

THE CENOMANIAN-TURONIAN MASS EXTINCTION AND RECOVERY PATTERNS IN BENTHONIC FORAMINIFERAL ASSEMBLAGES IN THE GANUZA AND MENOYO SECTIONS, NORTHERN SPAIN

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Benthonic foraminiferal response to the Cenomanian-Turonian Boundary Event was studied from two sections in northern Spain: Ganuza and Menoyo, representing middle shelf and upper bathyal environments, respectively.

The studied interval covers upper part of the planktonic foraminifer *Rotalipora cushmani* Zone, the *Whiteinella archaeocretacea* and *Helvetoglobotruncana helvetica* Zones.

The recorded changes in benthonic foraminiferal assemblages are interpreted as reflecting the decline of the oxygenation level of the bottom waters at the end of the *Rotalipora cushmani* Zone and the persistence of these unfavourable conditions in the *Whiteinella archaeocretacea* Zone in both studied sections.

A late phase of mass extinction, survival and recovery intervals were identified there. The mass extinction boundary is located in the uppermost part of the *Rotalipora cushmani* Zone while the boundary between survival and recovery intervals – in the lower part of the *Helvetoglobotruncana helvetica* Zone.

Despite of the differences in the taxonomic composition of benthonic foraminiferal assemblages in the studied sections which reflect their bathymetric position, the response to the changes in the oxygenation level of the bottom waters was very similar.

Stepped extinction within benthic foraminifers was observed in the uppermost *Rotalipora cushmani* Zone. In the late phase of mass extinction several species became extinct (e.g. *Gavelinella intermedia-cenomanica-baltica* group, *Tritaxia pyramidata*) and Lazarus taxa disappeared.

Survival interval is characterized by rare survivors and blooms of disaster species (e.g. *Praebulimina elata* – in both studied sections, and agglutinated forms – *Gaudryinella pusilla* in Ganuza and ?*Reophax* sp. in Menoyo) in the lower part and population bloom among ecological opportunists – such as *Gavelinella berthelini-plummerae* group, *Lingulogavelinella globosa*, *Lenticulina* spp. in Ganuza and *Ammobaculites* spp., *Valvulineria lenticula*, *Lenticulina* spp. in Menoyo – in the upper part. In the uppermost part of the survival interval Lazarus species return and immigrant species colonize sea bottom as well. In the recovery interval new species evolve and benthonic foraminiferal populations reach pre-extinction level of diversity.