

# Middle Jurassic fossils from Daghestan. A revision of ammonites and bivalves collected by the Déchy Caucasus expeditions (1884–1902)

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(with 1 figure & 4 plates)

M. DÉCHY, the Hungarian traveller organised several mountaineering trips to the Caucasus in the years 1884 to 1902, when geologist members of the parties collected rock and fossil samples. These were described by K. PAPP, later professor of the Department of Paleontology of the University of Budapest. The specimens went finally to the collections of the Hungarian Natural History Museum. A revision of the better-localized Bajocian and Callovian specimens, mostly from around the Daghestanian town Gunib are revised. Two ammonites: *Stephanoceras liechtensteinii* and *Prorsisphinctes loczyi* described as new by PAPP, and several other ammonites and bivalves are now re-described and illustrated with proper photographs. The positions of the fossils within the sequences are poorly known, thus the material has historical rather than stratigraphic value.

## Introduction

MORIZ VON DÉCHY (1851-1917), a Hungarian traveller and mountaineer studied law, geography and geology at the University of Budapest, then published technical papers on his own studies in various European high mountains (see PAPP 1918). He took up his residence – by marriage – in Russia, and he became interested in travels in the Caucasus. Between 1884 and 1902 he organised seven expeditions to all parts of the Caucasus (BALÁZS 1992). In his third (1886), sixth (1898) and seventh (1902) expeditions outstanding Hungarian geologists were invited in the parties, who carried out geological observations and collected samples, rocks and fossils alike. The paleontological results of the studies of specimens collected by F. SCHAFARZIK in 1886, K. PAPP in 1898 and D. LACZKÓ in 1902 were incorporated as a chapter written by KARL PAPP in DÉCHY's three-volume travelogue published in German in Berlin, 1905-1907. An abridged version in Hungarian was also published in 1907, which used the figures of the fossils as decorative illustrations, with a general description on the fossils of the Caucasus by PAPP, but formal descriptions were left out from this single volume. PAPP gave a similarly general description later, with figures of some

specimens (PAPP 1910). All these works remained almost unknown for the wider audience, only some exceptionally well-informed researchers (e.g. L.F. SPATH, W.J. ARKELL and some Russian authors) cited and discussed these records.

Even the specimens have their own story. Originally, DÉCHY donated all his collections to the Hungarian Geological Institute. In those times K. PAPP was working in this institution, so the paleontological specimens, after determination and publication went into the collection of the Institute. They were especially highly esteemed, having been exhibited as a representative material from an exotic place in the public exhibition of the paleontological collection of the Institute. As such, they were introduced with a detailed text and figures in the guidebook to the Institute's Collections (PAPP 1910).

When the building of the Hungarian Natural History Museum was seriously damaged in a fire during the 1956 Revolution in Budapest, Hungarian institutions helped to rebuild the destroyed collections of the Paleontological Department. The Hungarian Geological Institute donated hundreds of specimens and several

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smaller collections, including that of DÉCHY's from the Caucasus.

Recently, in the time of moving the Paleontological Department of the Natural History Museum in a new building, a good occasion emerged to revise the collections and update the information on the material. Apparently not all

specimens survived the movings. While the new and figured specimens are available, some others seem to be lost: e.g. '*Peltoceras*' species and '*Reineckia anceps*' and many bivalves cannot be found or impossible to trace their whereabouts now.

### Middle Jurassic beds in Daghestan

The most interesting fossils what PAPP published are from Daghestan. This eastern part of the Caucasus has been a famous place for Jurassic fossils. The geological descriptions of VON ABICH (1878-1887) and the classic monograph of NEUMAYR & UHLIG<sup>2</sup> (1892) in which they worked out the Jurassic fossils of VON ABICH served as bases for further studies, mainly from German-speaking Europe. REDLICH (1895) worked out the fossils which were collected by the chemist P. CONRATH in the Caucasus. RENZ took several trips, and his results were published in numerous papers (e.g. RENZ 1904, 1914).

Most of the ammonites determined by PAPP came from Gunib, a famous locality even in those times (Text-fig. 1). Additional sporadic specimens are from other places, which are not discussed here, because the preservation of, or the information on the specimens are too poor to make them any value. One exception was made: the wonderful type specimen of *Stephanoceras liechtensteini*, a species introduced by PAPP is discussed below.

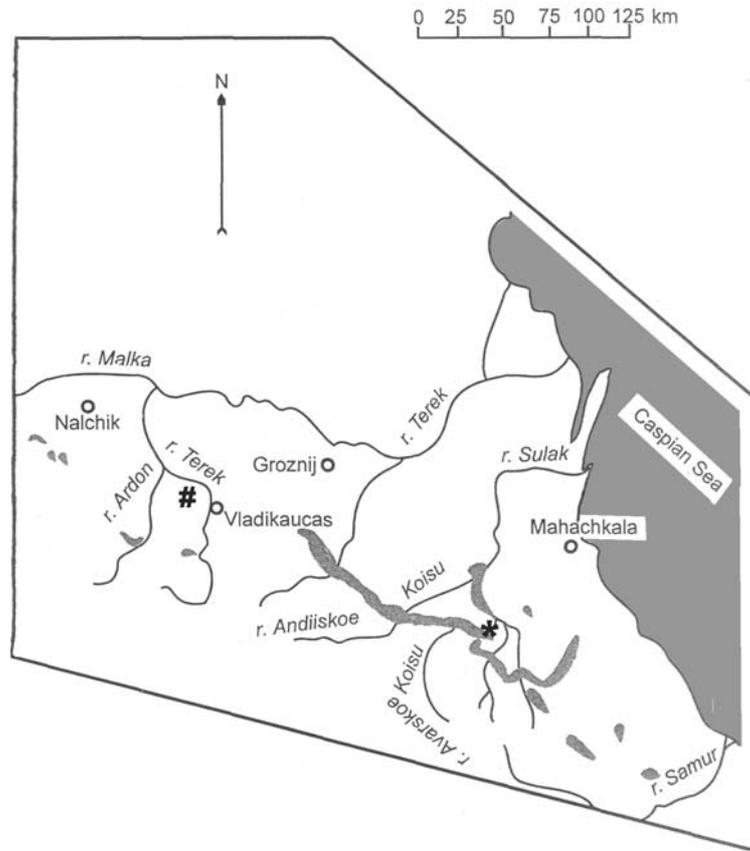
PAPP described 15 Jurassic bivalve taxa, including two species as new, from the material collected by members of the Déchy expeditions. Most of them are poorly preserved internal moulds whose identification even at genus level is uncertain. Three species seem to be, however, worthy of discussion. Most of the bivalves came from Gunib, but some specimens from the Kuban Valley are also treated here.

The local geology of the Middle Jurassic formations was discussed in detail by ZHIVAGO (1958) then BESNOSOV (1967). The rocks which have yielded the here discussed fossils in Gunib belong into two formations. The Upper Bajocian ammonites came from the Mogoh Member of the Tsudakhar Formation (= 'schwarze Geoden-

schiefer' in RENZ 1904, 1914) which is a dark, mainly clayey series with occasional siltstones and sideritic concretions. The Upper Bajocian part (i.e. Niortense, Garantiana and Parkinsoni Zones) of this member is 250 metres in thickness (BESNOSOV 1967, p. 13). The Tsudakhar Formation continues upward into the Lower Bathonian as indicated by *Oranicerias* and other parkinsoniids (see BESNOSOV et al. 1973), then after a stratigraphic hiatus and profound facies change Callovian beds follow. There is a basal conglomerate traditionally ranged into the Lower Callovian, which is followed around Gunib by the Armhi Formation (see BENENSON 1983, p. 47) with light grey, greenish, clayey limestones containing clayey or silty intercalations. This greyish limestone, which is rather thin (3.5-4 m) here around Gunib, yielded the Callovian ammonites and bivalves indicating the Middle Callovian.

Many previous authors indicated Gunib as a locality of Upper Bajocian ammonites, and some sporadic specimens were figured from here. However, almost all of these specimens are without sound stratigraphy. It seems most possible that the fossils were picked up from the debris at the foothills or in the riverbeds as specimens in concretions weathered out from the shales. This is probably true for all previous records in NEUMAYR & UHLIG and RENZ, and later authors probably followed this easy and quick way of collecting. Thus the discussions and descriptions below are not for stratigraphic use but for evaluations in paleobiogeography, and the whole material has a historical value more than anything else.

<sup>2</sup> In the NEUMAYR & UHLIG monograph not only VON ABICH's, but the small material collected by the Swedish engineer HJ. SJÖGREN (1889) was also treated.



Text-fig. 1. Simplified map of Daghestan and the surrounding Caucasian regions (modified from BESNOSOV & MITTA 1998). Shaded areas = Middle Jurassic outcrops. # = the locality of *Stephanoceras liechtensteini*; \* = Gunib.

### Systematic descriptions of ammonites (A.G.)

*Dinolytoceras zhivagoi* BESNOSOV, 1958  
Pl. 1, figs 5-6.

1907. *Lytoceras Linneanum* D'ORB. – PAPP, p. 145.

1914. *Lytoceras polyanchomenum* GEMM. – RENZ, p. 665, pl. 27, fig. 4.

1958. *Dinolytoceras zhivagoi* sp. n. – BESNOSOV, p. 86, pl. 22, fig. 1, pl. 23, figs 1, 2, pl. 24, figs 1, 2, text-fig. 32.

non 1972. *Lytoceras* cf. *zhivagoi* (BESNOSOV) – PAVIA, p. 96, pl. 15, fig. 4.

1982. *Dinolytoceras zhivagoi* BESNOSOV – AZARIAN, p. 47, pl. 7, figs 5, 6.

Material: A single body chamber fragment (M 63 3308) determined by K. PAPP as „*Lytoceras Linneanum* D'ORB.”

Description: The dimensions of this preserved short body-chamber fragment cannot be measured properly, but the characteristic morphology makes possible to determine it even in this state. It has a rounded, somewhat higher than wide cross-section

with slightly flattened flanks. It is sculptured with dense, rounded single ribs which run sinuously on the shell, being separated by narrow intercostal spaces. One of the specific rounded collars, which are so characteristic to the specimens of the type series, is also visible.

Remarks: *D. zhivagoi* is seemingly a Caucasian lytoceratid, as shown by the citations mentioned in the synonymy. The single extra-Caucasian record (PAVIA, 1972) is doubtful as hinted by PAVIA himself.

BESNOSOV (1958) – while he did not give 'derivatio nominis' – most probably named this species after N.V. ZHIVAGO, the geologist who gave the best stratigraphic data on the Jurassic of Daghestan.

*Putealicerias laubei* (NEUMAYR, 1871)  
Pl. 2, fig. 4.

1871. *Harpoceras Laubei* nov. sp. – NEUMAYR, p. 29, pl. 9, fig. 4.

1933. *Hecticoceras laubei* NEUMAYR – CHIKHACHEV, p. 25, pl. 3, fig. 2; pl. 6, figs 1,7,8.  
 1964. *Hecticoceras (Rossiensiceras) laubei* NEUMAYR – STANKEVITCH, p. 64, pl. 20, fig. 2.  
 1975. *Putealicerias (Zietenicerias) laubei* (NEUMAYR, 1871) – LOMINADZE, p. 55, pl. 5, figs 3-5, 7.  
 2000. *Hecticoceras laubei* (NEUMAYR, 1871) – BESNOSOV & MITTA, p. 54, pl. 19, fig. 2.

Material: A single specimen (M 63 3317) from Gunib, collected by D. LACZKÓ in 1902.

Description: A poorly preserved internal cast with a better half-whorl which shows a very widely umbilicated form with characteristic sculpture. This latter consists of strong tubercles at the umbilical seam, leaving no place to any inner ribs. From the tubercles falcoid outer ribs arise and similar ribs appear also in the intertubercular spaces. The outer ribs curve out to the venter, where terminate at the elevated keel. The venter itself is high tectiform, giving a narrow, ventrally acute shape to the whorl-section.

Remarks: *P. laubei* is a common hectioceratic in Europe and in the Caucasus also. It is very similar to *P. krakoviense* described also by NEUMAYR (1871, p. 28). The difference is in the whorl-section, which is rounded in *P. krakoviense*, and in the sculpture, where tubercles appear rarely on the sharp inner ribs. The species has been described from the Middle Callovian of Daghestan also by STANKEVITCH (1964, p. 65) and LOMINADZE (1975, p. 57).

*Stephanoceras liechtensteinii* PAPP, 1907  
 Plate 2, figs 5-6.

1907. *Stephanoceras Liechtensteinii* n. sp. – PAPP, p. 163, pl. 6, fig. 4.

Material: A single, well-preserved, but incomplete specimen (M 63 3610).

Locality: PAPP (1907, p. 165) gave 'west of Vladikavkaz, from the drift pebbles of the Fiagdon creek, from dark, irony limestone pebble, collected by M. DÉCHY'. However, the original label, written also by PAPP, says that the specimen was donated by a certain DELBISCHEFF, a local friend of M. DÉCHY, what probably does not change the provenance of the specimen.

Description: A beautifully preserved but incomplete, medium-size specimen. It shows very evolute coiling of nearly circular whorls. The body chamber becomes somewhat laterally flattened and its venter widens out a little, giving a subrectangular aspect near the aperture. The sculpture consists of short, radial inner ribs with small, acute tubercles from which prorsiradiate outer ribs arise on the inner whorls. There are 18 primary and 65 secondary ribs on the distal

preserved half of the body chamber. The outer ribs become radial or slightly rectiradial and rounded on the body chamber. The shell is septate up to about 800 mm diameter, showing 1¼ whorl body chamber, thus probably only a short apertural part is missing.

Comparisons and remarks: PAPP (loc. cit., p. 164) compared the specimen to *Stephanoceras Freycineti* BAYLE, 1878 and *Ammonites Bayleanus* OPPEL, 1858, both regarded now as *Skirroceras*. The latter species was mentioned from the Caucasus by NEUMAYR & UHLIG (1892, p. 49), but probably on the basis of a different species having more than 210 mm diameter. KRIMHOLZ (1961, p. 9) mentions this form as '*Stephanoceras bayleanum* var. *lichtensteinii* PAPP' in a composite faunal list containing Aalenian and Bajocian ammonite names. Nevertheless, *S. liechtensteinii* is most similar to *Stephanoceras skolex* (BUCKMAN, 1921), which occurs in the type area in the *Stephanoceras rhytum* (Bj12) faunal horizon of the higher Otoites sauzei Zone (CALLOMON & CHANDLER 1990, p. 98).

PAPP named this species after Prince FRANZ LIECHTENSTEIN who was the Austro-Hungarian ambassador to the Russian Tsarist Court.

*Cadomites (Cadomites) daubenyi*  
 (GEMMELLARO, 1877)  
 Pl. 1, figs 1-2.

1877. *Stephanoceras Daubenyi* GEMM. – GEMMELLARO, p. 67, pl. 4, figs 3 and 5.  
 1907. *Stephanoceras linguiferus* D'ORB. – PAPP, p. 145.  
 1961. *Stephanoceras (Cadomites) deslongchampsii* DEFRANCE – KRIMHOLZ, p. 119, pl. 8, figs 2,3.  
 non 1985. *Cadomites (Cadomites) daubenyi* (GEMMELLARO) – ROSTOVTSSEV, p. 144, pl. 29, figs 2,3.  
 1985. *Cadomites (Cadomites) deslongchampsii* (DEFRANCE) – ROSTOVTSSEV, p. 145, pl. 40, fig. 4.  
 non 1993. *Cadomites daubeni* (GEMMELLARO), 1877 (sic!) – BESNOSOV & MITTA, p. 63, pl. 5, fig. 2.  
 non 1998. *Cadomites (Cadomites) daubenyi* (GEMMELLARO, 1877) – BESNOSOV & MITTA, p. 24, pl. 10, fig. 1.

Material: A single incomplete specimen with preserved inner whorls and part of the body chamber. The original label is lost, but a tag stuck on the specimen shows the original notion '*Stephanoceras linguiferus* D'ORB.'. Now the catalogue number of the Natural History Museum is M 63 3211.

Description: A partially preserved specimen consisting a part of the inner whorls and ca. a quarter of the body-chamber. The whorl-section is

slightly depressed on the phragmocone, becoming narrower on the body-chamber where the venter becomes highly-arched. The sculpture is made up by slender, slightly prorsiradiate inner ribs ending in small, elongated nodes, where the thin secondary ribs arise. There are 3-4 forwardly-arched secondaries by primaries on the visible parts of the whorls.

Remarks: The Caucasus is an area with good representation of *Cadomites*: KRIMHOLZ (1961), ROSTOV TSEV (1985) and BESNOSOV & MITTA (1993, 1998) figured different species. However, the first records of '*Stephanoceras rectelobatum* HAU.' in NEUMAYR & UHLIG (1892, pl. 5, fig. 5, pl. 6, fig. 2) refer to ammonites belonging to s. str. *Stephanoceras*.

KRIMHOLZ figured a specimen from Gunib which belongs to *C. daubenyi* (see synonymy).

*Garantiana (Garantiana) longidoides*  
(GAUTHIER, TRÉVISAN & JORON, 2000)  
Pl. 1, fig. 9.

- pars* 1907 *Parkinsonia Schloenbachi* SCHLIPPE – PAPP, p. 145.  
1925 *Odontolkites longidens*, QUENSTEDT sp. 1846 – in BUCKMAN 1909-30, pl. 582.  
2000 *Odontolkites longidoides* n. sp. – GAUTHIER et al., p. 17, pls 1-3.

Material: Several incomplete specimens, mainly body chamber fragments.

Description: This is a large, robust *Garantiana* with slightly higher than wide whorls and strong sculpture. The prorsiradiate primary ribs bifurcate just above the middle of the flank and the secondaries, following the direction of the primaries, run until the narrow ventral furrow. On the proximal part of the body chamber the secondaries terminate in small tubercles alternating along the ventral furrow, then near the aperture the furrow closes up and the secondary ribs become continuous across.

Remarks: *G. longidoides*, especially in fragments, may be similar to some *Parkinsonia*. While *Garantiana* is well documented from the Caucasus (see e.g. BESNOSOV & MITTA 1993, 1998), there are no former data on this group from the area.

*Parkinsonia pseudoparkinsoni* WETZEL, 1911  
Pl. 1, figs 3-4; Pl. 2, figs 2-3.

1907. *Parkinsonia parkinsoni* SOWERBY – PAPP, p. 144.  
1907. *Parkinsonia ferruginea* OPPEL – PAPP, p. 145, pl. 8, fig. 1  
1911. *Park. pseudoparkinsoni* n. sp. – WETZEL, p. 200, pl. 16, figs 4-6.

- ? 1914. *Parkinsonia ferruginea* OPPEL – RENZ, p. 665, pl. 29, fig. 2.  
1993. *Parkinsonia densicosta* (QUENSTEDT), 1887 – BESNOSOV & MITTA, p. 194, pl. 39, fig. 2.  
1998. *Parkinsonia densicosta* (QUENSTEDT) – BESNOSOV & MITTA, p. 13, pl. 20, fig. 3, pl. 22, fig. 2.

Material: Two specimens (M633200, M 63 3203), collected by SCHAFARZIK from the dark shales of the Gunib Hill.

Description: A widely-umbilicated parkinsoniid with low and narrow whorls. The sculpture consists of prorsiradiate inner ribs which bifurcate slightly above the middle of the flanks, but single ribs and intercalatory outer ribs also appear. The secondaries terminate abruptly and alternately along the narrow ventral furrow.

Remarks: *P. pseudoferruginea* differs from the congeneric forms by its narrower umbilicus and somewhat irregular ribbing. The species was cited earlier from the area under the name *P. densicosta* (QUENSTEDT) (see synonymy).

*Parkinsonia parkinsoni* (J. SOWERBY, 1821)  
Pl. 2, fig. 1.

1907. *Parkinsonia Ujbányaense* BÖCKH – PAPP, p. 145.  
1956. *Parkinsonia (Parkinsonia) parkinsoni* (J. SOWERBY) – in ARKELL 1951-58, p. 143, text-fig. 53.  
1985. *Parkinsonia parkinsoni* (SOWERBY) – ROSTOV TSEV, p. 158, pl. 42, figs 3,4, pl. 43, fig. 1.  
1993. *Parkinsonia parkinsoni* (SOWERBY), 1821 – BESNOSOV & MITTA, p. 189, pl. 39, fig. 1.  
1998. *Parkinsonia parkinsoni* (SOWERBY, 1821) – BESNOSOV & MITTA, p. 28, pl. 18, figs 2-4.

Material: A single, incomplete specimen (M 63 3207) collected by SCHAFARZIK in Gunib.

Description: A medium-size parkinsoniid with narrow whorls of which low umbilical wall rounds into the flattened flanks. The ventrolateral shoulder is narrowly rounded, the venter is narrow and becomes slightly arched on the body chamber. The ribbing consists of slender, sharp ribs which branch into two secondary ribs near the ventrolateral edge. The inner ribs are straight, the secondaries bend forward and form a distinct angle at the sides of the ventral groove. The ribbing does not fade out on the body chamber. The inner:outer rib ratio is 1:2 on the penultimate half-whorl.

The specimen preserves a part of the body chamber and is still septate at 77 mm diameter.

Remarks: *Parkinsoni parkinsoni* has been commonly mentioned from the Caucasus. NEUMAYR & UHLIG (1892, p. 88), later RENZ (1914, p. 664) recorded it from Gunib, and Soviet

authors from the wider areas. The illustrations given by ROSTOVITSEV then by BESNOSOV & MITTA (see synonymy) prove the Caucasian presence of the species.

*Parkinsonia zatwornitzkii* BESNOSOV, 1993

Pl. 1, figs 7-8.

*pars* 1907. *Parkinsonia Schloenbachi* SCHLIPPE – PAPP, p. 145.

1993. *Parkinsonia zatwornitzkii* BESNOSOV sp. – BESNOSOV & MITTA, p. 191, pl. 38, fig. 1.

1998. *Parkinsonia zatwornitzkii* BESNOSOV, 1993. – BESNOSOV & MITTA, p. 28, pl. 19, figs 1,2.

Material: A single specimen (M 63 3207) labelled together an example of *P. parkinsoni* (see description above).

Description: An incomplete specimen with wide umbilicus, low whorls and strong ribbing. The whorl-section is trapezoidal with greatest width at the umbilical margin, convergent flanks and flattened, though narrow venter. There are 20 primary and 36 secondary ribs on the last preserved half-whorl, indicating bifurcate and simple ribs. The ribs are strong and high with furcation points in various level and alternation along the ventral smooth band.

Comparison and remarks: The very strong, rare ribbing with irregularities in the bifurcating/simple rib appearances and height of the furcation points makes this specimen very similar to that described and figured by BESNOSOV as *Parkinsonia zatwornitzkyi* n. sp. Further similarity is the evolute look given by the open umbilicus and the low whorls.

*Parkinsonia* sp.

Pl. 1, figs. 10-11.

There are several smaller whorl fragments in the collection which belong to *Parkinsonia*. One (M 63 3199) is figured here. It is most similar to the form BESNOSOV described as *P. pseudoplanulata* n. sp. (in BESNOSOV & MITTA 1993, p. 192, pl. 40, fig. 1, the holotype refigured in BESNOSOV & MITTA 1998, pl. 20, fig. 2). BESNOSOV's figures show a form with flattened whorl-sides and ribbing with almost straight primary ribs bifurcating very high on the flanks. All these features are shown on the here introduced form from Gunib, which locality was mentioned also by BESNOSOV as one of the places where his type material came from (loc. cit.).

*Prorsisphinctes loczyi* (PAPP, 1907)

Pl. 3, figs 1-2, 5-6, 7.

1907. *Perisphinctes Lóczyi* n. sp. – PAPP, p. 165, pl. 7, figs 1-2.

1907. *Perisphinctes daghestanicus* n. sp. – PAPP, p. 166, pl. 7, fig. 3

1910. *Perisphinctes Lóczyi* PAPP – PAPP, p. 307, fig. 148.

*non* 1993. *Prorsisphinctes loczyi* (PAPP) – BESNOSOV & MITTA, p. 128, pl. 16, fig. 2.

*pars* 1998. *Prorsisphinctes (Prorsisphinctes) loczyi* (PAPP) – BESNOSOV & MITTA, pl. 14, figs 2,3 (only)

Material: 4 specimens from Gunib, collected originally by SCHAFARZIK. Two of them (both catalogued as M 63 3301) were figured as '*Perisphinctes Lóczyi* n. sp.', and one (M 63 3304) as '*Perisphinctes daghestanicus* n.sp.' by PAPP. A further fragment (also M 63 3304) from the same collection probably also belongs into this species. The original of PAPP 1907, pl. 7, fig. 1 is designated here as lectotype (Pl. 3, figs 1-2).

Measurements:

specimen	D	Whorl-height (Wh)	Wh/D (%)	Whorl-breadth (Wb)	Wb/D (%)	Umbilical width	U/D (%)	Sr/Pr (last ½ whorl)
M 633301a	95	30	31.5	32	33.5	44	46.5	59/33
lectotype	72	23	32	24	33.3	36	50	
M 633301b	82	29	35.5	30	36.5	40	49	55/32

Description: A medium-size, evolute *Prorsisphinctes* with rounded, slightly higher than wide whorl-section. The innermost whorls, best shown in the '*P. daghestanicus*' specimen (Pl. 3, fig. 7) are smooth, then ribs appearing first on the outer part of the flanks, and reaching down to the umbilical seam at ca. 10 mm diameter. Tubercules do not occur. The ribbing remains regular throughout, with dense, radial inner ribs which bifurcate above the middle of the flank. The outer ribs swing slightly forward, forming a subtle arch on the venter. Single ribs also occur, thus the outer/inner rib ratio is 1.7. The ribs are rounded and somewhat wider than the intercostal spaces. Deep constrictions appear first on the innermost whorls and remain constant in number: 3 per whorls. The specimens are septate up to at least 90 mm diameter. The ribbing remains unchanged on the body chamber. Aperture unknown.

Comparison and remarks: Uppermost Bajocian perisphinctids are commonly recorded from the Caucasus. From the several forms described and figured by BESNOSOV & MITTA (1993, 1998) only

two are regarded here as conspecific (see synonymy).

*Peltoceras* sp.  
Pl. 3, fig. 8.

Material: A single body-chamber fragment (M 63 3212A) from the grey silty limestone of Gunib.

Description: The preserved body-chamber part indicates a robust form with narrow ribs which arise at the umbilical seam, form a short arch until a strengthening on the umbilical margin, then stretch the flank radially to terminate in blunt tubercles on the ventrolateral margin. From the tubercles low, faint secondary ribs (two from each tubercle) arise but fade out before reaching high on the low, rounded venter.

Discussion and remarks: PAPP (1907, p. 146) mentioned '*Peltoceras Athleta* PHILLIPS' and '*Peltoceras Arduennensis* D'ORB.' from LACZKÓ's collection from Gunib, however no ammonites labelled *Peltoceras* are in the surviving material. The here described specimen was labelled simply as '*Ammonites*'.

*Peltoceras* is documented in Daghestan by several authors (see BESNOSOV et al. 1973, pp. 137-139).

*Kosmoceras (Kosmoceras) grossouvrei*  
R. DOUVILLÉ, 1915  
Pl.3, figs 3-4.

1907. *Cosmoceras Jason* REINECKE – PAPP, p. 146, pl. 8, fig. 3.  
pars 1915. *Cosmoceras Grossouvrei* n. sp. – DOUVILLÉ, p. 37, pl. 12, fig. 3 (only)  
1963. *Kosmoceras (Kosmoceras) grossouvrei*, R. DOUVILLÉ 1915 – TINTANT, p. 308, pl. 32, fig. 2.

Material: A single specimen (M 63 3209), consisting an adult body-chamber.

Description: A medium-size form with whorl-section with rounded umbilical and inner lateral sides, convergent flanks and flattened venter. The sculpture consists of inner ribs which are radial up to the first tubercles on the umbilical margin, slightly curve forward below the second tubercles at about the lower third of the flank. Here outer ribs arise running falcoidally to form fine tubercles on the ventrolateral margin, then cross the venter rectangularly.

Remarks and comparison: This is a *Kosmoceras* with the main specific feature being the well-developed second tubercles on the lower third of the flanks. The lectotype (DOUVILLÉ 1915, pl. 12, fig. 3) is an evolute form with very dense outer ribbing. The specimen figured by TINTANT (1915, pl. 32, fig. 2) is more similar with fewer ribs. *K. aff. grossouvrei* was mentioned previously from Daghestan (BESNOSOV et al. 1973, p. 137).

### Description of the bivalves (I. Sz.)

*Pholadomya (Bucardiomya) lirata*  
(J. SOWERBY, 1827)  
Pl.4, figs 1-4.

PAPP (l. c. p. 133, pl. 3, figs 1, 1a, 1b) erected a new species ('*P. schafarziki* n. sp. '), based on a single fine specimen found by F. SCHAFARZIK in the 'Upper Limestone' (i. e. Armhi Formation) of Gunib. The specimen is of rounded triangular outline and bears six radial plicae which form blunt tubercles at the places of intersections with the comarginal rugae. This shape and ornamentation are characteristic of *P. (Bucardiomya) lirata*, a species of Aalenian-Oxfordian age, which reached its greatest geographical distribution in the Callovian (HOLZAPFEL 1998).

*Ceratomya excentrica* (ROEMER, 1836)  
Pl. 4, figs 5-7.

This species is, due to its large size, far the most conspicuous one in the Jurassic bivalve collection of the Déchy expeditions, represented by about a dozen specimens. PAPP (l. c. pl. 4, figs 1, 1a) figured a specimen of '*Ceromya excentrica* (VOLTZ) AGASSIZ var. nov.' from the Callovian of Psebay which, however, could not be identified in the material. The Caucasus specimens display definitely divaricate plicae which are, according to DELVENE (2001), the distinguishing feature of this long-ranging species.

*Pleuromya alduini* (BRONGNIART, 1821)  
Pl. 4, figs 8, 9.

PAPP (1907, p. 158, pl. 4, figs 2, a-c) erected *Pleuromya merzbacheri* n. sp. based on a single internal mould collected from the Callovian of

Psebay. The features displayed by the specimen, such as the relatively truncated anterior part and the well-rounded ventral margin are, however, characteristic of *P. alduini*, a widespread Bathonian-Oxfordian species as recently discussed by DELVENE (2001, 2007).

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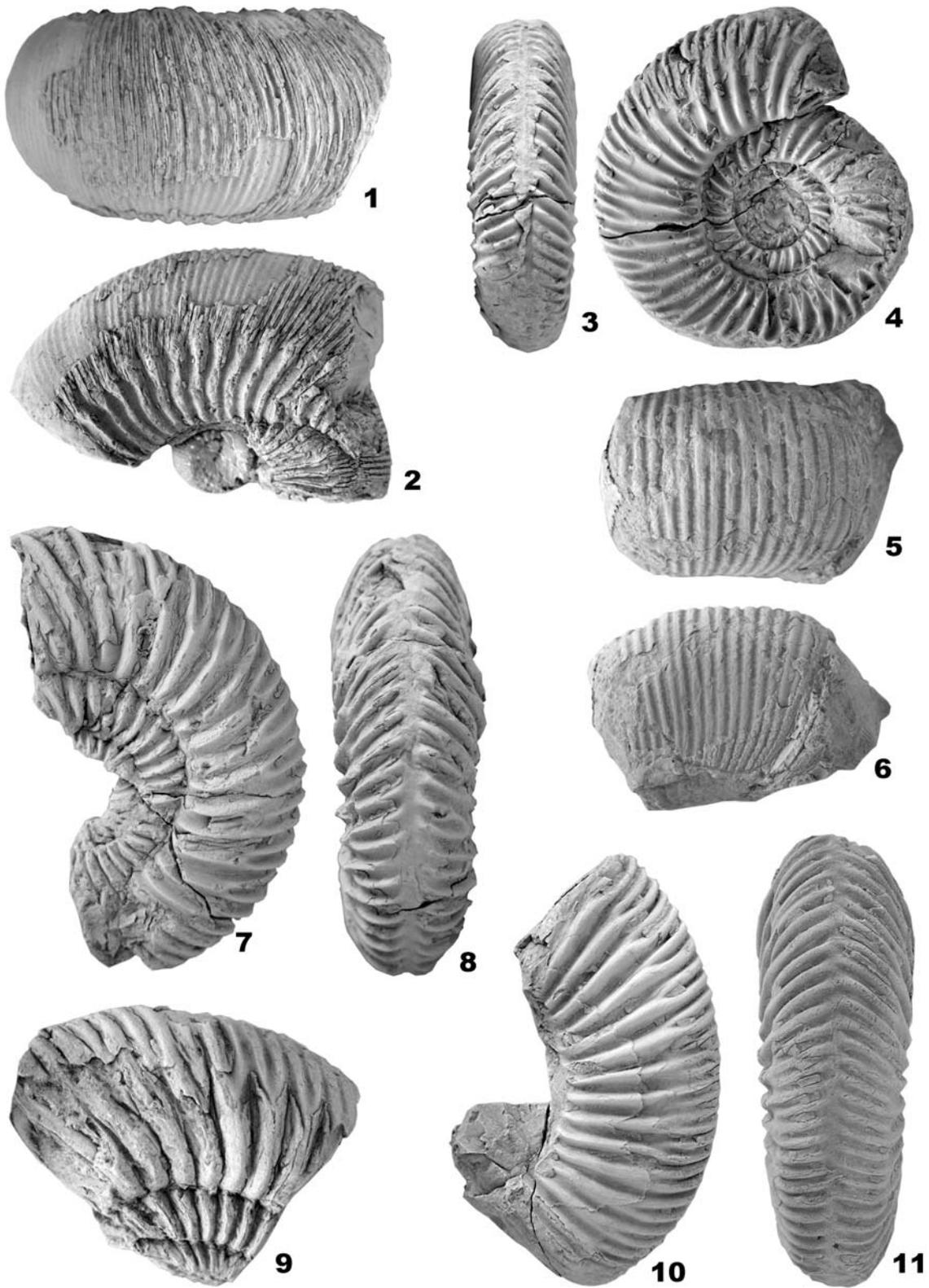
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## Plate 1

- Figs 1-2: *Cadomites (Cadomites) daubenyi* (GEMMELLARO, 1877). M 63 3211. Collected by F. SCHAFARZIK, 1886. Gunib Hill, Upper Bajocian dark shale.
- Figs 3-4: *Parkinsonia pseudoparkinsoni* WETZEL, 1911. M 63 3200; figured by PAPP as '*Parkinsonia ferruginea* OPPEL' in 1907, pl. 8, fig. 1. Collected by F. SCHAFARZIK, 1886. Gunib Hill, Upper Bajocian dark shale.
- Figs 5-6: *Dinolytoceras zhivagoi* BESNOSOV, 1958. M 63 3308. Collected by F. SCHAFARZIK, 1886. Gunib Hill, Upper Bajocian dark shale.
- Figs 7-8: *Parkinsonia zatwornitzkii* BESNOSOV, 1993. M 63 3207A. Collected by F. SCHAFARZIK, 1886. Gunib Hill, Upper Bajocian dark shale.
- Fig. 9: *Garantiana (Garantiana) longidoides* (GAUTHIER, TRÉVISAN & JORON, 2000). M 63 3204. Collected by F. SCHAFARZIK, 1886. Gunib Hill, Upper Bajocian dark shale.
- Figs 10-11: *Parkinsonia* sp. M 63 3199. Collected by F. SCHAFARZIK, 1886. Gunib Hill, Upper Bajocian dark shale.

All figures in natural size

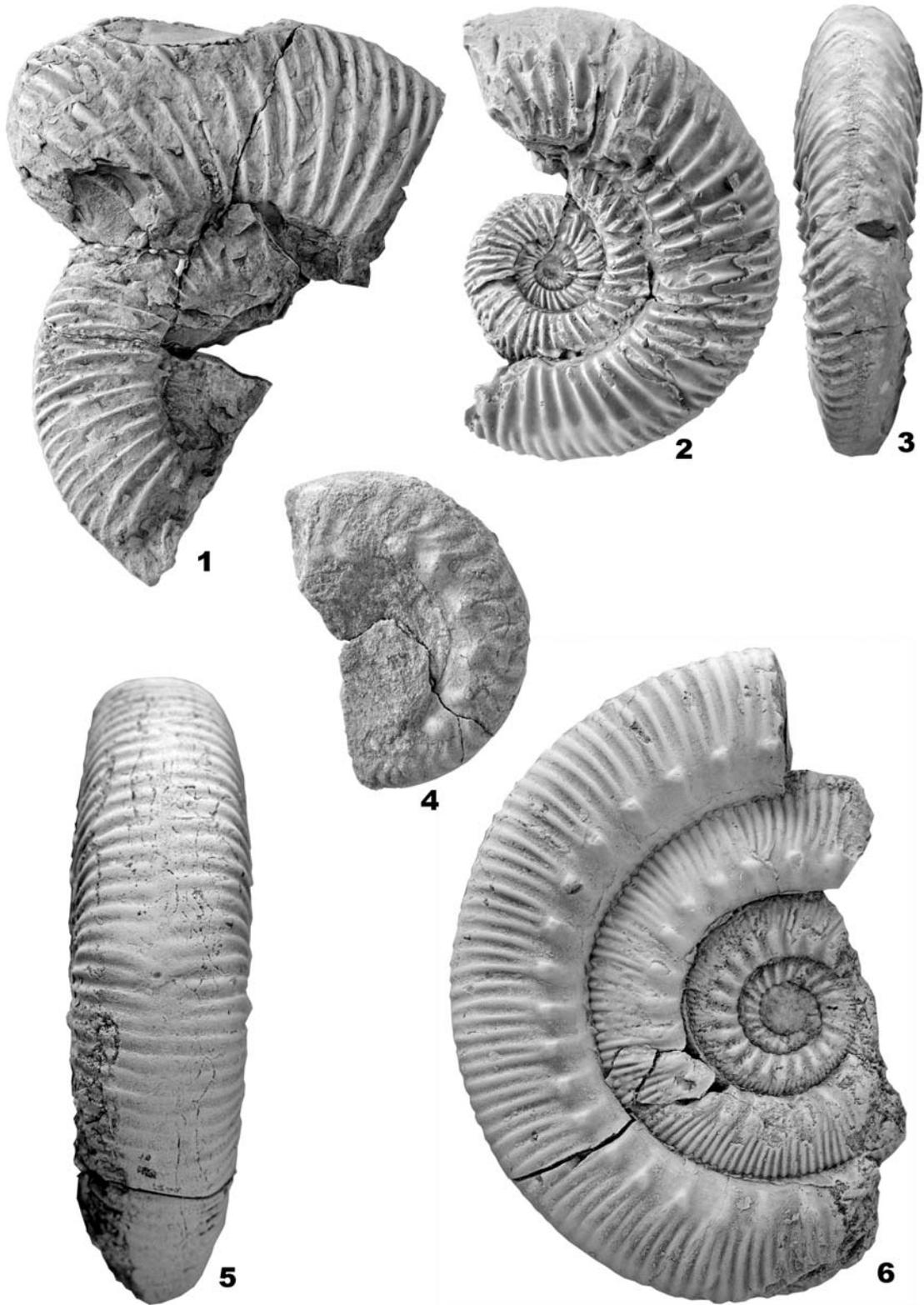


## Plate 2

- Fig. 1: *Parkinsonia parkinsoni* (J. SOWERBY, 1821). M63 3207B. Collected by F. SCHAFARZIK, 1886. Gunib Hill, Upper Bajocian dark shale.
- Figs 2-3: *Parkinsonia pseudoparkinsoni* WETZEL, 1911. M 63 3203. Collected by F. SCHAFARZIK, 1886. Gunib Hill, Upper Bajocian dark shale.
- Fig. 4: *Putealicerias laubei* (NEUMAYR, 1871). M 63 3317. Collected by D. LACZKÓ, 1902. Gunib, Castle hill, Callovian greyish silty limestone.
- Figs 5-6: *Stephanoceras liechtensteinii* PAPP, 1907. M 63 3610. Collected by M. DÉCHY, 1885. From the drift pebbles of the Fiagdon river, Bajocian black shale.

All figures in natural size

Plate 2



## Plate 3

Figs 1-2; 5-6; 7: *Prorsisphinctes loczyi* (PAPP, 1907).

1-2: lectotype, M 63 3301A; figured by PAPP in 1907, pl. 7, fig. 1.

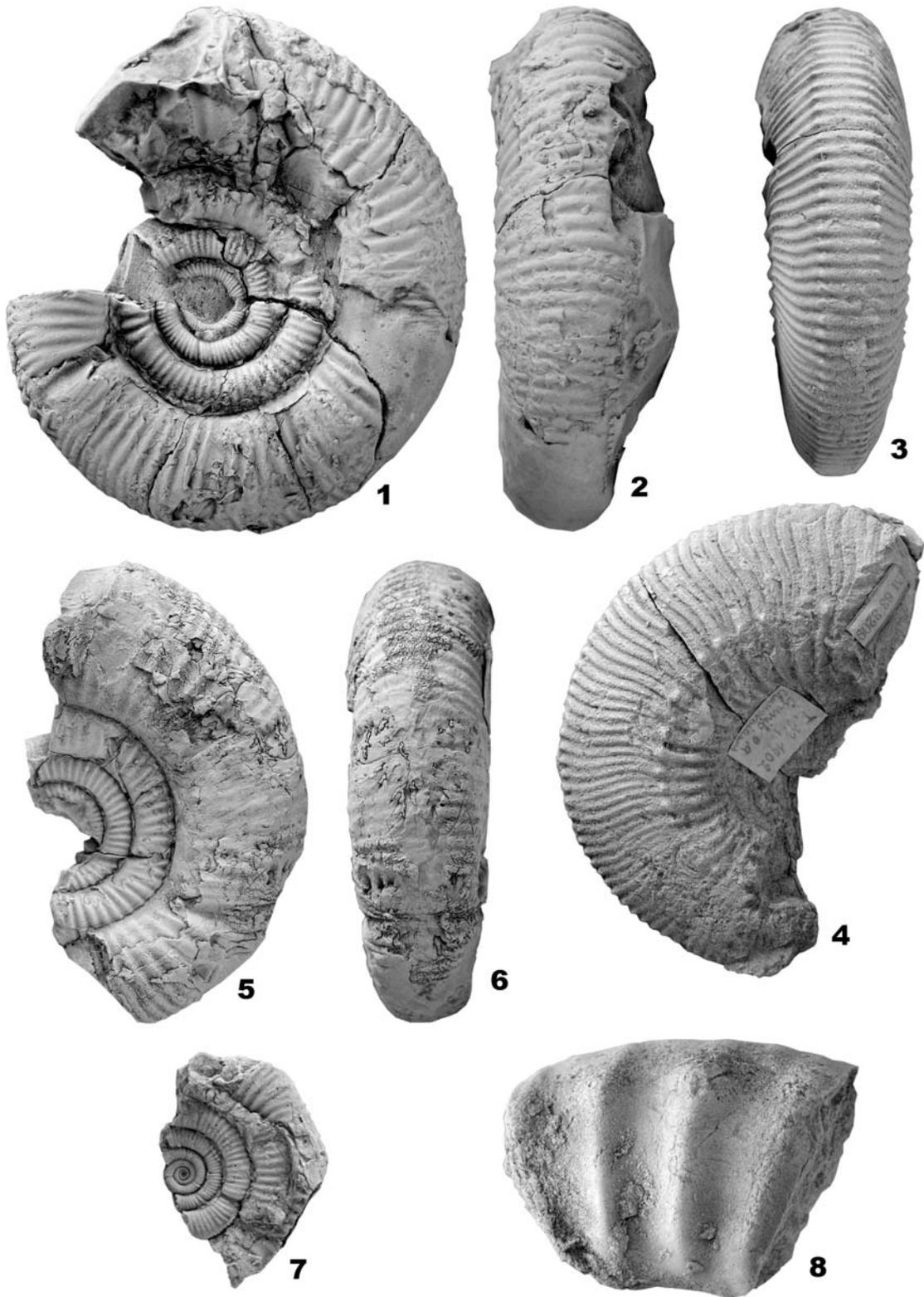
5-6: paralectotype No.1, M 63 3301B; figured by PAPP in 1907, pl. 7, fig. 2.

7: paralectotype No.2, M 63 3304A; figured by PAPP as '*Perisphinctes daghestanicus* n. sp.' in 1907, pl. 7, fig. 3. All collected by F.SCHAFARZIK, 1886. Gunib Hill, Upper Bajocian dark shale.

Figs 3-4: *Kosmoceras (Kosmoceras) grossouvrei* R. DOUVILLÉ, 1915. M 63 3209; figured by PAPP as '*Cosmoceras Jason* REINECKE' in 1907, pl. 8, fig.3. Collected by D.LACZKÓ, 1902. Gunib, Castle hill, Callovian greyish silty limestone.

Fig. 8: *Peltoceras* sp. M 63 3212. Collected by D. LACZKÓ, 1902. Gunib, Castle hill, Callovian greyish silty limestone.

All figures in natural size



## Plate 4

Figs 1-4. *Pholadomya (Bucardiomya) lirata* (J. SOWERBY, 1827) 2: M63 3198. 1, 3: '*Pholadomya schafarziki* n. sp.' as figured by PAPP in 1907, pl. 3, figs 1, 1b, respectively. Collected by F. SCHAFARZIK, 1886. Gunib, Callovian.

Figs 5-7. *Ceratomya excentrica* (ROEMER, 1836). 5: '*Ceromya excentrica* AGASSIZ var. n.' as figured by PAPP (1907), pl. 4, fig. 1, Collected by D. LACZKÓ, 1902. Psebay, Kuban Valley; 6: M. 63 3190; 7: M. 63 3189, Collected by F. SCHAFARZIK, 1886. Gunib, Callovian.

Figs 8-9. *Pleuromya alduini* (BRONGNIART, 1821) . 8: '*Pleuromya merzbacheri* n. sp.' as figured by PAPP (1907, pl. 4, fig. 2). Collected by D. LACZKÓ, 1902. Psebay, Kuban Valley, Callovian.

All figures in natural size except Figs 1, 3 and 5 which are approx. 0.75x.

