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Remarks on the Toarcian–Aalenian fossil assemblage of the Kis-Teke Hill, Gerecse Mts (Hungary)

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(with 6 figures and 4 plates)

The red, nodular marl beds of Toarcian-Aalenian age of the Kis-Teke Hill yielded a rich fossil assemblage consisting of gastropods, bivalves, ammonites, belemnites and brachiopods. The ammonite fauna proved to be especially abundant and diverse and the relatively high percentage of Ammonitina allowed a biostratigraphical subdivision of the section. Beside representatives of taxa characteristic of the peri-Mediterranean Jurassic some rare genera including *Urkutites, Rarenodia*, *Praerycites* and *Staufenia* have also been encountered. These and some other interesting forms are described.

Introduction

Due to the proximity of the Danube River which provided good shipping opportunity, the Jurassic succession of the Gerecse Mts has been exposed in several quarries since the times of Romans. The rocks used as building or ornamental stones – traditionally referred to as „Gerecse red marble" – represent the lower and middle part of the Lower Jurassic and are followed by a red, ammonite-rich marl succession of Toarcian age. During the late seventies and early eighties of the last century large-scale collecting work was done from these beds known as Kisgerecse Marl, resulting in a detailed biostratigraphical subdivision of the successions as well as the correlation of the ammonite zones used in the peri-Mediterranean region with those of the classical NW-European areas (see GÉCZY & SZENTE 2007, KOVÁCS & GÉCZY in press).

The end of the last century saw a renewed interest in the Jurassic of the Gerecse Mts, largely due to a programme aimed at the re-cultivation of abandoned quarries. This activity led to the discovery of the gastropod-rich Toarcian beds of the Kis-Teke Hill (GALÁCZ & SZABÓ 2001). Independently, one of us (Z. K.) began to collect fossils „bed-by-bed" from the same locality, which effort has resulted in about one and a half thousand of specimens forming the base of this study.

Locality

The studied succession is exposed in an abandoned quarry once opened on the eastern slope of the Kis-Teke Hill, north of the village of Tardos, in a right tributary of the Malom Valley (Fig. 1).

An overview of the geology of the area and details of the stratigraphy of the sequence exposed can be found in VINCZE (2002) and GALÁCZ & SZABÓ (2001), respectively. A trench dug in 2006 revealed that the base of the Toarcian is a 20 cm thick pale yellow, unfossiliferous clay bed which overlies conformably the corroded surface of the uppermost, leached bed of the Pliensbachian limestone.

The Toarcian–Aalenian succession is dissected by normal faults of some 10 cm offset, running parallel to the quarry wall. Between the fault-planes, however, the succession proved to be undisturbed. Twenty beds of some 4 m cumulative thickness could be identified. Stratigraphic distribution of ammonite taxa collected bed-by-bed is indicated in Fig. 2.

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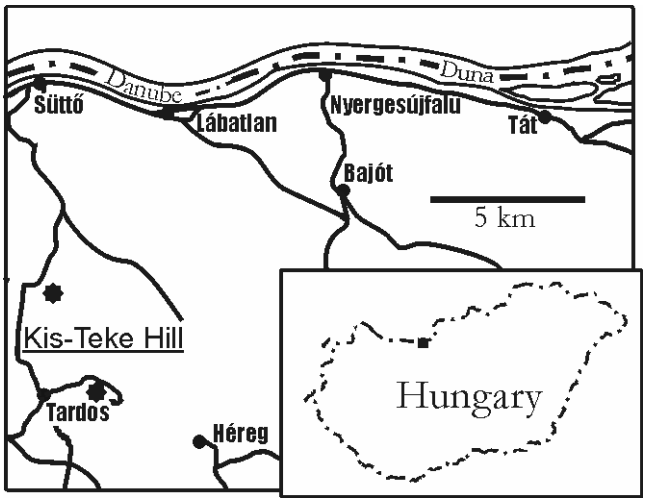

Fig. 1. Location of the studied Toarcian–Aalenian section of the Kis-Teke Hill.

Toarcian – Aalenian fauna of the Kis-Teke Hill section

A list of fossils identified until now from the Toarcian – Aalenian fauna of the Kis-Teke Hill can be found below.

PHYLUM MOLLUSCA

I. CEPHALOPODA
Number of specimens belonging to the Ammonoidea subclassis: 1414

PHYLLOCERATINA

PHYLLOCERATIDAE ZITTEL, 1884 (611 specimens: 43%)
Phylloceras sp.
Calliphylloceras beatricis (BONARELLI, 1897) (Pl. 1, Fig. 8.)
Calliphylloceras altisulcatum quadratum GÉCZY, 1967
Calliphylloceras supraliassicum (POMPECKJ, 1893)
Calliphylloceras sp.
Ptychophylloceras sp.
Holcophylloceras ultramontanum (ZITTEL, 1869)

LYTOCERATINA

LYTOCERATIDAE NEUMAYR, 1875 (92 specimens: 6%)
Lytoceras amplum OPP.- PRINZ, 1904
Lytoceras rasile VACEK, 1886
Lytoceras sp.
Alocolytoceras sp.
Audaxlytoceras sp.

AMMONITINA (711 specimens: 51%)
(Numbers of determined specimens are detailed.)

A, DACTYLIOCERATIDAE HYATT, 1867
Zugodactylites rotundiventer (BUCKMAN, 1927) (5)
Zugodactylites braunianus (D'ORBIGNY, 1845) (11) (Pl. 1, Fig. 9.)
Nodicoeloceras sp. (3)
Mesodactylites broilii (MITZOPOULOS, 1930) (3)
Mesodactylites sapphicus (RENZ, 1912) (1) (Pl. 1, Fig. 10.)

Mesodactylites sp. (16)
Transicoeloceras viallii PINNA, 1966 (8)
Telodactylites renzi PINNA et LEVI-SETTI, 1971 (2)
Catacoeloceras dumortieri (DE BRUN, 1932) (1) (Pl. 1, Fig. 11)
Catacoeloceras sp. (4)
Peronoceras verticosum (BUCKMAN, 1914) (1)
Peronoceras subarmatum (YOUNG et BIRD, 1822) (3) (Pl. 1, Fig. 12)
Peronoceras sp. (11)
Collina meneghinii BONARELLI, 1897 (12)
Collina sp. (28)

B, HILDOCERATIDAE HYATT, 1867

I. HARPOCERATINAE NEUMAYR, 1875
Harpoceras subexaratum (BONARELLI, 1881) (1)
Harpoceras mediterraneum PINNA, 1968 (13) (Pl. 1, Fig. 13)
Osperlioceras sp. (4)
Pseudolioceras lythense (YOUNG et BIRD, 1828) (10)

II. POLYPLECTINAE VENTURI, 1981
Polyplectus pluricostatus HAAS, 1913 (8) (Pl. 1, Fig. 14)
Polyplectus discoides (ZIETEN, 1831) (1)

III. HILDOCERATINAE HYATT, 1867
Hildoceras sublevisoni FUCINI, 1919 (8)
Hildoceras caterinii MERLA, 1933 (1)
Hildoceras lusitanicum MEISTER, 1913 (199) (Pl. 1, Fig. 17)
Hildoceras apertum GABILLY, 1976 (10)
Hildoceras sp. cf. *apertum* GABILLY, 1976 (1)
Hildoceras bifrons (BRUGUIÈRE, 1792) (10) (Pl. 1, Figs 15, 16)
Hildoceras semipolitum BUCKMAN, 1902 (3)
Urkutites sp. (1) (Pl. 1, Fig. 18, 19)

IV. MERCATICERATINAE GUEX, 1973
Mercaticeras hellenicum (RENZ, 1906) (8)
Mercaticeras thyrrenicum (FUCINI, 1905) (2)
Mercaticeras umbilicatum BUCKMAN, 1913 (4)
Mercaticeras dilatum (MENEGHINI, 1883) (5)
Mercaticeras sp. (31)
Pseudomercaticeras frantzi (REYNES, 1868) (1)
Pseudomercaticeras sp. (8)
Crassiceras bayani (DUMORTIER, 1874) (1) (Pl. 2, Figs 1, 2)
Crassiceras canavarii (FRANCESCHI, 1921) (1) (Pl. 2, Fig. 3)
Merlaites clausus (MERLA, 1932) (2)
Merlaites gradatum (MERLA, 1932) (4)

V. GRAMMOCERATINAE BUCKMAN, 1905
Pseudogrammoceras subregale PINNA, 1968 (1) (Pl. 2, Fig. 4)
Pseudogrammoceras sp. (2)

VI. LEUKADIELLINAE MACCHIONI – VENTURI, 2000
Leukadiella helenae RENZ, 1913 (1) (Pl. 2, Figs 5, 6)

VII. PARONICERATINAE SCHINDEWOLF, 1973
Paroniceras sternale (BUCH in D'ORBIGNY, 1849) (28)
Frechiella kammerkarensis (STOLLEY, 1903) (31)

C. PHYMATOCERATIDAE HYATT, 1867

Phymatoceras robustum HYATT, 1867 (1) (Pl. 2, Fig. 7)
Phymatoceras narbonense BUCKMAN, 1898 (1)
Phymatoceras sp. (5)
Furloceras speciosum (MERLA, 1933) (6)
Furloceras venustulum (MERLA, 1933) (4) (Pl. 2, Figs 8, 9, 13)
Furloceras erbaense (HAUER, 1856) (3) (Pl. 2, Fig. 10)
Furloceras chelussii (PARISCH et VIALE, 1906) (5)
Furloceras iserense (OPPEL, 1856) (11)
Furloceras cornucopia (MERLA, 1933) (1) (Pl. 2, Fig. 14)
Furloceras caroli (MERLA, 1933) (1) (Pl. 2, Fig. 11, 12)
Furloceras anomalum (MERLA, 1933) (4)
Furloceras sp. (45)
Denckmannia fabale (SIMPSON, 1855) (1) (Pl. 3, Fig. 1)
D, HAMMATOCERATIDAE BUCKMAN, 1887
Dumortieria sp. (1)
Rarenodia sp. cf. *planulata* VENTURI, 1975 (1) (Pl. 3, Figs 2, 3)
Geczyceras costatum (GABILLY, 1973) (1)
Geczyceras sp. aff. *perplanum* (PRINZ, 1904) (2)
Hammatoceras sp. aff. *insigne* (SCHÜBLER, 1830) (1)
Crestaites meneghinii (Bonarelli, 1899) (2) (Pl. 3, Fig. 4)
Planammatoceras tenuinsigne (VACEK, 1886) (1) (Pl. 4, Fig. 1)
Planammatoceras sp. (1)

E, ERYCITIDAE SPATH, 1928
Praerycites sp. aff. *civitellensis* VENTURI, 1981 (1) (Pl. 4, Fig. 2)
Erycites sp. aff. *telegdirothi amplus* GÉCZY, 1966 (1) (Pl. 4, Fig. 3, Pl. 5, Fig. 1)
Cagliceras sp. aff. *crassiventris* (MERLA, 1934) (2) (Pl. 5, Fig. 2)
Erycites sp. (2)

F, GRAPHOCERATIDAE BUCKMAN, 1905
Staufenia sp. cf. *sehndensis* (HOFFMANN, 1913) (1) (Pl. 5, Figs 3, 4)

NAUTILIDA
Cenoceras sp. (9)

II. BIVALVIA
Goniomya sp. (1) (Pl. 1, Fig. 7)

III. GASTROPODA (86)
Eucyclus capitaneus (MÜNSTER, 1844) (Pl. 1, Fig. 4)
Eucyclus tataensis SZABÓ, 1995 (Pl. 1, Figs 1, 2)
Eucyclus barnabasi SZABÓ, 1995 (Pl. 1, Fig. 3)
Eucyclus sp.
Tretospira? sp.
Leptomaria? sp. (Pl. 1, Fig. 6)
Riselloida? sp. (Pl. 1, Fig. 5)

IV. BELEMNITIDA
Acrocoelites? sp. (2)

TENTACULATA PHYLUM
BRACHIOPODA
Linguithyris aspasia (ZITTEL, 1869) (3)

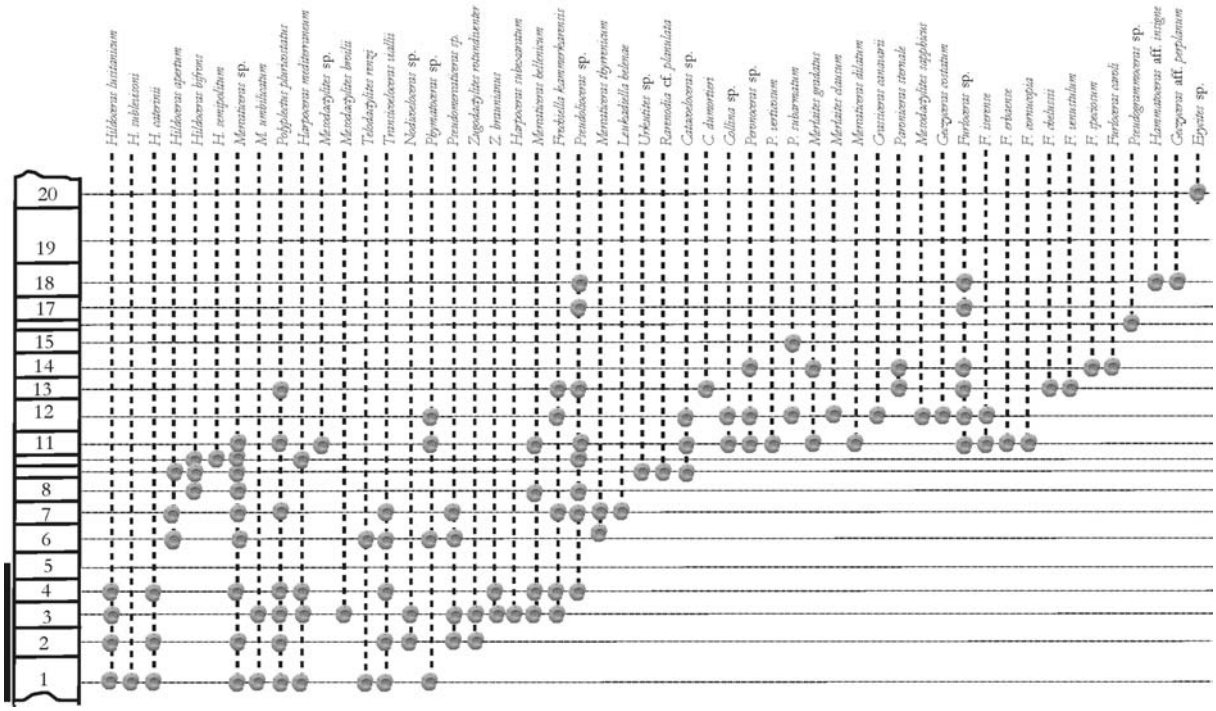

Fig. 2. Distribution of the ammonite taxa collected bed-by-bed. The boundary of Bifrons and Gradata Zones can be drawn between Beds 10 and 11. The bar represents 1 m.

Systematic paleontology

FAMILY Dactylioceratidae HYATT, 1867
SUBFAMILY Nodicoeloceratinae VENTURI et FERRI, 2001
GENUS *Catacoeloceras* BUCKMAN, 1923

Catacoeloceras dumortieri (DE BRUN, 1932)
(Pl. 1, Fig. 11)

1874 *Ammonites crassus* (PHILLIPS), DUMORTIER, pl. 27, fig. 5-7
1932 *Coeloceras Dumortieri* n. sp., DE BRUN, p. 106, pl. 5, fig. 3
1961 *Dactylioceras dumortieri*, MAUBEUGE, p. 567
1966 *Catacoeloceras dumortieri* (MAUBEUGE), FISCHER, pl. 6, fig. 10
1971 *Catacoeloceras dumortieri* (MAUBEUGE), PINNA & LEVI-SETTI, pl. 12, fig. 1, 3
1972 *Catacoeloceras dumortieri* (MAUBEUGE), Guex, pl. 11, fig. 3-4
1987 *Catacoeloceras dumortieri* DE BRUN, ELMI & BENSHILI, pl. 1, fig. 5
1997 *Catacoeloceras dumortieri* (DE BRUN), CASSEL, pl. 13, fig. 7
1998 *Catacoeloceras dumortieri* DE BRUN, RULLEAU, pl. 7, fig. 7-10, pl. 8, fig. 1-6
2001 *Catacoeloceras dumortieri* DE BRUN, RULLEAU et al., pl. 5, fig. 5-6
2005 *Catacoeloceras dumortieri* (DE BRUN), BECAUD et al., p. 27, fig. 11-12

Material: a single internal cast with body chamber of mediocre preservation

Dimensions: D: 48, H: 10 (21%), W: 14

Description: Small, evolute form with a wide umbilicus. The umbilical wall is low, the margin is rounded. The flanks are slightly convex. The ventrolateral shoulder is rounded, the venter is low and wide. The ornamentation consists of strong ribbing. Straight and prorsiradiate primaries arising on the umbilical wall bifurcate at the shoulder. Weakly developed tubercles appear at the furcation points. Forwardly-curved secondary ribs cross the venter without interruption.

Remarks: *C. dumortieri* differs from *C. crassum* (YOUNG et BIRD, 1828, in PHILLIPS, 1835, pl. 12, fig. 15) by being more evolute and less broad coiling, and by having less dense ribbing. It was 1932 when DE BRUN first realized the difference of the three specimens published by DUMORTIER as *A. crassus*. DE BRUN erected a new species, *Coeloceras Dumortieri*, but his publication remained unknown in the literature. MAUBEUGE (1961) pointed out again the differences of DUMORTIER's specimens, and also described them as a new taxon, *Dactylioceras dumortieri*. By the reason of priority, DE BRUN has been recently regarded as the author of the taxon.

Distribution: *C. dumortieri* is typical of the Variabilis/Gradata Zone in England, France, Italy and Morocco. The Kis-Teke Hill specimen also comes from the Gradata Zone (bed K13), it was associated with *Polyplectus pluricostatus, Paroniceras sternale, Furloceras venustulum, F. chelussi*.

FAMILY Hildoceratidae HYATT, 1867
SUBFAMILY Hildoceratinae HYATT, 1867
GENUS *Urkutites* GÉCZY, 1967

Urkutites sp.
(Pl. 1, Figs 18, 19)

Material: a single phragmocone of moderate preservation

Dimensions: D: 37, H: 12 (32%), W: 9

Description: Small, evolute, platycone form with a tricarinate-bisulcate venter. The umbilicus is wide and shallow, the umbilical margin and the ventrolateral shoulder are rounded. The venter is narrow with a low keel and shallow furrows. Weakly developed tubercles can be observed on the umbilical area: this is the specific difference between *Urkutites* and the other Hildoceratinae. Slightly sinuous ribs appear above the umbilical area, some of them emerge from the tubercles and reach the venter. The last half whorl bears 23 ribs.

Remarks: Although this specimen is most similar to *Urkutites inflatus* GÉCZY, 1967, the ribs appear only about the middle of the whorl-side on the latter (GÉCZY 1967b:153 fig. 3). Futhermore, it is close to the *Urkutites* sp. documented by Venturi (2004b, overloaf) but has narrower furrows.

Discussion: The genus *Urkutites* was proposed by GÉCZY for specimens of Hildoceratinae, which "differs from *Hildoceras* in the tubercles around the umbilicus and the absence of a lateral spiral grove" (GÉCZY 1967b:125), and also differs from *Hildaites,* as well as the Harpoceratinae and Phymatoceratinae. At first the new genus was regarded as a synonym of *Hildoceras* (DONOVAN et al. 1981:140), but later Italian paleontologists approved of *Urkutites* as a valid genus (NINI et al. 1997; VENTURI 2004b). The occurrence of the taxon in the Gerecse Mts is documented only from the Kis-Teke Hill section.

Distribution and stratigraphic range: The genus is recorded from the Bifrons Zone of Hungary and Italy. As the first specimens were collected from debris, the exact stratigraphic position of the genus was unidentified. According to NINI et al. (1997:290) and VENTURI (2004b:16), *Urkutites* appears in the lower Bifrons Zone (probably in the Sublevisoni Horizon) in the Apennines. However, the specimen figured here comes from the Bifrons Subzone, above the Lusitanicum Horizon (bed K9), it was associated with *Hildoceras apertum*, *H. bifrons, Mercaticeras* sp., *Catacoeloceras* sp., and *Rarenodia* sp. cf. *planulata*.

FAMILY Phymatoceratidae HYATT, 1867
SUBFAMILY Phymatoceratinae HYATT, 1867
GENUS *Furloceras* ELMI et RULLEAU, 1995

Furloceras caroli (MERLA, 1933)
(Pl. 2, Figs 11, 12)

1933 *Phymatoceras Caroli* n. sp., MERLA, p. 32, pl. 3, fig. 3-4
1963 *Brodieia caroli* (MERLA), KOTTEK, p. 59, pl. 3, fig. 3
1975b *Chartronia caroli* (MERLA), VENTURI, pl. 27, fig. 3, pl. 28, fig. 9
2007 *Furloceras caroli* (MERLA), GÉCZY & SZENTE, pl. 6, fig. 1-2

Material: a single internal mould of moderate preservation

Dimensions: D: 100; H: 33; W: 20

Description: Medium-size, evolute form with tricarinate-bisulcate venter. The umbilicus is wide and shallow. The umbilical wall is low, its edge is rounded. The flanks are gently convex to the middle, then flattened and convergent. The ventrolateral shoulder is rounded. The furrows are narrow and shallow, the keel is low. The whorl-section is elongated subtrapezoidal. No body-chamber is preserved. The ornamentation consists of dense ribbing with 72 secondaries on the last whorl. Short primaries emerge from the umbilical margin without tubercles, and branch into two sinuous secondary ribs.

Remarks: The specimen figured here is very close in morphology to the lectotype designated by KOTTEK (1963:59), however the latter has slightly more involute shell. *F. caroli* differs from the other species of the genus by having narrow and elongated whorl-section, and fine, dense ribbing.

Distribution: The taxon is known from the Gradata Zone of Italy and Greece. In Hungary, some specimens of *F. caroli* are recorded from the Bifrons Zone of the Pisznice and Kis-Gerecse sections, Gerecse Mts (GÉCZY & SZENTE, 2007:228). The Kis-Teke Hill example comes from the Gradata Zone (bed K14), it was associated with *Peronoceras subarmatum*, *Paroniceras sternale*, and *Furloceras speciosum*.

FAMILY Hildoceratidae HYATT, 1867
SUBFAMILY Leukadiellinae MACCHIONI et VENTURI, 2000
GENUS *Leukadiella* RENZ, 1913

Leukadiella helenae RENZ, 1913
(Pl. 2, Figs 5, 6)

1913 *Leukadiella Helenae* RENZ n. sp., RENZ, pl. 14, fig. 1-3
1923 *Leukadiella Helenae* RENZ, RENZ, p. 292, pl. 12, fig. 3
1966 *Leukadiella helenae* C. RENZ, WENDT, pl. 13, fig. 1-4

2000 *Leukadiella helenae* RENZ, MACCHIONI & VENTURI, p. 328, pl. 3, fig. 14, 20
2001 *Leukadiella helenae* RENZ, VENTURI & FERRI, p. 210, p. 212

Material: a single internal cast of moderate preservation

Dimensions: D: 17, H: 8 (47%), W: 10

Description: Small-size, evolute, depressed phragmocone with a subquadrangular whorl-section. The umbilicus is relatively wide and deep, the umbilical margin is rounded. The flanks are convex, the ventrolateral shoulder is rounded. The venter is broad, and carinate-bisulcate with a prominent keel and grooves. The ornamentation consists of single, strong, slightly rursiradiate ribs arising from the umbilical margin. Their intervals are wide and concave. There are 10 ribs on the last whorl. The ribs terminate at the ventrolateral shoulder in tubercles.

Remarks: The Paroniceratinae and Leukadiellinae are typical Tethyan groups appearing in the Toarcian. The genus *Frechiella* Prinz and particularly *Frechiella kammerkarensis* Stolley are markedly frequent taxa in the Gerecse Mts, while *Leukadiella* is especially rare. A single fragment of *L. jeanneti* RENZ, 1927 has only been recorded from the Kis-Gerecse section until now (GÉCZY & SZENTE 2007:231).

Distribution: The taxon is known from the Bifrons Zone of the Mediterranean and the Submediterranean regions (Greece, Italy, Austria, Switzerland, Hungary, Spain, South France), and from Algeria, Chile, Argentina, North America (MACCHIONI & VENTURI, 2000:321). The Kis-Teke Hill specimen comes from the Bifrons Subzone (bed K7) associated with *Hildoceras apertum*, *Polyplectus pluricostatus, Pseudolioceras lythense, Transicoeloceras viallii*, *Frechiella kammerkarensis*, *Mercaticeras thyrrenicum*.

FAMILY Hammatoceratidae BUCKMAN, 1887
SUBFAMILY Hammatoceratinae BUCKMAN, 1887
GENUS *Rarenodia* VENTURI, 1975

Rarenodia sp. cf. *planulata* VENTURI, 1975 (Pl. 3, Figs 2, 3)

Material: poorly preserved fragments of the phragmocone and the body chamber

Dimensions: D: approx. 210

body-chamber: H: 52, W: 26

fragment A (fragment of the penultimate whorl): H: 35, W: 26, ribs: 8/90mm

fragment B (fragment of an inner whorl): H: 27, W: 20, ribs: 22/90mm

Description: Large, evolute form. The umbilicus is wide and shallow with a low umbilical wall. The umbilical margin and the ventrolateral shoulder are weakly developed and rounded. The flanks are slightly convex, the venter is wide. The whorl-section of inner fragments is ovally-shaped with a subacute venter, while the section of the body chamber is acute-oval. The ornamentation consists of a well-developed radial ribbing. The ribs emerge from the margin, and decease at the shoulder. The ribbing is dense on the inner whorls, while stronger and more widely spaced on the penultimate whorl, where their intervals are concave. Due to the poor state of preservation, two weakly developed nodes can only be observed on the fragment B. Despite the corroded surface, the suture-line can be observed. The E is large and developed, its length is 2/3 of the L. The L is wide and lacerated, the U3 is oblique (Fig. 3).

Remarks: *Rarenodia* was introduced by VENTURI (1975a) with two species: *R. planulata* and *R. latecosta*. The new genus has phylogenetic significance, *Rarenodia* being the earliest representative of the superfamily Hammatoceratacea (VENTURI, 1975a:19, 1994:344, RULLEAU et al. 2001:55, MOYNE & NEIGE, 2004:117, BECAUD et al., 2005:31). (More studies on *Rarenodia*: NICOSIA et al., 1977, NICOSIA & PALLINI, 1978, WIEDENMAYER, 1980, VENTURI, 1981, JAKOBS, 1997, VENTURI, 2003, VENTURI & FERRI, 2001).

Differences: Although the ribbing of the fragment B is unusually dense, the ornamentation of the Kis-Teke Hill specimen is typical of *Rarenodia*, being denser on the inner whorls and more widely spaced at large diameter. However, the fragment A differs in morphology from the other *Rarenodia* figured in previous papers or from those found in various localities in the Gerecse Mts. Its whorl-section is close to *R. latecosta* (see VENTURI, 1975a:14, fig. 3, VENTURI, 2003:12, fig.1), but its suture is not the same. Dimensions resemble the specimens presented by VENTURI & ROSSI (2003:105), and JAKOBS (1997, pl.10-11), but there is considerable difference in the ribbing. Suture differs from the typical lobe-line figured by VENTURI (1975a, 1994, 2001, 2003), having more developed ES and LS1, and an oblique U3. Although the oblique U3 is typical of *Rarenodia* forms of the Erbaense Zone in the Apennines (VENTURI, 1994:347), on the whole the suture structure seems to be praerycitid (VENTURI, 1994, pl. 3, fig. c): large E, large and asymmetrical L, ES and LS1 are almost the same broad, LS2 is well-developed, U2 and U3 are approx. the same size. By reason of the suture-line, this specimen presumably represents a transitional form between *Rarenodia* and the earliest species of *Geczyceras* appearing in the Gradata Zone [*Geczyceras costatum*, *G. clausum* (GABILLY)] and the Thouarsense Zone [(*G. bonarellii* (PARISH et VIALE), *G. porcarellense* (BONARELLI)] in the Gerecse Mts.

Distribution: The taxon is known from the Middle Toarcian of Italy, Spain, Hungary and North America.

The specimen figured here comes from the Bifrons Subzone (bed K9), it was associated with *Hildoceras apertum, H. bifrons, Mercaticeras* sp., *Urkutites* sp., *Catacoeloceras* sp.

Fig. 3. Suture-line of *Rarenodia* sp. cf. *planulata* VENTURI

FAMILY Hammatoceratidae BUCKMAN, 1887
SUBFAMILY Hammatoceratinae BUCKMAN, 1887
GENUS *Planammatoceras* BUCKMAN, 1922

Planammatoceras tenuinsigne (VACEK, 1886)
(Pl. 4, Fig. 1)

1886 *Hammatoceras tenuinsigne* n. sp., VACEK, p. 88, pl. 12, fig. 6-7
1910 *Hammatoceras* sp. aff. *tenuinsigne* VACEK, HAHN, p. 386, pl. 16, fig. 7
1914 *Hammatoceras tenuinsigne* VACEK, FOSSA-MANCINI, p. 75
1932 *Hammatoceras tenuinsigne* VACEK, DE BRUN, p. 184, pl. 2, fig. 7
1961 *Hammatoceras* (*Hammatoceras*) cf. *tenuinsigne* VACEK, KRYMHOLZ, p. 105, pl. 6, fig. 5
1963 *Planammatoceras tenuinsigne* (M. VACEK), ELMI, p. 87, fig. 32, p. 88, fig. 33
1966 *Hammatoceras tenuinsigne* VACEK, GÉCZY, p. 62, pl. 13, fig. 3.
1966 *Hammatoceras tenuinsigne* VACEK, NUTSUBIDZE, p. 147, pl. 34, fig. 1
1992 *Planammatoceras tenuinsigne* (VACEK), MARTINEZ, p. 169, pl. 37, fig. 6
1994 *Planammatoceras tenuinsigne* (VACEK), GOY et al., pl. 2, fig. 11
1996 *Planammatoceras tenuinsigne* (VACEK), RULLEAU, pl. 33, fig. 3-4
1997 *Planammatoceras tenuinsigne* (VACEK), CRESTA, p. 32, p. 33, fig. 5, pl. 1, fig. 1-6
2001 *Planammatoceras tenuinsigne* (VACEK), RULLEAU et al., pl. 26, fig. 5
2002 *Planammatoceras tenuinsigne* (VACEK), CRESTA, p. 183, fig. 119
2005 *Planammatoceras tenuinsigne* (VACEK), PALLINI et al., p. 15, pl. 11, fig. 1-5, pl. 16, fig.12
2007 *Planammatoceras tenuinsigne* (VACEK), RULLEAU, pl. 79, fig. 3

Material: a single phragmocone of moderate preservation

Dimensions: D: 160; H: 50 (31%); W: 26

Description: Large, moderately evolute, discoidal form with a well-developed hollow ventral keel. The umbilical wall is low, the flanks are slightly convex. The ornamentation consists of dense ribbing without tuberculation. There are 44 ribs on the outer part of the whorl, but due to the state of preservation the exact number of the inner ribs and the intercalatories cannot be examined. The primary ribs are rursiradiate on the umbilical walls and rectiradiate on the flanks. The primaries branch into two thinner secondary ribs, which bend forward on the venter. The compressed subtriangular whorl-section is approximately twice as high as wide, and well corresponds to the shape illustrated in PALLINI et al. (2005: plate 16, fig. 12). The suture-line shows characteristic hammatoceratid feature (Fig. 4)

Remarks: The Kis-Teke Hill example is strikingly close in morphology to VACEK's types, but it differs by having a slightly more evolute shell resembling the specimen figured by CRESTA (2002:183, fig. 119). On the ground of the recent revision of the Gerecse Ammonitina material, *P. tenuinsigne* seems to be a frequent taxon in the assemblage. The less involute style of coiling appears to be an intraspecific variability.

Distribution: Aalensis Zone – Murchisonae Zone: France, Spain, Italy, Morocco. In Hungary, it is known from the Comptum Zone – Murchisonae Zone of Csernye (Bakony Mts.) (GÉCZY, 1966:64; 1967:258-259) and from the Meneghinii – Opalinum Zones in the Gerecse Mts.

Fig. 4. Suture-line of *Planammatoceras tenuinsigne* (VACEK)

FAMILY Erycitidae SPATH, 1928
SUBFAMILIY Erycitinae SPATH, 1928
GENUS *Praerycites* VENTURI, 1981

Praerycites sp. aff. *civitellensis* VENTURI, 1981
(Pl. 4, Fig. 2)

Material: a single poorly preserved, fragmentary internal mould

Dimensions: D: 94, H: 28 (29%), W: 30

Description: Medium-size, moderately evolute form without ventral keel. The umbilicus is shallow, the flanks are convex, the venter is rounded, the whorl-section is wide-oval. The ornamentation consists of thick, radiate primary ribs bifurcating at the lower third of the whorl-height without tubercles. Thinner and curved secondaries fading away create a ventral smooth band. No body-chamber is preserved. The suture-line not visible in all details shows erycitid character. The length of the E is 1/3 of the L. The L is long and widely ramified. The lateral saddle is more developed than the external one, the U is divided and oblique.

Remarks: The genus was introduced by Venturi (1981) for erycitid forms occurring as early as the Bifrons Zone. It presumably derived from *Rarenodia*, and is considered as one of the ancestors of both the Hammatoceratinae and the Erycitinae lineages (MARTINEZ, 1992, RULLEAU et al, 2001).

The Kis-Teke Hill example is very close in morphology to the holotype (VENTURI, 1981:85-87, fig. 5, p. 91, fig. 8/c, pl. 1, fig. 7) in its coiling style and ribbing, but is significantly larger (D of holotype: 21, D of paratype n. 279: 46, VENTURI, 1981:86). It also shows close affinity to other examples figured by VENTURI (1994, pl. 7, fig. 8, 11), PARISI et al. (1998, pl. 3, fig. 3) and VENTURI (2004a, p. 20, fig. 3, overloaf, fig. 3).

The Kis-Teke Hill specimen comes from the Clausus Subzone (bed K12) associated with *Collina meneghinii, Peronoceras subarmatum, Merlaites clausus, Crassiceras canavarii, Mesodactylites sapphicus, Geczyceras costatum, Furloceras iserense.*

Distribution: *Praerycites* is known from the Bifrons Zone – Gradata Zone of Italy. This is the first documentation of the genus from Hungary.

SUBFAMILIY Erycitinae SPATH, 1928
GENUS *Erycites* GEMMELLARO, 1886

Erycites sp. aff. *telegdirothi amplus* GÉCZY 1966
(Pl. 4, Fig. 3, Pl. 5, Fig. 1)

1966 *Erycites telegdirothi amplus* n. subsp. GÉCZY, p. 89, p. 235, fig. 3

Material: a single, well-preserved internal mould with the half of the body-chamber

Dimensions: D: 105, H: 30 (28%), W: 26

Description: Medium-size, moderately evolute form with a deep umbilicus and convex flanks. Erycitid coiling: inner whorls are more involute (u: 42.5%) than the last one (u: 47.6%). The cross-section of the phragmocone is wide-oval becoming narrower on the body chamber with max. width at the lower third of the flank. The ornamentation consists of dense ribbing without tubercles. Strong primary ribs emerge from the umbilicus, and branch into two or three thinner secondary ribs at the lower third. The secondaries fading on the venter form a 1.5 mm intersection. The ribs slightly rectiradiate on the inner whorls, became prorsiradiate on the body-chamber. There are 12 primary and about 31 secondary ribs on

the first half of the last whorl. The suture-line has a specific erycitid structure.

Remarks: The specimen differs in morphology from most *Erycites* species documented until now. The nearest form is *Erycites telegdirothi amplus* GÉCZY, 1966 from Csernye. Its sample can be examined in the collection of Geological Institute of Hungary. The example MÁFI J5327 is very close to the Kis-Teke Hill specimen in the coiling style and the suture line, however it differs by having finer primary ribs that bifurcate at the mid-flank.

Distribution: The genus is typical of the Upper Toarcian – Upper Aalenian in Europe, North Africa, Caucasus, Alaska, New Zealand(?) and Thailand. In Hungary, *Erycites telegdirothi amplus* has been hitherto known from the Upper Aalenian of Csernye (Bakony Mts).

Fig. 5. Suture-line of *Erycites* sp. aff. *telegdirothi amplus* GÉCZY

FAMILY Graphoceratidae BUCKMAN, 1905
SUBFAMILY Leioceratinae SPATH, 1936
GENUS *Staufenia* POMPECKJ, 1906

Staufenia sp. cf. *sehndensis* (HOFFMANN, 1913)
(Pl. 5, Figs 3, 4)

Material: a single internal cast of moderate preservation

Dimensions: D: 115, H: 53 (46%), W: 18

Description: Discoidal, involute form with a narrow, high, fastigate venter and lanceolate whorl-section. The flanks are slightly convex, the umbilicus is moderately deep and narrow. The umbilical wall is vertical, the margin is somewhat angled. Weakly developed sigmoid ribbing can be seen only on the upper half or third of the flank. The suture-line is simple with short and broad lobes.

Remarks: The specimen resembles the lectotype designated by RIEBER (1963:42), however, it slightly differs in morphology. It has similar size and coiling style, but possesses fastigate venter, less developed ribbing, and a moderately different suture-line structure. RIEBER (l.c.) emphasized the variability of the taxon, and this variability has been well-confirmed by the examples figured in the literature by various authors (e.g. GÉCZY, 1967a, pl. 40, fig. 5, CONTINI, 1969, pl. 1, fig. 6-9, pl. 12, fig. 4-5, pl. 13, fig. 1-5, pl. 24, fig. 25-28, LINARES et al., 1988, pl. 1, fig. 10, METODIEV, 1997, pl. 5, fig. 3 and RULLEAU, 2000, pl. 20, fig. 1-2). For the lack of essential data (e.g. ornamentation of the body chamber and stratigraphic range) the exact determination of the Kis-Teke Hill specimen does not seem possible.

The genus *Staufenia* indicates the upper part of the Lower Aalenian, but due to the condensation of the bed J12, where the example was found, its exact stratigraphic position is unknown. The example was associated with *Furloceras speciosum, F. iserense, Merlaites gradatus, Paroniceras sternale, Geczyceras* sp. aff. *perplanum, Dumortieria* sp., *Erycites*? sp., *Osperlioceras* sp., *Pseudogrammoceras* sp..

Distribution: The taxon is typical of the Murchisonae Zone in Germany, Spain, France, Bulgaria. In Hungary, a single specimen is known from the Lower Aalenian of Csernye (Bakony Mts).

Fig. 6. Suture-line of *Staufenia* sp. cf. *sehndensis* (HOFFMANN)

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Plate 1

Toarcian fossils from the Kis-Teke Hill.

Figs 1, 2. *Eucyclus tataensis* SZABÓ, 1995
Fig. 3. *Eucyclus barnabasi* SZABÓ, 1995
Fig. 4. *Eucyclus capitaneus* (MÜNSTER, 1844)
Fig. 5. *Riselloida*? sp.
Fig 6. *Leptomaria*? sp.
Fig. 7. *Goniomya* sp.
Fig. 8. *Calliphylloceras beatricis* (BONARELLI, 1897)
Fig. 9. *Zugodactylites braunianus* (D'ORBIGNY, 1845)
Fig. 10. *Mesodactylites sapphicus* (RENZ, 1912)
Fig. 11. *Catacoeloceras dumortieri* (DE BRUN, 1932)
Fig. 12. *Peronoceras subarmatum* (YOUNG ET BIRD, 1822)
Fig. 13. *Harpoceras mediterraneum* PINNA, 1968
Fig. 14. *Polyplectus pluricostatus* HAAS, 1913
Figs 15, 16. *Hildoceras bifrons* (BRUGUIÈRE, 1792)
Fig. 17. *Hildoceras lusitanicum* MEISTER, 1913
Figs 18, 19. *Urkutites* sp.

All photographs in natural size.

Plate 1

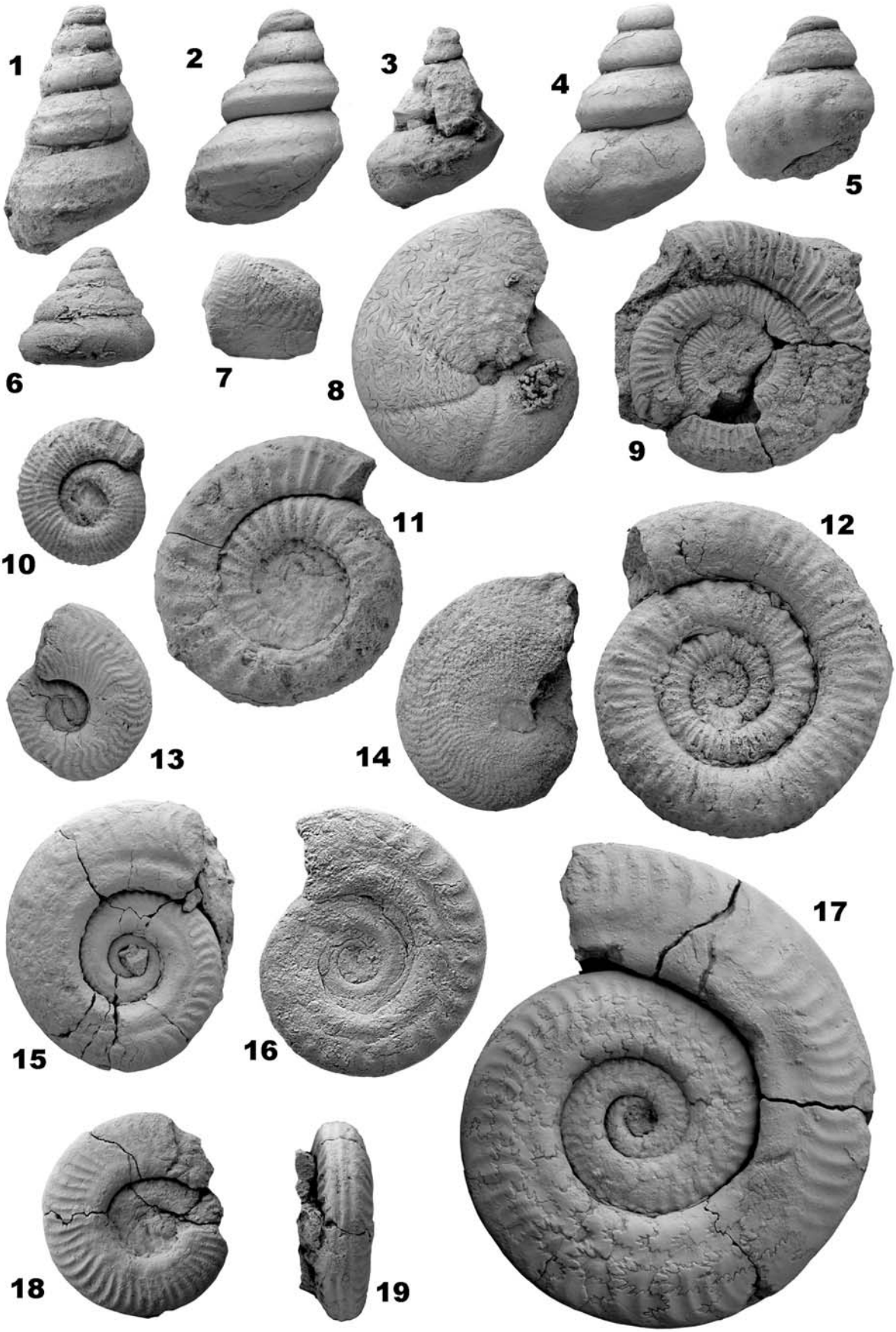

Plate 2

Toarcian ammonites from the Kis-Teke Hill

Figs 1, 2. *Crassiceras bayani* (DUMORTIER, 1874)
Fig. 3. *Crassiceras canavarii* (FRANCESCHI, 1921)
Fig. 4. *Pseudogrammoceras subregale* PINNA, 1968
Figs 5, 6. *Leukadiella helenae* RENZ, 1913 (2x)
Fig 7. *Phymatoceras robustum* HYATT, 1867
Figs 8, 9, 13. *Furloceras venustulum* (MERLA, 1933)
Fig. 10. *Furloceras erbaense* (HAUER, 1856)
Figs 11, 12. *Furloceras caroli* (MERLA, 1933)
Fig. 14. *Furloceras cornucopia* (MERLA, 1933)

All photographs in natural size, except Figs 5, 6

Plate 2

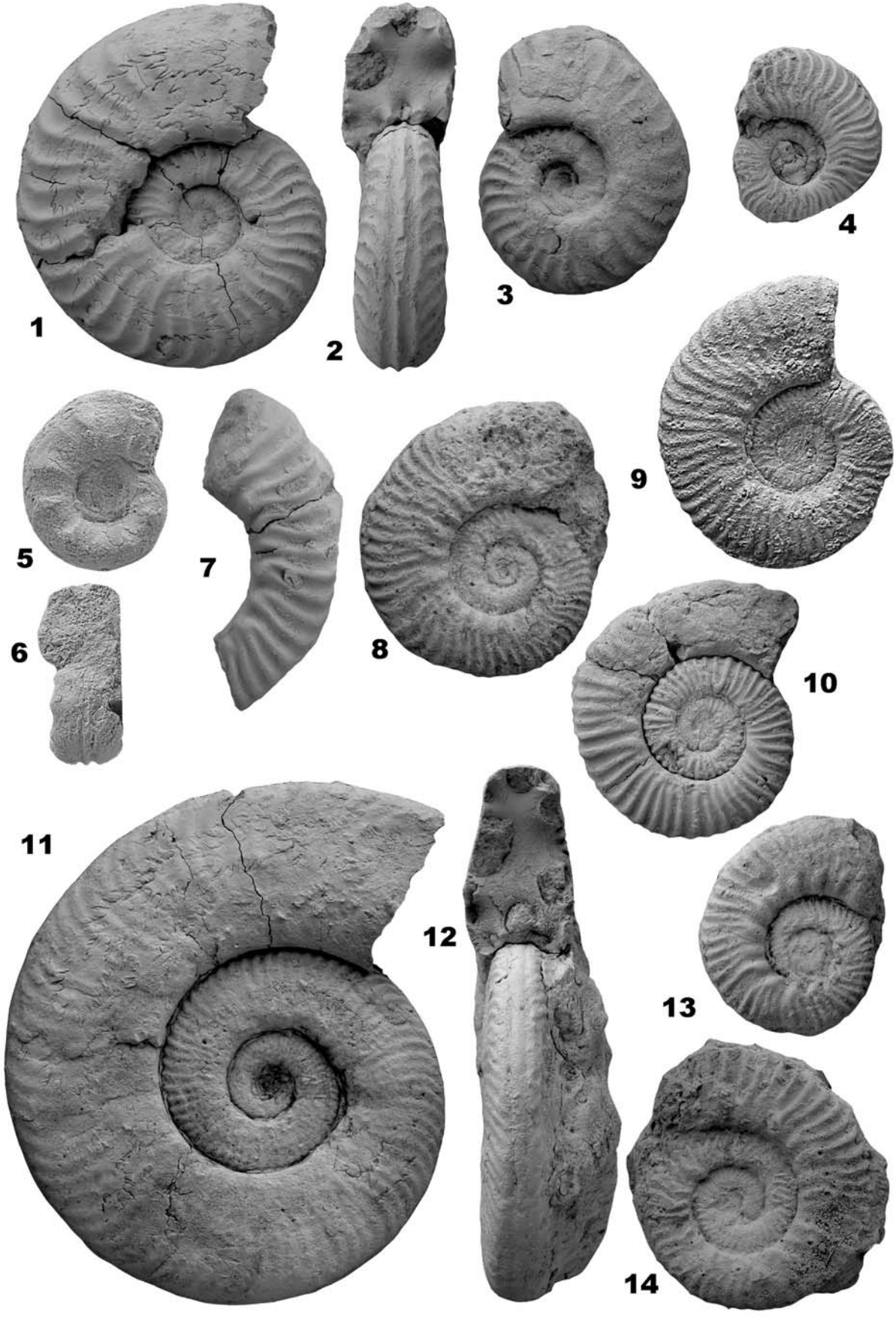

Plate 3

Toarcian ammonites from the Kis-Teke Hill

Fig. 1. *Denckmannia fabale* (SIMPSON, 1855)
Figs 2, 3. *Rarenodia* sp. cf. *planulata* VENTURI, 1975
Fig. 4. *Crestaites meneghinii* (BONARELLI, 1899)

All photographs in natural size.

Plate 3

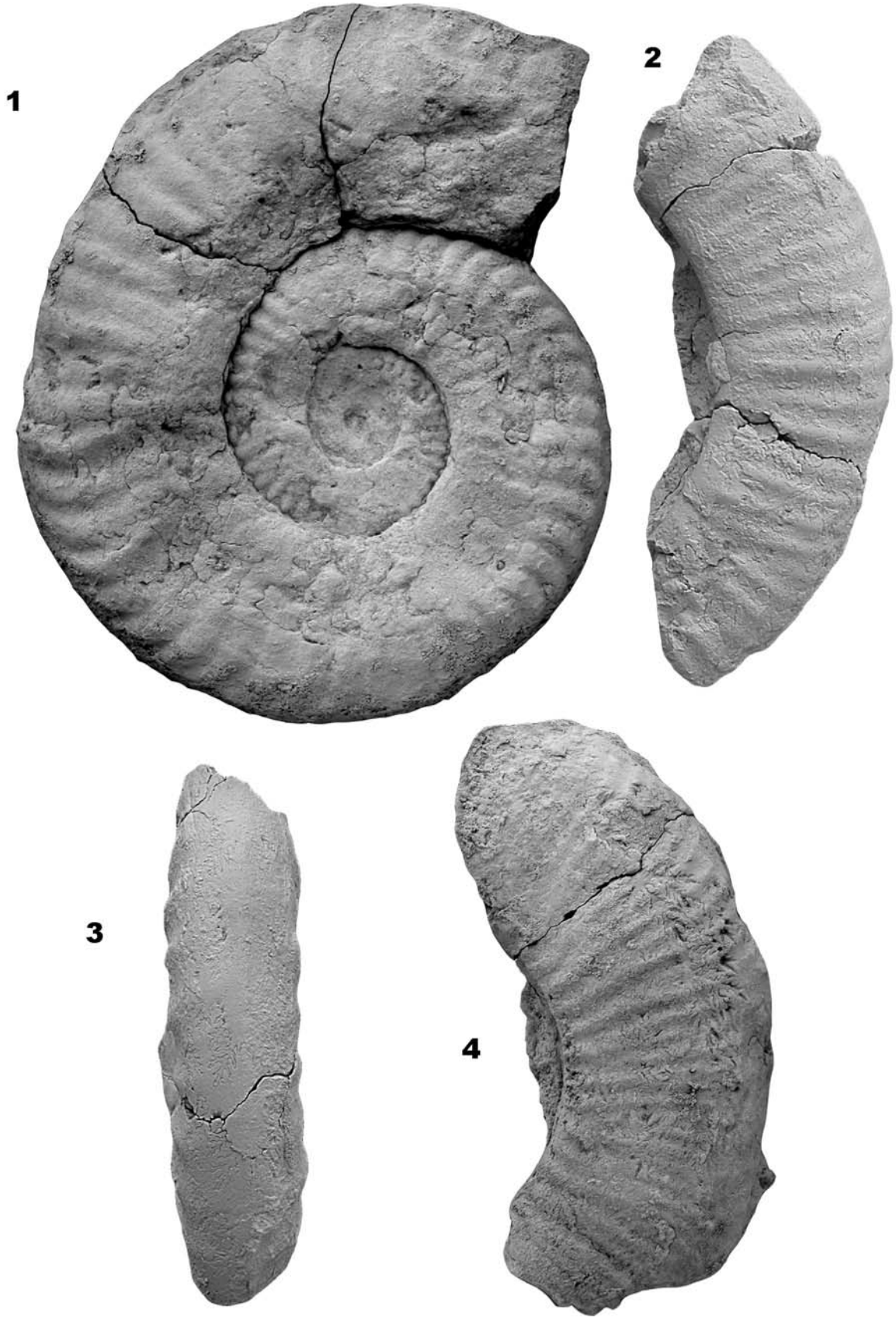

Plate 4

Toarcian and Aalenian ammonites from the Kis-Teke Hill

Fig. 1. *Planammatoceras tenuinsigne* (VACEK, 1886)
Fig. 2. *Praerycites* sp. aff. *civitellensis* VENTURI, 1981
Fig. 3. *Erycites* sp. aff. *telegdirothi amplus* GÉCZY, 1966

All photographs in natural size.

Plate 4

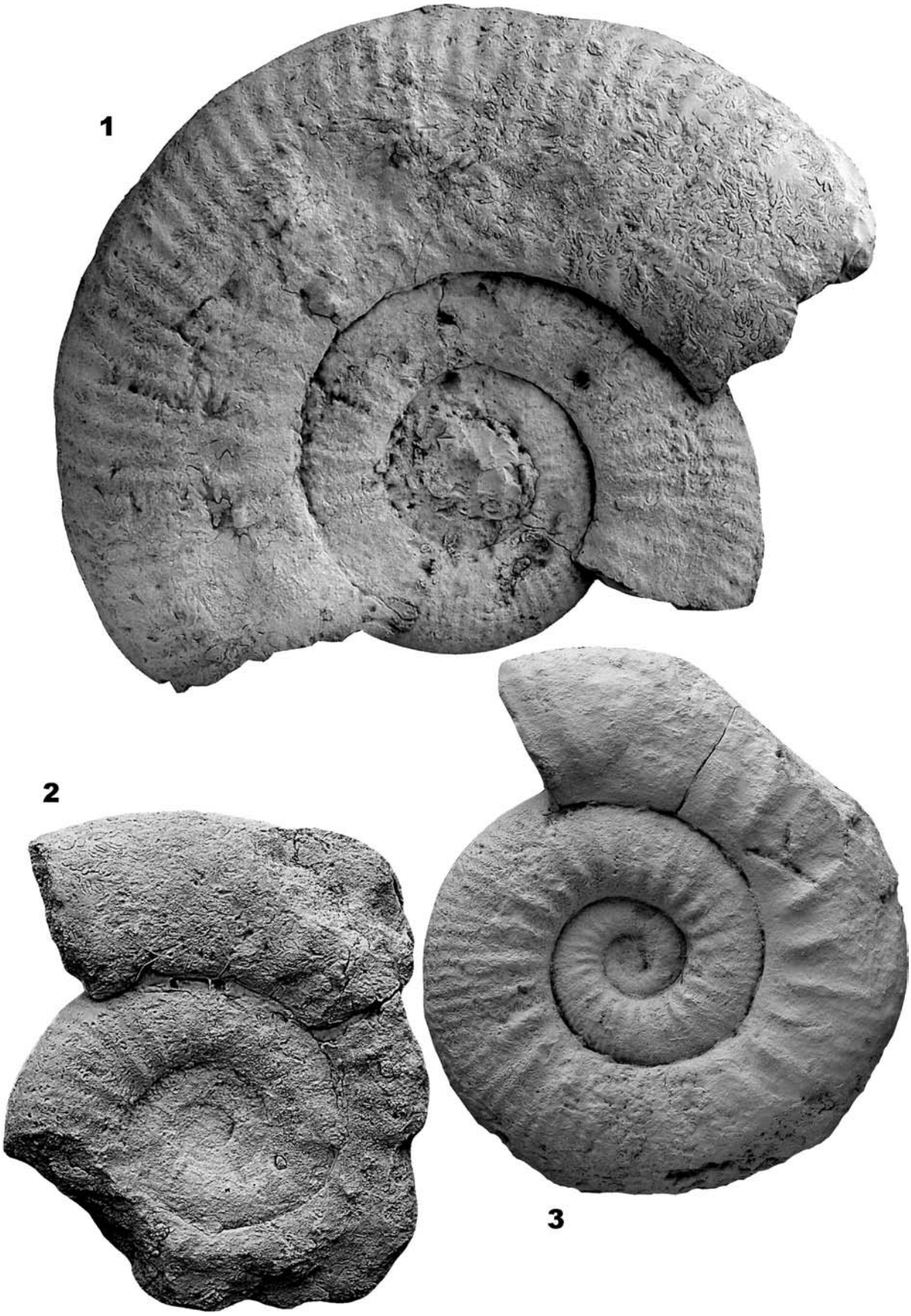

Plate 5

Toarcian and Aalenian ammonites from the Kis-Teke Hill

Fig. 1. *Erycites* sp. aff. *telegdirothi amplus* GÉCZY, 1966
Fig. 2. *Cagliceras* sp. aff. *crassiventris* (MERLA, 1934)
Figs 3, 4. *Staufenia* sp. cf. *sehndensis* (HOFFMANN, 1913)

All specimens in natural size.

Plate 5