GEOLOGIJA *52/1*, 29-32, Ljubljana 2009
https://doi.org/10.5474/geologija.2009.004

Pseudopolyconites slovenicus n.sp. resedimented to Paleocene flysch breccia of the Soča river valley (Slovenia)

Pseudopolyconites slovenicus n.sp. presedimentiran v paleocensko flišno brečo Posočja

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Prejeto / Received 29. 1. 2009; Sprejeto / Accepted 5. 3. 2009

Key words: redeposited rudist, *Pseudopolyconites*, taxonomy, Soča Valley, Slovenia
Ključne besede: presedimentiran rudist, *Pseudopolyconites*, taksonomija, Posočje, Slovenija

Abstract

An entirely preserved large specimen of Upper Cretaceous rudist *Psedopolyconites slovenicus* n. sp. is described, characterized by the low and broad lower valve surrounded by a thick envelope of tiny straight tubules. The specimen was redeposited in Paleocene from the northern edge of Adriatic-Dinaric carbonate platform into a marginal part of the flysch basin.

Izvleček

Opisan je v celoti ohranjen velik primerek zgornjekrednega rudista *Psedopolyconites slovenicus* n. sp. za katerega je značilna nizka in široka spodnja lupina obdana z debelim ovojem drobnih ravnih cevk. Primerek je bil v paleocenu presedimentiran s severnega roba Jadransko-dinarske karbonatne platforme v obrobni del flišnega bazena.

Introduction

At the Biteż settlement 2 km north of Grgar and 6 km southeast of Anhovo (Fig. 1) the owner of property Ivan Štrukelj found a large specimen of Upper Cretaceous rudist of the *Polyconites* genus in the excavation for a farm building in Paleocene breccia. The specimen is preserved in the Gorica Museum at Nova Gorica (Stanislav Bačar's museal exhibition of fossils at Ajdovščina, arch. no. 8142).

Finds of resedimented rudists in Paleocene flysch of the Soča river valley have been described already at the beginning of 20th century. Numerous fossils were found, and registered in their writings already by Kossmat (1906, 1908, 1909, 1913, 1920) and Winkler (1920, 1923), but only Wiontzek (1934) more precisely determined and described the collected fossil material, to which he added also his own rudist collection. Buser (1986,1987) who mapped in the frame of the Basic geologic map of SFR Yugoslavia the sheet Tolmin and Videm (Udine), found in flysch beds of the Soča valley numerous new localities of resedimented rudists (Buser et al., 1988). D. Pejović (1996) among collected rudists of Podbrdo flysch cyclotheme determined the species *Vaccinites giordanii* (Pirona), *Hippuritella cornucopiae* (Defrance) and the new species *Pironaea buseri* Pejović.

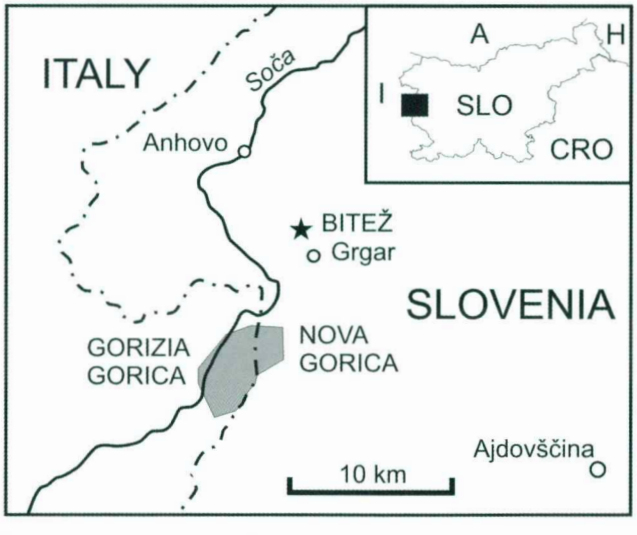

Fig. 1. Location map of *Pseudopolyconites slovenicus* n. sp.

Collecting of rudists in Paleocene flysch beds in surroundings of Anhovo was carried out between 1999 and 2000 by Jurkovšek who assembled a large collection of redeposited rudist fauna in which the following species have been determined (Pleničar, 2005; Pleničar et al., 2001): *Vaccinites vesiculosus* (Woodward), *Hippuritella lapeirousei* (Goldfuss), *H.* ex gr. *castroi* sensu Vicens, *H. heritschi* (Kühn), *Hippurites bioculatus* (Lamarck), *H. conicus adriaticus* Sladić-Trifunović, *H. turgidus* Roland du Coquan, *H. colliciatus* Woodward, *Bournonia* cf. *excavata* (D'Orbigny) Douvillé, *Sabinia aniensis* Parona and *Offneria* cf. *italica* Masse. All described fossils were redeposited in Paleocene to the flysch environment. For certain species on the basis of comparison with species found in primary Cretaceous platform carbonate rocks the exact location of their primary source and stratigraphic position could be established, while for some of them (e.g. the genus *Pironaea*) we presume that they lived at the edge of the carbonate platform which became later in totality eroded.

Geologic description

Upper Cretaceous and Paleocene beds with resedimented rudists are developed in Slovenia in the region of External Dinarides only. The flysch basin was shifted already end of Cretaceous from the area of Slovenian basin to the region of Adriatic-Dinaric carbonate platform. Flysch between Grgar and Anhovo belongs predominantly to the marginal respectively proximal part of the flysch basin, therefore it consists numerous intercalations of calcareous and conglomeratic breccia as a result of submarine slumps (Skaberne, 2003; Pogačnik et al., in press). They are up to several tens of meters thick, and they locally predominate over interbedding of marlstone, sandstone and calcarenite. Kuščer with co-workers (1976) reported limestone blocks up to 100 m long and 30 m thick. To very large calcareous olistoliths belong probably also the Cretaceous limestone southeast of Anhovo that was marked as smaller tectonically delimited blocks within the Paleocene flysch on the Basic geologic map, sheet Tolmin and Videm by Buser (1987).

The Paleocene flysch between Anhovo and Grgar contains next to well preserved rudists and fragments of rudist limestone also pieces of various Triassic and Jurassic limestones. Nummulites and alveolinas, otherwise frequent fossils in younger flysch levels of this area have not been recorded so far either in cement or among breccia fragments. The Lower to Upper Paleocene age of flysch was determined only locally by nannoplankton which, however, does not exclude the possibility of Eocene beds in the upper part of flysch sedimentation.

At Biteż lies the breccia with grey, grey green and brown violet marly cement just above the erosional boundary with the Upper Cretaceous limestone from which rudists of genera *Durania*, *Gorjanovicia*, *Rajka*, *Sauvagesia* and *Lapeirouseia* have been mentioned by Buser (1986). In this area is characteristic for the Upper Cretaceous platform development also the horizon with rounded rudist valves that belong mostly to genus *Sabinia*.

In addition to the new species *P. slovenicus* in the Paleocene breccia above the earlier described Santonian-Campanian limestone also several other resedimented rudists were collected. They will be the object of future research together with regional geologic investigations and examination of nannoplankton in marly cement.

Systematic paleontology

Familia: PSEUDOPOLYCONITIDAE
Sladić-Trifunović, 1980
Genus: *Pseudopolyconites* Milovanović, 1935
Pseudopolyconites slovenicus n.sp.
Fig. 2 a – c

Derivation of name: after state of Slovenia where the specimen was found.

Holotype: a complete valve (Fig. 2 a – c, sample no 8142, Gorica Museum: Museal exposition of Stanislav Bačar's fossils at Ajdovščina).

Type locality and stratigraphic position: Biteż settlement near Grgar, Soča river valley; resedimented into Paleocene flysch breccia.

Material studied: A single specimen with both valves (Holotype).

Diagnosis: Low and broad (dish-shaped) lower valve and convex upper valve. Lower valve is covered with an envelope of straight tubules which are visible on the external surface as tiny parallel furrows. The lower valve has a slightly concave anterior part and a convex posterior, or cardinal side. The pseudocolumns E and S are poorly expressed.

Description

The entire specimen of rudist (the lower and upper valves) is slightly eroded on surface. The relatively low and broad lower valve together with the convex upper valve measures in height 14 cm and in diameter 21 cm at the commissular part at contact of the two valves. The lower valve is of shallow conical (dishlike) shape, and the upper valve represents its convex cover. The lower valve is covered with an envelope of »growth tubules«. Tubules are straight, and appear on the external side of valve as fine parallel furrows. The »growth tubules« are not observed on upper valve.

A horizontal section across the upper valve has been made at a distance of 4 cm below the commissure. In the section, internal structure of lower valve consisting of several layers is visible. On its external side it is surrounded by the envelope of straight »growth tubules« of about 1 mm diameter. The tubular envelope is 10 to 20 mm wide. The envelope of »growth tubules« is followed by a cortical layer whose structure is not clear (it is probably a lamellar layer). Thickness of this layer varies largely, from 3 mm on the side of ligamen-

Fig. 2 a. *Pseudopolyconites slovenicus* n.sp. – upper and lower valve; holotype; Gorica Museum: Museal exposition of Stanislav Bačar's fossils at Ajdovščina, sample no. 8142, Bitež near Grgar.

Sl. 2 a. *Pseudopolyconites slovenicus* n.sp. – zgornja in spodnja loputa; holotip; Goriški muzej: Muzejska razstava fosilov Stanislava Bačarja v Ajdovščini, vzorec št. 8142, Bitež pri Grgarju.

Fig. 2 b. *P. slovenicus* n.sp.; holotype; – upper valve

Sl. 2 b. *P. slovenicus* n.sp.; holotip; – zgornja loputa

Fig. 2 c. *P. slovenicus* n.sp. – cross section through the lower valve, 4 cm below the commissure
L = ligamental column; S, E = siphonal pseudocolumns; BC = main body cavity

Sl. 2 c. *P. slovenicus* n.sp. - prečni presek spodnje lupine, 4 cm pod komisuro
L = ligamentni stebriček; S, E = sifonalna psevdostebrička; BC = glavna bivalna votlina

tal column to around 10 mm in the siphonal zone. This layer is separated from the internal part of valve by a rather uniformly thick intermediate layer that is recrystallized, and from it protrudes the ligamental column L. On the internal side of the lower valve follows an irregularly thick darker laminar layer that laterally passes into variously thick, irregularly shaped prisms of the prismatic layer.

The lower valve has a flat to slightly concave anterior side and a convex posterior, or cardinal side. The siphonal pseudocolumns E and S are poorly expressed.

Very important in genus *Pseudopolyconites* is the shape of the ligamental column in various horizontal sections of the lower valve that display various stages of ontogenetic evolution of the same individual. In the described specimen of *P. slovenicus,* in the section of lower valve that corresponds to later ontogenetic stages, is the head of ligamental column large and of pentagonal outline with a diameter of up to 13 mm. The stem at ligamental column is relatively thin, and measures in the horizontal section of valve (4 cm below the commissure) 8 mm in length.

Position of both teeth is not clear. Probably the teeth are oriented at a small angle to axis of the ligamental column.

Remarks

Species *P. slovenicus* is to the most similar to species *P. serbicus* Milovanović (Milovanović, 1939; Pejović & Sladić-Trifunović, 1977) and *P. dechaseauxae* Milovanović & Sladić (Milovanović & Sladić, 1957). The first one has a large, oblong head of ligamental column in the late ontogenetic stage, and the shape of a thin hook in the early ontogenetic stage. The stem of ligamental column in species *P. serbicus* is thicker as in species *P. slovenicus*. The section of lower valve is in *P. serbicus* of a more triangular shape, and round in *P. slovenicus*. *P. dechaseauxae* has a very thick stem, a thicker and broader posterior side of distal part of the head at ligamental column in

the late ontogenetic stage, a concave upper valve and a more triangular outline of the cross-section of its highest part, in comparison to species *P. slovenicus*.

A relatively thick head of the ligamental column have next to the species *P. serbicus* and *P. dechaseauxae* also species *P. ljubicae* Sladić-Trifunović, *P. ovalis* Milovanović, *P. manjae* Milovanović & Sladić, *P. giganteus* Milovanović & Sladić, *P. balcanicus* Milovanović & Sladić, *P. bacevicensis* Milovanović & Sladić, *P. boljevacensis* Sladić-Trifunović and *P. robustus* Sladić-Trifunović (Sladić-Trifunović, 1983, 1986, 2004; Sladić-Trifunović & Campobasso, 1980), although they differ in other characteristics from species *P. slovenicus* to such a degree that the latter must be considered a distinct species.

Acknowledgement

The authors would like to thank Mr. Ivan Štrukelj (Bitež) and Mr. Stanislav Bačar (Gorica Museum: Stanislav Bačar's collection at Ajdovščina) for enabling a loan of the fossil for study, and Mr. Mladen Štumergar and Mr. Stane Zakrajšek for technical support. The investigation was financialy supported by the Slovenian Research Agency (programme number P1-0011).

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