

High-resolution palaeoenvironmental records from Miocene patch reefs from SE-Kalimantan (Indonesia)

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The development of the extraordinary coral reef diversity in SE-Asia is a response to long-term environmental changes resulting from the closure of the Indonesian Throughflow (ITF) during the Oligocene-Miocene transition. To disentangle the complex relationship between the tectonic history of the ITF and associated environmental changes, paleoclimatic reconstructions are required. Here we present seasonally-resolved palaeoenvironmental records obtained from Miocene corals and molluscs. Corals and molluscs are increasingly used as archives for paleoclimatic reconstructions, as they incorporate and store the elemental and isotopic composition of their ambient marine milieu. However, certain restrictions apply, as diagenetic processes such as recrystallization of aragonite to calcite or secondary aragonite precipitation lead to an overprint of the original geochemistry, resulting in unreliable palaeoenvironmental reconstructions. Thus, to obtain reliable paleoclimatic information, primary coral/mollusc aragonite is required, which however is rarely preserved in 'deep time' Miocene or older strata.

Here, we present initial aragonitic results of well-preserved Miocene corals and molluscs from East Kalimantan, Indonesia. Besides long-term records from corals, co-existing giant clams (*Tridacna* sp.) are of special interest, which preserve a decadal record of interannual environmental variability. Trace element/Ca ratios from laser-ablation mass spectrometry (LA-ICPMS) and micromilled $\delta^{18}\text{O}$ data are used to infer seasonally-resolved changes in climatic (e.g. SST) and environmental (e.g. SSS) conditions. Obtained numerical ages are based on strontium isotope stratigraphy.