

有孔虫の石灰化機構と環境指標

Calcification mechanisms in foraminifera and proxy incorporation

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Anthropogenic carbon emissions have now been recognized to not only cause global warming but also ocean acidification (OA), anoxia, ocean stratification, changes in biogeochemical cycles, ecosystem functioning etc. At the end, our carbon hunger may turn out to be one of the biggest challenges faced by future society. Although, the impacts of global warming have been studied for some time now, other aspects of carbon perturbations such as OA are still in its infancy. To investigate and understand the impacts of the present carbon perturbation, it is of utmost importance to exploit proxy records in Earth history in order to understand its consequences on longer timescales.

Calcifying organisms, such as pteropods, bivalves, corals and foraminifera are not only among the first victims of ongoing OA but also provide a rich resource for pale-oceanographers and climatologists because their geochemical make-up (proxies) can be used to reconstruct past ocean history and evolution during and after natural carbon perturbations. However, it has been shown for all geochemical proxies that the main assumption of only one environmental variable controlling a target proxy is too simple. Empirical calibrations introduce a lot of uncertainty because the mechanisms of proxy incorporation are not well understood. The major problem is that the calcification mechanisms are still a black box. In this presentation I will review the current knowledge of calcification in foraminifera.

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