$\delta^{18}O$ as seawater and palaeoclimate proxy: results of *in-situ* SIMS in modern shark and ray dental apatite

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Inter- and intra-tissue oxygen isotopic compositions of modern shark teeth have been studied *in-situ* using a secondary ion microprobe at NordSIM facility (Natural History Museum, Stockholm). Several species of sharks have been analysed – the Sandbar shark, Sand Tiger shark, Nurse shark, Black tip reef shark, White tip reef shark, and the ray, Bowmouth Guitarfish. All the specimens included in this study were growing their teeth in monitored environment of constant temperature and salinity of the tropical ocean tank at the Blackpool Sea Life Center (UK). High spatial resolution of ion microprobe allowed to target separate layers of enameloid: the parallel-bundled enameloid and the tangle-bundled enameloid, as well as the dentine. The resulting $\delta^{18}O$ values were replicable within the each of separate tissues of the tooth, and within each species. Guitarfish showed unexpectedly low $\delta^{18}O$ values in the basal parts of the dentine, confirming the importance of tissue-selective approach to obtaining the $\delta^{18}O$ as a temperature proxy. Resulting discrepancy provides unique insight to possible 'vital effects' and species-specific dental biomineralization patterns, as well as general applicability of dental apatite $\delta^{18}O$ values as proxies to those of the ambient seawater.