

An unexpected mineral in reef-building massive coral

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Coral reefs are important for marine ecosystem by providing habitat to many animals in tropical and subtropical zones. Coral skeletons are also mineralogically interesting, because they consist of aragonite (CaCO_3) which is a thermodynamically metastable mineral phase under growth environments of corals. So far, the calcification process has been still unknown. It is generally known that XRD patterns of reef coral skeletons show only aragonite phase peaks, although chemical analyses reveal that coral skeletons contain various elements. Recently it was suggested that such elements directly break into calcification medium from seawater. This indicates that abundant elements in seawater, such as Na^+ , Cl^- , SO_4^- may precipitate in coral skeleton during calcification as halite and gypsum. To confirm these mineral phases, we observed massive coral skeleton of *Porites lobata* by Analysis Transmission Electron Microscope (ATEM) and Fourier Transform Infrared spectrometer (FT-IR) which are powerful tools to detect small amount of mineral phases. In this observation, we found an evidence that halite precipitates almost simultaneously with aragonite during calcification. The existence of halite is one of strong supports for the supporting a model of extracellular calcification. On the other hand, gypsum could not be observed. This suggests that coral have ion selectivity from seawater to calcification medium. The halite phase in coral skeleton will provide a new perception for understanding the process of coral calcification.

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