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コユビミドリイシ初期ポリプ骨格の酸素・炭素同位体比
Skeletal isotope compositions of Acropora coral primary polyps experimentally cultured at different temperatures

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We investigated temperature and growth-rate dependency of skeletal oxygen and carbon isotopes in primary polyps of *Acropora digitifera* (Scleractinia: Acroporidae) by culturing them at 20, 23, 27, or 31 ℃. We cultured primary polyps of *A. digitifera* at Sesoko Station, University of the Ryukyus, Motobu, Okinawa Prefecture, Japan for 10 days. From the results of the polyp weight and polyp area, calcification was most rapid at 27 and 31 ℃. The δ^{18}O — temperature relationship (– 0.18 ‰/℃) is consistent with reported ranges for *Porites*, indicating that juvenile *Acropora polyps* can be used for paleotemperature reconstruction. We found a gap between curves for the experimental polyps and the equilibrium curves for inorganic aragonite of about 3.0 ‰ for δ^{18}O and 8.0 ‰ for δ^{13}C, with the primary polyp values being lower than the equilibrium values of inorganic aragonite. The kinetic isotope effect was evident in the polyps cultured at low temperature but disappeared at high temperatures, despite relatively low light levels. The estimated upper calcification flux limit for a kinetic isotope effect (~0.4 – 0.7 g $CaCO_3$ /cm^2·y) was similar to that of *Porites* colonies with a linear extension rate of <5 mm/ y, suggesting that the calcification flux may be used as a measure of kinetic isotope effect dominance in different genera at different growth stages.

キーワード: coral, temperature, stable isotopes, polyp, kinetic effect
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