

Decline and recovery of foraminifera at the northern Tethyan margin during the Cenomanian-Turonian OAE-2: the Rehkogelgraben record (Ultrahelvetic Zone, Upper Austria)

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The Oceanic Anoxic Event 2 at the Cenomanian-Turonian boundary is one of the major paleoceanographic events during the Cretaceous. We present the results of foraminiferal assemblage-censuses across OAE 2 from a key section situated at the northern Tethyan margin (Wagreich et al., 2008). Although benthic forms are also present, our focus is on the planktic species representing the changes in the upper water column.

Planktic foraminifera are particularly frequent in the Late Cenomanian (56000 individuals/gram dry sediment, ind/gr). Their number decreases to 0.8 ind/gr during the OAE, and even 0.5 ind/gr immediately after the black shale deposition in the basal Turonian. Their number increased to about 12000 ind/gr in the Early Turonian.

About 70-80% of the Cenomanian assemblages are Hedbergellids (*Muricohedbergella*). Their percentages decrease during the OAE and vary between 10 and 50% in the Early Turonian. The fraction of Heterohelicids decreases already during the Late Cenomanian from 15 to 2%, is low during OAE and varies strongly in the Early Turonian (2-15%). *Whiteinella* occurs with 6 to 19% in Late Cenomanian samples, varies between 0 and 30% during the OAE and continues with about 30% in the Turonian. "Boreal" species (e.g., *W. baltica*) have their highest fractions (19%) during the late OAE and the basal Turonian. Percentages of *Praeglobotruncana* are low during Late Cenomanian (1-5%) and the OAE (0-4%) and increase noticeable in the Turonian (6->50%). Rotaliporids occur with 0.7 to 2.5% in Late Cenomanian samples.

Frequency of benthic foraminifera varies between 0.6 ind/gr during the OAE and more than 5800 ind/gr in the late Cenomanian. The majority (number) of benthics is part of the 0.063 to 0.125 mm fraction (about 95%). The lowest frequency is in the >0.250 mm fraction (0 to 7 ind/gr). The drop in frequency at the end of the Cenomanian is sharp. Benthic foraminiferal recovery after OAE 2 appears to be slow and is less than 500 ind/gr during the *W. archaeocretacea*-Zone. Pre-OAE levels are reached during the *H. helvetica*-Zone.

The records show distinct changes in planktic and also benthic assemblages, which are interpreted as direct consequences of changes in the oceanic environment. Well developed *K*-selected Late Cenomanian assemblages with abundant Rotaliporids (although dominated by Hedbergellids) are replaced by *r*-selected assemblages with low total numbers and relatively high fractions of the species *Schackoina cenomana* and *W. baltica*. Recovery of the paleo-ecosystem is represented by increasing numbers of larger and partly keeled species of the genera *Praeglobotruncana*, *Whiteinella*, *Dicarinella*, and *Helvetoglobotruncana*.

Wagreich, M., Bojar, A.-V., Sachsenhofer, R.F., Neuhuber, S., Egger, H. (2008): Calcareous nannoplankton, planktonic foraminiferal and carbonate carbon isotope stratigraphy of the Cenomanian–Turonian boundary section in the Ultrahelvetic Zone (Eastern Alps, Upper Austria). *Cretaceous Research* 29, 965-975.

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