



Possible vital effects in diatom oxygen isotopes

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Measurements of diatom oxygen isotopes ($\delta^{18}\text{O}_{\text{diatom}}$) are increasingly being utilised as a palaeoclimatic tool in lacustrine and marine sequences depleted in carbonates. In particular, records of $\delta^{18}\text{O}_{\text{diatom}}$ hold significant potential in aiding palaeoceanographic reconstructions in the Southern Ocean. However, due to the difficulty in purifying and separating individual taxa, measurements of $\delta^{18}\text{O}_{\text{diatom}}$ are commonly made on bulk mixed species assemblages. Accordingly, it is essential to fully understand the processes which may lead to isotope offsets in $\delta^{18}\text{O}_{\text{diatom}}$. Here, by using data from ODP site 882 in the North West Pacific Ocean, we review the evidence pointing towards a possible size or species effect in $\delta^{18}\text{O}_{\text{diatom}}$. The detection of large isotope offsets between different size fractions of diatoms imposes significant constraints upon the future use of $\delta^{18}\text{O}_{\text{diatom}}$ and reiterates the need to extract and analyse only species and size specific diatom samples for $\delta^{18}\text{O}$ analysis.