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# *Dendrophyllia*: A New Archive for Ocean Temperature and Nutrient Variability?

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The ongoing climate change affects marine life on a multitude of aspects such as ocean warming, acidification and deoxygenation, but also in the pattern and rate of marine primary production and carbon export. Predictions of future ocean conditions can be improved by data sets longer than the 200-yr instrumental records, thus benefiting from paleoceanographic data collected from different natural archives. Cold-water corals (CWCs), like *Dendrophyllia cornigera* and *D. ramea*, are azooxanthellate species that create complex habitats in cold-water ecosystems at intermediate ocean depths. During growth, CWCs incorporate trace elements into their skeletal structures, potentially serving as natural archives. While Li/Mg ratios have been established as a reliable temperature proxy in well-studied CWCs like *Desmophyllum pertusum*, the genus *Dendrophyllia* — with its adaptability to a wide range of depths and temperatures [1] — remains an underexplored but promising candidate for reconstructing past oceanographic conditions. This study examines the potential of *Dendrophyllia* skeletons to serve as paleoenvironmental archives by evaluating Li/Mg and Ba/Ca ratios as proxies for past ocean temperatures and nutrient content, respectively.

Coral samples (n = 39), live-collected as bycatch from bottom-contact fisheries off Sagres (Portugal) and spanning 5–7 depth levels up to 510 m (depending on species), were selected for this study. Approximately, 2–3 individuals of each species (*D. cornigera* and *D. ramea*) were selected per depth level. Sample preparation and trace element analysis by ICP-MS followed Cuny-Guirriec et al. [2], and generalized additive models (GAMs) were used to correlate elemental ratios with environmental variables. While our work is ongoing, previous preliminary findings suggest species-specific Li/Mg-temperature relationships [3]. If successful, our effort will secure new paleoceanographic proxies for subsurface and upper-intermediate ocean temperature and nutrient conditions.

**References:**

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