

Evidence for palaeoenvironmental stability during the earliest Maastrichtian – implications from benthic foraminiferal assemblages from North Germany

Linnert, C.^{1,*}, Engelke, J.², Wilmsen, M.¹, Mutterlose, J.²

1) Ruhr-Universität Bochum, Bochum, Germany. *E-mail: christian.linnert@rub.de

2) Senckenberg Naturhistorische Sammlungen, Dresden, Germany

The latest Campanian – earliest Maastrichtian interval is well known as a period of global palaeoenvironmental perturbations including climate cooling, changing oceanic circulation patterns and an altered nutrient regime. These perturbations significantly affected marine phytoplankton communities like calcareous nannofossils (e.g. LINNERT et al., 2016; THIBAUT et al., 2016). Typical late Campanian nannofloral elements (e.g. *Biscutum* spp., *Watznaueria barnesiae*, *Rheinhardtites levis*) were increasingly replaced by cool-water taxa (e.g. *Arkhangelskiella cymbiformis*, *Kamptnerius magnificus*).

The impact of these environmental shifts on benthic communities is, however, less well known. In order to overcome this gap, we studied benthic foraminifer assemblages from the Krons Moor section (northwest Germany). This section provides a continuous succession of upper Campanian – lower Maastrichtian chalks with well-preserved foraminifera. Benthic assemblages are highly diverse (~40 species per sample) and abundant (~3.2*10⁵ specimens/Kg in >125µm fraction). Large size fractions (>500µm, >1000µm) are characterised by abundant infaunal agglutinated taxa like *Ataxophragmium*, *Eggerellina*, *Orbigynna*, *Tritaxia* and abundant lenticulids like *Lenticulina nuda* or *Lenticulina rotula*. The smaller fractions (>125µm, >250µm) show more diverse benthic communities with less frequent agglutinated species. Common taxa of these fractions include *Bolivina incrassata*, *Cibicidoides voltzianus*, *Gyroidinoides umbilicatus*, *Osangularia cordieriana*, *Sitella laevis* and *Stensioeina pommerana*. No variations of diversity or in the composition of morphogroups have been observed throughout the studied interval. Only a few taxa (e.g. *B. incrassata*, *Cibicidoides* spp., *Eponides* spp.) show a trend of decreasing abundances, whereas other taxa (*Cibicides beaumontianus*, *G. umbilicatus*, *Leavidentalina* spp.) increase. The relatively stable composition of benthic morphogroups suggests that there were no severe palaeoenvironmental disruptions in the North Sea basin like excess productivity or oxygen depletion. Sufficient organic matter was produced to supply abundant and diverse benthic communities without consuming too much oxygen. Minor palaeoenvironmental shifts are indicated by the variation patterns of individual taxa like *G. umbilicus* (increasing influx of organic matter) and *Bolivinoidea* spp. (cooling).

LINNERT, C. et al., 2016. *Paleoceanography*, **31**, 694–714.

THIBAUT, N. et al., 2016. *Clim. Past*, **12**, 429–438.