

Early Jurassic thecideids (*Thecideidae*, *Brachiopoda*) and associated fossils from Tivoli near Rome, Italy

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Kora jura Thecideida brachiopodák és velük együtt előforduló egyéb ősmaradványok a Róma (Olaszország) melletti Tivoliból

Összefoglalás

A dolgozat elsőként ismerteti az Appenninek alsó toarci rétegeiből a *Moorellina parca* (RAU), 1905, *Davidsonella sinuata* (DESLONGCHAMPS) és a *Suessia liasiana* (DESLONGCHAMPS) brachiopoda fajokat. A begyűjtött 460, többségében töredékes ammonitesz segítségével a brachiopodákban és krinoidea-maradványokban gazdag réteget a toarci bázisát jelző Polymorphum Zónába sorolhatjuk. A Colle Vecchio toarci szelvényét – a lelőhely egyedi és sajátos őslénytani értékei alapján – javasoljuk felvenni a földtani örökség regionális jegyzékébe.

Kulcsszavak: alsó jura, Középső-Appenninek, brachiopoda, ammonitesz, belemnitesz, Polymorphum Zóna, földtani örökség

Abstract

The aim of this paper is to point out the first reporting of *Moorellina parca* (RAU), *Davidsonella sinuata* (DESLONGCHAMPS) and *Suessia liasiana* (DESLONGCHAMPS) in the Apenninic Lower Toarcian beds. The sampling of 460 specimens of ammonites (mainly fragmentary specimens) allowed us to correlate the fossiliferous level known in the literature for the rich associations with brachiopods and crinoids in the basal Toarcian, Polymorphum Zone. Due to its uniqueness and paleontological value, we propose the Toarcian fossil deposit of Colle Vecchio to be included in the regional list of Geosites for the conservation of the geological heritage.

Keywords: Lower Jurassic, Central Apennines, Brachiopods, Ammonites, Belemnites, Polymorphum Zone, Geological heritage

Introduction

The brachiopod fauna of the Colle Vecchio outcrop was studied by VÖRÖS (2002); however, he did not report these micromorphic species of encrusting. Their recognition in a retrospect is due to the passion and patience of the second author (G. A.) who, during the preparation of the dossier relating to the formalization of the outcrop in the regional catalog of Geosites (CRESTA et al. 2005), recognized the species encrusted on other fossils and present in the microfauna associated with the level of *Koninckella* already known in the literature.

The present volume dedicated to the scientific activity of Attila VÖRÖS provides an excellent opportunity to inform the scientific community of this occurrence.

Geological and stratigraphic framework

As pointed out by MANNI & DI NARDO (2021 and references therein), the Colle Vecchio outcrop (*Figure 1, A*) is part of the Apennine Jurassic pelagic succession included in the “Monte Catillo” Regional Nature Reserve. Our attention, motivated by the opportunity to include the outcrop in the Regional Catalogue of Geosites, was focused on the layers within which the fossil association known in the literature originates.

The sampled section (*Figure 1, B*) is 7 meters thick and consists of white and light grey micritic limestones with chert lenses and nodules from the topmost portion of the Corniola Formation corresponding regionally to the basal Toarcian. The authors have highlighted two different scenar-

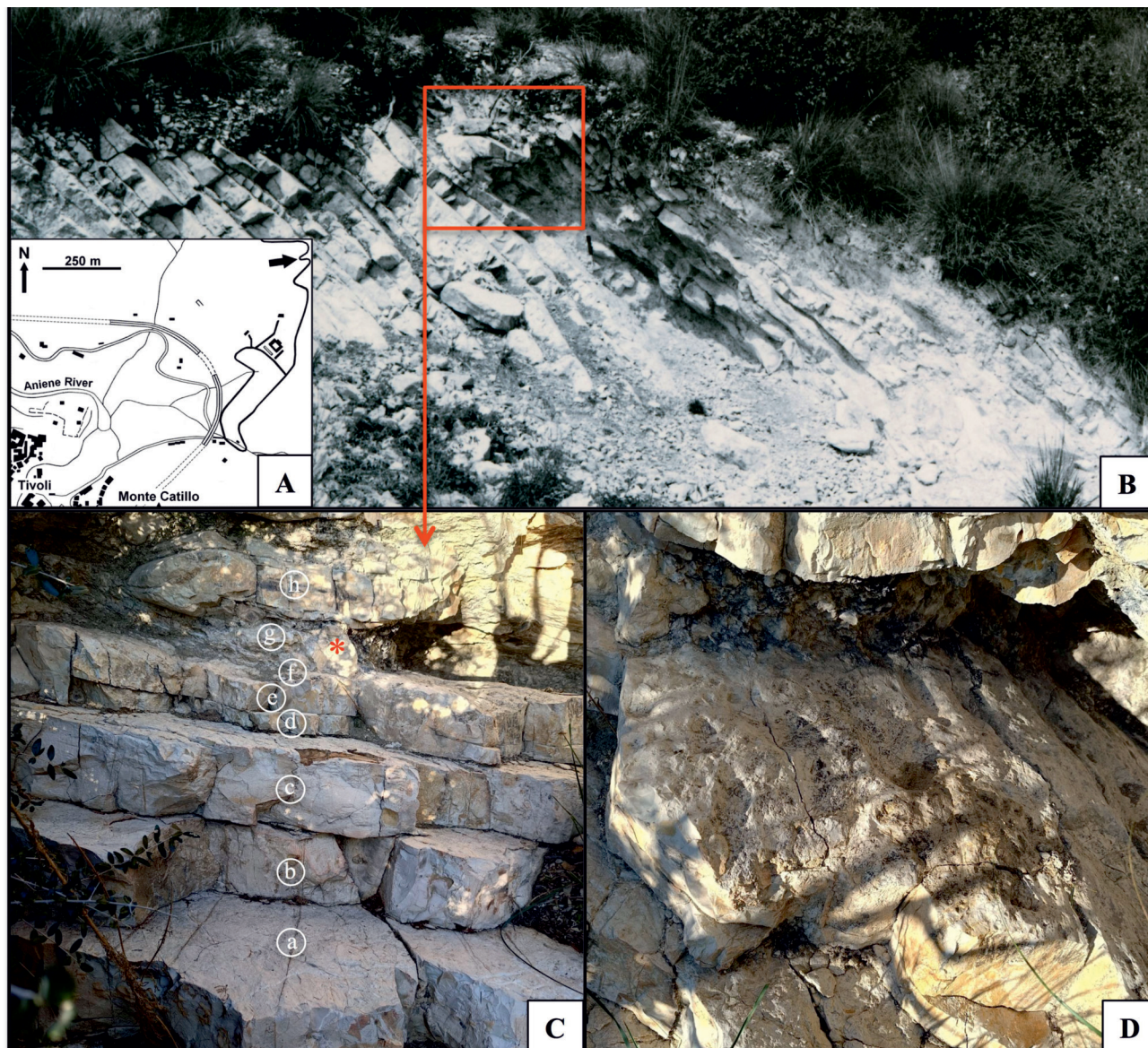


Figure 1. A) location of the Colle Vecchio outcrop (from MANNI & DI NARDO 2021); B) stratigraphic succession of the topmost part of the Corniola Formation; C) sampled stratigraphic interval: bed a - micritic limestones (20 cm, macrofossils not found); bed b - micritic limestones (18 cm, macrofossils not found); bed c - micritic limestones (18 cm) with an irregular surface on the top covered by a marly layer of variable thickness (1-2 cm) macrofossils not found; bed d - micritic limestones (5 cm) with a firm ground on the top, macrofossils not found; bed e - micritic limestones (14 cm) with a hard-ground erosion surface on the top containing indeterminate brachiopods; bed f - marly level of variable thickness (2-5 cm) with resedimented ammonites, belemnites and brachiopods; bed g - marl and marly clays (25-30 cm), richly fossiliferous, from which the specimens described in the literature come (MANNI & NICOSIA 1990, VÖRÖS 2002, MANNI & DI NARDO 2021); bed h - slumping level (130 cm), followed by recent debris cover that hides the stratigraphic succession; D) detail of bed e top surface in which the depressions filled by marls containing ammonites, brachiopods and resedimented belemnites can be seen

I. ábra. A) a Colle Vecchio lelőhely (MANNI & DI NARDO 2021 nyomán); B) a Corniola Formáció felső részének rétegsora; C) a begyűjtött szelvény: a réteg - finomszemcsés mészkő (20 cm, makrofaunát nem szolgáltatott); b réteg - finomszemcsés mészkő (18 cm, makrofaunát nem szolgáltatott); c réteg - finomszemcsés mészkő (18 cm, egyenetlen felső felszínén 1-2 cm vastag, makrofaunamentes márgaréteggel); d réteg - finomszemcsés mészkő (5 cm) tetején keményfelszínnel, makrofaunamentes; e réteg - finomszemcsés mészkő (14 cm) tetején keményfelszínnel, meghatározhatatlan brachiopoda-maradványokkal; f réteg - változó vastagságú márgás réteg (2-5 cm) áthalmazott ammoniteszekkel, belemniteszekkel és brachiopodákkal; g réteg - márga és márgás agyag (25-30 cm), ősmaradványokban gazdag, (MANNI & NICOSIA 1990; VÖRÖS 2002; MANNI és DI NARDO 2021); h réteg - rogyott réteg (slump), (130 cm) felső részén törmelékkel fedve; D) az e réteg felső részének részlete; a mélyedéseket ammoniteszeket, belemniteszeket és áthalmazott brachiopodákat tartalmazó márga tölti ki

ios of lithostratigraphic evolution between this Formation and the above.

In the Pelagic Carbonate Platform areas (SANTANTONIO 1994; GALLUZZO & SANTANTONIO 2002; BALDANZA et al. 2022 and references therein) a hard-ground formed prior to the resumption of sedimentation with the nodular lime-

stones and marls of the Umbrian Marche Ammonitico Rosso Formation; in the most depressed basin areas there is a transition between the micritic sediments of the Corniola Formation to the predominantly marly-clayey sediments of the Marne di Monte Serrone Formation.

In addition to these two main typologies, there are cases,

like the one described here, in which tectonic and/or palaeogeographic evidence points to local variations. The peculiarity of this outcrop is the presence of a slumped level in contact with a surface with elements that suggest a slowing/stopping of sedimentation and the formation of a hard-ground whose clastic components (fragments of ammonites belonging to the Polymorphum Zone) are also found in the marl portion above, squeezed by gravitational sliding.

In detail, we found that in the upper part (beds a, b, c, d, e) the limestone layers are interspersed with thin marly and calcareous-marly layers of cm-thickness (Figure 1, C). The bank below the fossiliferous level (beds d-e) is divided by a “sharp surface” and has a hard-ground on the roof whose trace is represented by morphological depressions that form niches (Figure 1, D).

These depressions are filled by fossiliferous marls (Figure 1, C, bed f) in which the specimens of ammonites and belemnites displayed in Plate II have been found (Figure 1, D): some specimens show signs of re-sedimentation. Above, squeezed into calcareous and calcareous-marly levels bent by sliding, a chaotic level (bed g, 20–35cm) emerges consisting of fragments of micritic limestone in a richly fossiliferous marly-clayey matrix from which most of the known fossils come (MANNI & NICOSIA 1990, MARIOTTI 1994, VÖRÖS 2002, VENTURI 2006, MANNI & DI NARDO 2021).

Paleontological framework

Although the fossil association of this outcrop is known in the literature, in order to construct a dossier necessary for the proposal of a Paleontological Geosite we considered it necessary to resample the succession to constitute a reference collection, still under study, which is temporarily hosted by the second author (G. A.).

Fifty kg of fossiliferous marl from bed g was sieved and the subsequent count of the specimens found (1176) gave the following result: 460 ammonites (mostly in a fragmented state); 25 belemnites; 4 gastropods; 25 regular echinoids spines plus 3 specimens less than 1 cm in size (Figure 2); 200 crinoid cups (of genera already known in literature); 450 brachiopods, of which 200 belong to the groups Terebratulidae and Rhynchonellidae and 250 to Koninckinidae, in addition to the Thecideidae covered by this report encrusted on 30 organic bases (belemnites, crinoids, brachiopods). Specimens belonging to the genera *Suessia* and *Davidsonella* have also been found (Plate II); 50 fragments of problematic attribution (sponge spicules, corals?) and approximately one thousand of columnaria crinoids articles (with minimum size 2 mm).

Some ammonites and belemnites figured in Plate II came from the marly layer covering the eroded depres-

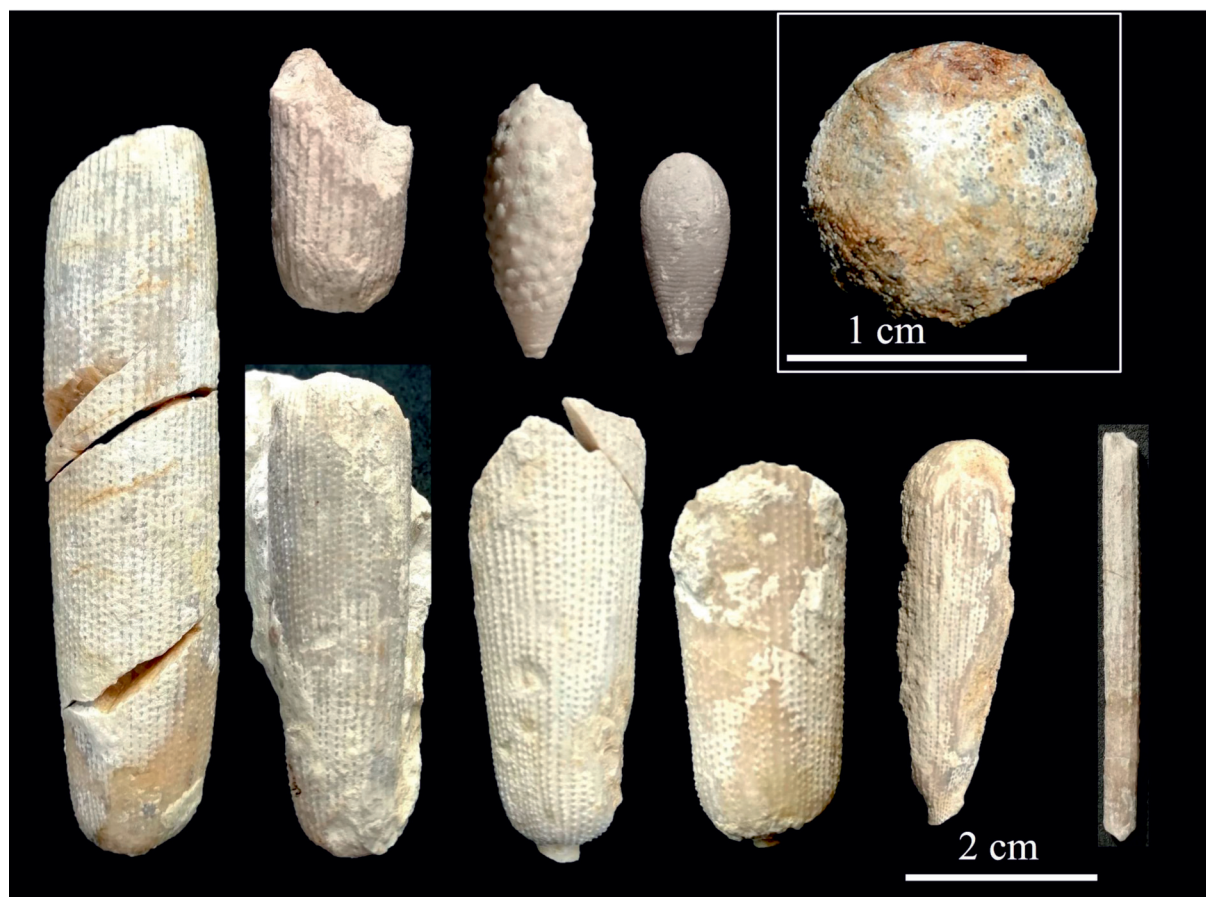


Figure 2. Regular echinoid remains from bed g. The figured specimens will be housed in the Piobbico Geo-Paleontological Museum collections

2. ábra. A g rétegből származó echinoidea-maradványok. A példányok a piobbicói földtani és őslénytani gyűjteményben lesznek elhelyezve

sions on the top of the last bed of the Corniola Formation (bed f).

Since the purpose of this report is to integrate our finds with an already extensive and well-determined paleontological dossier (MANNI & NICOSIA 1990, MARIOTTI 1994, VÖRÖS 2002, VENTURI 2006, MANNI & DI NARDO 2021), we provide a limited illustration of the specimens and a brief descriptions in the captions of the same to promote the knowledge of the association.

Conclusions

The ammonite faunas found both at the top of the Corniola Formation (bed f) and in the sieved fossiliferous level (bed

f) allow the attribution of the fossiliferous assemblages known in the literature to the basal Toarcian, Polymorphum Zone (FARAONI et al. 1994, CRESTA et al. 1995, PARISI et al. 1998).

The discovery of numerous Thecideidae referred to the species *Moorellina parca* (RAU) and *Davidsonella sinuata* (DESLONGCHAMPS) encrusted on belemnites, brachiopods and crinoids cup allows the extension of the palaeobiogeographical distribution area of this group to the central Apennines. A similar update can be made for *Suessia liasiana* (DESLONGCHAMPS).

The occurrence of this highly diversified fossiliferous concentration is a perfect motivation to propose the inclusion of the Colle Vecchio Toarcian outcrop in the geosites catalogue for the conservation of the Latio region geological heritage.

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Plate I – I. tábla

Fig. 1. *Davidsonella sinuata* (DESLONGCHAMPS) (CP020): a) cemented on a crinoid cup; b) c) d) a loose ventral valve in three different views: anterior, posterior and lateral.

Fig. 2. a) *Moorellina* sp. (C021) cemented on a *Linguithyris aspasia* (ZITTEL); b–c) enlarged views of the ventral valve.

Fig. 3. *Moorellina parca* (RAU) (CP022) (a) cemented on a *Koninckella gibbosula* (GEMMELLARO); b) enlarged view of the ventral valve.

Fig. 4. *Moorellina parca* (RAU) (CP023) two cemented remain valves (perimeter walls) on a columnaria: b) enlarged, c) interior view of one of the pedicle valve highlighted with red circle.

Fig. 5. *Suessia liasiana* (DESLONGCHAMPS) (CP024): a) dorsal view, b) brachial view; c–d) same specimen, photos taken with back light to show the internal preservation of the brachidium; e) oblique view of hinge margin with foramen f) commissure view.

Fig. 6. *Ismenia suessia* (DESLONGCHAMPS) (CP025).

The figured specimens will be housed in the Piobbico Geo-Paleontological Museum collections. All specimens come from bed g.

1. ábra. *Davidsonella sinuata* (DESLONGCHAMPS) (CP020): a) a példány egy krinoidea-kehelyhez tapadva; b), c), d), a ventrális teknő elülső, hátulsó és oldalsó nézetben.

2. ábra. a) *Moorellina* sp. (C021) *Linguithyris aspasia* (ZITTEL) példányára tapadva; b), c) a ventrális teknő nagyítva.

3. ábra. *Moorellina parca* (RAU) (CP022): a) *Koninckella gibbosula* (GEMMELLARO) példányára cementálva, b) a ventrális teknő nagyítva.

4. ábra. *Moorellina parca* (RAU) (CP023) két cementált példány krinoidea-nyélen: b) nagyítva, c) a pediculáris teknő belső nézete.

5. ábra. *Suessia liasiana* (DESLONGCHAMPS) (CP024): a) dorsális nézet, b) brachiális nézet; (c-d) ugyanaz a példány hátulról megvilágítva, hogy a kartámasztó váz látható legyen; e) a zárosperem nézete a forámmennel; f) a commissura felőli nézet.

6. ábra. *Ismenia suessia* (DESLONGCHAMPS) (CP025).

Valamennyi maradvány a g rétegből származik. A példányok a piobbicói földtani és őslénytani gyűjteményben lesznek elhelyezve.

Plate I – I. tábla

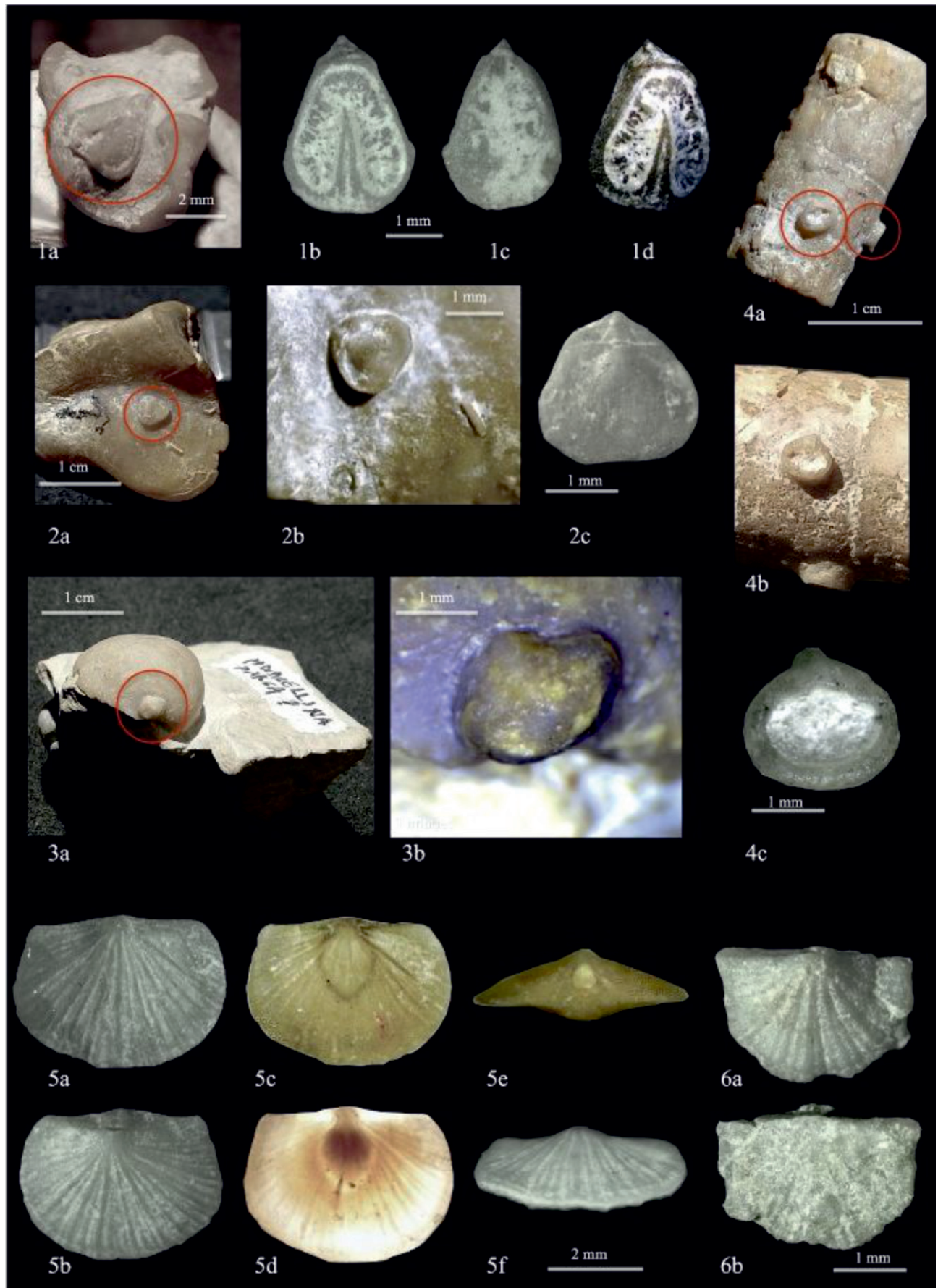


Plate II – II. tábla

- Fig. 1. *Dactylioceras (Eodactylites) pseudocommune* (FUCINI) (bed f, CP003); the asterisk indicates the beginning of the body chamber.
 Fig. 2. *Atractites* sp. (bed g, CP005).
 Fig. 3. *Canavaria retroplicata* GEMMELLARO (bed f, CP002): (a) ventral view, (b) lateral view.
 Fig. 4. *Harpophylloceras (Juraphyllites) eximium* (HAUER) (bed g, CP013); (a) ventral view, (b) lateral view.
 Fig. 5. *Acroelites* sp. LISSAJOUS (bed f, CP012).
 Fig. 6. *Protogrammoceras bassanii* (FUCINI) (bed g, CP009): (a) ventral view, (b) lateral view.
 Fig. 7. *Emaciaticeras* sp. (bed g, CP004): (a) ventral view, (b) lateral view.
 Fig. 8. *Lioceratoides* sp. (bed g, CP014).
 Fig. 9. *Dactylioceras (Eodactylites) pseudocommune* (FUCINI) (bed g, CP007), inner whorls.
 Fig. 10. *Calaiceras calais* (MENEHINI) (bed g, CP008), inner whorls.
 Fig. 11. *Fontanelliceras fontanellense* (GEMMELLARO) (bed g, CP009).
 Fig. 12. *Simpsonibelus expansus* (SIMPSON) (bed f, CP011): (a) lateral profile, (b) ventral profile.
 Fig. 13. *Acroelites* sp. LISSAJOUS (bed f, CP010): (a) lateral profile, (b) ventral profile.
 Fig. 14. *Canavaria retroplicata* GEMMELLARO (bed f, CP001): (a) ventral view, (b) lateral view; the asterisk indicates the beginning of the body chamber.

All specimens are figured in original size and will be housed in the Piobbico Geo-Paleontological Museum collections.

1. ábra. *Dactylioceras (Eodactylites) pseudocommune* (FUCINI) (f réteg, CP003); a csillag a lakókamra kezdetét jelöli.
 2. ábra. *Atractites* sp. (g réteg, CP005).
 3. ábra. *Canavaria retroplicata* GEMMELLARO (f réteg, CP002): (a) ventrális nézet, (b) laterális nézet.
 4. ábra. *Harpophylloceras (Juraphyllites) eximium* (HAUER) (g réteg, CP0013) (a) ventrális nézet, (b) laterális nézet.
 5. ábra. *Acroelites* sp. LISSAJOUS (f réteg, CP012).
 6. ábra. *Protogrammoceras bassanii* (FUCINI) (g réteg, CP009) (a) ventrális nézet, (b) laterális nézet.
 7. ábra. *Emaciaticeras* sp. (g réteg, CP004) (a) ventrális nézet, (b) laterális nézet.
 8. ábra. *Lioceratoides* sp. (g réteg, CP014).
 9. ábra. *Dactylioceras (Eodactylites) pseudocommune* (FUCINI) (g réteg, CP007) belső kanyarulatok.
 10. ábra. *Calaiceras calais* (MENEHINI) (g réteg, CP008) belső kanyarulatok.
 11. ábra. *Fontanelliceras fontanellense* (GEMMELLARO) (g réteg, CP009).
 12. ábra. *Simpsonibelus expansus* (SIMPSON) (f réteg, CP011) (a) ventrális nézet, (b) laterális nézet.
 13. ábra. *Acroelites* sp. (f réteg, CP010) (a) laterális nézet, (b) ventrális nézet.
 14. ábra. *Canavaria retroplicata* GEMMELLARO (f réteg, CP001) (a) ventrális nézet, (b) laterális nézet, a csillag a lakókamra kezdetét jelöli.
 Minden példány eredeti nagyságban. A maradványok a piobbicói földtani és őslénytani gyűjteményben lesznek elhelyezve.

Plate II – II. tábla

