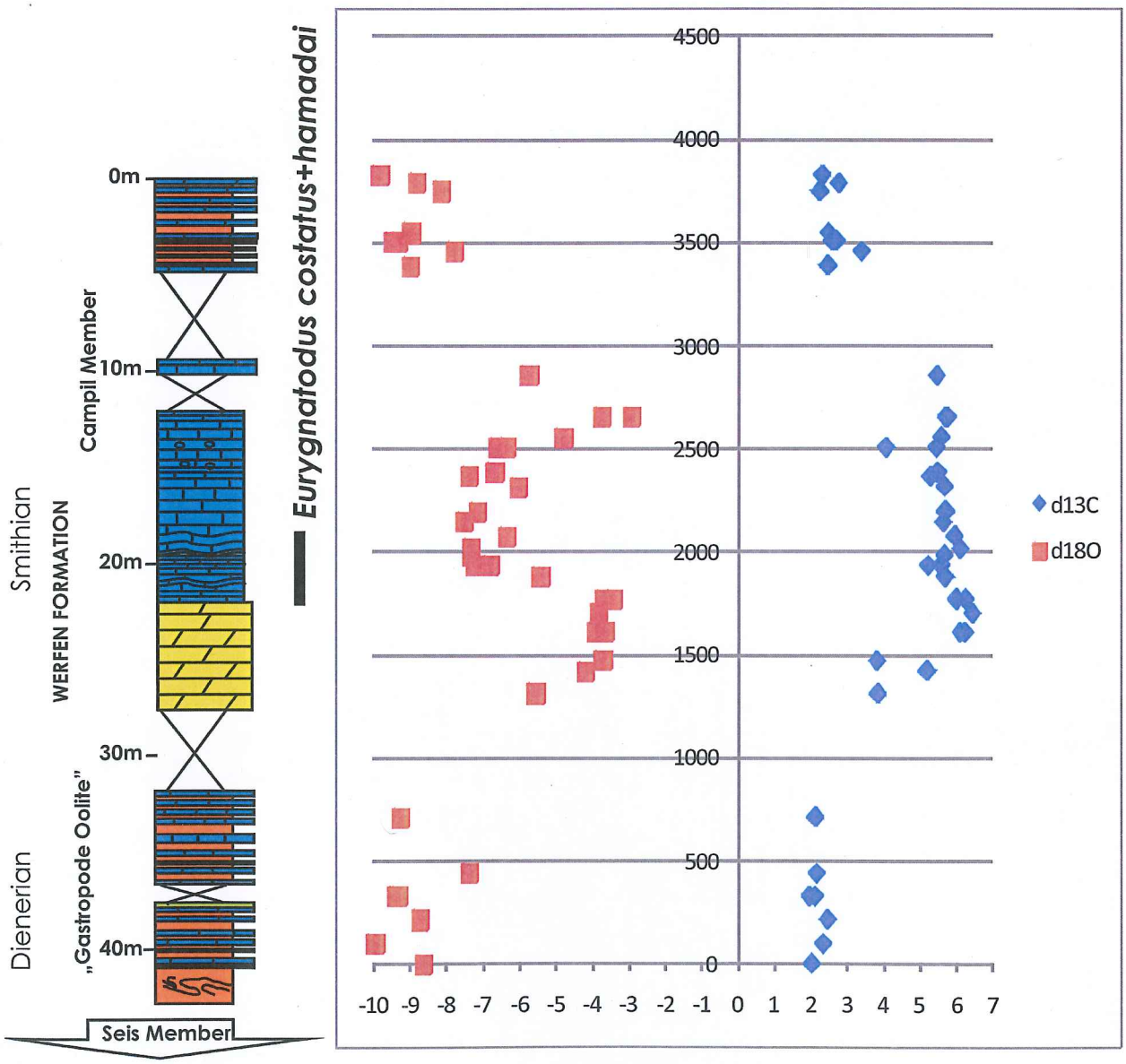
Significance of *Eurygnathodus costatus* and *Eurygnathodus hamadai* as indicators for the Dienerian-Smithian boundary (DSB): a study in the Dolomites (N-Italy)

→ Micha Horacek[1], Leopold Krystyn[2] & Rainer Brandner[3]

[1] HBLFA Francisco-Josephinum - Research Institute BLT Wieselburg, Rottenhauserstr. 1, 3250 Wieselburg, and Department of Lithospheric Research, Vienna University, Althanstr. 14, 1090 Vienna, Austria; e-mail: micha.horacek@josephinum.at
2 Department of Paleontology, Vienna University, Althanstr. 14, 1090 Vienna, Austria; e-mail: leopold.krystyn@univie.ac.at
3 Department of Geology, Innsbruck University, Innrain 52, 6020 Innsbruck, Austria; e-mail: Rainer.brandner@uibk.ac.at



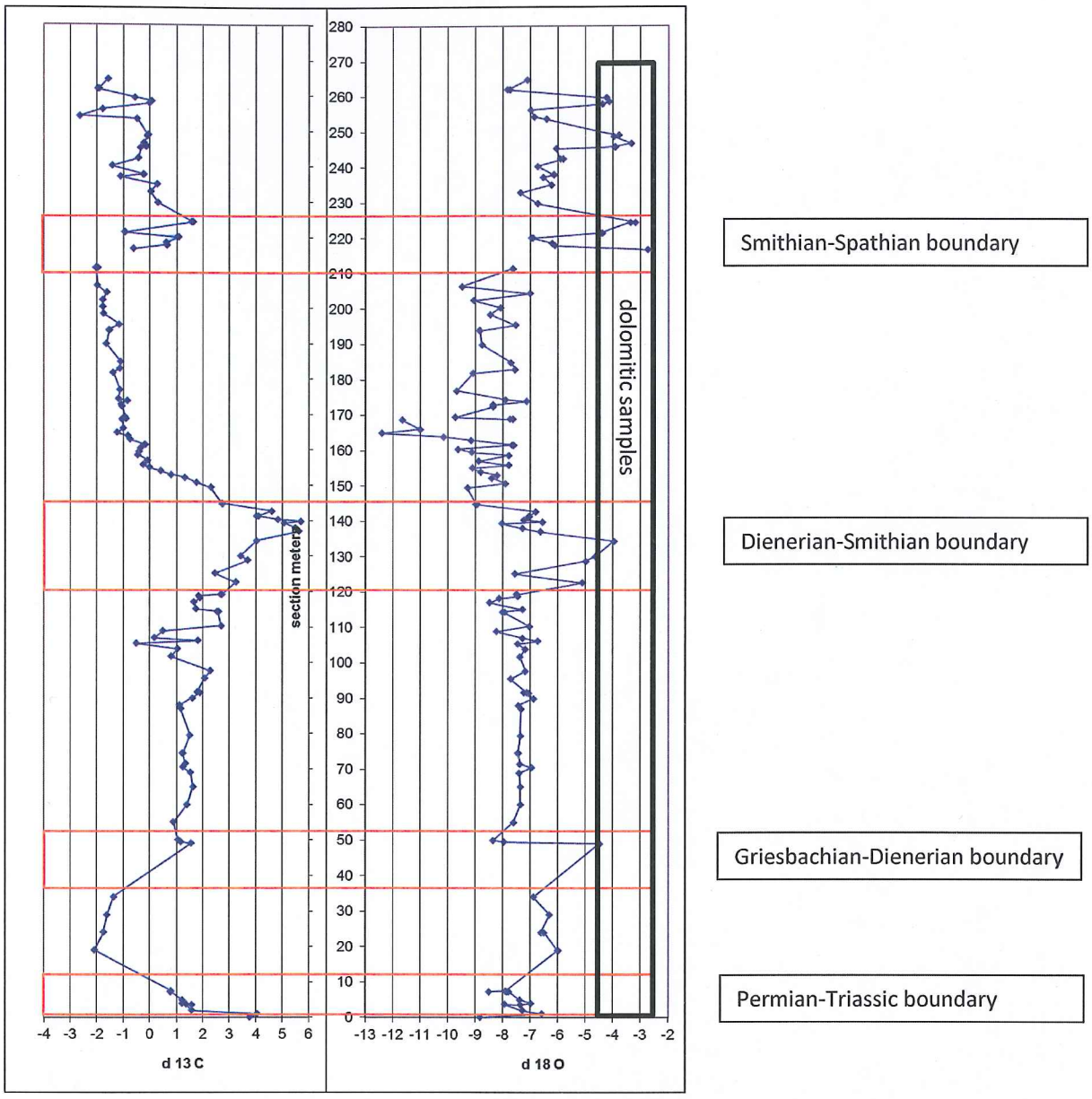


FIG. 2: Carbonate and oxygen isotope curves of the Uomo/L'Hom Picol section with approximate indication of boundaries.

The Early Triassic is a very peculiar period in Earth history, as it represents the time after the worst mass extinction event. Therefore it is of great interest and importance to correlate in time slices findings in various Early Triassic sections to combine the archived processes and evolutions in different regions. However, correlation often is hampered by absence or scarcity of time-diagnostic (macro-) fossils. The Early Triassic carbon isotope curve is a very valuable tool for stratigraphic correlation, but there are regionally significant variations in the curve shape for some Early Triassic intervals and thus additional markers are required. Conodonts have proven to be suitable, when available in the Early Triassic sediments, however for the Dolomites (and for many other shallow water sections as well) the fauna has been documented to be rather poor.

Now, sampling has been carried out in higher resolution and demonstrates that aside from the genera *Hadrodontina* and *Pachycladina* also *Eurygnathodus costatus* and *Eurygnathodus hamadai* co-occur during a short period across the Dienerian-Smithian boundary (DSB), tightly embracing the boundary sensu maximum $\delta^{13}C$ values of the carbon isotope curve (Fig. 1 IOB interval of the Rio Salt section near St. Vigil, Dolomites, Northern Italy). As these forms are abundant and have been identified in many Tethyan and also in Panthalassan sections (at low to moderate latitudes), they are very important forms for the definition and identification of the DSB. Furthermore, in the Dolomites they mark short intervals of open-marine influence in this shallow water realm. Additionally, it also shows that certain lithofacies (e.g., occurrences of dolomitic rocks, identified in the diagrams in Fig. 1 and 2 by elevated $\delta^{18}O$-isotopes around -4 to -2‰) in the Dolomites and also Dinarides (and perhaps even in other regions) can be correlated between different sections and regions and have been shown to occur more or less synchronously (Fig. 2: carbon and oxygen isotope values from the Uomo/L´Hom Picol section, Dolomites, Northern Italy).