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Abstracts

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dominated ecosystem has been completed in the Spathian following Chen-Benton's (2012) model of ecosystem recovery.

Permian–Triassic boundary: many possible locations, but can you really see it? croatian example

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The Late Palaeozoic deposits in Croatia were derived from the Palaeotethyan shelf areas along the northern Gondwana passive continental margin. They consist of carbonate, clastic and evaporite deposits which outcrop in 11 tectonically limited areas within the Inner and Outer (Karst) Dinarides, as well as occurring as clasts in younger sediments, or in drilling-core samples (Sremac, 2005; Fio et al., 2013).

Many sheets of the geological map of Croatia offer potential locations of Permian–Triassic boundary, but the reality is quite different: the contact is mostly covered, tectonized or marked by emergence, offering only several locations suitable for detailed studies. This can be best seen in the Velebit Mt. area: although continuous transition from Permian to Triassic is proposed in a more than 15 km long zone (Salopek, 1948; Sokaè et al., 1974), the continuous transition from Permian to Triassic was up to now confirmed at only two locations, Rizvanuša and Brezimenjaèa sections (Fio et al., 2010).

In the Velebit Mt. area the uppermost Permian deposits are represented by the Transitional Dolomite (TD). These are followed by the Sandy Dolomite (SD), which are relatively rich in terrigenous material and were generally attributed to the Lower Triassic. The lithologic TD–SD boundary is sharp, in places clearly erosional, and was previously considered as the Permian–Triassic boundary (PTB). Findings of the relatively rich assemblage of Permian fossils in the lowermost part of the SD, similar to the uppermost fossiliferous layer in the underlying TD, with no sign of redeposition, indicated that the PTB should be positioned at or above that level. Combination of palaeontological and sedimentological data, together with stable isotopes of carbonates ($\delta^{13}\text{C}_{\text{carb}}$, $\delta^{18}\text{O}_{\text{carb}}$), organic matter ($\delta^{13}\text{C}_{\text{org}}$, $\delta^{15}\text{N}_{\text{org}}$) and major, trace and rare earth elements, helped to determine the chemostratigraphic PTB in this area. The chemostratigraphic PTB is not visible in the field, but it is positioned within the SD, 11 m above the lithologic TD–SD boundary in the Rizvanuša section, and 0.2 m above it in the Brezimenjaèa section (Fio et al., 2010).

Uppermost Permian and Lower Triassic fossils were also found in a recently open profile in the Samoborska Gora Mt. (NW Croatia) composed of dolomites and dolomitic breccia. Lower and upper parts of the sequence represent shallow marine, possibly lagoonal facies, and comprise stratigraphically indicative Permian and Triassic biota, respectively. Middle part of the sequence is dominantly composed of intrabasinal breccia, with dessication features, and contains only disaster taxa (PTB survivors). This horizon is referred to as 'Transitional beds', with

expectations to determine chemostratigraphical PTB in the future within this part of the sequence (work in progress).

Further planned investigations of the PTB in Croatia include locations in the Gorski Kotar with proposed continuous clastic shallow-marine deposition and/or stratigraphic break at the PTB, and Central Dinarides (central and northern Dalmatia, SE Lika and western Bosnia) with Upper Permian and Lower Triassic evaporites, volcanic and clastic rocks.

References:

- Fio, K., Spangenberg, J. E., Vlahoviæ, I., Sremac, J., Veliæ, I., Mrinjek, E., 2010. Stable isotope and trace element stratigraphy across the Permian–Triassic transition: a redefinition of the boundary in the Velebit Mountain, Croatia. *Chemical Geology* 278, 38–57.
- Fio, K., Sremac, J., Vlahoviæ, I., Veliæ, I., Spangenberg, J. E., 2013. Permian deposits and the Permian–Triassic boundary in Croatia: palaeoclimatic implications based on palaeontological and geochemical data. In: G¹siewicz, A. & S³owakiewicz, M. (eds) *Palaeozoic Climate Cycles: Their Evolutionary and Sedimentological Impact*. Geological Society, London, Special Publications, 376, <http://dx.doi.org/10.1144/SP376.8>.
- Salopek, M., 1948. On the Upper Palaeozoic of the northeastern slope of the Velebit Mt. and Lika region – in Croatian. *Natural Sciences – Yugoslavian Academy of Science and Art*, 24, 101–169.
- Sokaè, B., Nikler, L., Veliæ, I., Mamužiæ, P., 1974. Basic geological map of SFR Yugoslavia 1:100.000, the Gospiæ sheet, L33-127. Croatian Geological Survey Zagreb (1963–1967), Federal Geological Institute, Belgrade.
- Sremac, J., 2005. Equatorial shelf of the Palaeozoic supercontinent – cradle of the Adriatic Carbonate Platform. *Geologia Croatica*, 58/1, 1–19.

Lilliput Ostracod faunas in the aftermath of the end-Permian extinction: Heterochonical Development

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Ostracods were strongly affected by the end-Permian extinction (EPE), with species extinction rates ranging from 74 to 100% depending on locality (Crasquin & Forel, 2013). Ostracod recovery is assumed to be complete during the Ladinian, when they are well known in the Tethyan domain. During the earliest Triassic, survival in refuge areas of microbial origin has been recently described: microbial mats would have provided an unlimited food supply and O₂ to the supposedly anoxic environment following the EPE (Forel, 2013; Forel *et al.*, 2012).

A Lilliput effect has been widely described for several fossil groups for the period in the aftermath of the EPE (*e.g.*, brachiopods, He *et al.*, 2007; gastropods, Payne, 2005; foraminifera, Song *et al.*, 2011), but was until now unknown for ostracods. Considering Length (L) as a proxy to body size, we computed L_{max} , L_{min} and L_{mean} of ostracod assemblages through the EPE for places where they survived in refuges. In addition we analyzed the repartition of specimens among 13 classes of size, from 101 to 1400µm. It appears that: (i) Maximal L_{max} , L_{min} and L_{mean}