A Short Note on the Occurrence of the Upper Triassic Oyster *Umbrostrea? montiscaprilis* (KLIPSTEIN, 1843) (Mollusca: Bivalvia) in the Northern Alpine Raibl Beds of the Schafberg, Salzburg, Austria

ISTVÁN SZENTE¹, HARALD LOBITZER² & FELIX SCHLAGINTWEIT³

3 Text-Figures, 1 Plate

Abstract

Northern Alpine Raibl Beds exposed at the northern foot of the Schafberg yielded a bivalve faunula consisting of three species characteristic of the Carnian stage. Although the shells are generally recrystallized, preserved structures of some valves of “Ostrea” *montiscaprilis* KLIPSTEIN, 1843 indicate that this species belongs to the genus *Umbrostrea* HAUTMANN, 2001.

Introduction

Oysters are a distinct and successful group of marine bivalves. Due to the predominantly calcitic composition of their shells, they have a good fossil record especially from the early Jurassic onwards. By contrast, key characters of classification such as inner features as well as mineralogy and structure of the valves are much less known in Triassic oysters, as a consequence of the frequent loss or recrystallization of their inner, presumably aragonitic shell layers (HAUTMANN, 2001a, 2006a, b). In fact, generic assignment of several Triassic species is still debated. The last decade saw the publication of a remarkable series of papers dealing with the origin and early evolution of oysters (CHECA & JIMÉNEZ-JIMÉNEZ, 2003; CHECA et al., 2006; HAUTMANN, 2001a, b, 2004, 2006a, b; MALCHUS, 2008; MÁRQUEZ-ALIAGA et al., 2005). In the light of this renewed interest, the occurrence of “Ostrea” *montiscaprilis* – originally described by KLIPSTEIN (1843) from the Carnian of the Monte Caprile (Goat Hill, if translated) of the Southern Alps – in the Northern Alpine Raibl Group of the Schafberg (Sheep Mountain, if translated) seems worth describing.

¹ ISTVÁN SZENTE: Eötvös Museum of Natural History, H 1117 Budapest, Pázmány P. s. 1/c, Hungary. szente@ludens.elte.hu
² HARALD LOBITZER: Lindaustraße 3, A 4820 Bad Ischl, Austria. harald lobitzer@aon.at
³ FELIX SCHLAGINTWEIT: Lerchenauerstraße 167, D 80935 München, Germany. FSchlagintweit1901@t-online.de
Slightly upstream, above the small waterfall exposing un-fossiliferous marl beds the bed of the creek is formed by limestone bedding planes displaying abundant bivalves among which *Schafhaeutlia*? sp. *mellingi* (Hauer, 1857) and *U.?* montiscaprilis could be identified (Text-Fig. 3a, b).

Some tens of meters upstream, megalodontid? bivalves can be seen in large quantities in a limestone bank forming the right flank of the creek (Text-Fig. 3c, d). The specimens are preserved as internal moulds with conjoined, closed valves and can not be extracted from the compact rock with hand tools.

Raibl Beds are also exposed higher on the right flank of the creek valley, along the path leading from Kreuzstein to the Eisenaueralm (Locality Sch 2). Two bivalve specimens, representing *S. mellingi* and *Rossiodus* cf. *columbella* (Hoernes, 1855) were found there by Dr. Miloš Siblík, Prague.

### Bivalves

**Umbrostrea** *montiscaprilis* (Klipstein, 1843)

(Pl. 1, Figs. 1–9, 11?)

Material: about a dozen specimens, presumably all left valves, embedded in compact limestone.

Description: Inequilateral, backward-curved, higher than long shells ornamented with up to 15 squamose, antimerigonal ribs/plicae whose number increases with intercalation of new ones at the postero-ventral region. Attachment area is subordinate if compared with the height of the valve. Umbonal cavity is well defined. Internal features can not be studied in the available material.

The shell structure has been completely obscured by recrystallization in most cases (e.g. Pl. 1, Figs. 5, 6). Some sections, however, display two shell layers of different structure (Pl. 1, Figs. 7, 8). The outer one seems to be of prismatic nature while the inner one is formed by...
U. montiscaprilis differs from Actinostreon haidingerianum (EMMRICH, 1853), a common species in the Rhaetian of the Northern and Southern Alps as well as of the NW Carpathians, by having more ribs/plicae (see e.g. ZAPFE, 1967, p. 438, Pl. 3, Figs. 7a, b; GOETEL, 1917, p. 169, Pl. 9, Figs. 4a, b.) and – probably – by its aragonitic inner shell layers (see below).

Uncertainty concerning the generic assignment of "O." montiscaprilis roots in the lack of appropriate knowledge of its shell mineralogy and structure. Differences between Triassic lophate oysters and Lopha rödin G., 1789 were already recognized by MALCHUS (1990) who erected the new genus Palaeolopha based on Ostrea haidingeriana as type species, and including – although doubtfully – Palaeolopha montiscaprilis as well. According to HAUTMANN (2001a), however, the shell of "O." haidingeriana is entirely calcitic and similar in microstructure to that of Actinostreon bayle, 1878 as documented by SIWERT (1972). Thus, Palaeolopha should be considered as a junior synonym of Actinostreon. On the other hand, evidence presented by HAUTMANN (2001a, b) and MÁRQUEZ-ÁLIAJA et al. (2005) suggest that shells of

sparry calcite. In another section layering of the middle part of the shell was found to be still preserved (Pl. 1, Fig. 9). No structural chambers ('Hohlräume') were observed. Some sections show elongated bodies composed of sparry calcite, associated with finely foliated calcite structures (Pl. 1, Fig. 11). Their relationship to U. montiscaprilis is, however, not justified.

Remarks: "Ostrea" montiscaprilis, usually assigned to the genera/subgenera Lopha or Alectryonia was frequently recorded from various Carnian formations of the Northern Calcareous Alps (see TOLLMANN, 1976) but it was only rarely described and figured (e.g. WÖHRMANN, 1889, p. 200, Pl. 6, Figs. 1–3). The Schafberg specimens agree well in shape with the type (KLIPSTEIN, 1843), as well as with those more recently described and figured in the literature, e.g. by JELLEN (1989) and LIEBERMAN (1979) (see also DIENER, 1923 for older references). The species was also recorded from North America (e.g. STANLEY, 1979), however, the specimens referred to have never been described or figured thus it is doubtful whether they are conspecific (MCRIBERTS, 1997).
well represented in the Carnian of the Northern Calcareous Alps (see e.g. Wöhrmann, 1889; Toula, 1910). In the older literature it is referred to as Gonodon, Gonodus or Corbis mellingi.

Rossiodus cf. columbella (M. Hoernes, 1855)

A single internal mould of a left valve may represent *R. colombella*, a characteristic Upper Carnian – Norian megalodontid species as described and figured by Végh-Neu-Brandt (1982).

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References


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The specimens in Figs. 2–4, 10 and 12–15 are coated with ammonium-chloride. The scale bar is 3 mm in Figs. 5–7 and 11, and 1 mm in Figs. 8, 9.

Figs. 1–9, 11?: *Umbrostrea? montiscaprilis* (KLIPSTEIN, 1843).

- Fig. 1: characteristic occurrence and preservation of valves, 0.6x.
- Figs. 2–4: left valves.
- Figs. 5, 6: longitudinal section of specimen in Fig. 2, umbo is to the left, acetate peels.
- Figs. 7, 8: cross section of ribs displaying traces of an outer calcitic prismatic? and an inner, originally aragonitic? shell layer, acetate peel.
- Fig. 9: preserved structure of the inner, recrystallized shell layer, acetate peel.

Figs. 10, 12–14: *Schafhaeutlia mellingi* (HAUER, 1857).

- Fig. 10: internal mould of a left valve bearing fine commarginal and radial ornamentation.
- Fig. 12: lateral view.
- Fig. 13: frontal view.
- Fig. 14: dorsal view.

Fig. 15: *Rossiodus cf. columbella* (M. HOERNES, 1855).