

Geochemistry of the shallow marine deposits at the Tyrnaueralm (Graz Palaeozoic)

GALLIEN, F.¹, SUTTNER, T.J.² & PAURITSCH, M.³

(1) University of Graz, Institute of Earth Sciences (Mineralogy and Petrology), Universitätsplatz 2, A-8010 Graz, Austria; gallienf@yahoo.de

(2) Austrian Academy of Sciences (CPSA) c/o University of Graz, Institute of Earth Sciences (Geology and Palaeontology), Heinrichstrasse 26, A-8010 Graz, Austria; thomas.suttner@uni-graz.at

(3) University of Graz, Institute of Earth Sciences (Geology and Palaeontology), Heinrichstrasse 26, A-8010 Graz, Austria; Marcus.Pauritsch@gmx.at

The succession along the forest road to the Tyrnaueralm (Hochlantsch Nappe) exposes a sequence of shallow marine deposits including the Flösserkogel Formation, Plabutsch Fm and the Tyrnaueralm Fm. Latter formation was studied in detail by KRAMMER (2001), who concentrated especially on microfacies and predominating coral guilds. A characterization of the Tyrnaueralm Formation and its members is given in HUBMANN & MESSNER (2005). However, the lower part of this unit consists of early diagenetic dolomites which are succeeded by silt and sandstones, volcano-clastic sediments, fossiliferous limestones and dolomites.

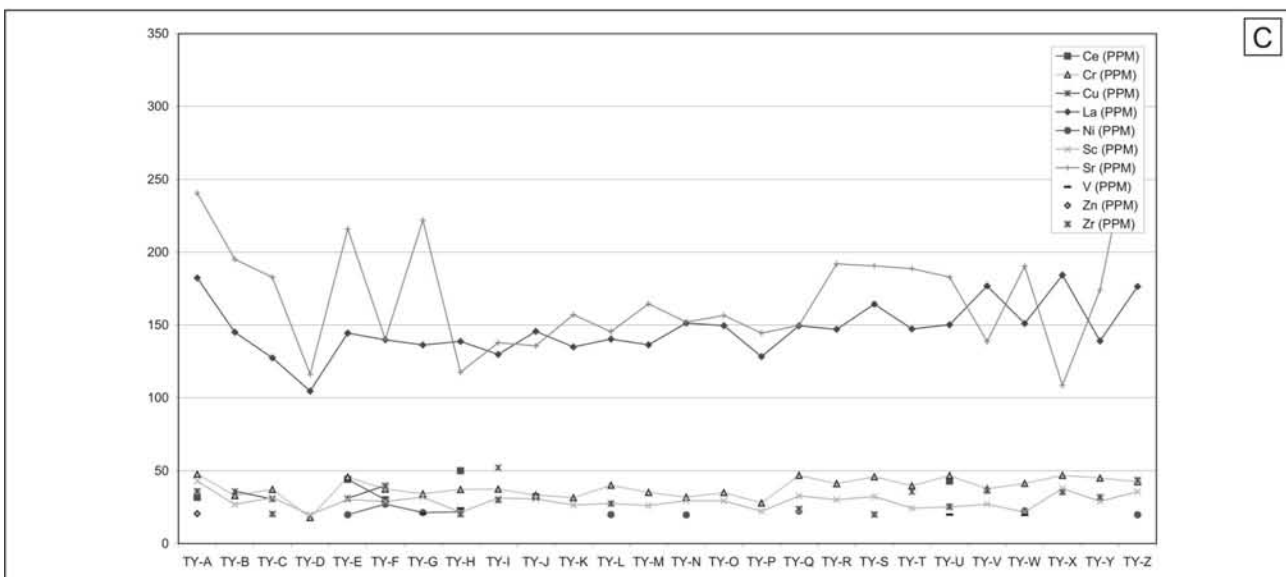
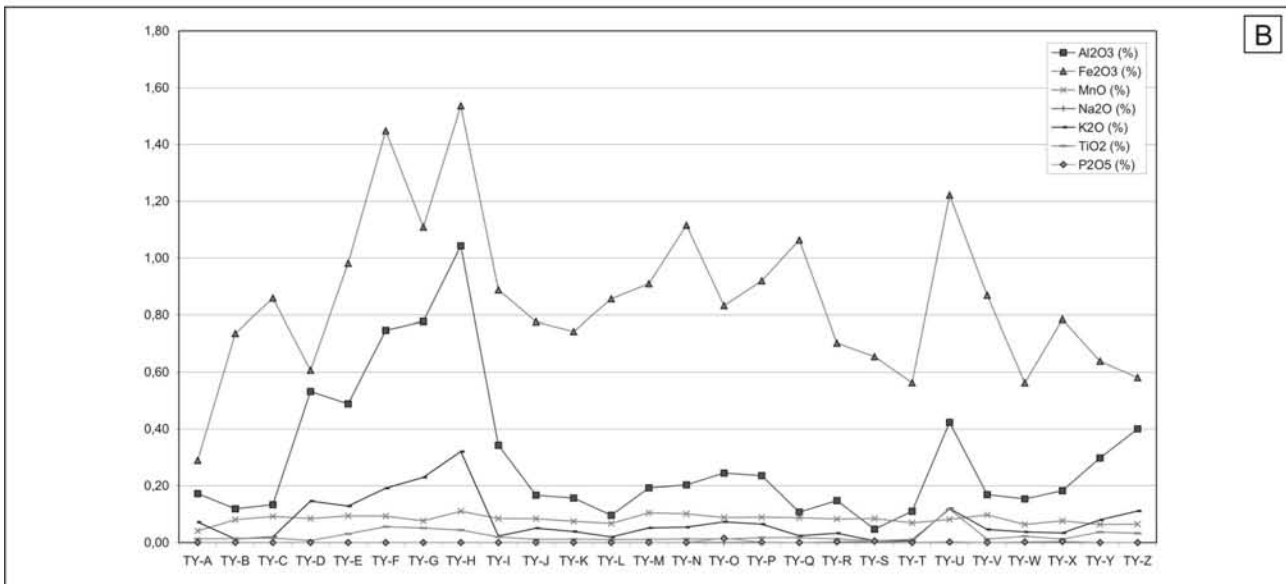
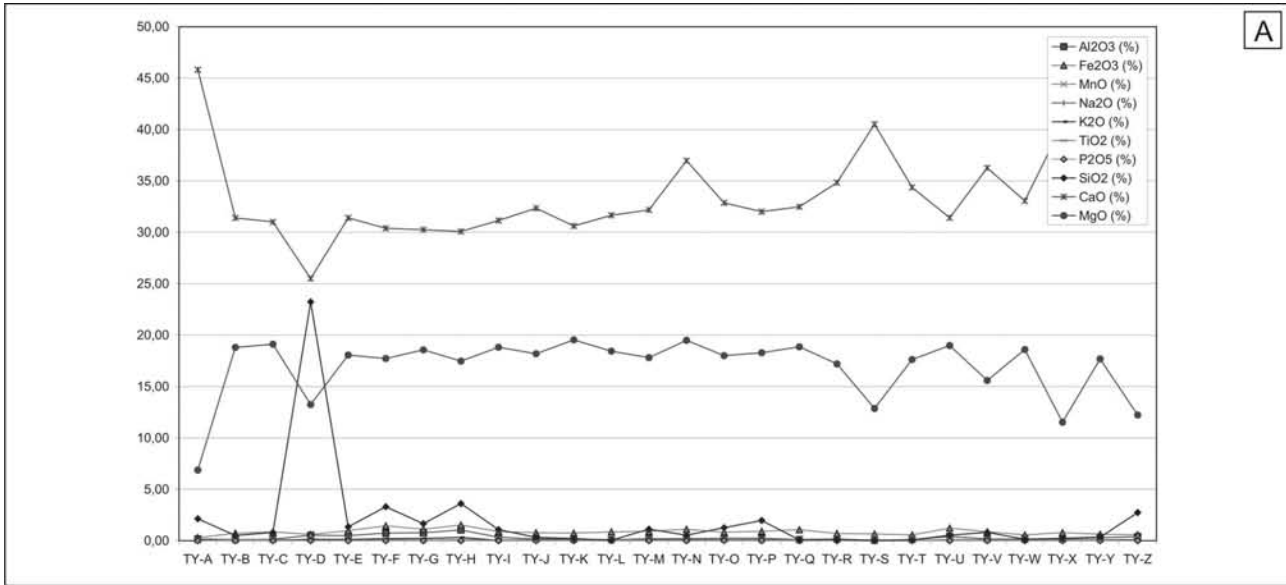
26 samples (Ty-A to TY-Z) were taken for geochemical analyses (major and trace elements) within the lower part formerly known as "Mitteldevondolomite". The purpose was to find out more on the original rock composition – as far as this is possible when measuring alpine Devonian sequences. Additionally to XRF analyses shown in Figure 1, stable isotopes, TOC and sulfur will be measured to complete the spectrum of elements necessary for paleoenvironmental interpretation.

At first glance it is visible that values of CaO and MgO which reflect dolomite content shifts at the very base of the unit and within the upper third (Fig. 1: A), whereas the siliciclastic input is generally low (except for sample Ty-D). Having a closer look at major elements of relatively low values (Fig. 1: B) two prominent excursions are recognizable which are produced by Al₂O₃ and Fe₂O₃ between samples Ty-C to Ty-J and Ty-T to Ty-V. Among the trace elements (Fig. 1: C) Sr and La show increased values (100-250 ppm) compared to the other elements measured. Comparing the single plots, three samples are observed which have nearly all values of elements increased (Ty-F, Ty-H and Ty-U). At the present stage of research any paleoenvironmental interpretation is still speculative, but it seems obvious that a change in the milieu happened at least twice in the sequence. Comparing the geochemical data with the results from microfacies analyses it turns out that the signal of biological productivity corresponds with the geochemical signals. Thus the changed environmental conditions indicated by regional increase of impurities of terrigenous weathering products are strongly related to the taphonomic community.

References:

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Autor(en)/Author(s): Gallien Florian, Suttner Thomas, Pauritsch Marcus

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