



Ocean current intensification during the Cenomanian-Turonian Oceanic Anoxic Event (OAE2) in the pelagic northern Helvetic Seewen Formation

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Several Cenomanian/Turonian pelagic limestone sections of Northern Tethyan origin were studied to gain a better understanding of shelf sedimentation and oceanography during a time of major carbon cycle perturbation. Three expanded sections in Eastern Switzerland (Chäserrugg, 32 m; Strichboden, 16 m and Kamor, 29 m) were sampled in 10 cm spacing. All sections belong to the northern Helvetic Seewen Formation (Churfürsten-Säntis nappe). Samples were analyzed for stable carbon- and oxygen-isotopes. The new C-isotope stratigraphy shows that isotopically defined OAE2 has a thickness of 2-3 meters in the Seewen Limestone successions of Eastern Switzerland. A chemostratigraphic correlation with other reference curves of the Latest Cenomanian and Earliest Turonian intervals is possible.

The onset of the $\delta^{13}\text{C}$ positive excursion of the Ocean Anoxic Event 2 (OAE2) is characterized by condensed beds with some dissolution features which are filled by glauconite grains. This characteristic layer can be found at several places in Eastern Switzerland. The condensed beds comprise the first $\delta^{13}\text{C}$ excursion of OAE2 (4.1 permil). Sedimentary facies on top of the condensed bed varies between more distal and more proximal shelf successions. At the locality Strichboden, darker and marlier limestones were formed in a more proximal shelf setting near or within an expanded oxygen minimum zone. More distal shelf successions are preserved in the Alpstein (Kamor) and in the Vorarlberg (A) region. In the Kamor section, the condensed interval preserves the signature of OAE2 with a $\delta^{13}\text{C}$ value of 4.8 permil. An 80 cm thick glauconite sand layer, the so called "lower" Götzis bed, forms the top of this condensed interval. Within the glauconite sand layer some micritic limestone pebbles were intercalated which have a $\delta^{13}\text{C}$ value of up to 5.1 permil. Therefore the carbonate production seems to be reduced during the OAE2 but never stopped completely. The sand facies reflects stronger current activity affecting sediments deposited along the more proximal shelf contemporaneous with the OAE2 (most positive $\delta^{13}\text{C}$ value). In the whole successions black shales or evidences for entire anoxia were lacking.