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Valvasoria carniolica n.gen. n.sp., a Triassic Worm from Slovenia

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Key words: *Valvasoria carniolica* n.gen. n.sp., Triassic, Fossil worm, Nematoda, Sipunculida, Slovenia.

Abstract

Carnian limestones exposed from Mojstrana to Triglav (the highest Slovenian mountain), are very important biostratigraphically, and especially for the palaeogeographic interpretation of the Upper Triassic. Outcrops can be traced in the Vrata Valley extending in a narrow belt several kilometres in a north-eastward - eastward direction. A very quiet depositional environment, with reducing conditions at the sea floor, permitted the preservation of soft-bodied animals. *Valvasoria carniolica* is a new genus and species. It has a cylindrical body with an expanded anteriormost portion. The systematic position of *Valvasoria* is unknown, however it might be related to Nematoda or Sipunculida.

1. INTRODUCTION

The stratigraphic profile exposed in the Vrata Valley (Fig. 1) has been known to palaeontologists from the beginning of the 20th century, when KITTL (1912) collected numerous well preserved specimens of *Halobia* cf. *fallax* MOJSISOVICS and *H. telleri* KITTL. On the basis of these bivalves he determined the age as Upper Carnian or Middle Norian. Several palaeontological studies of these pelagic limestones were performed more recently (JURKOVŠEK, 1984; RAMOVŠ, 1984, 1985; KOLAR-JURKOVŠEK, 1991) and the conodont fauna (*polygnathiformis*-A.Z.) established a Carnian age (KOLAR-JURKOVŠEK, 1991).

During geological mapping for the Basic geological map of the Beljak (Villach) and Pontebba sheet (JURKOVŠEK, 1987a, b) several excellently preserved fossils in the Vrata Valley have been collected, amongst which the most important is an 84 cm long skeleton of a birgeriid fish (JURKOVŠEK, 1984; JURKOVŠEK & KOLAR-JURKOVŠEK, 1986). Decapod crustaceans (KOLAR-JURKOVŠEK, 1991; JURKOVŠEK & KOLAR-JURKOVŠEK, 1992), cranial bones of *Saurichthys*, and the inarticulate brachiopod *Discinisca* have also been found together with the new fossil worm *Valvasoria carniolica*.

2. TAXONOMIC DESCRIPTION

Phylum, Class, Order and Family uncertain
Genus *Valvasoria* n.gen.

Type species: *Valvasoria carniolica* n.sp.

Diagnosis: Body cylindrical, unsegmented, with expanded anterior end, covered by a smooth and thick cuticle.

Etymology: This genus is named in honour of Johann Weikhard (Janez Vajkard) Valvasor, the Carniolian polymath, for his exceptional contribution to the knowledge of Slovene natural and national heritage. The fossil was discovered on the 300th anniversary of his death.

Range and occurrence: Carnian stage, Upper Triassic of Slovenia.

Valvasoria carniolica n. gen., n. sp.

Diagnosis: As the generic description.

Etymology: Species name refers to Carniola, the Latin name of a former province, today part of Slovenia.

Holotype: BJ 1286 (Pl. I, Figs. 1a, b).

Paratypes: BJ 1287 (Pl. I, Figs. 2, 3, 4), BJ 1419.

Repository: Palaeontological collection of Bogdan Jurkovšek, Dol pri Ljubljani, Slovenia, registered at the Slovenian Museum of Natural History, Ljubljana; the collection has been declared a monument by the Slovenian Ministry of Culture.

Type locality: Kozja Dnina in the Vrata Valley, Slovenia (Fig. 2).

Horizon: Carnian stage, Upper Triassic.

Description: Body slender, cylindrical; segmentation not visible. Anterior part of body narrow with width gradually increasing posteriorly (min. width 1.5 mm, max. width 5 mm). Anteriormost part marked by expanded structure and by a constriction behind it. Posterior part of body missing, preserved part 121 mm long.

The body is covered by a thick cuticle. In section, the lamellar structure of the cuticle is clearly visible (Pl. I, Fig. 4). The external surface of the cuticle appears to be smooth. In the paratype, small pores arranged in par-

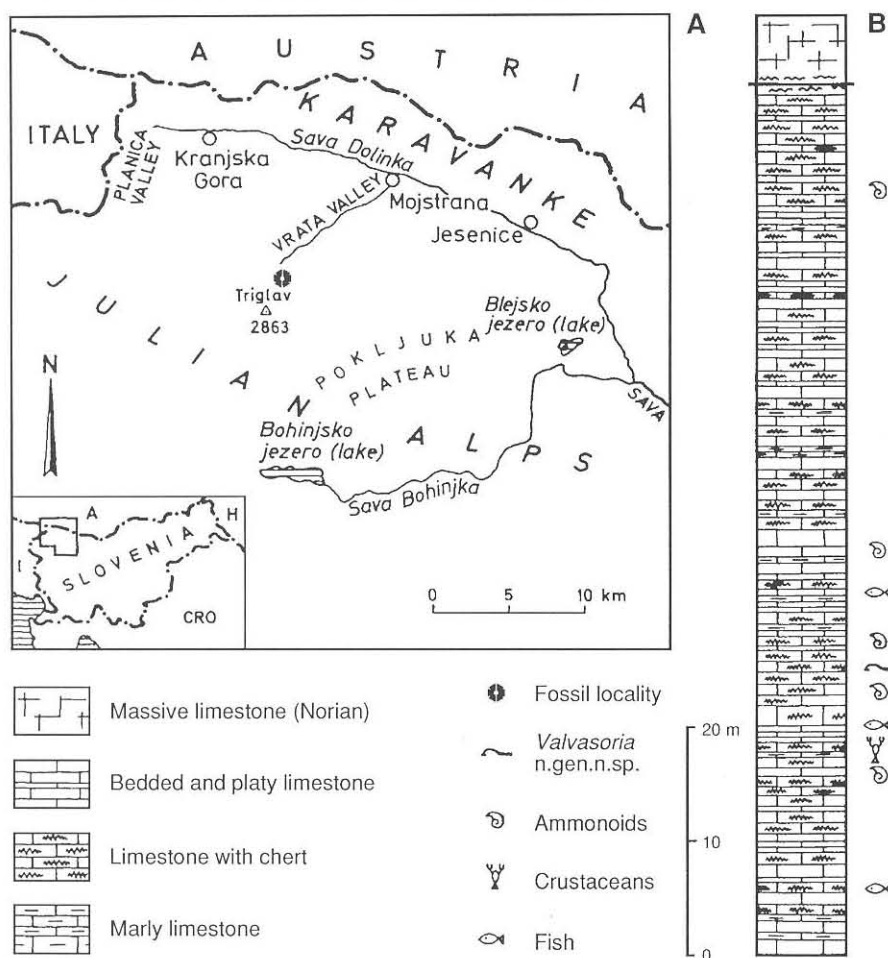


Fig. 1 Geographical sketch (a), and simplified stratigraphic column (b) of the Carnian beds containing *Valvasoria* at Kozja Dnina in the Vrata Valley, Slovenia.

allel transverse and oblique lines are seen under electron microscopy. In some places, two pores unequal in size appear closely together (Pl. I, Figs. 2, 3). The internal surface of the cuticle shows a relief structure, which can be observed in traces (partly shown on Pl. I, Fig. 4). In the middle part of the preserved holotype body annulation can be observed. It is represented by five circular belts approximately 0.1 mm wide. Distances between belts are 0.5 mm and 1 mm. The belts are composed of longitudinally arranged alternating fine ridges and grooves.



Fig. 2 Kozja Dnina, the type-locality of *Valvasoria carniolica* n.gen. n.sp.

Remarks: The relationship of *Valvasoria* to other taxa is not clear. Elongated, soft-bodied animals (“worms”) are classified into several phyla. Classification of recent worms is based on their soft-part anatomy and molecular data. The correct classification of many extinct genera of worms is difficult, even when the soft parts of the body are preserved. Therefore their assignment to higher taxa is as yet tentative and subject to future revision (HOWELL, 1966).

The systematic position of *Valvasoria* is unknown, however it might be related to the Nematoda or Sipunculida. Representatives of both groups are characterized by a worm-shaped, unsegmented body. Nematoda (roundworms) are free-living or parasitic, threadlike Aschelminthes known from virtually every marine, fresh water and terrestrial habitat. Their pharynx is modified for sucking and in some members (order Aracolamoidea) there are lip excrescences (HYMAN, 1951). Sipunculans are benthic and exclusively marine. The sipunculid body is divisible into a trunk and a retractile introvert bearing the mouth and feeding tentacles (BRUSCA & BRUSCA, 1990). In both groups, the body is covered by a cuticle secreted by the epidermis. The nematode cuticle surface is usually smooth, whereas the sipunculid body often bears fine cuticular structures. The cuticle of many modern nematodes is ringed or marked with longitudinal ridges and grooves

(BRUSCA & BRUSCA, 1990). The epidermis of both groups contains unicellular glands in free-living nematodes, as well as multicellular glands in sipunculids.

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PLATE I

Valvasoria carniolica n.gen. n.sp.

- 1 a) Holotype, BJ 1286, scale bar 10 mm.
b) Enlargement of the anterior portion of the holotype, BJ 1286, scale bar 5 mm.
- 2 External surface of the cuticle with pores arranged in rows, paratype, BJ 1287, scale bar 10 μm .
- 3 Detail of the external surface of the cuticle showing two pores unequal in size, paratype, BJ 1287, scale bar 10 μm .
- 4 Cross-section of the cuticle, paratype, BJ 1287, scale bar 100 μm .

