

Laboratory experimental evaluation of foraminiferal Mg/Ca

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The Mg content of foraminiferal test calcite is a function of its calcification temperature (Cronblad and Malmgren, 1981; Delaney et al., 1985). The Mg/Ca ratio in the foraminiferal tests has developed as a past time temperature proxy (e.g. Nuernberg, 1995, Rosenthal et al., 1997). The relationships between temperature and foraminiferal Mg/Ca ratio are species-dependent, and have been revealed for many species of both planktonic and benthic to reconstruct paleotemperature conditions (for planktonic species: Nuernberg et al., 1996; Hastings et al., 1998; Lea et al., 1999; McKenna and Prell, 2004; Russell et al., 2004). The mechanism of elemental uptake, however, are not totally clarified because the way of elemental observation in the living foraminiferal cell is very limited. Then, we run some laboratory culture experiments with living foraminifera, e.g. *Ammonia beccarii*, *Rosalina bradyi*, *Quinqueloculina yabei*, and *Planograblatella opercularis*, to indicate the relationship between Mg/Ca and growth temperature and salinity, the Mg micro-distribution in the test, the Ca uptake, storage and utilization, and the pH governing during calcification. This study, finally, discuss about some hypothesis of Ca and Mg management by the foraminiferal cell.