**Oxygen isotopes constrain annual growth periods and ambient temperature in modern North Sea oyster shells**

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The majority of oxygen isotope studies on carbonate fossils focus on the reconstruction of past climate conditions because oxygen isotopes are a valuable tool for estimating seawater palaeotemperature variability (and - under special circumstances - of absolute palaeotemperature). In a former study Surge et al. (2001) demonstrated that annual temperature and salinity variations are reflected in the growth bands of the oyster *Crassostrea virginica.* We have expanded on the theme of this study by focusing our attention on the modern Pacific Oyster (*Crassostrea gigas)*, which is currently spreading rapidly in the North Sea region. A left shell of *C. gigas*, sampled from a subtidal oyster bank offshore of Sylt island, was traversed by two sampling sections perpendicular to the growth direction through the umbo and the middle part of the shell. $\delta^{18}$O varies systematically between -1.6 and +1.6 ‰ in both profiles. The umbo and adjacent growth bands show the highest variability likely because adult oysters have been shown to stop growing during the summer months; Thus, only growth bands from the juvenile stages will yield a high annual or subannual resolution. We compared the obtained oyster shell values with values expected from equilibrium fractionation calculations of a simplified sea water system at the sample locality. These indicate, in accordance with Diederich et al. (2005), that *C. gigas* grows from approximately March to November. The relatively high variability in oxygen isotope ratios suggests that minimum temperatures for the onset of growth in *C. gigas* are around 6°C, not 10°C as hitherto suspected (Kirby, 2000).

References

Diederich S, Nehls G, van Beusekom JEE, Reise K (2005) Introduced Pacific oysters (*Crassostrea gigas*) in the northern Wadden Sea: invasion accelerated by warm summers? Helgol. Mar. Res. 59, 97–106

Kirby MX (2000) Paleoecological differences between Tertiary and Quaternary *Crassostrea* oysters, as revealed by stable isotope sclerochronology. Palaios 15, 132–141

Surge D, Lohmann KC, Dettman DL, (2001) Controls on isotopic chemistry of the American oyster, *Crassostrea virginica*: implications for growth patterns. Palaeogeogr. Palaeoclimatol. Palaeoecol. 172, 283–296

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