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Permian-Triassic boundary at Brušane village in Velebit Mt.

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Abstract

Upper Permian boundary dolomite from Brušane in Velebit has previously been considered to be devoid of fossils. Bedded and platy dolomite is mostly dark gray in colour. Micritic and sandy varieties can be distinguished. Now fusulinids, microforaminifers and calcareous algae have been determined from the uppermost dolomitic layer. *Gymnocodium* and *Glomospira* are the most abundant fossils associated with *Staffella cf. transiens*.



Project 106

Kratka vsebina

O zgornjepermškem mejnem dolomitu pri kraju Brušane na Velebitu so včasih mislili, da je brez fosilov. Plastoviti in ploščasti dolomit je v glavnem temno siv, mikritne in peščene strukture. V vzorcih vrhnje dolomitne plasti so bile določene fuzulinide, mikroforaminifere in apne alge. Najbolj pogostna fosila sta alga *Gymnocodium bellerophontis* in foraminifera *Glomospira* sp. div. Tu in tam ju spremlja *Staffella cf. transiens*.

Well known Permian cross-section near village Brušane in Velebit Mt. finishes with gray, so called "boundary dolomite", which was previously considered to be without fossils (M. Salopek, 1942, 251). Nevertheless, microfossils can be found, at least in the area investigated, a little north of Velnačka Glavica hill (V. Kochansky-Devidé, 1965, 111). The authors have now sampled a part of the cross-section beginning eight metres below the Permian-Triassic boundary and finishing at the very contact. Fossils are not well preserved and not very abundant, but they can be found even in the top Permian stratum. The following forms have been determined:

Fusulinidae: *Staffella cf. transiens* Kochansky-Devidé, *Staffella* sp. (with nankinelloid juvenarium), and *Schubertella?* sp.

Ferrian-Triassic boundary at Baršane village in Veliki Mt.

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Abstract

Upper Ferrian boundary between Permian and Triassic has previously been considered to be devoid of fossils. Hereby we show that it is mostly dark grey to colourless micritic and sandy varieties can be distinguished. New localities micritic micritic and calcareous algal have been determined from the uppermost Permian layer. *Gymnocodium* and *Gyroporella* are the most abundant fossils associated with Staffella cf.

Key words

Gymnocodium, *Gyroporella*, Permian, Triassic, Baršane, Veliki Mt. In this study we present the results of our investigations in the Permian-Triassic boundary zone at Baršane village in the north of Veliki Mt. The authors have now determined that the Permian-Triassic boundary is not well preserved and not clearly marked. The following list of fossils (with associated layers)

Table 1 — Plate 1

1 *Glomospira* sp. 3 samples; *Globivalvulina* sp., *Permocalculus* sp. No. 1/3. $\times 10$

2 *Hemigordius* sp. 5/2. $\times 30$

3—4 *Staffella* sp., 5/1, 3/1. $\times 30$

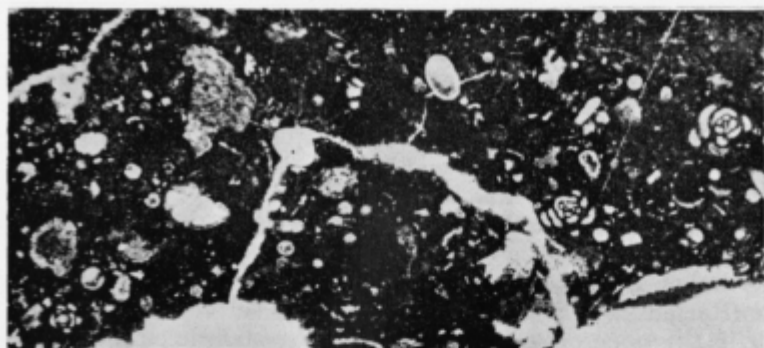
5 *Ammodiscus* sp. in the intraclast 1/1. $\times 30$

6 Dasycladaceae gen. indet. gen. n. ? No. 9. $\times 30$

7 *Gyroporella* ? sp. 9. $\times 30$

8—9 *Gymnocodium bellerophontis* (Rothpletz). 5/1, 3/1. $\times 30$

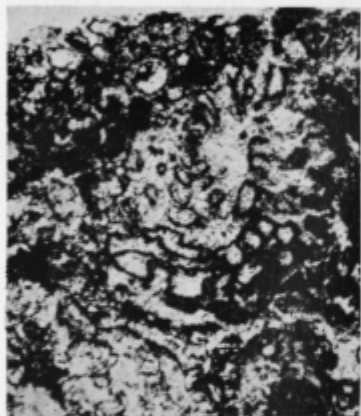
Photographs made by Pavlešič



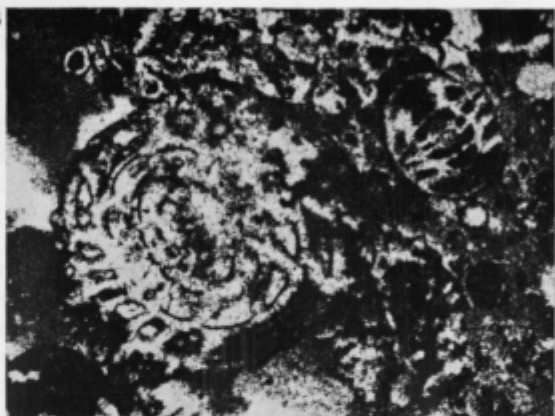
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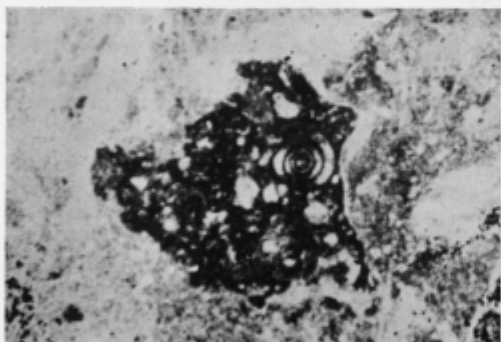
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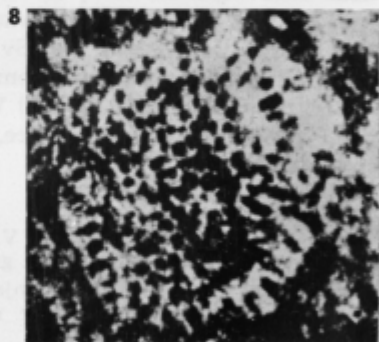
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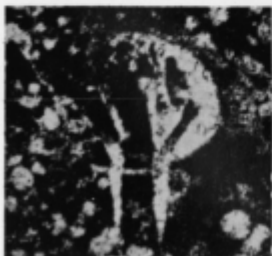
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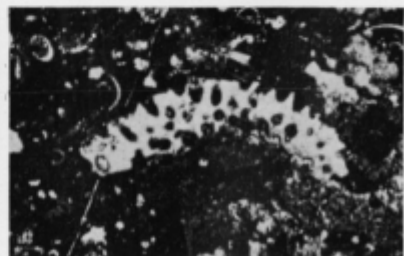
6



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8



9

Microforaminifers: *Ammodiscus*, *Ammovertella*, *Calcidiscus*, *Glomospira* sp. div., *Hemigordius* sp. div., Palaeotextulariidae gen. ind. and *Neotuberitina*.

Calcareous algae: *Gyroporella* sp., bulbous dasyclad alga, n. gen. ?, *Gymnocodium bellerophontis* (Rothpletz), and *Permocalculus* cf. *fragilis* (Pia).

Problematica: *Bacinella* sp. and *Sphaerae*.

In 17 slides the most abundant fossils are *Gymnocodium* and *Glomospira*. Sporadically, *Staffella* cf. *transiens* is rather frequent. These three forms have also been found in the uppermost Permian stratum. *Mizzia velebitana* Schubert and *Mizzia yabei* (Karpinski) which are abundant north of Velnačka Glavica hill, do not occur in the uppermost eight metres of Permian dolomitic series.

The upper part of Permian dolomite is partly layered (thickness of layers about 30 cm) and partly platy (thickness of plates 5–15 cm). Dolomite is mostly dark gray and has in general densely micritic to finely sandy appearance.

Lower Triassic dolomite is more pale-coloured than Upper Permian carbonate rocks, usually a little yellowish in colour, fine-grained, banded and contain somewhat mica. Thin sections made of oolitic dolomite and finely- and rarely-porous dolomite do not contain fossil rests. About 30 metres above the lowermost Triassic dolomite platy dolomite rich in mica occurs, also with no visible fossil rests.

Gradual transition of the Uppermost Permian dolomite into Lower Triassic dolomite can be followed in the whole Upper Palaeozoic belt Brušane-Baške Oštarije. Besides the locality described, it is especially evident on the road Brušane-Baške Oštarije, just ahead of the Takalice pass.

Towards the south-east, in continuation of the Palaeozoic uplifted blocks near Risovac, Mali Kraj and Čitluk, Uppermost Permian dolomite is overlain by yellowish sandy Lower Triassic dolomite. Farther to the south-east, in the area of Počitelj, Medak and Sv. Rok the geologic relationships are quite different. Permian boundary-dolomite can be missing and the sedimentation of Triassic can start with typical Werfenian slate. At the south-eastern margin of the Palaeozoic belt, near Ričice, Permian-Triassic boundary has mostly tectonic character.

References

Kochansky-Devidé, V. 1965, Karbonske i permske fuzulinidne foraminifere Velebita i Like — srednji i gornji perm. Acta geologica 5, 101–150, Zagreb.

Salopek, M. 1942, O gornjem paleozoiku u okolini Brušana i Baških Oštarija. Rad Jugosl. akad. 274, Mat. prir. razr. 85, 218–272, 6 tab. in 2 geol. karti, Zagreb.