. PZ-414 (a), evid. č. PZ-413 (b),
 evid. č. PZ-231 (c)

Museum number: acc. n. 107/2005 (sig. PZ-200), acc. n. 242-246/2005 (sig. PZ-336 – PZ-340), acc. n. 4-7/2006 (sig. PZ-409 – PZ-412), acc. n. 62/2007 (sig. PZ-661).

***Androgynoceras capricornus* (SCHLOTHEIM, 1820)**

Fig. 6 a – c, 7 a, b.

1820 *Ammonites capricornus* SCHLOTHEIM, Petrefaktenkunde, s. 71, s. 199, ex Wiedenmayer, 1977, s. 72.

1964 *Androgynoceras capricornum* (SCHLOTHEIM) – Rakús, s. 130, tab. 20., fig. 3.

1976 *Androgynoceras capricornus* (SCHLOTHEIM) – Géczy, tab. XIX, fig. 11, 12.

1976 *Androgynoceras capricornus* (SCHLOTHEIM) – Schlegelmilch, s. 69, pl. 33, fig. 10.

1977 *Androgynoceras capricornus* (SCHLOTHEIM) – Schlatter, tab. 4, fig. 6.

1977 *Androgynoceras capricornus* (SCHLOTHEIM) – Wiedenmayer, s. 72, tab. 15, fig. 7, 8.

1982 *Androgynoceras capricornus* (SCHLOTHEIM) – Hoffmann, s. 245, tab. 36, fig. 3 a, b.

1985 *Androgynoceras (Aegoceras) capricornus* (SCHLOTHEIM) – Phelps, tab. 2, fig. 6, 7.

Material: seven well, five partly preserved stone cores and four fragments of stone cores. Specimen from Bystrická valley is strongly deformed compressed. Ribbing, coiling and umbilical is preserved too (but only in complete stone cores).

Description: evolute, massive, serpenticonic shell. Coiling is relative slowly and regularly, last whorl grows one time the height of the previous whorl. Cross-section is oval – partly subquadrate. Ribbing is significant, strong, partly prorsiradiate, starting under umbilical

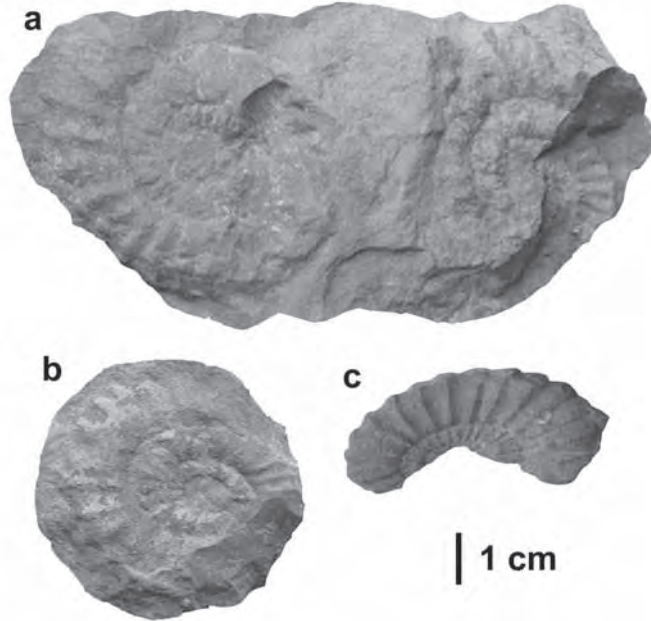


Fig. 7. *Androgynoceras capricornus* (SCHLOTHEIM), lateral view, sig. PZ-415 (a), sig. PZ-416 (b); *Oistoceras* sp., sig. PZ-14 (c)

Obr. 7. *Androgynoceras capricornus* (SCHLOTHEIM), laterálny pohľad, evid. č. PZ-415 (a), evid. č. PZ-416 (b); *Oistoceras* sp., evid. č. PZ-14 (c)

edge and crossing ventral side. Ribs on ventral side are partly concave. Umbilicus is relative wide and narrow, accounts for about 40 percent of the average of shell.

Locality: one specimen comes from Bystrická valley (*ex situ*), one from Veľká Ramžiná – Turecká (*ex situ*), eleven from the locality of Rovné (*ex situ*) and three from the locality of Úplaz (layer n. 49/50).

Stratigraphic range: Lower Plienbachian, Upper Carixian, zone with *Productylioceras davoei* (SOWERBY), subzone Capricornus.

Museum number: acc. n. 89/2005 (sig. PZ-182), acc. n. 138/2005 (sig. PZ-231), acc. n. 8 – 18/2006 (sig. PZ-413-423), acc. n. 61/2007 (sig. PZ-660).

Androgynoceras cf. capricornus (SCHLOTHEIM)

Material: one incomplete stone core.

Description: only part of stone core with characteristic ribbing is preserved.

Locality: specimen comes from the locality of Úplaz (layer n. 49/50).

Stratigraphic range: Lower Plienbachian, Upper Carixian, biozone IbeX, zone with *Productylioceras davoei* (SOWERBY).

Museum number: acc. n. 24/2005 (sig. PZ-117).

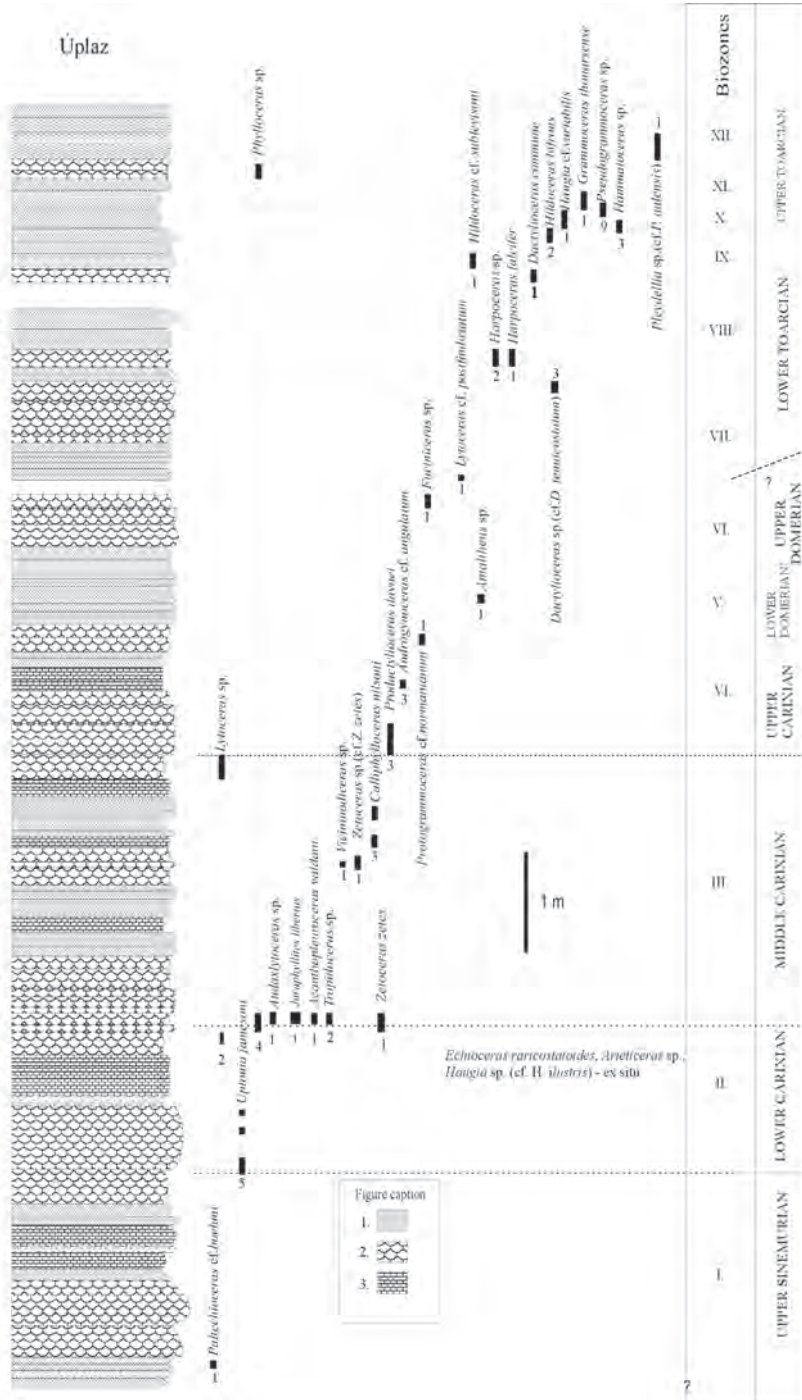


Fig 8. Lithological and biostratigraphical situations of the locality of Úplaz. Comments: Lithology of Adnet formation – 1. Marly limestones; 2. Nodular limestones; 3. Micritic limestones. Ammonite biozones: I. Zone Raricostatum; II. Zone Jamesoni; III. Zone IbeX; IV. Zone Davoei; V. Zone Margaritatus; VI. Zone Spinatum; VII. Zone Tenuicostatum; VIII. Zone Falcifer; IX. Zone Bifrons; X. Zone Variabilis; XI. Zone Thouarsense; XII. Zone Levesquei
 Obr. 8. Litologická a biostratigrafická situácia na lokalite Úplaz. Vysvetlivky: Litológia adnetského súvrstvia – 1. Slienité vápence; 2. Hľuznaté vápence; 3. Kalové vápence. Amonitové biozóny: I. zóna Raricostatum; II. zóna Jamesoni; III. zóna IbeX; IV. zóna Davoei; V. zóna Margaritatus; VI. zóna Spinatum; VII. zóna Tenuicostatum; VIII. zóna Falcifer; IX. zóna Bifrons; X. zóna Variabilis; XI. zóna Thouarsense; XII. zóna Levesquei

***Oistoceras* sp.**

Fig. 7 c.

Material: one incomplete well preserved stone core.

Description: evolute, massive, serpenticone shell. Coiling is relative slowly and regularly. Cross-section is not observable (stone core is compressed). Ribbing is similar significant, strong, with forward flexure on venter side. Umbilicus is not preserved.

Locality: specimen comes from the locality of Rovné (*ex situ*).

Stratigraphic range: Lower Plienbachian, Upper Carixian.

Museum number: acc. n. 15/1971 (sig. n. PZ-14 a,b).

Conclusion

This paper summarizes the results of research of family *Liparoceratidae* from Adnet Fm. in the Veľká Fatra Mts. Mainly ammonites have been found in the *ex situ* position, which prevents the inclusion of layers examined profiles (localities) and their mutual correlation. It identified 4 species, belongs to ammonite biozones Ibex and Davoei (subzones Valdani, Maculatum, Capricornus – Figulinum), which are typical for north-western Europe (boreal/sub-boreal realm) (Bendík, 2005a). Presented results complement the results of previous studies by the author, which bring new knowledge about ammonite zonation in Central Western Carpathians.

Acknowledgements. The research was conducted in the framework of SNM-MT VVÚ-PrV-B3 (Litofacial and faunistic changes in the envelope sequence and the Krížna nappe (Fatricum) in Jurassic from the Veľká and Malá Fatra Mts.).

Literature

ALKAYA, F. – MEISTER, C. Liassic Ammonites from the Central and Eastern Pontides (Ankara and Kelkit areas, Turkey). In *Revue de Paléobiologie*, Genève, 1995. Vol. 14, no. 1, 125-193.

ANDRUSOV, D. Poznámky k stratigrafii a paleontologii liasu centrálnokarpatských príkrovů. In *Věstník Stát. geol. ústavu*, Praha, 1931, roč. VII, s. 131-137.

ARKELL W. J. – KUMMEL, B. – WRIGHT, C. W. *Treatise on invertebrate paleontology. Part L, Mollusca 4, Cephalopoda Ammonoidea*. Geol. Soc. of America and Univ. of Kansas Press, 1957.

BENDÍK, A. Tethyan – Boreal connection during the Pliensbachian (Western Carpathians): an evidence from ammonite fauna. In *Slovak Geol. Mag.*, Bratislava, 2000. ISSN 1335-096X, vol. 6, n. 2 – 3, 223-228.

BENDÍK, A. Co-occurrence of Tethyan and Boreal ammonites in the Lower Liassic Formation of the Western Carpathians (Slovakia, Veľká Fatra Mts.): implications for palaeobiogeography and faunal migration. In *Biul. Panst. Inst. Geol., 12th Meeting of the Ass. of Europ. Geol. Societes*, Poland, Krakov, 2001, 21-22.

BENDÍK, A. *Ammonite fauna changes in Central Western Carpathians in Lower Jurassic: examples from Adnet Formation of Veľká Fatra Mts.*. Banská Bystrica, 2004a. Archív GÚ SAV Bratislava. Dizertačná práca, 165, 39 tab. (In Slovak.)

BENDÍK, A. Ammonite fauna of superfamily Psilocerataceae Hyatt, 1867 from the Lower Jurassic limestone formation of the Veľká Fatra Mts. (Central Western Carpathians, Slovakia). In *Mineralia Slov.*, 2004b. ISSN 0369-2086, 36, 1, 7-16.

BENDÍK, A. Lower Jurassic (Pliensbachian – Toarcian) ammonite zonation of Central Western Carpathians: examples from the Adnet Formation of the Veľká Fatra Mts. In *Zborník SNM v Martine : Kmetianum, Martin*, 2005a. ISBN 80-8060-175-5, roč. X, 75-94. (In Slovak.)

BENDÍK, A. Ammonite fauna of Adnet Formation in the location of Nová Hoľa (Veľká Fatra Mts., Western Carpathians, Slovakia). In *Zborník SNM v Martine : Kmetianum, Martin*, 2005b. ISBN 80-8060-175-5, roč. X, 95-104. (In Slovak.)

- BENDÍK, A. Liassic ammonite fauna from Úplaz in Veľká Fatra Mts. (Western Carpathians, Slovakia). In *Zborník SNM v Martine : Kmetianum, Martin*, 2008. ISBN 978-80-8060-234-5, roč. XI, 74-106. (In Slovak.)
- BENDÍK, A. Ammonite fauna from collection of Slovak National Museum in Martin – Andrej Kmeť Museum. In *Mineralia Slov., Bratislava*, 2010. ISSN 0369-2086, 42, 2, 264-268.
- BENDÍK, A. Microfacial analysis of the red nodular limestones stratum in the location of Nová Hoľa (Veľká Fatra Mts., Slovakia). In *Zborník SNM v Martine : Kmetianum, Martin*, 2011. ISBN 978-80-8060-270-3, roč. XII, 93-107. (In Slovak.)
- BENDÍK, A. Ammonite fauna of subfamily Harpoceratinae Neumayr, 1875 from Jurassic Janovky and Adnet formations in the Veľká Fatra Mts. (Central Slovakia). In *Mineralia Slovaca, Bratislava*, 2012. ISSN 1338-3523, 44, 3, 285-294.
- BLAU, J. – MEISTER, C. Liassic (Pliensbachian) Ammonites from the Lienz Dolomites (Eastern Tyrol, Austria). In *Jb. Geol. B.-A., Wien*, 1991. 134/2, 171-204.
- BUCKMAN, S. S. *Yorkshire Type Ammonites*. London, 1912. 1 (6 – 8), vii, viii, A – G, 27 pls., desc., 45-67.
- D'ORBIGNY, A. *Paléontologie française: Terrains jurassiques, partie 1, Céphalopodes*. Éditions Masson, Paris, 1842 – 1851.
- DONOVAN, D. T. – FORSEY, G. F. Systematics of Lower Liassic Ammonitina. In *Paleont. Contr. Univ. Kansas*, Kansas, Lawrence, 1973. Vol. 64, 1-18.
- FARAONI, P. – MARINI, A. – PALLINI, G. Biostratigrafia ad ammoniti della Corniola carixiana della Valle del F. Bosso (Appennino marchigiano). In *Palaeopelagos, Roma*, 1994. Vol. 4, 275-288.
- GÉCZY, B. *Les ammonites du Carixien de la montagne du Bakony*. Budapest, Akadémiai Kiadó, 1976, 1-223.
- GÉCZY, B. – MEISTER, C. Les ammonites du Domérien de la montagne du Bakony (Hongrie). In *Revue de Paléobiol., Genève*, 1998. Vol. 17, n. 1, 69-161.
- GÉCZY, B. – MEISTER, C. Les ammonites du Sinémurien et du Pliensbachien inférieur de la montagne du Bakony (Hongrie). In *Revue de Paléobiol., Genève*, 2007. Vol. 26 (1), 137-305.
- HOFFMANN, K. Die Stratigraphie, Paläogeographie und Ammonitenführung des Unter – Pliensbachium (Carixium, Lias gamma) in Nordwest – Deutschland. In *Geol. Jb, Hannover*, 1982. A 55, 3-439.
- KOLLÁROVÁ-ANDRUSOVÁ, V. Les Céphalopodes du Lias du Slovenský kras (Karst slovaque). In *Nauka o Zemi II, ser. Geol., Bratislava*, 1966, 3, 1-96.
- KOVÁČ, P. – BENDÍK, A. Structural analysis of Adnet limestones at locality Zvolen – Donovaly (Western Carpathians). In *Mineralia Slov., Bratislava*, 2002. 34, 3 – 4, 207-210. (In Slovak.)
- MEISTER, C. Les ammonites du Carixien des Causses (France). In *Mém. Sui. De Paléont.*, 1986. Vol. 109, 209 p.
- MEISTER, C. – FRIEBE, J.G. Austroalpine Liassic Ammonites from Vorarlberg (Austria, Northern Calcareous Alps). In *Beiträge zur Paläontologie, Wien*, 2003. Num. 28, 9-99.
- MEISTER, C. – DOMMERGUES, J.-L. – DOMMERGUES, C. – LACHKAR, N. – EL HARIRI, K. Les ammonites du Pliensbachien du jebel Bou Rharraf (Haut Atlas oriental, Maroc). In *Geobios*, 2011. Vol. 44, 117.e1–117.e60.
- PERŽEL, M. *Geologický výskum mezozoika juhozápadnej časti Veľkej Fatry*. Bratislava, 1967. Manuskript – archív ŠGUDŠ. Dielčia záverečná správa, 93.
- PHELPS, M. C. A refined ammonite biostratigraphy for the Middle and Upper Carixian (Ibex and Davoei zones, Lower Jurassic) in North – west Europe and stratigraphical details of the Carixian – Domerian boundary. In *Geobios*, 1985. N. 18, fasc. 3, Lyon, p. 321-362.
- RAKÚS, M. Paläontologische Studien im Lias der Grossen Fatra und des westlichen Teils der Niederen Tatra. In MIŠÍK, M., RAKÚS, M. (ed.) *Bemerkungen zu räumlichen Beziehungen des Lias und zur Paläogeographie des Mesozoikum in der Grossen Fatra*. Bratislava, 1964. Zbor. Geol. Vied., Západ. Karpaty, 1, 93-156.
- RAKÚS, M. – GUEX, J. Les ammonites du jurassique inférieur et moyen de la dorsale tunisienne. In *Mém. Géol.*, 2002, n. 39, 217 s.

SCHLATTER, R. The Biostratigraphy of the Lower Pliensbachian at the Type Locality (Pliensbach, Württemberg, SW – Germany). In *Stutt. Beitr. zur Naturk.*, 1977. Seria B, Nr. 27, 1-23.

SCHLEGELMILCH, R. *Die Ammoniten des süddeutschen Lias*. Gustav Fischer Verlag, Stuttgart, 1976.: 213 p.

SMITH, P. L. – TIPPER, H. W. Pliensbachian (Lower Jurassic) Ammonites of the Queen Charlotte Islands, British Columbia. In *Bull. of Am. Paleont.*, 1996. V, 108, n. 348, 122 p.

ŠTÚR, D. Die geologische Übersichtskarte des Wassergebietes der Waag im nordwestlichen Ungarn. In *Jb. Geol. Reichsanst.*, 1859. Wien, 10, 27-31.

ŠTÚR, D. Bericht über geologische Aufnahme im oberen Waag – und Granthole. In *Jb. Geol. Reichsanst.* 1868. Wien, 18, 3, 337-426.

WIEDENMAYER, F. Die Ammoniten des Besazio – Kalks (Pliensbachian, Südtessin). In *Schweiz. Paläont. Abh.*, 1977. B. 98, Basel, 1-169.

Author of photos Andrej Bendík, 2013. Collection of ammonites is deposited in the Slovak National Museum, Martin – Andrej Kmeť Museum.

Autor fotografií Andrej Bendík, 2013. Zbierka amonitov sa nachádza v Slovenskom národnom múzeu v Martine – Múzeu Andreja Kmeťa.

AMONITOVÁ FAUNA ČEĽADE LIPAROCERATIDAE HYATT, 1867 Z ADNetskÉHO SÚVRSTVIA VO VEĽKEJ FATRE (STREDNÉ SLOVENSKO)

Andrej Bendík

S ú h r n

Adnetské súvrstvie (typ fácie ammonitico rosso) vo Veľkej Fatre vystupuje predovšetkým v jej južných oblastiach, kde dosahuje hrúbky 20 metrov, výnimočne aj viac (cca 80 – 100 metrov, oblasť Liptovské Revúce) a laterálne sa zastupuje so škvŕnitými vápencami až slieňmi allgäuskeho súvrstvia, ktoré vystupujú v severnej časti pohoria. Toto súvrstvie je známe bohatou, avšak často slabšie zachovanou amonitovou faunou, ktoré sťažuje determináciu a následne neumožňuje vypracovávať určité faunistické analýzy. V príspevku, ktorý dopĺňa predchádzajúce práce autora, sú opísané nálezy amonitovej fauny čeľade *Liparoceratidae*, ktoré pochádzajú z piatich lokalít Veľkej Fatry, ale len dva druhy a jeden rod bol získaný priamo z profilu (*in situ*). Z nálezov sa podarilo určiť *Becheiceras* (*Liparoceras*) *bechei* (SOWERBY), *Liparoceras* (*Becheiceras*) *gallicum* SPATH, *Androgynoceras maculatum* (YOUNG, BIRD), *Androgynoceras capricornus* (SCHLOTHEIM), *Androgynoceras* cf. *capricornus* (SCHLOTHEIM), *Vicinodicerias* sp. a *Oistoceras* sp. Determinované amonity zastupujú tri amonitové zóny spodného plienschachu – karixu (*Ibex*, *Davoei*, *Margaritatus*) a štyri podzóny (*Valdani*, *Maculatum*, *Capricornus* – *Figulinum*). V rámci paleografickej príslušnosti opísaná amonitová fauna síce prináleží boreálnej – subboreálnej oblasti, ale nedostatočné množstvo získanej amonitovej fauny z lokalít Veľkej Fatry nám neumožňuje detailnejšie stanoviť príslušnosť územia pod vplyv paleogeografických oblastí počas spodnej jury.