



Mg/Ca in benthic foraminifera in the NE Pacific margin: tracers of temperature and carbonate undersaturation in intermediate waters

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Here we present a depth transect of benthic foraminifera Mg/Ca ratios from late Holocene sediments of the Baja California Margin to characterize the effects of carbonate saturation and early diagenesis on this tracer and to validate the method to reconstruct temperature gradients in the past. We have selected a few core tops from a collection of 21 gravity, piston and kasten cores retrieved offshore the western Baja California Margin, in a relatively narrow latitudinal belt spanning from 32°N (S of Ensenada) to 23°N (Cabo San Lucas) between 400 to 1700 m water depth. Modern vertical profiles of carbonate ion concentration show strong undersaturation of these upper intermediate waters coinciding with the oxygen minimum zone (OMZ) and a gradient towards less undersaturation below the OMZ. We use these observations to assess how the undersaturation of carbonate ion in the water column may affect the Mg/Ca ratios in two benthic foraminifera genera –infaunal *Uvigerina* spp. and epifaunal *Planulina* spp.- at higher bottom water temperatures than have been reported thus far.

Mg/Ca ratios for both genera show a spread of values bracketed by the higher values predicted from bottom water temperatures and the lower values derived from the Elderfield et al (2006) equation when a term considering the effect of carbonate undersaturation is added. This comparison shows that in general this method predicts

larger departures than those observed for most of the *Uvigerina* spp. samples, implying the importance of other yet quantified effects to alter the Mg/Ca in these strongly unsaturated intermediate waters which we will further explore with other properties measured from the water column and in the sediments.