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Ammonites from the Lower Bajocian (Middle Jurassic) beds of the classic locality of Bakonycsernye (Transdanubian Hungary), with special regard to the early otoitids and stephanoceratids

András Galácz[1]*, with the help of Mihály Dunai[2] & Zoltán Evanics[3]

[1]*Department of Palaeontology, Eötvös L. University, 1117 Budapest, Pázmány Péter sétány 1/c, Hungary*
[2]*1029 Budapest, Emese u. 13/A, Hungary*
[3]*6630 Mindszent, Szt. László u. 34, Hungary*

**Author for correspondence and reprint requests; E-mail:* galacz@ludens.elte.hu

Abstract

New collecting from the Middle Jurassic beds of the classic Bakonycsernye locality yielded very rich ammonite assemblages from the topmost Aalenian and the Lower Bajocian. A single bed, called here the Ovale Bed gave a high diversity Fissilobiceras ovale Zone fauna, with several stratigraphically diagnostic species and rich representation of early otoitids and stephanoceratids. These latters include topotypes of species described in classic monographs from this place. Here the earliest otoitids and stephanoceratids, *Docidoceras wysogorskii* and *Westermannites chocsinskyi,* respectively, appear first in beds belonging into the Graphoceras concavum Zone. The type horizon of *W. telegdirothi*, the best-known stephanoceratid from Csernye, most probably is within the Hyperlioceras discites Zone. Two new species are described, the otoitid *Trilobiticeras* (*Emileites*) *kecskemetii* n.sp. and the stephanoceratid *Mollistephanus ottiliae* n.sp., both form the Ovale Bed. Faunal affinities and the early development of the Otoitidae and Stephanoceratidae are discussed.

Key words: Otoitidae, Stephanoceratidae, Aalenian, Bajocian, Ovale Zone, Bakonycsernye (Hungary)

Zusammenfassung

Neubesammlungen der mitteljurassischen Schichten der klassischen Bakonycsernye Lokalität haben reiche Ammonitenvergesellschaftungen aus dem obersten Aalenium und unteren Bajocium erbracht. Aus einer Schicht, welche hier als Ovale Schicht bezeichnet wird, stammt eine diverse Fissilobiceras ovale Zone Fauna, die gleich mehrere stratigraphisch wichtige Taxa sowie frühe Otoitiden und Stephanoceratiden enthält. Letztere beinhalten Topotypen von Arten, die bereits in den klassischen Monoraphien über die Lokalität beschrieben wurden. Die frühesten Vertreter der Otoitiden und Stephanoceratiden, *Docidoceras wysogorskii* bzw. *Westermannites chocsinskyi*, erscheinen erstmalig in Schichten, die zur Graphoceras concavum Zone gehören. Der Typushorizont von *W. telegdirothi*, die am besten bekannte Stephanoceratidenart von Csernye, liegt sehr wahrscheinlich innerhalb der Hyperlioceras discites Zone. Zwei neue Taxa werden beschrieben, zum einen der Otoitide *Trilobiticeras* (*Emileites*) *kecskemetii* n. sp., zum anderen der Stephanoceratide *Mollistephanus ottiliae* n. sp. Beide stammen aus der Ovale Schicht. Die faunistischen Beziehungen sowie die frühe Entwicklung der Otoitidae und Stephanoceratidae werden diskutiert.

Schlüsselwörter: Otoitidae, Stephanoceratidae, Aalenium, Bajocium, Ovale Zone, Bakonycsernye (Ungarn)

1. Introduction
(A.G., M.D. & Z.E.)

Bakonycsernye, one of the classic localities of Early and Middle Jurassic ammonites in the Mediterranean realm have been made known by the classic works of Prinz (1904) and Géczy (1966, 1967). The Lower Jurassic ammonites have been revised during the past decades (Géczy 1974; Géczy & Meister 1998, 2007; Galácz et al. 2008), but information on the Aalenian and especially on the Bajocian ammonites remained limited. In the meantime general interest have been raised in the appearance and earliest representatives of the important Middle Jurassic families Stephanoceratidae and Otoitidae. The topmost Aalenian – lowermost Bajocian ammonites in the former publications on the Bakonycsernye assemblages suggested a chance to contribute for clearing up the stratigraphic position of several early stephanoceratids and otoitids mentioned here formerly as *Docidoceras* or *Stephanoceras*.

With new collecting several topotypes of previously designated species and numerous examples of other early Otoitidae and Stephanoceratidae have

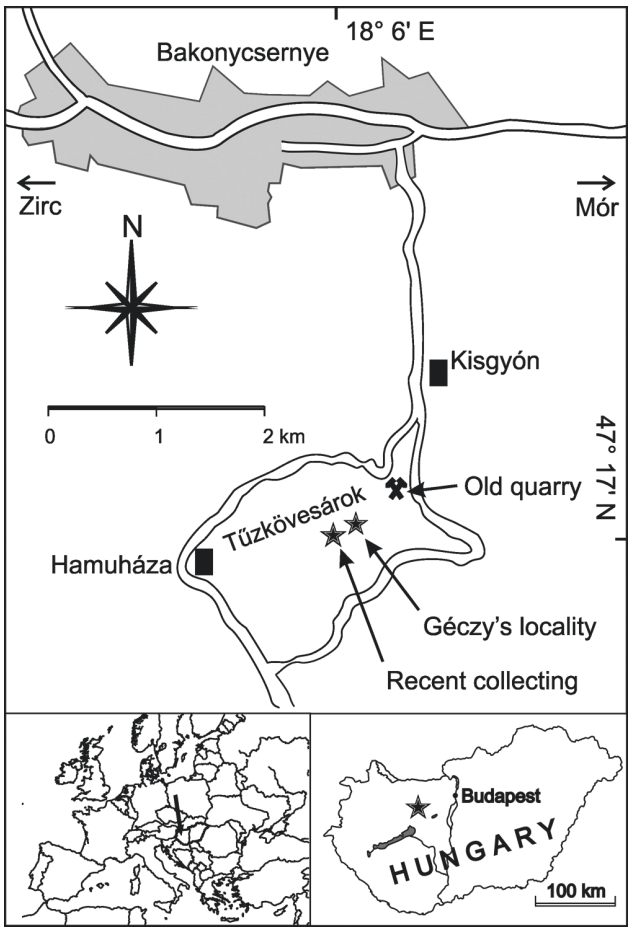
been collected, with accurate stratigraphic recordings. The collected material proved to be surprisingly rich in other, formerly unrecorded ammonites. These forms helped to establish a detailed stratigraphy, raising the value of the recognised other elements.

2. Locality and ammonite assemblages

2.1 Description and stratigraphy of the section

The studies are based on material from a recently excavated new section which was opened in some distance (ca. 50 m) from the main collecting site of the Lower Bajocian ammonites of Géczy (Textfig. 1). (The classic specimens of Hantken and Prinz were collected mostly from the loose as mixed in debris drifted by the temporary water flow in the Tűzkövesárok creek.) In this new section the Lower Bajocian layers, especially the one named here as Ovale Bed yielded far greater material than any collections before.

The newly excavated section reveals the 1.5 m thick rock sequence of the basal beds of the unfossiliferous radiolarite and the carbonates below. By lithostratigraphical arrangement, these rocks belong



Textfigure 1. Map of the Tűzkövesárok („Cherty ravine") localities of Bakonycsernye in Hungary.

to the Lókút Radiolarite and the underlying Tölgyhát Limestone formations, respectively (Főzy 2012). The section is intended to go down in the sequence as deep as possible both in technical and stratigraphic sense. In this paper only the uppermost Aalenian and the lowermost Bajocian part of the section is introduced, but since the collecting of the here studied fauna, the excavation and the sampling have been continued, resulting in extremely rich and beautifully preserved Aalenian and Toarcian ammonites.

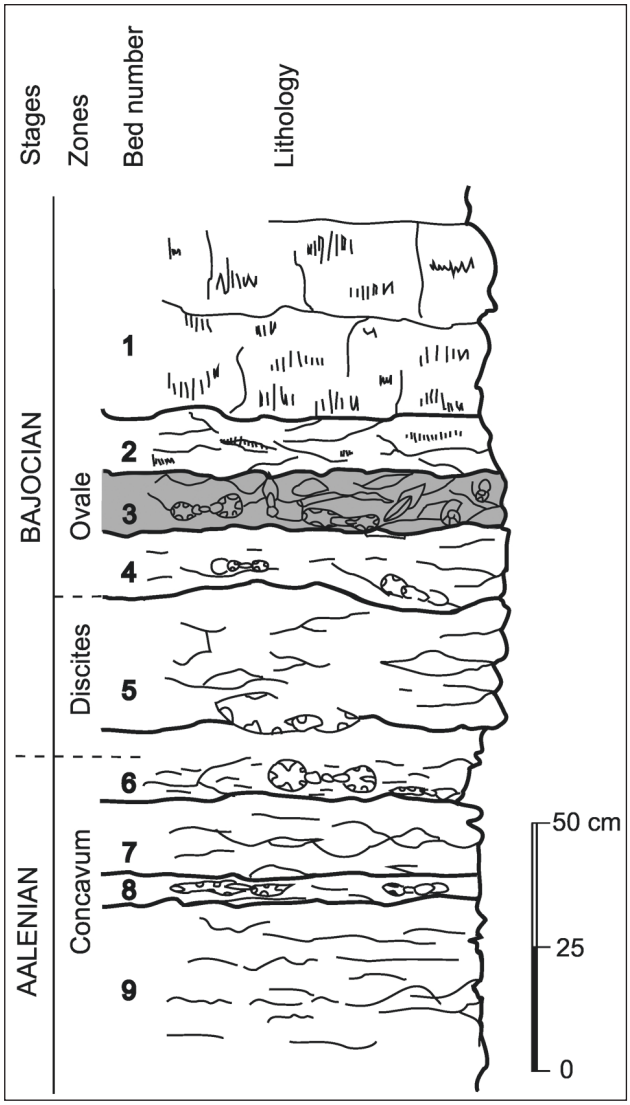
The here studied part of the section (Textfig. 2) shows in its lower 0.5 m a pinkish-reddish, nodular clayey limestone. The upper third of this limestone is a ca. 5 cm thick layer (Bed 8) with some ammonites, including ones belonging to *Hammatoceras, Erycites* and *Haplopleuroceras*. This is the first level of the earliest otoitids and stephanoceratids. The lithology shows a small change into pale, greyish-pinkish nodular limestone with clayey interlayers forming a 0.4–0.5 m thick unit. Its basal clayey layer (Bed 6) yielded a *Graphoceras concavum* specimen, and a few *Docidoceras* and *Westermannites*. These lowermost layers (Beds 8, 7, and 6) belong into the upper Aalenian Graphoceras concavum Zone, on the basis of the occurrence of the zonal index.

The main part (Bed 5) of the greyish-pinkish nodular limestone is almost barren for fossils, only some poorly preserved, large (20–30 cm) phylloceratids occur. This part most probably represents the Hyperlioceras discites Zone, with a single *Westermannites telegdirothi* from a corresponding bed in a nearby collecting point (see below). *Hyperlioceras*, the genus which ranges through the Discites Zone, was never recorded in Csernye, while appears in the Gerecse Mts, with *W. telegdirothi* (see Cresta & Galácz 1990).

The next member of the sequence is a grey or greenish-yellowish marl with hard limestone nodules. In its lower 15 cm thick part (Bed 4) some rare ammonites, incl. '*Docidoceras*' specimens appear, whilst in the upper, similarly thick part (Bed 3) an enriched assemblage occurs. This is the main fossil layer, called here 'Ovale Bed', because it yielded large specimens of *Fissilobiceras ovale*. This part of the section belongs into the Fissilobiceras ovale Zone. Apart from the zonal index, diagnostic is the appearance of several s. str. *Bradfordia*, indicating the basal part of the zone. The same is suggested by the absence of *Witchellia romanoides*, the species characteristic to the higher parts of the Ovale Zone.

The overlying unfossiliferous beds (Beds 2 and 1) show a transition towards the radiolarite with nodular, siliceous marl layers, then thick-bedded, siliceous limestone.

Géczy (1966: p. 11), on the basis of his field studies, gave practically the same description of this part of the sequence. He even mentioned a portion (as he measured, of 60 cm thickness) poor in ammonites. This may partly correspond to Bed 5 and 4 of the now excavated section (Textfig. 2). He also



Textfigure 2. The stratigraphy and the lithology of the recently collected and here discussed Tűzkövesárok section.

recognised that most of the Lower Bajocian ammonites came from a single bed what he mentioned as 'banc du *Docidoceras*' or 'horizon à *Docidoceras*'.

The old and the new section, with practically the same lithologies resulted in ammonite collections with some significant differences. The most conspicuous is the richness and the far bigger diversity revealed by the recent collecting. This can probably due to the not uncommon preservation pattern of sediments and buried organic remains in starving sedimentary basins, where the slowly accumulating fine-grained deposits remain subject long to the winnowing effect of bottom currents. These latters result in local, lenticular enrichment of shells, while in other places, commonly nearby, non-depositions (i.e. stratigraphic gaps) or fossil-free layers appear. Thus it well may be that former collecting works found the Ovale Bed or its equivalent as a poorly-fossiliferous or even barren part of the section.

This is particularly true to the non-stephanoceratid elements of the assemblages. Whilst earlier authors noticed and reported the presence of most of the now identified otoitids and stephanoceratids, only *Bradfordia gracililobata*, *'Sonninia' ovale*, and a few other, poorly preserved sonniniids were documented in the classic works (see Géczy 1966, 1967).

Another interesting fact is that the probably best-known early stephanoceratid from Csernye, *Westermannites telegdirothi* (Géczy, 1967) did not turn up during the otherwise surpassingly rich new collecting. A single specimen came from a site nearby, from a bed corresponding to the almost barren Bed 5 of the main target section (Textfig. 2) of the recent collecting. This specimen (illustrated here in Textfigs 3, 4) is very similar to the type (Géczy 1967: pl. 62, fig. 1) in size and in poor sculpture, partly due to preservational causes. In the Gerecse Mts, a north-eastern member of the Transdanubian Range, former studies firmly established the Discites Zone age of this species (Cresta & Galácz 1990: p.170). This singular recent find supports the above detailed interpretation of the differences between the old and new collections, indicating that Géczy, in the 1960's had the chance to collect more fossiliferous rock equivalents of layers now found almost barren.

2.2 General characteristics of the fauna

The preservation of the ammonites, practically the single group of fossils found here in these beds, is characteristic in rosso ammonitico limestones below siliceous marls and radiolarites. All ammonites appear as heavily subsolved internal moulds with upper halves merged into the carbonate matrix. Most specimens lie parallel to the bedding surfaces, but in the Ovale Bed, which is packed with ammonites, the final embedding was chaotic, probably because of agitation effect of infaunal mud burrowers.

The most conspicuous feature of the here studied ammonite assemblages is the extremely high diversity. Most of the specimens came from a single, 20 cm layer ('Ovale Bed', see Textfig. 2), and they show both generic and specific diversity very high. Most common ammonites are the phylloceratids with the species *Phylloceras perplanum* Prinz, *P. baconicum* Hantken in Prinz, *P. supraliasicum* (Pompeckj), *Ptychophylloceras tatricum* (Pusch), *Calliphylloceras altisulcatum* (Prinz) and *Holcophylloceras ultramontanum* (Zittel). Lytoceratids are subordinate in representation, the species *L. subfrancisci* Sturani and *Alocolytoceras isztimeri* Galácz & Kassai appear with several specimens. Hammatoceratids, sonniniids (incl. witchelliids) are moderately represented, haploceratids (incl. *Hebetoxyites* and *Bradfordia*) are rare, and most common are otoitids and stephanoceratids. From the Lower Bajocian collection, 101 Ammonoidea specimens were studied systematically, and the percentage distributions are as follows:

Systematic group	Representation in % of total specimens collected
Hammatoceratidae (*Fissilobiceras*)	8
Sonniniidae (Sonniniinae + Witcheliinae)	10
Hebetoxyitidae	3
Strigoceratidae	2
Oppeliidae (Bradfordiinae + Oppeliinae)	6
Otoitidae	22
Stephanoceratidae	49

Altogether, 23 species of 14 genera or subgenera were identified from the Ovale Bed, a richness comparable only to that of some beds in the English Inferior Oolite or similar layers in Normandy.

2.3 Faunal affinities

As of affinity to similar assemblages, the Swabian faunas, including that of the type locality in the Wutach, are rare and dominated by *Fissilobiceras* and sonniniids, with very subordinate and sporadic early otoitids and stephanoceratids (Dietze et al. 2005; Dietze et al. 2012; Ohmert 1988, 2004). In southern England (Parsons 1974; Dietze et al. 2007) the sonniniids and witchelliids show remarkable diversity, with subordinate *Fissilobiceras*, oppeliids (incl. *Bradfordia*), otoitids, while strigoceratids and stephanoceratids appear with single species. The Dorset and Somerset assemblages are similar to that in Csernye, but interestingly the sonniniids + witchelliids and the otoitids + stephanoceratids show inverted dominance and diversity. This was formerly suggested as caused by bioprovincialism (Dietze et al. 2007: p. 20), and indeed, looking at typical Tethyan areas, such as the Apennines (Cresta & Galácz 1990), the same groups appear in similar quantitative distribution. Subbetic faunas (Sandoval 1990) having been distributed in epeiric seas facing the western Tethys, show high diversity and rich representation of early otoitids and stephanoceratids. In the Cordillera Iberica the diversity in the Ovale Zone is high, with early otoitids and stephanoceratids occurring frequently in some places (Fernández-López 1985: pp. 722–724). The assemblages in the Lusitanian basin (see Rocha et al. 1990) show transitional features.

Surprisingly, the closest similarity in morphogroups is shown with the assemblages of the Alaskan Kialagvik Formation. These were described by Westermann (1969) from his 'S. sowerbyi Zone', which roughly corresponds to the European Ovale Zone and the lower part of the Laeviuscula Zone. Survivors from the Discites Zone (e.g. *Eudmetoceras*) and endemic genera (*Alaskinia*) occur, but other genera, partly with endemic species, are very similar to those of Csernye. There are 4 phylloceratid and one lytoceratid species, and *Praeoppelia, Hebetoxyites, Euhoploceras, Witchellia*, early otoitids as *Docidoceras*, *'Pseudocidoceras'*, and *Pseudotoites*, as well as *Trilobiticeras* are represented, and early stephanoceratids also occur, with '*Docidoceras* (*Docidoceras*?) sp. aff. *D. longalvum'*. Remarkable is the dominance of otoitids in the Ammonoidea, which is, together with the representation of phylloceratids, is a strong Tethyan feature. Westermann (1969: pp. 23–30) discussed this affinity in detail, and this Tethyan affinity supported the identifying of the Peninsular Terrane within the Athabascan Province in the North Cordilleran Region (see Taylor et al. 1984: p. 129).

Recently a summary from Tibet (Yin 2010) documented rich representation of *Westermannites* (and possibly *Riccardiceras*) from beds equivalent to the European Discites Zone. The mainly fragmentary specimens are shown together with *Haplopleuroceras*, *Euhoploceras* and *Amblyoxyites*, which occur with species reminding Alaskan forms.

3. Systematic descriptions

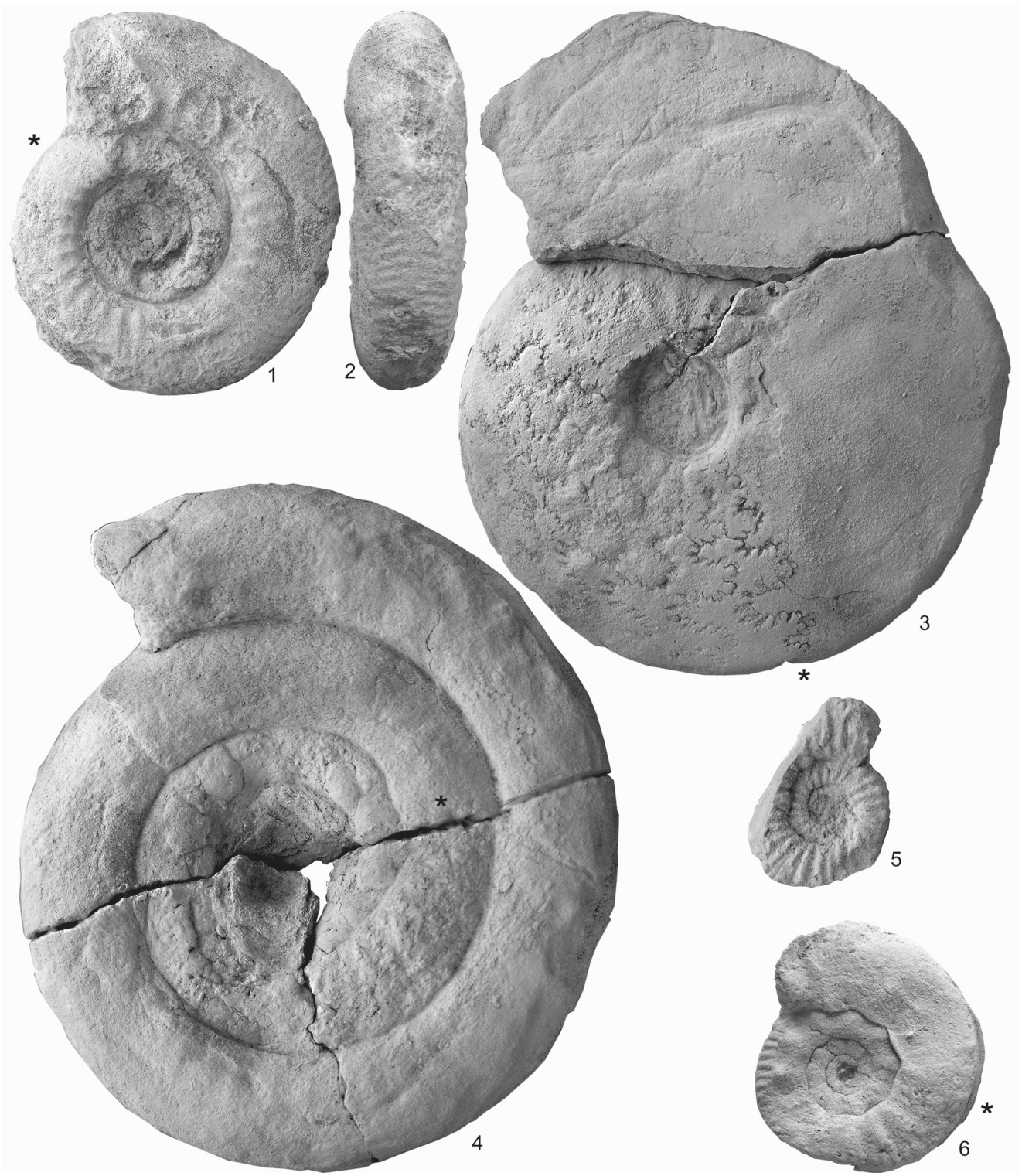
(A.G.)

3.1 General remarks

The majority of the here described ammonites belongs to two private collections, owned by coauthors Zoltán Evanits and Mihály Dunai. Their specimens are numbered with initials EZPC and DM, respectively. They donated generously the type specimens of the here designated new species to the collections of the Natural History Museum of the Eötvös L. University, where some other discussed specimens also belong. These latter specimens are registered as EMNH (Eötvös L. University, Museum of Natural History). The also discussed and illustrated type specimens of formerly designated species of Prinz and Géczy are from the collections of the Hungarian Geological and Geophysical Institute (Magyar Földtani és Geofizikai Intézet, MFGI), and are cited with the inventory numbers accordingly.

In this work only the Aalenian-Bajocian stephanoceratids and other Bajocian elements from the succession are treated, the uppermost Aalenian non-stephanoceratid forms are presented here only for establishing the stratigraphy around the Aalenian/Bajocian boundary. The following diagnostic Aalenian ammonites were found in the topmost part of the pinkish-reddish, nodular rosso ammonitico (Bed 8) and in the basal few centimetres of Bed 6 (see in Textfig. 2):

Hammatoceras spinosum Hantken in Prinz, 1904 (Textfig. 3,6). A topotype (EZPC 7482) of the species



Textfigure 3. Some diagnostic Upper Aalenian ammonites from Beds 6 and 8, and a *Westermannites telegdirothi* (Géczy, 1867) topotype. **(1, 2)** *Erycites* sp. aff. *fallifax* Arkell, 1957; EZPC1681, Bed. 8. **(3)** *Graphoceras concavum* (J. Sowerby, 1815); EZPC7160, Bed 6. **(4)** *Westermannites telegdirothi* (Géczy, 1967). A topotype specimen from a nearby site, probably equivalent of the Discites Zone. **(5)** *Haplopleuroceras crassum* Gérard, 1938; EZPC6824, Bed 8. **(6)** *Hammatoceras spinosum* Hantken in Prinz, 1904; EZPC7482, Bed 8. Asterisk marks end of phragmocone. All photos natural size.

described first by Prinz from the original material of Hantken, then redescribed by Géczy (1966: p. 49). The species was recently discussed in detail by Galácz & Kovács (2013). Whilst earlier records from Csernye indicated the Ludwigia murchisonae Zone as stratigraphic provenance, this specimen now is from the Concavum Zone (Bed 8), together with the first stephanoceratids. This is seemingly a juvenile example showing the end of the phragmocone at 3.5 cm diameter.

Erycites sp. aff. *fallifax* Arkell, 1957 (Textfig. 3,1–2) (EZPC 1681). A small *Erycites* preserved with the aperture. It shows close similarity to *E. fallifax* Arkell, but it has denser ribbing with shorter primaries. Earlier records from Csernye (in Géczy 1966) indicated the Murchisonae Zone beds as the main source of the rich local *Erycites* material, however a single *E. fallax fallax* specimen was found 'dans le sommet de l'Aalenian supérieur' (Géczy loc. cit.: p. 109). This specimen is from Bed 8.

Haplopleuroceras crassum Gérard, 1938 (Textfig. 3,5). The specimen (EZPC 6824) is an incomplete, poorly preserved example from Bed 8. This is especially similar to „*Haplopleuroceras subspinatum*" in Roman & Gennevaux (1912: pl. 3, fig. 1), what Gérard (1938: p. 623) ranged into his newly designated species *H. crassum*. The depressed whorls and the coarser, rarer ribs are distinguishing features.

Graphoceras concavum (J. Sowerby, 1815) (Textfig. 3,3) (EZPC 7160). This zonal index species was previously documented also by Géczy from Csernye (1967: p. 218), though he also had a single specimen. The here illustrated example came from the very base of Bed 6, indicating that the biostratigraphic and the lithologic boundaries do not coincide here in this section.

Several additional ammonites (*Hebetoxyites* sp., *Riccardiceras* spp.) ranging through the Aalenian/Bajocian boundary are treated below.

3.2 Species descriptions

Family Hammatoceratidae Buckman, 1887

Genus *Fissilobiceras* Buckman, 1919

Type species *Ammonites fissilobatus* Waagen, 1867.

Fissilobiceras is the temporally last representative of the large Family Hammatoceratidae (see Howarth 2013). There is a comprehensive discussion on the genus and its successive species from the Discites up to the Humphriesianum Zone in Dietze et al. (2005: pp. 62–70).

Fissilobiceras ovale (Quenstedt, 1886)
Pl. 1; Pl. 2, Fig. 1.

	1886	*Ammonites Sowerbyi ovalis* – Quenstedt, p. 496, pl. 62, fig. 1.
v	1966	*Sonninia ovalis* (Quenstedt 1886)? – Géczy, p. 125, pl. 34, fig. 2, pl. 44, fig. 1.
	1985	*Sonninia ovalis* (Qu. 1886) – Schlegelmilch, pl. 17, fig. 3, pl. 18, fig. 1.
	2005	*Fissilobiceras ovale* (Quenstedt, 1886) [M] – Dietze et al., p. 63, fig. 35. (*cum syn*.)
	2007	*Fissilobiceras ovale* (Quenstedt, 1886) [M] – Dietze et al., p. 16, pl. 8, figs 1,2.
	2012	*Fissilobiceras ovale* (Quenstedt, 1886) – Dietze et al. p. 105, pl. 1, figs 1–2, pl. 2, figs 1–4, pl. 3, figs 1–3, pl. 4, figs 3,4.

Material: Eight specimens including a half-broken large phragmocone and internal whorls, all from the Ovale Bed (Bed 3 in Textfig. 2).

Description: The large specimen (Pl. 1) is ca. 250 mm and still septate. It has low umbilical side, narrowly rounded umbilical corner, gently convex, almost flat flanks and narrow, flattened ventral side with a pronounced keel. The umbilicus remains narrow throughout. The inner whorls (Pl. 2, Fig. 1), up to 50–60 mm diameter show very lowly rounded, wide ribs, then the whorls remain completely smooth. The suture-line with the large, asymmetric lateral lobe, so beautifully shown on the lectotype (Schlegelmilch 1985: pl. 17, fig. 3), is well visible even on the subsolved surface of the specimen.

Remarks: The lectotype was designated by Oechsle (1958: p. 93), and refigured by Schlegelmilch (1985) and later (as a plaster cast) by Dietze et al. (2012: pl. 1, figs 1, 2). This is a species with wide geographical distribution in Europe. Géczy (1966) was the first to document it in the Mediterranean realm. His illustrated phragmocone fragment (loc. cit.: pl. 34, fig. 2) shows the same features what the now collected examples display.

Family Sonniniidae Buckman, 1892

Subfamily Sonniniinae Buckman, 1892

Genus *Sonninia* Douvillé, 1879

Subgenus *Euhoploceras* Buckman, 1913

Type species: *Sonninia acanthodes* Buckman, 1889.

Euhoploceras is traditionally kept as subgenus name for sonniniids with wide umbilicus, rounded whorls and tuberculate or spinous, rursiradiate ribs.

Sonninia (*Euhoploceras*) *adicra* (Waagen, 1867)
Pl. 2, Figs 5, 6.

	1867	*Ammonites adicrus* Waagen sp. – Waagen, p. 591, pl. 25, fig. 1a, b.
v	1966	*Sonninia adicra* (Waagen, 1867) – Géczy, p. 124, pl. 35, figs 1,2, pl. 44, fig. 3.
	2005	*Sonninia* (*Euhoploceras*) *adicra* (Waagen, 1867) [M] – Dietze et al., p. 25, figs 7–10 (*cum syn*.)

Material: Four incomplete specimens from the Ovale Bed (Bed 3 in Textfig. 2).

Description: The illustrated specimen is a seemingly subadult example with damaged and repaired keel. However it shows the main characteristic morphological elements: the comparatively wide umbilicus, the inflated whorl-section and the strong tubercles of the inner whorls which sit on rectiradiate, strengthened ribs. On a fragmentary adult specimen

Plate 1: *Fissilobiceras ovale* (Quenstedt, 1886). Wholly septate internal mould. Ovale Bed (Bed 3); EZPC7542. Natural size.

the irregularity shown by the ribs and tubercles is well visible.

Remarks: Recently Dietze et al. (2005) gave a wider interpretation of the species, giving variety status for several previously introduced 'species'. In the here studied material this form is too rarely represented to judge on its finer taxonomic (i.e. infraspecific) status.

Sonninia (*Euhoploceras*) *berckhemeri* Dorn, 1935
Pl. 2, Fig. 2.

1935 *Sonninia berckhemeri* nov. sp. – Dorn, p. 31, pl. 21, fig. 1, textfig. pl. 2, figs 1, 2.
1937 *Sonninia Sowerbyi* Miller var. *subtrigonata* var. nov. – Gillet, p. 20, pl. 1, fig. 2, pl. 2, fig. 8, textfigs 10, 11.
1985 *Sonninia berckhemeri* Dorn 1935 – Schlegelmilch, p. 59, pl. 15, fig. 3.
2005 *Sonninia* (*Euhoploceras*) *adicra* (Waagen), var. *berckhemeri* ex Dorn 1935 sp. [M] – Dietze et al., p. 29, fig. 11.

Material: A single specimen form the Ovale Bed.

Description: The specimen is a 125 mm diameter internal mould which is septate up to 120 mm, showing only a short part of the bodychamber. Characteristic is the appearance of very short inner ribs with pointed tubercles in the umbilicus. The tubercles lose sharpness on the middle whorl, where only radial, slightly forwardly curved, weak ribs remain. Well before the end of the phragmocone, all sculptural elements disappear leaving the convergent, somewhat arched flanks smooth. The umbilicus remains narrow throughout.

Remarks: Dietze et al. (2005) regarded *Sonninia berckhemeri* as a variety of *S*. (*Euhoploceras*) *adicrum* (Waagen). In the here studied material sonniniids are very subordinately represented, without intermediates, thus keeping the morphospecific name seems useful to express the morphological identity.

Subfamily Witchelliinae Callomon & Chandler, 2006 (in Chandler et al. 2006)

Genus *Witchellia* Buckman, 1889

Type species 'Ammonites *laeviusculus* J. de C. Sowerby, designated by Buckman (1889, in 1887–1907: p. 82).

Witchellia jugifera (Waagen, 1867)
Pl. 3, Figs 1,2.

1867 *Ammonites jugifer* Waagen n. sp. – Waagen, p. 596, pl. 26, fig. 3.
1985 *Sonninia jugifera* (Waagen 1867) – Schlegelmilch, p. 60, pl. 16, fig. 2.
2005 *Witchellia jugifera* (Waagen, 1867) [M] – Dietze et al., p. 59, fig. 34a. (*cum syn*.)
? 2007 *Witchellia* cf. *jugifera* (Waagen) – Dietze et al., p. 14, pl. 5, fig. 2.
2007 *Witchellia jugifera* (Waagen) [M] – Dietze et al. p. 14, pl. 5, fig. 3a, b.
2009 *Witchellia jugifera* (Waagen) [M] – Dietze et al. p. 21, textfig. 3a, b.
? 2009 *Witchellia* cf. *jugifera* (Waagen) [M] – Dietze et al. p. 14, pl. 5, figs 10, 11

Material: Five specimens from the Ovale Bed. All are poorly preserved, with subsolved surface and hardly visible innermost whorls.

Description: These incomplete specimens show maximum 125 mm diameter and septation up to ca. 90 mm. The umbical wall is perpendicular, the lateral side is flat or gently convex, the keeled venter is depressed, thus the whorl-section is quadrangular. The umbilicus is relatively narrow, the umbilical seam running at about the middle of the flanks. The ribbing is strong on the middle whorls, weakening gradually towards the bodychamber. Most ribs on the middle whorls appear in twos with a few unconnected intercalatories, all are falcoid, whilst the bodychamber bears only faint, simple ribs which completely fade out distally.

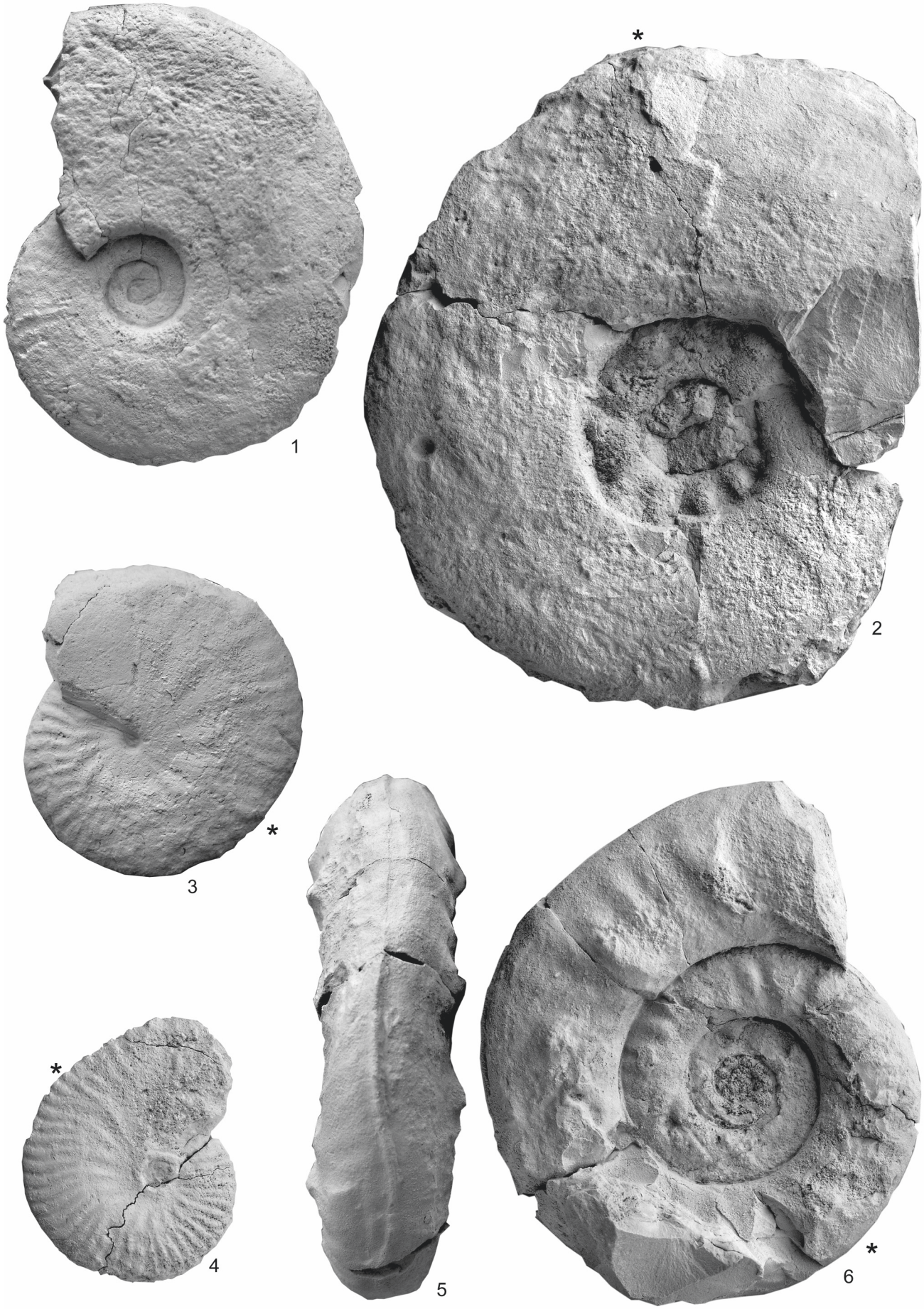
Remarks: The recently designated lectotype (Dietze et al. 2007: pl. 5, fig. 3) is a wholly septate specimen, apparently the phragmocone of a big species. It shows how narrow is the umbilicus on the last septate whorl, and how the strong ribs become falcoid above mid-flank. The lectotype and further specimens from Swabia are from the Ovale Zone (oechslei Horizon, Dietze et al. 2007: p. 60); the here described Csernye examples came from the same zone.

Witchellia sayni Haug, 1893.
Pl. 3, Fig. 3.

1885 *Ludwigia corrugata*, Sowerby, sp. – Douvillé, p. 26, pl. 2, figs 1–5, pl. 3, figs 1, 2, textfigs 6,7.
1893 *Witchellia sayni* n.sp. – Haug, p. 308.
? 1988 *Witchellia sayni* (Haug) – Fernández-López et al., p. 312, pl. 1, fig. 5.
? 1990 *Witchellia sayni* (Haug) – Sandoval, p. 154, pl. 1, fig. 5.
2007 *Witchellia sayni* (Haug) – Dietze et al. p. 13, pl. 6, figs 1a, b.

Material: Two well-preserved specimens from the Ovale Bed.

Plate 2: (1) *Fissilobiceras ovale* (Quenstedt, 1886). Wholly spetate internal whorls; DM2013/031. **(2)** *Sonninia* (*Euhoploceras*) *berckhemeri* Dorn, 1935; EZPC6840. **(3)** *Hebetoxyites incongruens* Buckman, 1924; EZPC7544. **(4)** *Hebetoxyites mouterdei* Fernández-López, 1985; DM2013/015. **(5, 6)** *Sonninia* (*Euhoploceras*) *adicra* (Waagen, 1867); DM2013/040. All specimens from the Ovale Bed (Bed 3) = Fissilobiceras ovale Zone. Asterisk marks end of phragmocone. All photos natural size.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Description: The beautiful big specimen (Pl. 3, Fig. 3) is septate up to 140 mm diameter, and shows only 1/5 whorl of bodychamber, indicating adult size of about 200–220 mm. The coiling is moderately evolute on the middle whorls with slightly narrower umbilicus on the last preserved whorl. Because of preservation, sculpture is visible only from the middle whorls outwards. It consists of low, rounded, weak ribs which fade out well before the end of the phragmocone, and return as very faint, irregular costae on the bodychamber.

Remarks and comparisons: On the basis of the original figures of Douvillé (1885: pl. 2, figs 1–5, pl. 3, figs 1, 2), most subsequent authors regarded *W. sayni* as a small species (e.g. Fernández-López et al. 1988; Sandoval 1990). However, Dietze et al. (2007: p. 14) selected the big specimen of Douvillé (1885: pl. 2, fig. 1) as lectotype, thus the scope of the species became wider. *W. sayni* and *W. jugifera* are very close morphologically; they are distinguished here by the wider umbilicus and the lower whorl-section on the middle whorls of *W. jugifera*, and by the finer, straight ribs in *W. sayni*. Another difference is in the shape of the cross-section: *W. jugifera* has gently convex whorl-sides, while *W. sayni* shows flattened flanks.

The small specimen of Fernández-López et al. (1988: pl. 1, fig. 5) came from the Laeviuscula Zone, and Sandoval (1990: pl. 1, fig. 5) illustrated another small specimens, from the Ovalis (Sub)Zone. These forms differ from the recently designated lectotype (see above) of which age remained uncertain (see Dietze et al. 2007: p. 34), but the co-occurrence with *Witchellia romanoides* suggests the Ovale Zone. The common recognition of the small forms which possibly differ on species level, might have led to use *W. sayni* as the index of the basal subzone of the Laeviuscula Zone. Dietze et al. (2005: p. 17) suggested to abandon the use of *W. sayni* as a subzonal index in the Laeviuscula Zone.

Superfamily Haploceratoidea Zittel, 1884

Family Hebetoxyitidae Buckman, 1924

Genus *Hebetoxyites* Buckman, 1924

Type species *Hebetoxyites hebes* Buckman, 1924.

This genus, which was so individual for Buckman to base a suborder, Hebetoxyitidae on it, is a particular group of forms which show intermediates between Bradfordiidae and Oppeliidae, and important differences from Strigoceratidae. Fernández-López (2012) argumented justly to keep this suborder separate, however, to place here the very *Oppelia*-like *Kleistoxyites* is ambiguous (see below).

In Csernye the collection yielded three specimens of this genus, each belonging to different species. Remarkable is that one of the specimens (Pl. 4, Fig. 3) came from Bed 8, i.e. from the Concavum Zone. This is the level of the earliest known representatives of the genus, however these earliest forms were hitherto known only from Southern Alaska and Oregon, i.e. from the Pacific realm (see Fernández-López 2012: p. 66). Because of its state of preservation this specimen remained undetermined on species level.

Hebetoxyites mouterdei Fernández-López, 1985
Pl. 2, Fig. 4.

1985 *Hebetoxyites* aff. *clypeus* Buckman – Fernández-López, p. 154. pl. 14, fig. 2A, B.
1985 „*Hebetoxyites*" *mouterdei* nov. sp. – Fernández-López, p. 155, pl. 14, fig.5A, B, textfigs 13, 14c.
1985 *Hebetoxyites incongruens* Buckman – Sandoval, p. 106, pl. 2, figs 5–9, textfigs 2–9.
2007 *Hebetoxyites hebes* Buckman – Dietze et al., p. 20, textfigs 7d, e.
2012 *Hebetoxyites mouterdei* Fernández-López – Fernández-López, p. 69, figs 4F, 7A–L, 8, table 3.

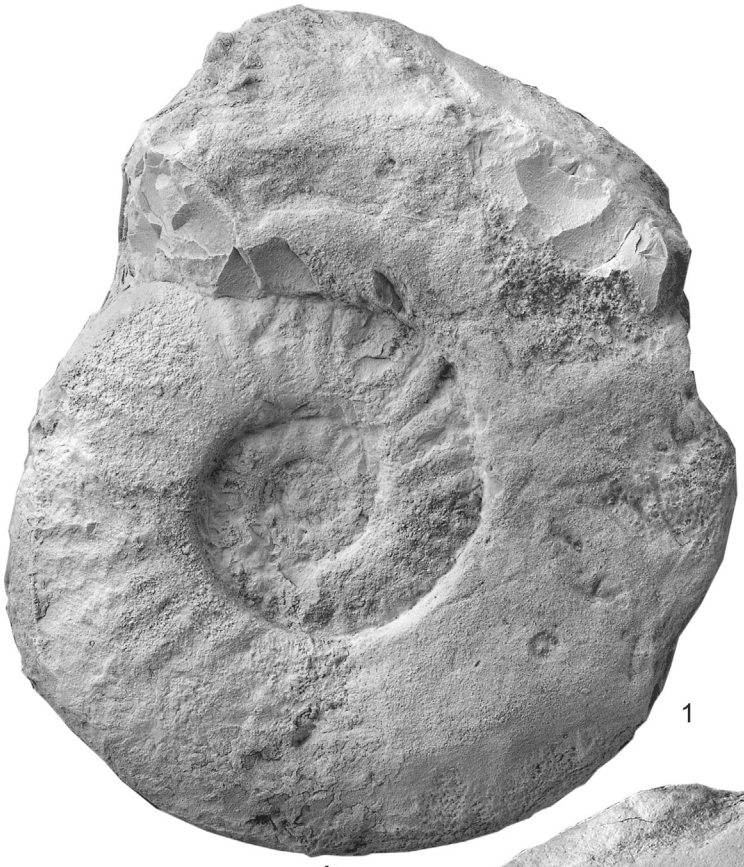
Material: A single specimen with incomplete bodychamber.

Description: This is a small, involute ammonite with well-differentiated rim as umbilical margin, what is encircled by a depressed part of the flank, giving a concavity on the inner third of the lateral side. The ribbing consists of short radial primaries arising after a smooth stripe above the umbilical rim, and of falcoid secondaries which branch in twos or threes from the primaries. The ribs terminate at the margin of the very narrow, sharp but unkeeled venter. The septal suture is dominated by the wide first and second lateral saddles, with a rather narrow and short lateral lobe in between.

Remarks: This specimen with its dimensions, periumbilical concavity and strong ribbing matches very well the members of the type series described and illustrated recently by Fernández-López (2012). While the Iberian specimens came from the Ovale and Laeviuscula zones, the forms illustrated by Dietze et al. (2007: fig. 7d, e), and regarded as synonyms by Fernández-López, came from the Ovale Zone, just as the one described here.

Hebetoxyites incongruens Buckman, 1924
Pl. 2, Fig. 3.

Plate 3: (1) *Witchellia jugifera* (Waagen, 1867); EZPC6835. **(2)** *Witchellia jugifera* (Waagen, 1867); DM2013/009. **(3)** *Witchellia sayni* Haug, 1893; DM2013/027. All specimens from the Ovale Bed (Bed 3) = Fissilobiceras ovale Zone. Asterisk marks end of phragmocone. All photos natural size.



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1924 *Hebetoxyites incongruens* nov. – Buckman (in 1909–1930), pl. 497.
non 1985 *Hebetoxyites incongruens* Buckman – Sandoval, p. 106, pl. 2, figs 5–9, textfigs 2–9.
1990 *Hebetoxyites incongruens* Buckman – Cecca et al., pl. 4, fig. 1.
2007 *Hebetoxyites incongruens* Buckman – Schweigert et al., p. 49, textfig. 27.
2012 *Hebetoxyites incongruens* Buckman – Fernández-López, p. 69, textfigs 4D, E, 6A–J, table 2.

Material: A single specimen.

Description: A medium-size oxycone ammonite with narrow umbilicus, flat whorl-sides and narrow, unkeeled venter. The sculpture consists of weak inner ribs which arise after a smooth area above the narrowly rounded umbilical margin, and stronger bi- or triplicate outer ribs branching from the primaries at midflanks. The ribbing becomes weaker on the bodychamber which begins at 47 mm diameter.

Remarks: The here described specimen matches very well the type figured by Buckman (1924: pl. 497) and refigured by Schweigert et al. (2007: textfig. 27). The type came from the Sandford Lane Fossil Bed, Sandford Lane Quarry, near Sherborne, Dorset, i.e. from the Laeviuscula Zone. The Iberian occurrence documented by Fernández-López (2012) is similarly of Laeviuscula Zone age, while the here described specimen came from the Ovale Zone (Bed 3 in Textfig. 2).

Family Strigoceratidae Buckman, 1924

Subfamily Strigoceratinae Buckman, 1924

Genus *Strigoceras* Quenstedt, 1886

Type species *Ammonites truellei* d'Orbigny, 1845

A comprehensive recent study is available about the genus (Schweigert et al. 2007). *S. compressum* is one of the earliest representatives of the genus which seems to appear with *S. praenuntium* (Buckman, 1924) down in the Brasilia bradfordensis Zone of the Middle Aalenian.

Strigoceras compressum Buckman, 1896
Pl. 4, Fig. 6.

1924 *Varistrigites compressus*, Etheridge sp. – Buckman (in 1909–1930), pl. 468.
pars v 1967 *Bradfordia gracililobata* (Vacek, 1886) – Géczy, p. 225, pl. 56, fig. 3 (only)
1985 *Strigoceras comprexum* (Etheridge) *sensu* Buckman 1924 – Sandoval, p. 93, pl.1, figs 2, 3.
2007 *Strigoceras strigifer* (Buckman) – Dietze et al., p. 17, textfig. 5a, b.
2007 *Strigoceras compressum* Buckman – Dietze et al., p. 17, textfig. 5c-d.
2007 *Strigoceras compressum* Buckman, 1896 – Schweigert et al., p. 12, textfigs 5, 6.

Material: Two specimens, one from the old Géczy collection.

Description: Relatively big specimens, the bigger one being wholly septate at 100 mm diameter. The coiling is very involute, with umbilicus of 3–4% width. The flanks are flattened, with a very shallow midflank groove. The ribbing is shown faintly on the internal mould. The outer ribs are visible as low, wedge-shaped, slightly forwardly curved costae starting from the median furrow of the flank. The sharp venter does not show traces of the hollow keel, but this can be due to the preservation. The suture-line cannot be seen entirely on either specimens, but visible portions indicate genuine strigoceratid suture, more complicated than that shown on the holotype (seen in Schweigert et al. 2007: fig. 5).

Remarks and comparison: There was an undetermined, bigger specimen in the old collection of Géczy, in a matrix clearly indicating the Ovale Bed (Bed 3), the same level yielding the recently collected example. Due to the state of preservation, the internal mould shows the sculpture feebly and the venter lacks the traces of hollow keel. Nevertheless, even the faint ribbing and the weakly discernible midflank groove, with the general habit of the specimens give strong indications of the species.

Family Oppeliidae Douvillé, 1890

Subfamily Bradfordiinae Donovan et al., 1981

Genus *Praeoppelia* Westermann, 1969

Type species *Bradfordia*? (*Praeoppelia*) *oppeliiformis* Westermann, 1969.

Westermann (1969: p. 48) introduced the subgeneric unit *Praeoppelia* within the genus *Bradfordia* for the group of *Oppelia gracililobata, O. subplicatella* (both of Vacek) and his Alaskan *P. oppeliiformis*. The scope of *P. gracililobata* was narrowed by Favre (1912: p. 7), who ranged the specimens on Vacek's pl. 10 figs 2 and 3 into *Oppelia praeradiata* Douvillé

Plate 4: (1) *Praeoppelia gracililobata* (Vacek, 1886); EZPC7157. **(2)** *Bradfordia costata* Buckman, 1910; DM2013/014. **(3)** *Hebetoxyites* sp.; EZPC1681. **(4)** *Bradfordia costata* Buckman, 1910; DM2014/023. **(5)** *Bradfordia costata* Buckman, 1910; DM2013/004. **(6)** *Strigoceras compressum* Buckman, 1896; DM2013/032. **(7)** *Kleistoxyites protrusus* Buckman, 1922; DM2013/35. All specimens from the Ovale Bed (Bed 3) = Fissilobiceras ovale Zone, but that on Fig. 3, what is from Bed 3, i.e. Concavum Zone. Asterisk marks end of phragmocone. All photos natural size.


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(1885: pl. 3, figs 6, 7) (now regarded *Bradfordia*).

Praeoppelia gracililobata (Vacek, 1886)
Pl. 4, Fig. 1.

v 1886 *Oppelia gracililobata* n.sp. – Vacek, p. 83, pl. 10, figs 1 and 4 (only).
v 1904 *Oppelia gracililobata*, Vacek, mut. nov. – Prinz, p. 129, pl. 4, fig. 1.
v 1967 *Bradfordia gracililobata* (Vacek, 1886) – Géczy, p. 225, pl. 56, fig. 3, pl. 57, figs 1, 3, pl. 65, fig. 79, Textfig. 238.
v 1967 *Bradfordia* cf. *subplicatella* (Vacek, 1886) – Géczy, p. 227, pl. 58, fig. 1, textfig. 239.
1971 *Bradfordia* (*Praeoppelia*) *gracililobata* (Vacek), 1886 – Sapunov, p. 79, pl. 1, fig. 5, pl. 2, figs 1,2.
1983 *Bradfordia* (*Praeoppelia*) cfr. *gracililobata* (Vacek) – Pavia, pl. 7, fig. 9.
1985 *Praeoppelia* cf. *gracililobata* (Vacek) – Fernández-López, p. 182, pl. 16, fig. 6, textfig. 17I, D.
1988 *Praeoppelia gracililobata* (Vacek) 1886 – Sadki, p. 237, pl. 1, fig. 16.
2009 *Praeoppelia gracililobata* (Vacek) – Dietze et al., 24, pl. 4, fig. 2.

Material: Three specimens.

Description: A medium-size compressed ammonite with narrow (6%) umbilicus, slightly convex flanks and narrowly rounded venter. Characteristic is the slightly raised umbilical margin and the faint ribbing which fades out on the bodychamber. In the septal suture the shallow external lobe, the large, wide first lateral lobe and the big, emerged first lateral saddle are the main distinguishing elements.

Remarks and comparisons: Géczy (1967: p. 225) described and documented the species from Csernye in every detail and with fine figures (see synonymy).

Most of the specimens illustrated in the literature are medium-size or small forms, and their identifications are apparently based on the cross-section figure of Vacek (1886: pl. 10, fig. 6) what shows emerged umbilical shoulder, relatively broad whorls and widely rounded venter. The Csernye material illustrates well the aspects of the species in adult stage what may attain 160–170 mm diameter.

Genus *Bradfordia* Buckman, 1910

Type species *Bradfordia liomphala* Buckman, 1910

Bradfordia costata Buckman, 1910
Pl. 4, Figs 2–5.

1910 *Bradfordia costata,* sp. nov. – Buckman, p. 94, pl. 10, fig. 6, pl. 11, fig. 1.
? 1988 *Bradfordia* (*Bradfordia*) *costata* Buckman 1910 – Sadki, p. 231, pl. 1, figs 5,6.
? 1989 *Bradfordia* (*Bradfordia*) *costata* Buckman – Benshili, p. 175, pl. 23, fig. 2.
? 1990 *Bradfordia* (*Bradfordia*) *costata* Buckman 1910 – Benshili, p. 78, pl. 1, fig. 4 (refiguration of the former in Benshili 1989)

Material: Four specimens including two well-preserved adults and a juvenile.

Description: Comparatively big species attaining 90 mm maximum diameter with half-whorl bodychamber. The umbilicus is relatively narrow (13%), the whorl is relatively wide, with ca. 30% values. In the middle whorls the ribbing consists of dense simple ribs arising on the inner third of the flank. On the last whorl the ribs become rarer and coarser, they leave smooth the inner half, then the inner two-thirds of the flank, and run characteristically backward, forming the so distinct *Bradfordia*-ribbing. The ribs end on the sides of the narrow, highly rounded venter.

Remarks and comparisons: As Buckman (1910: p. 94) described, this species differs from the other, big *Bradfordia* (*B. liomphala*) by its stouter whorls, coarser ribs and distinct umbilical rim. The smaller forms illustrated by Sadki (1988: pl. 1, figs 5, 6) have wedge-shaped ribs and very distinct ventrolateral margin, features never seen in *Bradfordia* s. str. The specimen illustrated by Benshili twice (in 1989 and 1990) is too incomplete to show characters well. As for stratigraphy, Buckman (1910: p. 94) referred his specimen from the upper part of the Bradford Abbas Fossil Bed, which belongs to the upper part of the Discites Zone (Bj-3, see Callomon & Chandler 1990: p. 95). The Bakonycsernye specimens all came from the Ovale Zone (Bed 3 in Textfig. 2).

Subfamily Oppeliinae Douvillé, 1890

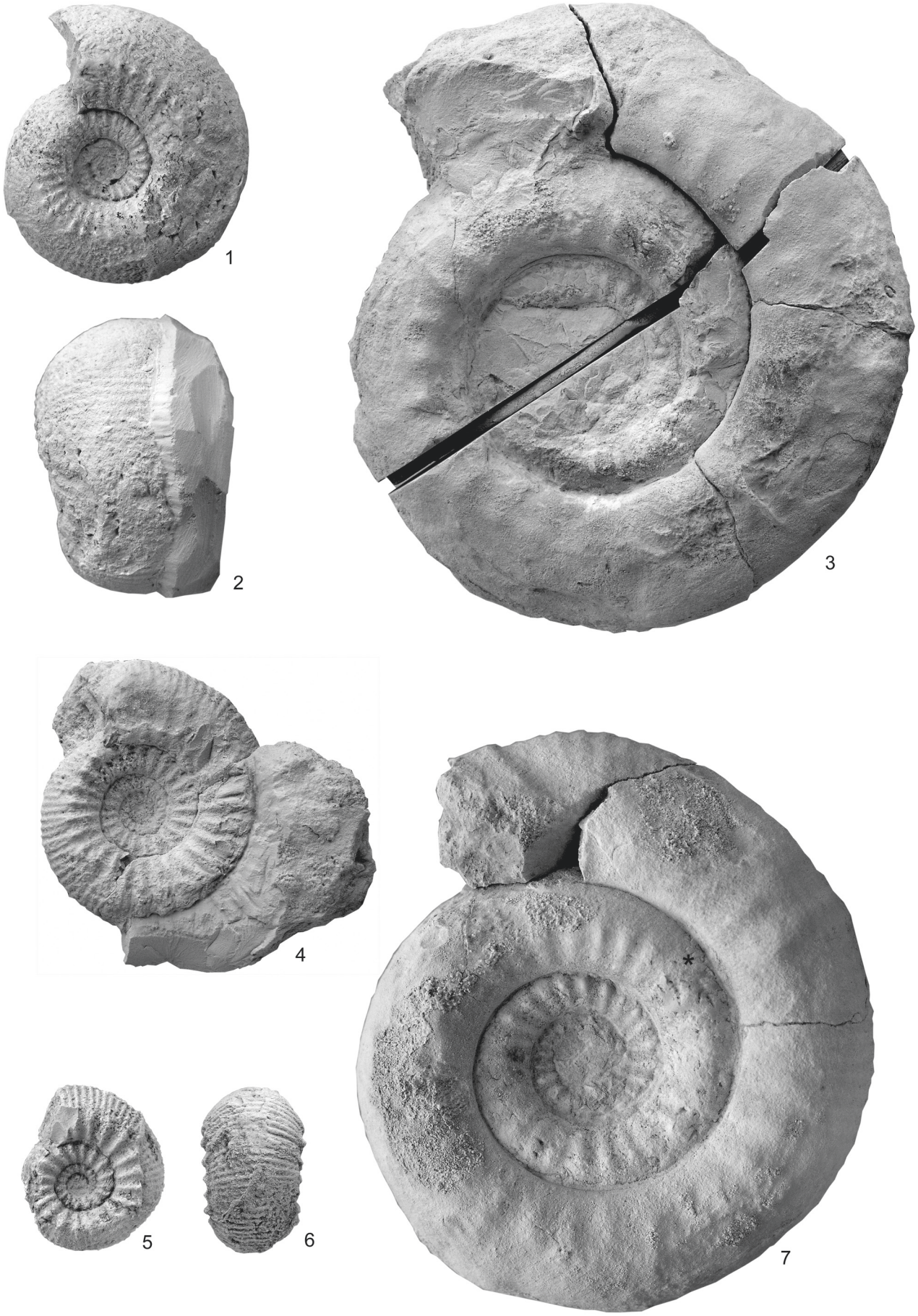
Genus *Kleistoxyites* Buckman, 1922

Type species (by monotypy) *Kleistoxyites protrusus* Buckman, 1922

Kleistoxyites protrusus Buckman, 1922
Pl. 4, Fig. 7.

1922 *Kleistoxyites protrusus*, nov. – Buckman (in 1909–1930), pl. 317, figs 1–4.

Plate 5: (1, 2) *Docidoceras cylindroides* Buckman, 1919; DM2013/007. **(3)** *Docidoceras zemistephanoides* Géczy, 1967, holotype MFGI J2657. **(4)** *Docidoceras zemistephanoides* Géczy, 1967, topotype, middle whorls; DM2013/048. **(5, 6)** *Docidoceras zemistephanoides* Géczy, 1967, topotype, inner whorls; DM2013/043. *Docidoceras zemistephanoides* Géczy, 1967, topotype, entire specimen; DM2013/049. All specimens from the Ovale Bed (Bed 3) = Fissilobiceras ovale Zone, but that on (3) what is from 'Bajocien inférieur' (see Géczy 1967: p. 233). Asterisk marks end of phragmocone. All photos natural size. The holotypes of Prinz (1904) and Géczy (1967) illustrated here and followingly were cut half by Géczy to trace the cross-section accurately.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Material: Three incomplete specimens.

Description: A thinly-whorled, relatively big oppeliid with very narrow, almost closed umbilicus. The lateral sides are flat with a slight break somewhat below midflanks. The sculpture is hardly visible in these internal moulds, but the lowly flattened ribs are discernible. These arise around the lower third of the flank, bifurcate shortly after, releasing forwardly curved secondaries. At 60–70 mm diameter, still on the phragmocone, the inner ribs fade out and the elongated outer ribs remain the only sculptural elements. Entire suture-line cannot be seen in any of the specimens, but some portions indicate a pattern more complicated than on the holotype. Entire bodychamber and aperture are not preserved. Buckman indicated (1922, on pl. 317) the very big size giving „max c. 200 +", and indeed, the biggest specimen from Csernye is septate up to at least 110 mm diameter.

Remarks: The holotype came from the upper part of the Bradford Abbas Fossil Bed, which represents the upper part of the Discites Zone (Bj-3 horizon, see Callomon & Chandler 1990: p. 97). Formerly regarded as strigoceratid, this monospecific genus was excluded from that subfamily by Schweigert et al. (2007: p. 49), because the type specimen lacks strigation and hollow, floored keel. The bradfordiid *Praeoppelia* is different with raised periumbilical margin, rounded venter and dense outer ribbing. The stratigraphically nearest oppeliids are recorded in the literature from the Humphriesianum Zone, thus it is reasonable to keep Buckman's separate generic name for this early form.

Family Otoitidae Mascke, 1907

The earliest forms of this family were recorded from the upper Aalenian, and following the view of Buckman, have been ranged into genus *Docidoceras*. Later works (e.g. Géczy 1967; Rocha et al. 1990; Sandoval et al. 2000) revealed that this group is far richer and more diverse than originally thought, and many of its members differ significantly from s. str. *Docidoceras*, i.e. from the few forms centred around *Docidoceras cylindroides* Buckman, the type species. These forms are ranged now into Family Stephanoceratidae (see below). On the other hand, as it was pointed out by Donovan et al. (1981: p. 147), true *Docidoceras* and allies differ from the earliest stephanoceratids, and could be retained within Otoitidae.

Genus *Docidoceras* Buckman, 1919

Type species *Docidoceras cylindroides* Buckman, 1919

The genus in its current interpretation is left to comprise medium- to large-size, stoutly-whorled serpenticones with deep, crater-like umbilicus, dense to rare prominent ribbing and characteristic projected peristome bordered by a wide, rounded collar. In Csernye at least three species could be distinguished, the rare type species, and the more common *D. zemistephanoides* Géczy and *D. wysogorskii* (Prinz), both designated originally from this locality.

Docidoceras cylindroides Buckman, 1919
Pl. 5, Figs 1, 2.

1919. *Docidoceras cylindroides*, nov. – Buckman, 1919 (in 1909–1930), pl. 133A, figs 1, 2.
1921. *Docidoceras cylindroides* S.Buckman 1919 – Buckman (in 1909–1930), pl. 133B, figs 1–3.

Material: A single specimen from the Ovale Bed.

Description: This is an incomplete specimen preserved only the phragmocone. In its dimensions (D: 51 mm; H: 37%; W: 70.5%; U: 33.5%) this is very near to the „paratype" illustrated by Buckman in 1921 on his pl. 133B. The ribbing is similar, too, consisting of dense, straight, radial primary and secondary ribs. The Bakonycsernye specimen shows 35 primary and 89 secondary ribs on its last preserved whorl, while Buckman's specimen bears 25 trifurcating ribs at comparable diameter.

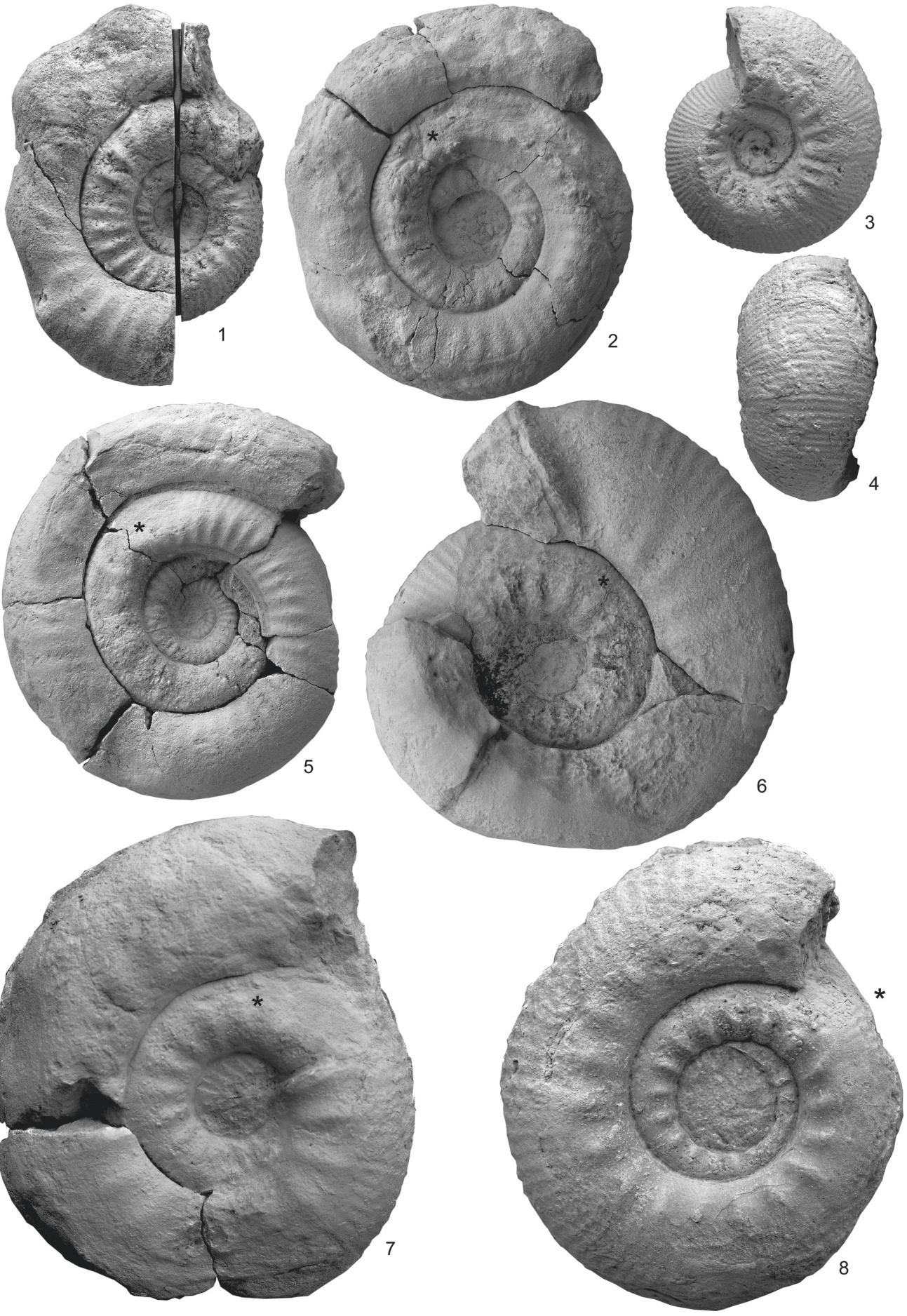
Remarks: This is the type species of the genus, never cited by anybody else but Buckman himself.

Docidoceras zemistephanoides Géczy, 1967
Pl. 5, Figs 3–7.

v 1967 *Docidoceras zemistephanoides* n. sp. – Géczy, p. 233, pl. 58, figs 2,5; pl. 60, fig. 3, textfig. 244.
1985 *Docidoceras zemistephanoides* Géczy, 1967 – Fernández-López, p. 345, pl. 36, fig. 8, textfig. 38B.
1990 *Docidoceras zemistephanoides* Géczy – Benshili, p. 78, pl. 1, fig. 7.
v 1990 *Docidoceras zemistephanoides* Géczy – Cresta & Galácz, p. 197, pl. 12, fig. 1.
2010 *Docidoceras zemistephanoides* Géczy – Dietze et al., p. 75, pl. 1, figs 1–4.

Material: The holotype and five additional, newly collected specimens, all from the Ovale Bed.

Plate 6: (1) *Docidoceras wysogorskii* (Prinz, 1904), holotype, collected by Hantken in 1869, MFGI J1067, 'Bajocien inférieur' (see Géczy 1967: p. 230). **(2)** *Docidoceras wysogorskii* (Prinz, 1904) topotype, Bed 8 Concavum Zone; EZPC6825. **(3, 4)** *Trilobiticeras* (*Emileites*) *malenotatus* Buckman, 1927, middle whorls, Bed 3, Ovale Zone; DM2013/028. **(5)** *Docidoceras wysogorskii* (Prinz, 1904) topotype, Bed 8 Concavum Zone; EZPC7486; **(6)** *Trilobiticeras* (*Emileites*) *malenotatus* Buckman, 1927, Bed 3, Ovale Zone; DM2013/006. **(7)** *Trilobiticeras* (*Emileites*) *kecskemetii* n. sp. 1st paratype. Bed 3, Ovale Zone; EMNH2014.1.2. **(8)** *Trilobiticeras* (*Emileites*) *kecskemetii* n. sp. Holotype. (Umbilicus on middle and inner whorls is unprepared.) Bed 3, Ovale Zone; EMNH2014.1.1. Asterisk marks end of phragmocone. All photos natural size.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Description: The holotype (Pl. 5, Fig. 3) is a poorly preserved, medium-size ammonite with subsolved surface showing the sculpture in reduced preservation. The better preserved topotypes (incl. the specimens illustrated here in Pl. 5, Figs 4–6) show the coronate inner whorls with prorsiradiate inner ribs ending in strengthened terminations. Later, on the penultimate whorl, the umbilicus becomes wider and shows the furcations of the ribs. On the last half of the bodychamber the inner rib/outer rib ratio is 16/32. The holotype shows 420°, the illustrated entire topotype (Pl. 5, Fig. 7) 450° bodychamber, the septation ceasing at 69 and 58 mm, respectively.

Remarks: With its depressed, wide whorls, strong, almost tuberculated inner ribs, and strongly projected peristomal rim this species certainly belongs into *Docidoceras*. It is distinguished from the type species *D. cylindroides* Buckman by its rarer ribs and wider umbilicus even on the inner and middle whorls.

This is a commonly cited early otoitid. As distinguishing features, all authors recognised the robust appearance of the species with depressed, widely rounded whorls and denser, then rare inner ribs. However, there is a range of variability in coiling and ribbing. The specimen illustrated by Benshili (1990: pl. 1, fig. 7) represents the densely ribbed variety, while the one described by Dietze et al. (2010: pl. 1, figs 1, 2) belongs to the variant with narrower umbilicus and distant ribs.

Docidoceras wysogorskii (Prinz, 1904)
Pl. 6, Figs 1, 2, 5.

v	1904	*Coeloceras* (*Stephanoceras*) *Wysogórskii* nov. sp. – Prinz, p. 102, pl. 19, fig. 3.
v	1967	*Docidoceras wysogorskii* (Prinz, 1904) – Géczy, p. 229, pl. 58, figs 3,4; pl. 69, fig. 2, textfig. 240.
	2010	*Docidoceras* cf. *wysogorskii* (Prinz, 1904) – Dietze et al., p. 76, pl. 1, figs 5–7.

Material: the holotype and four newly collected topotypes.

Description: A relatively small species with extremely evolute last whorl. The holotype is an incomplete specimen with deep umbilicus in the depressed inner whorls. The dense ribbing in the inner and middle whorls consists of short, radial, blunt inner ribs with strengthenings at the point of furcation which is below midflank. The furcation point is displaced higher on the last whorl, where the inner ribs become rarer and change to prorsiradiate. There are three, sometimes two secondaries, which fade out gradually on the last whorl. As emphasized by Géczy in the description (1967: p. 230), the bodychamber, beginning at 43–47 mm diameter, is remarkably long, attaining 1¼ –1½ whorl length. Entire aperture not preserved.

Remarks and comparison: The holotype (refigured here in Pl. 6, Fig. 1) came from the oldest material, having been collected by Hantken in 1869. Its cadicone internal whorls, blunt ribs and numerous secondaries stress the *Docidoceras* affinity. Its small size, long, evolute, and strongly constricted bodychamber distinguish it from the above treated congeneric species. This species is one of the earliest otoitids which appears in the Concavum Zone. While the matrix of the holotype unequivocally indicates the Ovale Zone, and at least two recently collected topotypes came also from this zone, further two specimens (illustrated in Pl. 6, Figs 2, 5) was found in Bed 8, i.e. in the Concavum Zone.

Genus *Trilobiticeras* Buckman, 1919

Subgenus *Emileites* Buckman, 1927

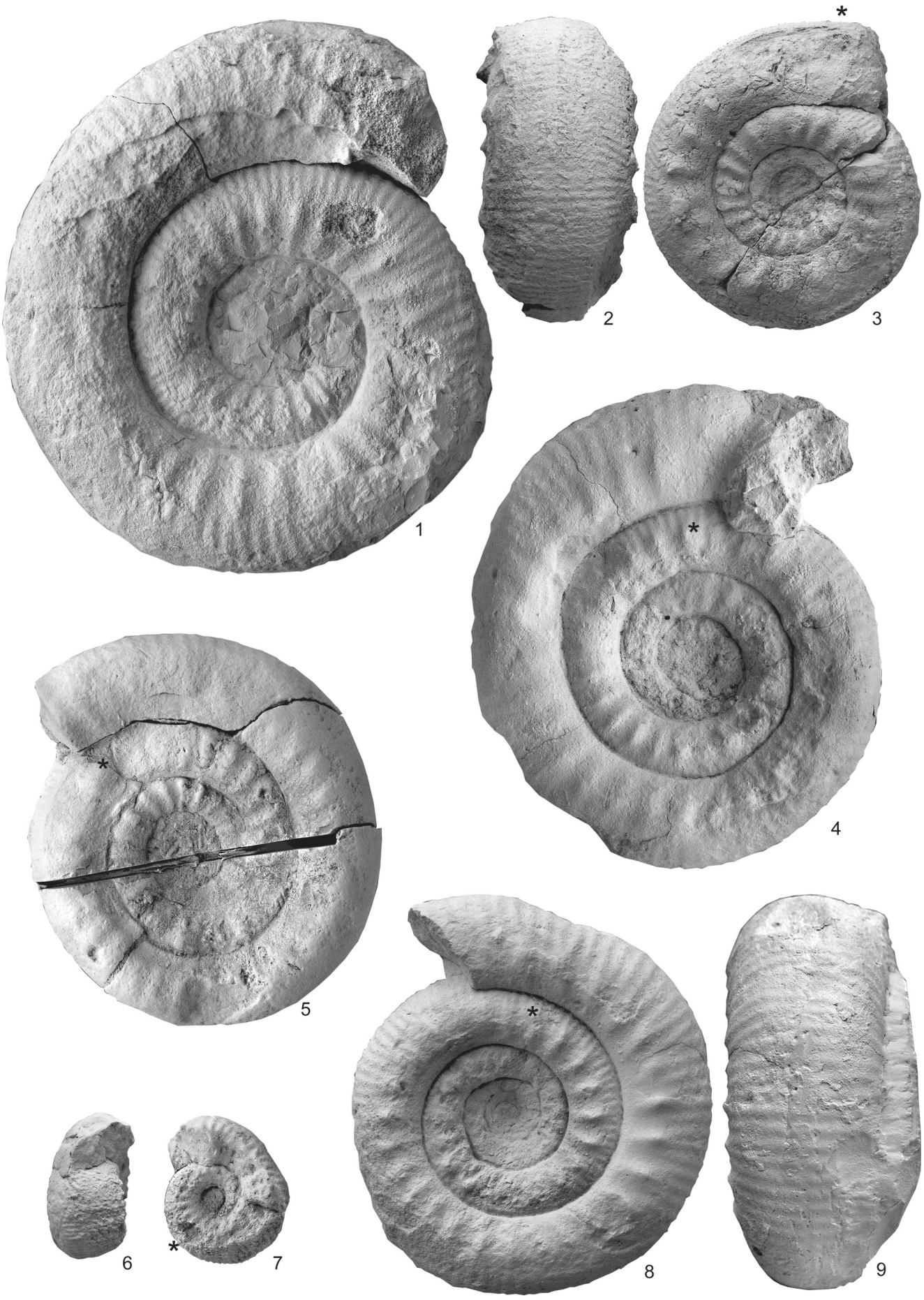
Type species *Emileites malenotatus* Buckman, 1927 (in 1909–1930: pl. 702).

Emileites is an early otoitid macroconch subgenus, very similar to the younger *Emileia*. The main distinguishing features are the smaller size and the simpler sutrure line. In Csernye *E. malenotatus* Buckman, the widely distributed type species, and a new species were identified.

Trilobiticeras (*Emileites*) *malenotatus* Buckman, 1927
Pl. 6, Figs 3, 4, 6.

	1927	*Emileites malenotatus*, nov. – Buckman (in 1909–30), p. 46, pl. 702.
v	1967	*Emileia* sp. – Géczy, p. 236, pl. 60, fig. 1, textfig. 247.
non	1977	*Trilobiticeras* (*Emileites*) *malenotatus* (S. Buckman) – Parsons, p. 105, pl. 17, fig. 10.
non	1983	*Emileia* (*Emileites*) *malenotata* (Buckman) – Sandoval, p. 182, pl. 6, fig. 3.
pars	1985	*Emileites malenotatus* Buckman – Fernández-López, p. 345, pl. 37, fig. 5 (only).
non	1988	*Emileites malenotatus* Buckman – Fernández-López et al., p. 345, pl. 1, fig. 6.
	2007	*Emileia* (*Emileites*) *malenotata* (Buckman) [M] – Dietze et al., p. 18, pl. 9, figs 1, 2.
	2008	*Emileites malenotatus* Buckman [M] – Dietze & Chandler, p. 169, textfig. 1a–d.
?	2008	*Emileites* aff. *malenotatus* Buckman [M] – Dietze & Chandler, p. 171, textfig. 1g, h.

Plate 7: **(1)** *Riccardiceras perfectum* (Buckman, 1922); DM2013/051. **(2, 3)** *Westermannites chocsinskyi* (Hantken in Prinz, 1904) topotype; EZPC7481. **(4)** *Westermannites chocsinskyi* (Hantken in Prinz, 1904) topotype; DM2013/025. **(5)** *Westermannites chocsinskyi* (Hantken in Prinz, 1904), holotype, collected by Hantken in 1869, MFGI J1066. **(6, 7)** *Trilobiticeras* (*Trilobiticeras*) *platygaster* Buckman, 1923; DM2013/012. **(8, 9)** *Westermannites chocsinskyi* (Hantken in Prinz, 1904) topotype; DM2013/042. All specimens from the Ovale Bed (Bed 3) = Fissilobiceras ovale Zone, but that on (2–3) is from the Concavum Zone, and (5) from the 'complexe bajocien' (see Géczy 1967: p. 231). Asterisk marks end of phragmocone. All photos natural size.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Material: Five well-preserved specimens and further five partially preserved or heavily subsolved examples.

Description: Medium-sized (of 80–90 mm adult diameter) species with involute, cadicone inner and middle whorls and contracted bodychamber (of 360 to 400° length, beginning at 40 to 60 mm diameter), where mainly the whorl-width decreases. The bodychamber is sculptured up to the peristome. The sculpture consists of projected inner ribs and similarly oriented secondaries. The primary/secondary rib ratio is 23/115 in the middle and 24–25/76–80 in the last whorl. The primary ribs are shorter and sharp in the middle whorls. The peristome has a deep preapertural constriction and a simple, slightly projected collar. The suture-line is complicated with narrow and high saddles, deep, symmetric 1st lateral and a somewhat shorter 2nd lateral lobe and a contrastingly simple umbilical lobe. The whole suture construction is on the best way towards the very elaborate *Emileia* suture.

Remarks and comparisons: The innermost visible whorls in this material show very sharp inner ribs which swing strongly forward in a characteristic manner well shown in the beautiful example figured by Fernández-López (1985: pl. 37, fig. 5). This feature is the key to relate these macroconchs to microconchs ranged into *Trilobiticeras*. The relatively big size, the dense primary ribbing and the 1/3 primary/secondary rib ratio on the last whorl seem good differential characters. All European specimens regarded here as conspecific came from the Ovale Zone, where also the holotype probably came from (Dietze & Chandler 2008: p. 169). The Bakonycsernye specimens were all yielded by the Ovale Bed of the section.

Trilobiticeras (*Emileites*) *kecskemetii* n. sp.
Pl. 6, Figs 7, 8.

Holotype: EMNH2014.1.1; illustrated in Pl. 6, Fig. 6.

Paratypes: Two specimens (EMNH2014.1.2 and 3), the 1st is illustrated in Pl. 6, Fig. 7.

Material: The holotype, two paratypes and three additional, partially preserved examples.

Measurements:

specimens	D	H	W	U	H/D	W/D	U/D	Pr
holotype	87	30	35	35	34.5	40	40	21
1st paratype	91	32	30	34	35	33	37	21
2nd paraype	46.5	18.5	26	19	40	56	41	23

Type level and locality: Ovale Bed (Bed 3 = Fissilobiceras ovale Zone, probably lower part) of the new section in the Tűzkövesárok, Bakonycsernye.

Derivation of name: Referring to Tibor Kecskeméti, our honoured friend and respected palaeontologist, highly esteemed *Nummulites* expert.

Diagnosis: Large *Emileites* with inflated inner and middle whorls, slightly contracted and eccentric bodychamber, and strong ribbing with rare, radial inner ribs and dense, straight secondary ribs (inner rib/outer rib ratio is 1/4).

Description: The holotype is a medium-size ammonite, big for the genus, with very wide umbilicus and slightly, evenly contracted bodychamber. This one is selected because it shows the sculpture better. The 1st paratype reveals better the narrower umbilicus on the phragmocone, and the similarly long, ca. one whorl bodychamber. The sculpture, as shown on the holotype, is formed by strong, short, radial, well-spaced inner ribs which branch slightly above mid-flank into four outer ribs. The *Emileia*-style aperture is bordered with a simple peristomal rim.

Remarks and comparisons: The here designated new species differs from the common and here also represented *E. malenotatus* in its bigger size, stouter whorls and radial inner and outer ribs (see above).

Subgenus *Trilobiticeras* Buckman, 1919

Type species *Trilobiticeras trilobitoides* Buckman, 1919 (in 1909–1930: pl. 140).

Trilobiticeras is regarded here as the microconch of *Emileites* – following the concept of Parsons (1977: p. 106). Similar view is expressed by the procedure of Dietze & Chandler (2008), who regarded *Trilobiticeras cricki* Parsons, 1977 as the microconch of *Parsemileites liebi* (Maubeuge), the latter belonging to a group of ammonites which differs from *Emileites* only in size.

Trilobiticeras (*Trilobiticeras*) *platygaster* Buckman, 1922.
Pl. 7, Figs 6, 7.

1922 *Trilobiticeras platygaster*, nov. – Buckman 1922 (in 1909–30), pl. 277A
non 1922. *Trilobiticeras platygaster*, nov. – Buckman 1922 (in 1909–30), pl. 277B

Material: A single, imperfectly preserved specimen.

Description: A small, microconchiate ammonite with cadicone inner and middle whorls and depressed, eccentrically coiled bodychamber. The septate part of the conch ends at 17 mm diameter, the length of the bodychamber is 2/3 whorl. The pe-

ristome is partially preserved, showing only the lateral swelling which is the base of the lappet. Entire sculpture cannot be seen; the inner half of the last whorl bears 11 inner and 36 corresponding outer ribs. The inner ribs end in tiny, sharp tubercles at the furcation points. On the last part of the bodychamber the outer ribs become strong and blunt.

Remarks: A rarely cited species, recorded only from the type area (Bradford Abbas, Dorset) by Buckman (1922: pl. 277A). From the same locality and bed he figured a „paratype" which is a specimen with healed shell injury on the bodychamber (a "dysmorph" by Buckman), thus shows very different morphology, therefore excluded here from the synonymy. As Buckman suggested even by naming, the main character of this species is the flattened venter forming the outer side of the coronate whorls. Another differential feature is the dense ribbing with trifurcate ribs.

Family Stephanocertidae Neumayr, 1875

The morphological diversity of the group of early stephanoceratids ranged formerly in *Docidoceras* indicated the establishing new genera: *Riccardiceras* by Westermann (1995) and *Westermannites* by Dietze et al. (2001). Most recently Chandler & Dietze (2004) cleared that *Mollistephanus*, another early stephanoceratid, can be traced down to the very base of the Bajocian, thus extending the field of diversity at the beginning of the family.

Genus *Riccardiceras* Westermann, 1995

Type species *Coeloceras longalvum* Vacek, 1886.

In the original differential diagnosis of *Riccardiceras* by Westermann (1995: p. 109) it is stressed the „platyconic to serpenticonic, rounded whorls with complete, plicate costae", and the „subvertical 2nd lateral lobe, U_2" as particular features. The generic value of this sutural character was denied by Dietze et al. (2001: p. 17), referring to genuine *Stephanoceras* species which show unretracted, i.e. 'subvertical' umbilical lobe. However, subsequent authors (Dietze et al. 2001; Sandoval et al. 2000) kept *Riccardiceras* as a convenient genus for the big, evolute, planulate members of the *'Docidoceras' perfectum* group around the Discites Zone.

Riccardiceras perfectum (Buckman, 1922)
Pl. 7, Fig. 1.

	1922	*Docidoceras perfectum*, nov. – Buckman (in 1909–30), pl. 314.
non	1939	*Docidoceras perfectum* Buckman – Roché, p. 223, pl. 7, fig. 1.
?	1990	*Docidoceras* cf. *perfectum* Buckman – Rocha et al., p. 58, pl. 3, figs 1, 8, 9.
non	1990	*Stephanoceras* aff. *perfectum* (Buckman) – Callomon & Chandler, 1990, p. 106, pl. 2, fig. 2, pl. 3, fig. 1.
v	1990	*Docidoceras perfectum* Buckman – Cresta & Galácz, p. 192, pl. 11, fig. 4.
pars	2000	*Riccardiceras telegdirothi* (Géczy, 1967) – Sandoval et al., p. 34, pl. 3, fig. 1 (only)

Material: Three specimens from the Ovale Bed.

Description: Evolute, planulate ammonites with whorl section wider than high, rounded flanks and venter, and long bodychamber. The figured specimen is of 105 mm diameter, showing the end of septation at ca. 58 mm and more than one entire whorl of bodychamber, without the aperture. The sculpture consists of dense, regular ribbing. There are 32 internal ribs and 94 secondaries on the last preserved bodychamber whorl. The primaries are blunt and straight with strengthened furcation point at the middle of the flank, where usually three secondary ribs arise. The rounded secondaries run radially or with a very slight backward curve, and cross the venter continuously. The inner whorls are similarly evolute, with regular, straight ribs which have their furcation points higher, near the ventrolateral shoulder, thus the outer ribs cannot be seen in the umbilicus of the inner and middle whorls.

Remarks: This relatively big, massive form is very near in habit and ribbing to the type of '*Docidoceras*' *perfectum* Buckman (1922: pl. 314). It seems significant that the here discussed forms are internal moulds, thus show the sculpture weaker. This preservation difference is well indicated on the holotype, which is a specimen with incompletely preserved shell (see some portions of the bodychamber of the specimen on pl. 314 in Buckman 1909–30). The examples figured by Rocha et al. (1990: pl. 3, fig. 1 and figs 8, 9) and Sandoval et al. (2000: pl. 3, fig. 1) are also internal moulds without the shell and thus showing fainter ribbing. The shelly specimens from the English Inferior Oolite appear to bear sharper, better distinguished ribbing, and this gives these ammonites the stephanoceratid character.

The most similar form is „*Coeloceras*" *longalvum* Vacek (1886: pl. 17, figs 1, 2), chosen by Westermann (1995) as the type species of *Riccardiceras*. This Aalenian (most probably Bradfordensis Zone, see Callomon et al. 1994: p. 108) ammonite is apparently the earliest member of the lineage. Morphologically it shows extremely evolute coiling without eccentricity, denser ribbing, and primary and secondary ribs equal in strength on the bodychamber. The ribs do not exhibit any trace of strengthening or tubercle at furcation points, in spite of the fact that the lectotype is a „grossentheils beschaltes Exemplar" (see Vacek 1886: explanation to pl. 17).

While the type specimen of '*Docidoceras*' *perfectum* came from the Discites Zone (Bj-3, see Callomon & Chandler 1990: p. 96), another occurrence

from the basal Ovale Zone (Bj-4 horizon) is also indicated from the type area (Callomon & Chandler loc. cit.: p. 97).

Genus *Westermannites* Dietze, Chandler, Schweigert & Auer, 2001

Types species *Coeloceras limatum* Pompeckj, 1897

The diagnosis of *Westermannites* (in Dietze et al. 2001: p. 12) emphasizes the coronate-cadiconic inner whorls, and the bullate cross section and the excentric coiling at the end of the phragmocone.

Westermannites chocsinskyi (Hantken in Prinz, 1904) Pl. 7, Figs 2–5, 8, 9.

v 1904 *Coeloceras* (*Stephanoceras*) *Chocsinskyi* Hantk. msc. nov. sp. – Prinz, p. 93, pl. 15, fig. 2.
v 1967 *Docidoceras chocsinskyi* (Hantken in Prinz, 1904) – Géczy, p. 230, pl. 59, fig. 5, textfig. 241.
v 1990 *Docidoceras chocsinskyi* (Hantken in Prinz) – Cresta & Galácz, p. 170, pl. 8, fig. 2.

Material: The holotype and three better preserved specimens from the Ovale Bed, and one specimen from the Concavum Zone (Bed 6 in Textfig. 2).

Description: The holotype (Pl. 7, Fig. 5) is a medium-size, strongly subsolved specimen, septate up to 53 mm diameter and has a complete whorl of bodychamber without aperture. The inner whorls are coronate, expressed by the primary ribs which become sharp toward the ventrolateral corner. The middle whorls are slightly depressed, *Coeloceras*-like, and the bodychamber shows minimum contraction. The sculpture consists of triplicate ribs. The newly collected specimens (see Pl. 7, Figs 4, 8, 9) show the ribbing more clearly. The primary ribs are sharp on the inner and middle whorls, they are short, having the furcation point well below midflanks. The secondaries are rounded, slightly projected.

Remarks and comparison: The holotype (MFGI J1066) was cut half to make the cross-section well visible (see Géczy 1967: textfig. 241). This shows how depressed are the inner whorls, and how wide the whorl-section remains even on the bodychamber. With the relatively small size, evolute coiling, and lowly branching, sharp ribs, this species differs from the congeneric forms represented in the material.

'*Docidoceras*' *chocsinskyi ophioides* n. subsp. of Géczy (loc. cit.: p. 231, holotype refigured here on Pl. 8, Figs 1, 2) differs in its narrower whorls, extremely evolute coiling and more numerous secondary ribs.

The matrix and the preservation indicate the Ovale bed as the source of the holotype. Most of the recently collected specimens also came from this bed, but one additional example (illustrated in Pl. 7, Figs 2, 3) was yielded by the Concavum Zone, in this way this is the earliest hitherto known stephanoceratid here in Csernye. This Concavum and the previously known Ovale Zone records could be linked with the morphologically very similar form figured from the Discites Zone of the Infernaccio section of the northern Apennines (Cresta & Galácz 1990: pl. 12, fig. 3).

Westermannites parvus (Géczy, 1967) Pl. 8, Figs 3–5.

v 1967 *Docidoceras zemistephanoides parvum* n.subsp. – Géczy, p. 232, pl. 59, figs 1, 3, textfig. 243.

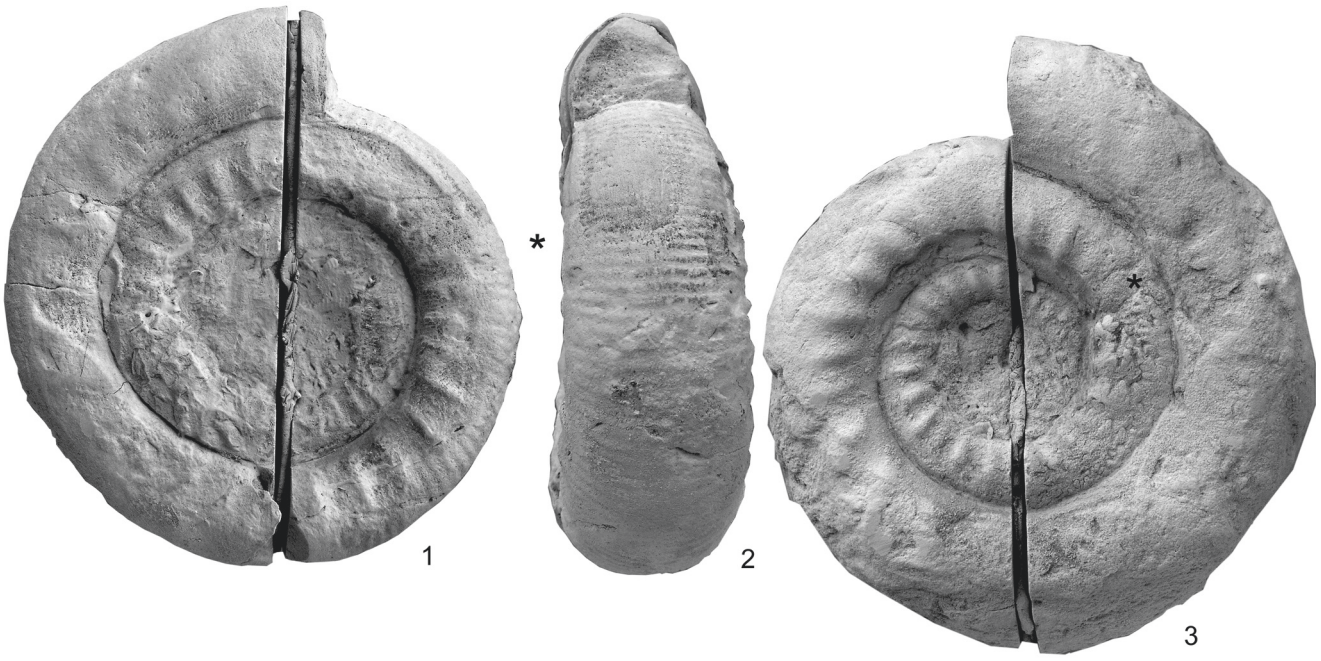
Material: The holotype (refigured here in Pl. 8, Fig. 3) and six, recently collected topotypes.

Description: A relatively small serpenticone (D = 82 mm of the holotype, and similar adult sizes of the topotypes) with cadicone inner whorls and strongly contracted bodychamber where mainly the whorl-width becomes reduced. The sculpture consists of sharp, tuberculate primary ribs on the inner whorls (20–23 at 35 mm diameter). On the last whorl the inner ribs become rare and reach only below the middle of the flank, where branch into 4 secondaries. Towards the aperture, the sculpture tends to smooth out gradually. The body-chamber is of 1 ¼ whorls long and terminates in an inclined peristome with a ventrally projected apertural rim.

Remarks and comparison: Géczy (1967: p. 232) distinguished this form by its small size, a character well recognizable in the newly collected material, too. The original description mentions the depressed internal whorls and the sharp ribs, which become weaker towards the aperture. Ribs were recorded in similar numbers (23–25) on the penultimate whorl in the holotype and the paratypes.

The aperture of the holotype was apparently destroyed when cutting half the specimen, but the description indicates "La bordure péristomale est conforme à celle de la sous-espèce nominate", i.e. that of '*Docidoceras*' *zemistephanoides*, what is a rim strongly projected on the ventral side (see in Géczy 1967: pp. 232–234).

Plate 8: **(1, 2)** *'Docidoceras' chocsinskyi ophioides* Géczy, 1967. Holotype, MFGI J2655. **(3)** *Westermannites parvus* (Géczy, 1967). Holotype, MFGI J2656. **(4, 5)** *Westermannites parvus* (Géczy, 1967) topotype; EZPC7590. **(6)** *Mollistephanus*? sp. inner whorl; DM2013/031. **(7, 8)** *'Docidoceras'* n. sp., Géczy, 1967, original of his pl. 60, fig. 2, textfig. 245. MFGI J2660. **(9)** *Mollistephanus*? sp.; DM2013/045. All specimens from the Ovale Bed (Bed 3) = Fissilobiceras ovale Zone, but those on (1–3, 7–8) which are from the 'complexe bajocien', see Géczy (1967). Asterisk marks end of phragmocone. All photos natural size.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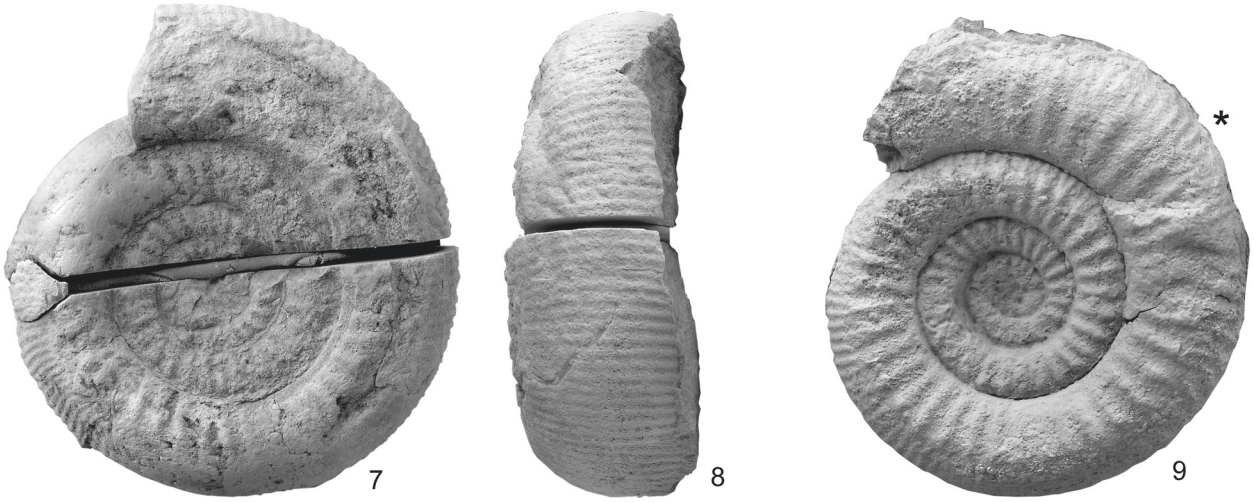
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Genus *Mollistephanus* Buckman, 1922

Type species *Mollistephanus mollis* Buckman, 1922

Mollistephanus, on the basis of its new diagnosis (in Chandler & Dietze 2004: p. 223) differs from s.str. *Stephanoceras* only with its smaller size. What is very characteristic, is the style of ribbing. The inner ribs are slightly prorsiradiate, while the tightly arranged secondaries arch backwards, resulting in a gracefully swung costation. The here identified new species exhibits this character well, while the form described below as *Mollistephanus westermanni* shows different affinity. Similar is the case with *'Docidoceras' planulatum* Buckman (1921: pl. 264) with holotype from the basal Discites Zone (faunal horizon Bj-1, see Chandler & Dietze 2004: p. 223). This small ammonite (refigured by Chandler & Dietze 2004: fig. 3a, b) with coiling involute on the inner and gradually more and more evolute on the outer whorls, shows depressed whorls throughout. The ribbing is radial and consistently biplicate, remaining strong up to the peristome. Recently this species was ranged into *Mollistephanus* by Fernández-López (2014: p. 12). A very similar form came from the here treated Ovale Zone material, the only difference being its bigger size (Pl. 8, Fig. 9; inner whorls on Pl. 8, Fig. 6). It is even closer to '*Mollistephanus* aff. *kondai*' described by Dietze et al. (2010: p. 82, textfig. 3a–c) from the Trigonalis subzone of Nenningen, Swabian Alb. Géczy also described a similar form as '*Docidoceras* n.sp.', which differs only in denser ribs (see Pl. 8, Figs 7, 8). The few available specimens are insufficient to decide on systematic status, however establishing a new (sub)genus could be justified and useful.

Mollistephanus ottiliae n. sp.
Pl. 9, Figs 1, 3, 4.

Holotype: EMNH2014.2.1; illustrated in Pl. 9, Fig. 1.

Paratypes: EMNH2014.2.2-3; illustrated in Pl. 9, Figs 3, 4.

Material: Three specimens mentioned above and designated as holotype and paratypes.

Measurements:

specimen	D	H	H/D (in %)	W	W/D (in %)	U	U/D (in %)	Pr/Sr
holotype	98	28	28.5	38	38.5	45	46	40/92
	73	28	38.5	43	59	31	42.5	35/89
1st paratype	106	31	29	~39	~37	55	52	38/113
2nd paratype	117	33	28	42	36	64	54.5	38/114
	90	27	30	34	37.5	44	49	38/109
	68	23	34	33	48.5	29	42.5	33/87

Type locality and level: Bakonycsernye, Bakony Mountains, Ovale Bed in the new section illustrated here in Textfig. 2. Lower Bajocian, Fissilobiceras ovale Zone, probably lower part.

Derivation of name: Ottilia refers to Ottilia Szives, outstanding specialist on Cretaceous ammonites, our kind colleague and friend from the Palaeontological Section of the Hungarian Natural History Museum.

Diagnosis: Early *Mollistephanus* with relatively big size, serpenticone coiling, wide phragmocone whorls, body-chamber constricted both in height and width, and distinct, untuberculate ribbing.

Description: The holotype is a nearly complete adult specimen, only the terminal ca.1/4 whorl of body-chamber with the peristome is missing. The innermost whorls cannot be seen in the deep umbilicus, the penultimate whorl shows wide, depressed, rounded cross-section. The bodychamber, which is apparently longer than one whole whorl, is constricted by the diminishing whorl-height and width, resulting in narrowing whorl and opening umbilicus. The ribbing consists of rounded, dense inner ribs running radially on the phragmocone, and becoming projected on the body chamber. The ribs show biplications and unconnected intercalatories. The secondary ribs remain radial or slightly prorsiradiate throughout, while the projection of the inner ribs becomes gradually stronger towards the aperture. The branching of ribs occurs little below the middle of the flank and never bears tubercles. The 1st paratype is a complete adult specimen, only its peristome is missing. This is a subsolved internal cast where the sculpture is less enhanced and the umbilicus appears somewhat wider than on the holotype. Entire suture-line cannot be seen, but the high lateral saddle, and the deep first lateral lobe are well-visible. This latter is characteristically asymmetric because of the low, much shorter second lateral saddle. The umbilical lobe is unretracted.

Plate 9: (1) *Mollistephanus ottiliae* n. sp. Holotype; EMNH2014.2.1. **(2)** *Mollistephanus*? *westermanni* (Sandoval, 2000); DM2013/019. **(3)** *Mollistephanus ottiliae* n. sp. 1st paratype; EMNH2014.2.2. **(4)** *Mollistephanus ottiliae* n. sp. 2nd paratype; EMNH2014.2.3. **(5)** *Mollistephanus*? *westermanni* (Sandoval, 2000); DM2013/002. All specimens from the Ovale Bed (Bed 3) = Fissilobiceras ovale Zone. Asterisk marks end of phragmocone. All photos natural size.

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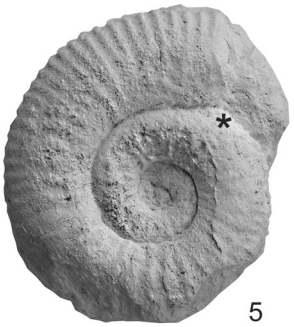

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Remarks and comparison: A very similar ammonite is the holotype of *Mollistephanus cockroadensis* described by Chandler & Dietze (2004: p. 223, fig. 3.1a, b) from the Ovale Zone of Cockroad Farm, Beaminster, Dorset, southern England. This is a specimen with an estimated 95 mm diameter, and dense, apparently untuberculate ribbing, thus similar in size and style of sculpture. On the other hand, the Dorset specimen shows thinner whorls, longer primaries, with branching points above the middle of the flank and both the inner and outer ribs with radial run all the way through the bodychamber.

Mollistephanus? *westermanni* (Sandoval, 2000)
Pl. 9, Figs 2, 5.

2000 *Riccardiceras westermanni* [M] Sandoval n. sp. – Sandoval et al., p. 38, pl. 4, figs 4–7.

Material: Two specimens from the Ovale Bed (Bed 3, Ovale Zone, see Textfig. 2).

Description: The specimen illustrated in Pl. 9, Fig. 5 is a small ammonite with a relatively narrow umbilicus and slightly eccentrically coiled last whorl what is the bodychamber beginning at ca. 25 mm diameter and lacking only the aperture. The whorl-section is circular, with convex flanks. The ribbing consists of short inner ribs which regularly bifurcate below midflanks. The ribs are slightly prorsiradiate on the middle whorl, then become radial on the bodychamber, i.e. the last preserved whorl. Tubercles cannot be seen. The other specimen (Pl. 9, Fig. 2) is similar in dimensions, but differs in having denser ribs and narrower umbilicus.

Remarks and comparison: These specimens are very similar to the figured members of the type series (Sandoval et al. 2000: pl. 4, figs 4–7), with the single difference: the Bakonycsernye examples are of narrower umbilicus: 42% and 32%. Difference in the rib density is shown also in the type series. Sandoval et al. (2000) recorded the type series from the Discites Zone of Spain and Portugal, the here described forms are stratigraphically younger, coming from the Ovale Zone, probably from its lower part.

Sandoval (in Sandoval et al. 2000: p. 40) compared his new form to *Mollistephanus* species, and Chandler & Dietze (2004: p. 223) ranged it into *Mollistephanus*. Its small size, planulate coiling, tubercle-less furcation points and tight (approximated) secondary ribbing suggest this arrangement, however establishing a new (sub)genus to accommodate this form and the others mentioned above cannot be ruled out .

4. Conclusions

When treating the origin of the so characteristic Middle Jurassic ammonite superfamily Stephanoceratacеae, Donovan et al. (1981: p. 146) referred to the hammatoceratid *Erycites*, by branching in the Upper Aalenian Brasilia bradfordensis Zone. Later this was documented with forms which were regarded as Aalenian *Stephanoceras* [*Stephanoceras* aff. *perfectum* (Buckman), see Callomon & Chandler 1990: p. 95, pl. 2, fig. 2, pl. 3, fig. 1]. However, these forms are better placed in *Riccardiceras* (see Westermann 1995: p. 112; Sandoval et al. 2000: p. 31; Dietze et al. 2001: p. 14). At least one of the specimens figured by Callomon & Chandler from the Concavum Zone (Aa-14/15) of Horn Park (1990: pl. 2, fig. 2) shows the same coiling and style of ribbing as displayed in the earliest *Mollistephanus* (*M. cockroadensis* Chandler & Dietze, 2004) from the closely succeeding Bj-1 horizon of the Bajocian. In this way *Mollistephanus* could be regarded as an early offshoot from the basal stephanoceratid stock *Riccardiceras*.

Another early member of this lineage is *Westermannites*, which seems to be separated already in the Concavum Zone, as it is evidenced by the here recorded topmost Aalenian *W. chocsinskyi*. This genus was designated on the basis of 'coronate-cadiconic juvenile stage' and the bullate cross section at the end of the phragmocone and the eccentric coiling (see Dietze et al. 2001: p. 11). These are typical s.str. stephanoceratid characters appearing in several micro- and macroconchiate *Stephanoceras* species. Nevertheless, these Lower Bajocian forms and s.str. *Stephanoceras* seem to be separated by an apparent morphological discontinuity in the Laeviuscula and Sauzei zones, where only the last *Mollistephanus* and *Riccardiceras*, the particular *Skirroceras* and allies (e.g. '*Skolekostephanus*', '*Kallistephanus*', etc.), and the peculiar *Kumatostephanus* appear. This gap may justify the distinguishing of individually named genera around the Aalenian/Bajocian boundary.

In this way we arrive to a scheme where there are no known early species to range into s.str. *Stephanoceras*, thus we necessarily have to abandon the concept that "This genus is now known to range continuously from the Upper Aalenian …" (Chandler & Dietze 2004: p. 221). It seems more reasonable to follow the view that not the true *Stephanoceras* genus, but the stephanoceratid **lineage** appears in the Aalenian, and it goes up to the Late Bajocian and beyond. When one accepts the generic independence of *Mollistephanus, Skirroceras, Kumatostephanus* etc. in addition to s. str. *Stephanoceras*, there is no ground to deny the similar systematic rendering of the similar morphological diversity below the Humphriesianum and Sauzei zones.

A remarkable phenomenon is that the other important Bajocian family, the Otoitidae produced morphologically very *Stephanoceras*-like forms (s. str. *Docidoceras* spp.) around the Aalenian/Bajocian boundary. While *Stephanoceras*- or *Erycites*-like forms appear in the Concavum Zone [*Docidoceras wysogorskii* (Prinz, 1904), see above and Pl. 6, Figs

2, 5], the morphological individualization was established early in this lineage, with the appearance of *Emileites* and *Parsemileite*s in the Ovale Zone (Dietze & Chandler 2008).

The roots of Otoitidae and Stephanoceratidae is undoubtedly in the Erycitinae (Donovan et al. 1981; Westermann 1995) and the great diversity and high percentage representation of both, and especially of the stephanoceratids, suggest Tethyan, most probably Mediterranean Tethyan origin. The time of this split is most probably Concavum Zone for both subfamilies, what is now supported by the here presented Bakonycsernye records.

As of dimorphism, the Bakonycsernye material gives little to the picture hitherto known. As usual in assemblages from pelagic limestones, microconchs appear very subordinately. This is true for all represented groups: the microconch sonniniids, witchelliids, stephanoceratids, etc. are completely missing, and only a single specimen, described above as *Trilobiticeras* (*T.*) *platygaster* represents the microconchiate otoitids.

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