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Lower Devonian Conodonts from the Pohorje Mountains (Eastern Alps, Slovenia)

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1 Text-Figure and 1 Plate

Slovenia
Pohorje Mts.
Lower Devonian
Biostratigraphy
Conodonts

Contents

Unterdevonische Conodonten aus dem Pohorje-Gebirge (Ostalpen, Slowenien)

Zusammenfassung

In der Magdalensbergserie im Pohorje-(Bachern-) Gebirge (Ostalpen, Slowenien) treten lokal Kalkeinschaltungen in Schiefern auf. Die Vorkommen von Desetnik wurden auf Conodonten untersucht. Die Fauna beinhaltet *Latericriodus* sp., *Pandorinellina exigua philipi* (KLAPPER), und *Polygnathus dehiscens* PHILIP & JACKSON, die ein unterdevones Alter (Oberes Pragium und Unteres Emsium) belegen.

Abstract

The Magdalensberg Series of the Pohorje Mts. (Eastern Alps, Slovenia) is characterized by local occurrences of limestone intercalations within slates. Those of Desetnik have been examined by means of conodonts. The recovered fauna yields *Latericriodus* sp., *Pandorinellina exigua philipi* (KLAPPER), and *Polygnathus dehiscens* PHILIP & JACKSON, indicating a Lower Devonian (Upper Praghian and Lower Emsian) age.

1. Introduction

The Pohorje Mts. belong to the Eastern Alps and are predominantly built of metamorphic rocks and include a remarkable magmatic core. They are transgressively and only partly overlain by Permo-Triassic, Triassic, Cretaceous, Miocene and Quarternary strata. Metamorphic rocks of the Pohorje Mts. can be subdivided according to their metamorphic grade decreasing from the bottom to the top and to their characteristic rock intercalations. The major part of the metamorphic sequence is characterized by the almandine-amphibolite facies that includes eclogite lenses at certain levels. Only a minor part of the disturbed sequence corresponds to greenschists. This rock sequence is followed by the overthrust Magdalensberg Series (Štalenskogorska serija) (FANINGER, 1970, 1973; HINTERLECHNER-RAVNIK, 1971, 1973, 1995; HINTERLECHNER-RAVNIK & MOINE, 1977; MIOČ, 1977, 1978; MIOČ & ŽNIDARČIČ, 1976; NIEDERMAYR et al., 1993).

The Magdalensberg Series is composed of reddish and greenish slates of Ordovician to the Lower Devonian age (MIOČ, 1978); however in the uppermost part of the Magdalensberg Series limestone intercalations occur locally at Kobansko and also in the western Pohorje Mts. At Kozjak (Kobansko), lenses of metamorphosed limestone produced conodonts of Lower Devonian age (MIOČ & RAMOVŠ, 1973). The purpose of this study is to extend micropaleontological examination of the same lithostratigraphic unit to the Pohorje Mts., in order to establish its age and to improve knowledge of Devonian conodonts in Slovenia.

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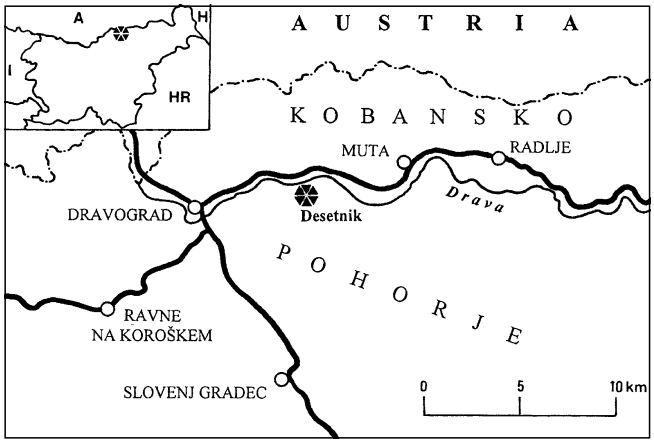

Text-Fig. 1.
Sketch map showing position of studied locality Desetnik in the Pohorje Mountains.

2. Conodont Biostratigraphy

Limestone lenses in the Magdalensberg Series are precisely marked (Basic Geological Map of SFR Yugoslavia 1 : 100.000, sheet Slovenj Gradec – MIOČ & ŽNIDARČIČ, 1976). For this study we examined rocks outcropping in the western part of Pohorje Mts. Our sampling locality is situated in the vicinity of the farm-house at Desetnik (Text-Fig. 1). Limestone layers of seven isolated outcrops were sampled and processed for conodonts. They belong to the thicker, medium gray limestone intercalation within the slate of Silurian–Devonian age (MIOČ & ŽNIDARČIČ, 1976).

Conodonts were recovered from samples 1, 2, 4, 5, and 7 in low diversity and low abundance. Conodonts are fragmentarily preserved and thermally deformed. They show a high colour alteration index (CAI = 5–5.5) sensu EPSTEIN et al. (1977). Conodont fauna comprises following taxa:

Latericriodus sp.,
Pandorinellina exigua philipi (KLAPPER),
Polygnathus dehiscens PHILIP & JACKSON.

Specimens assigned to *Latericriodus* are slender with two lateral processes, partly fused denticles and broadly expanded basal cavity. The illustrated specimen (Pl. 1, Fig. 2) shows great similarity to *Latericriodus huddlei* (KLAPPER & ZIEGLER), however its state of preservation does not enable confident determination.

In specimens referred to *Pandorinellina exigua philipi* (KLAPPER) (Pl. 1, Figs. 3a,b, 4a–c) the anterior part of the blade is conspicuously high, denticles at mid-length are low. The lobes are asymmetrical and situated just posteriorly of mid-length; the outer lobe is wider than the inner. The basal cavity is located under the two lobes and extends anteriorly and posteriorly as a narrow groove.

The upper surface of the platform in *Polygnathus dehiscens* PHILIP & JACKSON (Pl. 1, Figs. 1a–c) is slightly constricted and is continuous with the tongue. The free blade is not preserved completely. The basal cavity is large and shallow.

There are several poorly preserved unidentified specimens belonging to the Icriodontidae MÜLLER & MÜLLER and Spathognathodontidae HASS.

The conodont fauna recovered is of Lower Devonian. The stratigraphic importance of *Latericriodus* in European Lower Devonian has been emphasized by WEDDIGE & ZIEGLER (1977). The accurate age of the fauna can be inferred by the polygnathid species. Several conodont zones based on polygnathid lineages in the Lower and Middle Devonian have been recognized (KLAPPER & JOHNSON, 1975; SANDBERG, 1979; WEDDIGE & ZIEGLER, 1977, 1979; BULTYNCK, 1989). The stratigraphic range of *P. dehiscens* is Upper Praghian to Lower Emsian; the species is the name-bearer of the *dehiscens* Zone and ranging into Lower *gronbergi* Zone (SWEET, 1988) based on previous conodont biozonal schemes. Species of *Polygnathus*, including *P. dehiscens*, are widely distributed and provide a mean of correlating Lower and Middle Devonian sequences (KLAPPER, ZIEGLER & MASHKOVA, 1978; KLAPPER & ZIEGLER, 1979).

All studied and illustrated specimens have been catalogued and deposited in the Institute of Geology, Geotechnics and Geophysics, Ljubljana, under catalogue numbers IGGG 2660, 2662, 2758, 2745, 2761. SEM photographs were taken by Dr. K. DRAŠLAR and Mag. J. RODE (Institute of Biology, Ljubljana University).

3. Conclusion

Magdalensberg Series is a characteristic overthrusted unit of the Eastern Alps that is predominantly composed of slates. On the Basic Geologic Map of SFRY, sheet Slovenj Gradec, the age of this series is assigned from Ordovician to the Lower Devonian (MIOČ, 1978). MIOČ (1978) also compared this series with the Magdalensberg Series in Carinthia, Austria, where it belongs to the Gurktal Thrust System, and spans the interval from Middle (?) Ordovician to the Middle Devonian (SCHÖNLAUB & HEINISCH, 1993).

Conodonts from limestone intercalations within slates were previously studied at several locations scattered along the Eastern Alps (SCHÖNLAUB, 1993; SCHÖNLAUB & HEINISCH, 1993). The higher stratigraphic levels of the Gurktal Thrust System of Austria belong to the pelagic facies of Althofen. It is composed of a carbonate dominated sequence that produced Middle Ordovician to Tournaisian/Viséan conodont faunas (RIEHL-HERWIRSCH, 1970; SCHÖNLAUB, 1971, 1979; BUCHROITHNER, 1978; NEUBAUER, 1980; NEUBAUER & HERZOG, 1985; NIEDERL, 1980). Paleozoic rocks surrounding the Neogene Styrian basin, the Paleozoic of Graz and equivalent rocks of the Gurktal Thrust System, yield conodont faunas of different stratigraphic levels (NEUBAUER & SASSI, 1993), however the limestones in the hanging wall of the equivalent rocks of the Gurktal Thrust System were proved to be of Lower Devonian age by conodonts (MIOČ & RAMOVŠ, 1973; BUGGISCH et al., 1975; EBNER, 1975; NEUBAUER & SASSI, 1993).

In our study of the limestone intercalations of Desetnik, Lower Devonian conodonts are documented from the Pohorje Mts. The fauna is represented by the following elements: *Latericriodus* sp., *Pandorinellina exigua philipi* (KLAPPER), and *Polygnathus dehiscens* PHILIP & JACKSON. They indicate an Upper Praghian and Lower Emsian age. This conodont fauna provides new biostratigraphic evidence from the area of Pohorje Mts. and provides a means of correlating Lower Devonian sequences in the Eastern Alps.

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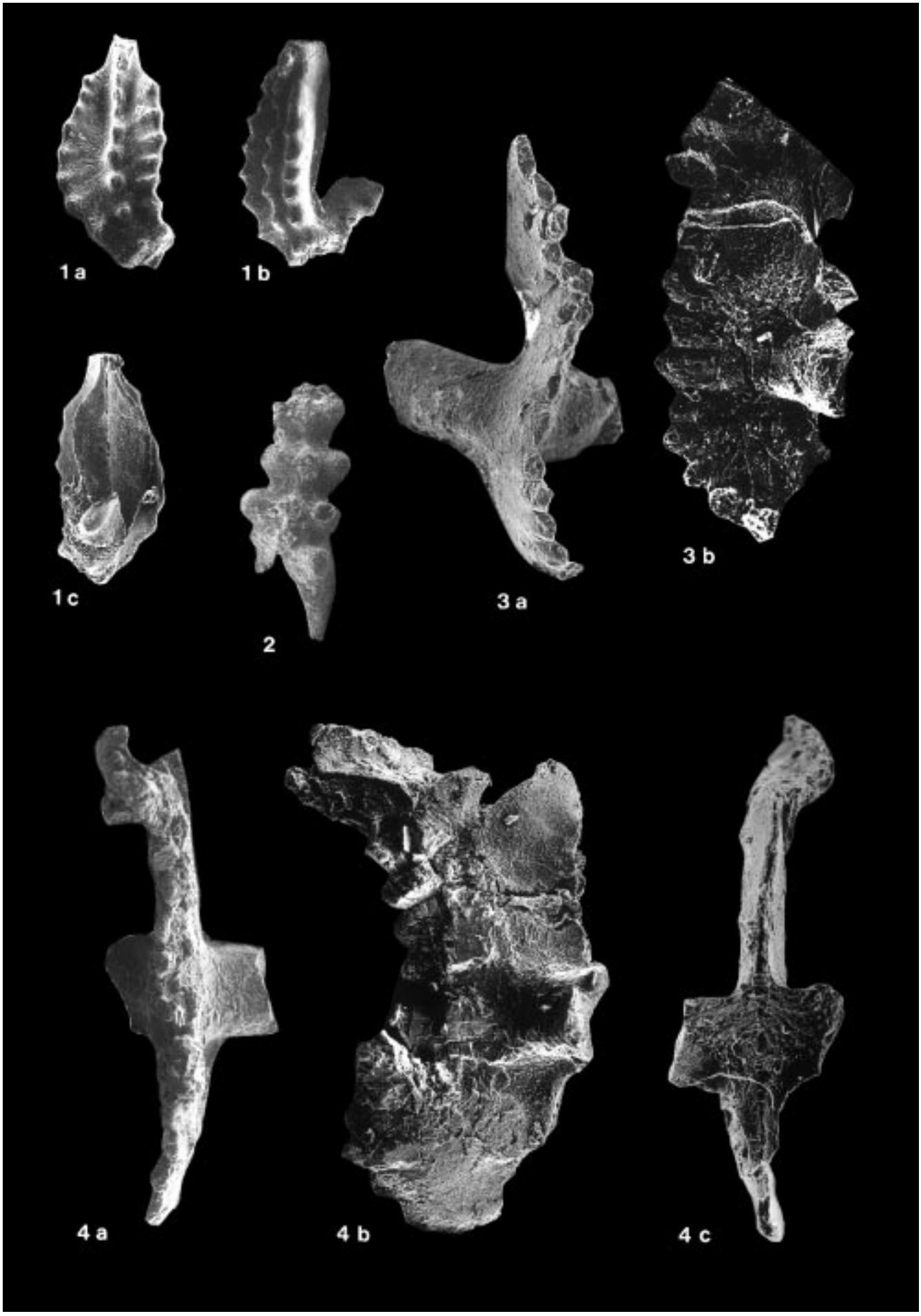
Plate 1

Figs. 1a–c: *Polygnathus dehiscens* PHILIP & JACKSON.
a = upper, b = lateral and c = lower views of Pa element.
Sample Desetnik 2 (IGGG 2662).

Fig. 2: *Latericriodus* sp.
Upper view of Pa element.
Sample Desetnik 5 (IGGG 2758).

Figs. 3a,b, 4a–c: *Pandorinellina exigua philipi* (KLAPPER).
a = upper, b = lateral and c = lower views of Pa elements.
Sample Desetnik 5 (IGGG 2758).

All magnifications 70×.


1a
1b
1c
2
3a
3b
4a
4b
4c