

## DEPOSITIONAL ENVIRONMENT OF THE SACHRANG FORMATION (LOWER TOARCIUM, NORTHERN CALCAREOUS ALPS).

EBLI, Oskar<sup>1</sup>, VETŐ, István<sup>2</sup>, LOBITZER, Harald<sup>3</sup>, SAJGÓ, Csanád<sup>4</sup>, DEMÉNY, Attila<sup>4</sup> & HETÉNYI, Magdolna<sup>5</sup>

<sup>1</sup> Institut f. Paläontologie u. historische Geologie, D-80333, München, Richard-Wagner-Str. 10

<sup>2</sup> Geological Institute of Hungary, H-1143 Budapest, Stefánia út 14

<sup>3</sup> Geologische Bundesanstalt, A-1031 Wien, Rasumofskygasse 23

<sup>4</sup> Laboratory for Geochemical Research, H-1112 Budapest, Budahörsi út 45

<sup>5</sup> József Attila University, H-6722, Szeged, Egyetem u. 2

The **Sachrang Fm.** is a product of the Toarcian Anoxic Event (TAE) and represents bituminous, finely laminated black shales with a thickness varying from 70 cm to more than 27 m. Due to geological setting and micropaleontological content of the rocks under examination, 2 different members can be differentiated: The **Sachrang member** is intercalated in typical grey basinal sediments, therefore sedimentary thickness is highest (more than 27 m) and duration (*exaratum* to *bifrons*-zone) is longest. Microfacies comprises rocks rich in radiolaria. Resedimented intervals are rather common and represented by up to 1 m thick layers of densely packed Intra-Biomicrites, sometimes with low-angle cross-stratification. The **Unken member** is sandwiched between red limestones and represents a marginal facies of the Sachrang Formation. Thickness is max. 3,5 m, the sedimentation is restricted to the *bifrons*- zone. The shales are rich in bivalves and intercalations of resediments (turbidity currents, debris-flows), often exhibiting green colours and an extreme high content of calcareous nannoplankton and foraminifera. Due to the changing of thick (21-72µm) nanofossil-rich layers with thin clay-rich laminae (4-29µm) a seasonal variation in pelagic bioproductivity is documented. A superimposed cyclicity is recorded by the changing of general calcite-rich and -poor layers in the order of cms to dms. They represent intervals of  $5,7 \times 10^3$  to  $17,1 \times 10^3$  years and are interpreted as climatically induced, the more calcareous layers representing times of warmer periods with a general higher bioproductivity of the calcareous nannoplankton. Elevated paleoproductivity of the photic zone is correlated with upwelling. The driving mechanism for this scenario is the downflowing of warm saline waters, generated in shallow shelf-seas, that replace the nutrient rich bottom waters. Furthermore at the sediment-water-interface mats built of sulfuroxidizing bacteria (Beggiatiaceae) existed. Together with the nearly omnipresent foraminifera they document the occurrence of free O<sub>2</sub> in the overlying water. Because of the low diversity and density of foraminifera-faunas in the deep basinal sections, O<sub>2</sub> content was mostly low and is thought to represent dysaerobic or exaerobic conditions. Organic, inorganic and isotope geochemical investigations indicate an initial 2-3 fold increase of bioproductivity during a first stage of the TOA, followed by a slightly decrease of productivity.

- EBLI, O. (1997): Biofazies und Sedimentation an passiven Kontinentalrändern: Lias und Dogger des Mittelabschnittes der Nördlichen Kalkalpen und des frühen Atlantik (DSDP site 547 B, offshore Marokko).- Münchner Geowiss. Abh., **32**, 1-255.
- EBLI, O., VETŐ, I., LOBITZER, H., SAJGÓ, C., DEMÉNY, A. & HETÉNYI, M. (in print): Primary productivity and early diagenesis in the Toarcian Tethys on the example of the Mn-rich black shales of the Sachrang Formation, Northern Calcareous Alps.- Adv. in Org. Geochemistry, 25 pp.