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Isotope Paleoecology of the Miocene Planktic Foraminifera *Globoquadrina Dehiscens* as Inferred from International Ocean Discovery Program Site U1510, Southwest Pacific

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Isotope Paleoecology of the Miocene planktic foraminifera *Globoquadrina dehiscens* as inferred from International Ocean Discovery Program Site U1510, southwest Pacific

Background

- Prior studies, Keller (1985) and Pearson and Shackleton (1995), have determined that *G. dehiscens* does not have a clear palaeoecological signal
- Prior studies had low resolution and did not differentiate between different size fractions
- Goal is to determine if *G. dehiscens* can be used to reconstruct ancient ocean conditions

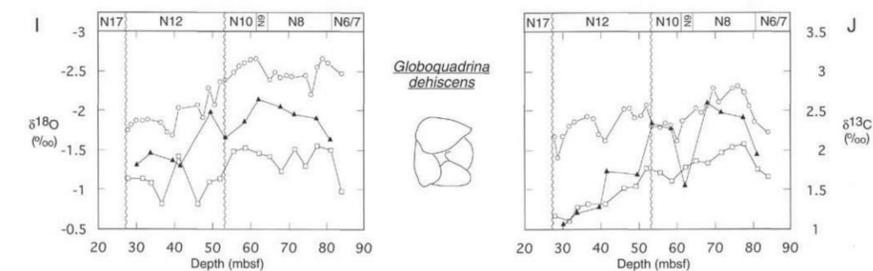


Figure 1 (Above): *G. dehiscens* $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ as inferred by IODP Site 871, western Pacific Ocean

Methods

- Specimens of *G. dehiscens* were picked from Site U1510A located in the center of the Tasman Sea
- Samples were sieved into 6 size fractions (425 μm , 355 μm , 300 μm , 250 μm , 180 μm , 150 μm) and picked
- Isotope analysis was run for sample at Hamilton College's Isotope Lab for $\delta^{18}\text{O}$ ‰ and $\delta^{13}\text{C}$ ‰

Figure 2: Modern sea surface temperature map showing the location of Site U1510A (red dot)

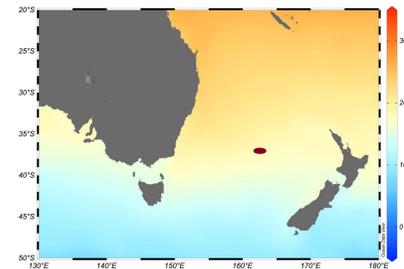
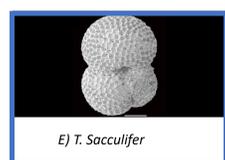
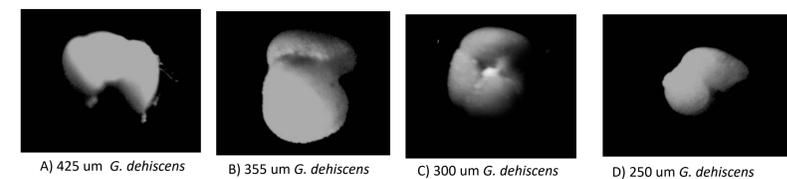
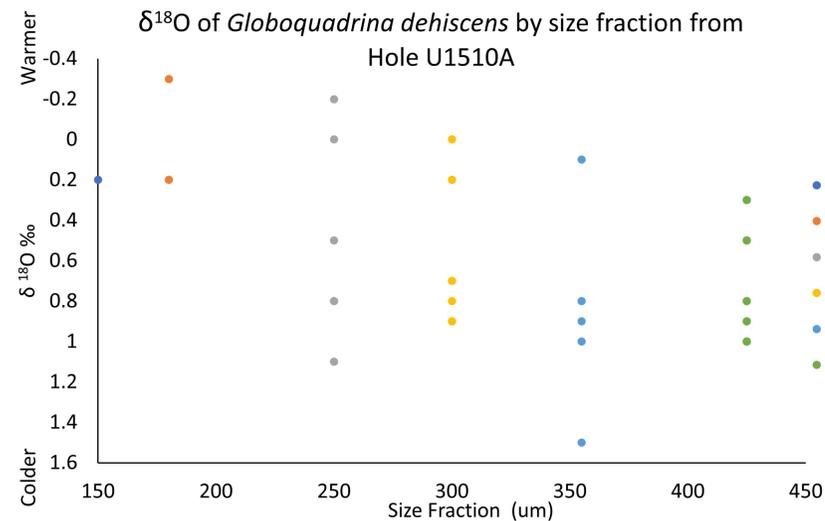


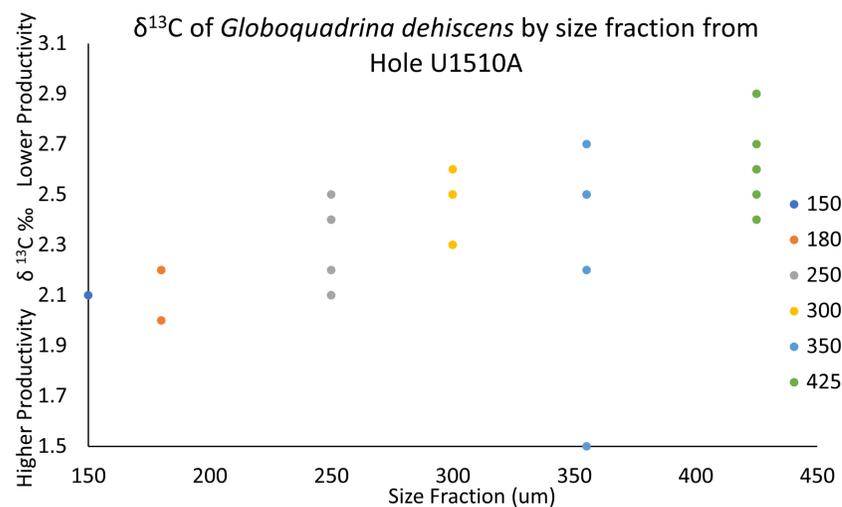
Figure 3: Photographs taken using the AM Scope system microscope (A-D) and a SEM (E-F)



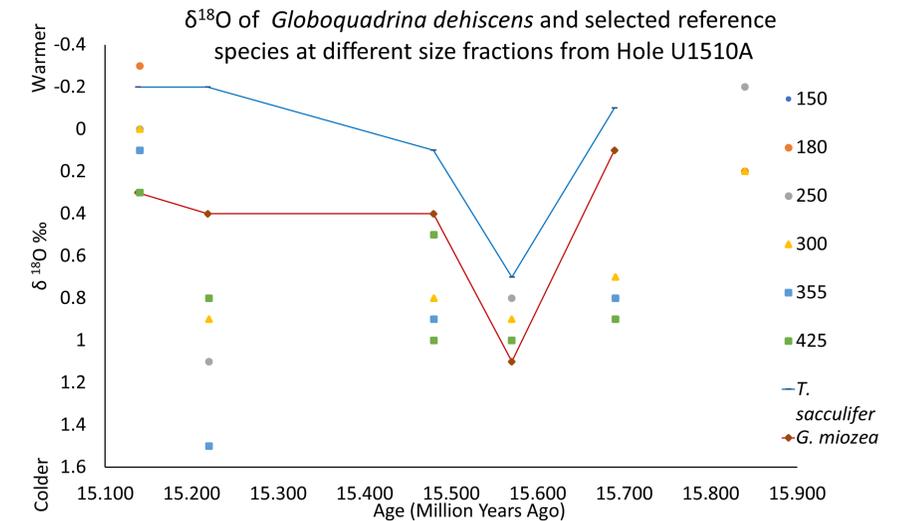
Results and Discussion



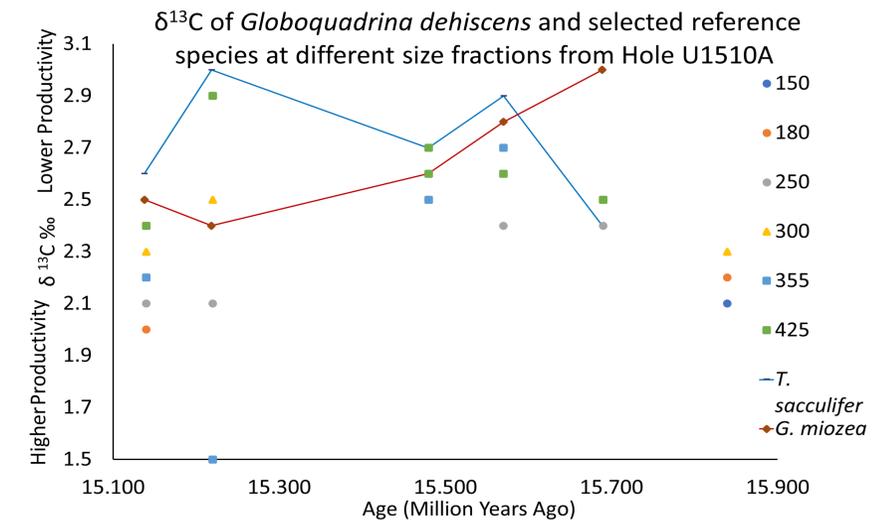
- Large scatter in values across all size fractions
- $\delta^{18}\text{O}$ across size fractions appear to lack a correlation. However, smaller size fractions may live in warmer waters, but more data is needed to infer this



- Large scatter in values across all size fractions
- $\delta^{13}\text{C}$ amount and size fraction do not appear to be connected, more data will help indicate if *G. dehiscens* migrates higher in the water column through its life



- $\delta^{18}\text{O}$ values are divided between surface dwelling and thermocline depending on the year, suggesting high seasonality
- No clear trend for $\delta^{18}\text{O}$ shows that *G. dehiscens* does not have a clear niche



- In general *G. dehiscens* is plotting below *G. miozea*
- As size fraction increases there is indication that *G. dehiscens* is moving up the water column towards the mixed-layer

Key Conclusions

Preliminary data indicates *G. dehiscens* is not a reliable palaeoceanographic proxy, as it does not seem to have a clear niche through time. As this site is within the mid-latitudes, seasonality may be complicating records.