

Paleotemperature, productivity and shell size of *Hedbergella delrioensis* in the Cretaceous thermal maximum

MORIYA, Kazuyoshi^{1*}; TSUTSUI, Keita¹

¹Dep. Earth Sciences, Sch. Education, Waseda Univ.

Planktic foraminifers, experienced two major diversity crises at the Cretaceous/Paleogene boundary and the Eocene/Oligocene boundary, have emerged in late Jurassic and repeatedly flourished in these 100 myr Earth history (e.g. Norris, 1991). Among them, the Cretaceous foraminifers diversified in the greenhouse interval. Morphologies of some Cretaceous species are very unique, and never reappeared after the K/Pg boundary (Norris, 1991). Its diversity has widely been discussed in relation with oceanic anoxic events in the mid-Cretaceous (e.g. Leckie et al., 2002).

On the other hand, size distribution within a modern planktic foraminiferal community, and intra-species size variation are known to respond to abiotic properties, such as temperature and salinity, and productivity (Bijma et al., 1990a, 1990b; Schmidt et al., 2004). However, the size distribution of the Cretaceous foraminifers has not been widely analyzed so far. We discuss the intra-species size variation of the mid-Cretaceous planktic foraminifer, *Hedbergella delrioensis*, and environmental qualities; paleotemperature, salinity and productivity.

Pelagic sediments used for this study were recovered in ODP Leg 207 at Demerara Rise, the equatorial Atlantic. Samples were washed through a sieve with 64 μ m opening. Approximately 100 individuals of *H. delrioensis* were picked from particles larger than 125 μ m. The largest linear dimension of each individual was measured, and the stratigraphic variation of average size was described. Since TEX₈₆ and carbon and oxygen isotope composition of planktic foraminifers have already been analyzed by Forster et al. (2007) and Moriya et al., (2007), stratigraphic variations of these proxies were discussed with the size distribution. Average size of *H. delrioensis* co-varies with the productivity estimated from the carbon isotope composition. Considering that the paleotemperature and salinity had been unchanged in the interval analyzed, it is expected that the size of *H. delrioensis* responded to the local productivity.

Bijma, J. et al. (1990) Jour Foram Res. 20, 117-127.

Bijma, J. et al. (1990) Jour Foram Res. 20, 95-116.

Forster, A. et al. (2007) Geology. 35, 919-922.

Leckie, R. M., et al. (2002) Paleoceanography. 17, 10.1029/2001PA000623.

Moriya, K. et al. (2007) Geology. 35, 615-618.

Norris, R. D. (1991) Paleobiology. 17, 388-399.

Schmidt, D. N. et al. (2004) Mar Micropaleontol. 50, 319-338.

Keywords: Cretaceous, planktic foraminifer, shell size, paleotemperature, productivity