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Characterizing conodont biophosphate from the Early Triassic: an analytical and paleoclimatological approach

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In the aftermath of the most catastrophic mass extinction on Earth, the Early Triassic was a period of major environmental perturbations that required consecutive adaptations of marine organisms. The paleoclimate was not uniformly adverse and climatic oscillations as well as regional variations controlled the ecological recovery during this time interval. To complement this perspective, bioapatite of apparently well-preserved conodonts (CAI 1 to 2) were analyzed for their elemental and stable oxygen isotope compositions as proxies for alteration and/or to estimate the paleoclimatic conditions and relative sea water temperatures. The analytical approach is based on stable isotope analyses of oxygen in phosphate in two ways: a classical method of silver phosphate microprecipitation and, given samples with a scarcity of conodonts, in-situ measurements by secondary ion mass spectrometry (SIMS). Preliminary results are considered satisfactory in terms of homogeneity of sample sets and their relative precision of measurement for both techniques. Currently, three samples are being tested to be assigned as routine phosphate reference material for biominerals: platform (P1) dental elements of Sc. milleri for conodonts, one fossil and one recent shark tooth for general bioapatite. These new in-house standards will be used to correct the accuracy of the oxygen isotopic values and consequently be able to address paleoclimatic changes for a number of Early Triassic sections.