

Laboratory culture experiments: effect of dissolved oxygen concentration on planktonic foraminifera

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Planktonic foraminifera shows significant species turnover ratio related Cretaceous oceanic anoxic event (OAEs), however, the direct effect of dissolved oxygen (DO) concentration on planktonic foraminifera remain obscure. Although culture experiments can investigate quantitatively the relationship between foraminiferal ecology and environmental parameters, DO-controlling experiment has never been conducted because of the difficulty of observation and/or control of dissolved oxygen under the modern ocean condition. In the present study, we cultured two planktonic foraminifera species (*Orbulina universa* and *Globigerina bulloides*) under six different DO conditions. Both species have extremely high tolerance to low DO than we expected before, and it suggests that at least "dysoxic" condition (more than 0.7 mg O₂ l⁻¹) could not be a direct cause of the extinction of planktonic foraminifera at OAEs. Their high tolerance to extremely low DO would be caused by the evolutionary descendant of benthic foraminifera. Final shell weight increased with DO despite almost the same culture duration among treatments, thus it suggests foraminiferal fossil shell weight could reflect the DO conditions.

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