

Pretreatments and analytical protocol for a compound-specific stable isotope analysis of fatty acids in the *Porites* coral skeleton

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This study highlights the preliminary results of a compound-specific stable isotope analysis of fatty acids (CSIA-FA) in scleractinian coral skeleton for establishing a new proxy of coral paleo-heterotrophy. Corals have both heterotrophic (feeding) and autotrophic (photosynthesis) modes of assimilation for acquiring nutrients [1]. Although most of the metabolic energy is obtained from autotrophy, heterotrophy could account for as much as 66% of the carbon incorporated into the skeleton depending on coral species and environmental conditions. By the CSIA-FA in zooxanthellae and coral tissue, previous studies found that different feeding behaviors were specific to each coral colony [2]. Therefore, these isotopic features of coral skeleton could be a new proxy of paleo-heterotrophy rate for corals.

To establish an effective analytical protocol, we examined several pretreatments of *Porites* coral skeleton (JCp-1). Dichloromethane (DCM), and not NaOH, was the most suitable solvent for pretreatments in coral skeletons. Approximately 100 mg of coral powder was adequate for CSIA-FA. Results will be discussed in the context of establishing the new proxy by CSIA-FA in the *Porites* coral skeleton.

[1] Teece, Estes, Gelsleichter & Lirman D (2011), *Limnol Oceanogr* 56, 1285-1296.

[2] Houlbreque, Ferrier-Pages (2009), *Biological reviews of the Cambridge Philosophical Society* 84 (1), 1-17