Comparing Cr concentration data from modern marine skeletal carbonates from sites with the contrasting continental Cr inputs

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Ocean water yields an integrated global signal of geological and biological processes controlling the elemental fluxes between the lithosphere, hydrosphere and atmosphere that, in turn, modulate the physico-chemical conditions at the Earth's surface. Therefore, understanding the distribution and concentration patterns of major and trace elements in seawater, and precipitating marine carbonates, is one of the main research objectives in earth system sciences. Concentrations of chromium (Cr) were measured in modern marine skeletal carbonates by an Element2 magnetic sector field ICP-MS (Thermo Scientific), at the Institute of Geology, Academy of Sciences, using a medium resolution ($m/\Delta m = 4000$) mode in order to separate ^{52}Cr from polyatomic interferences eg. $^{36}Ar^{16}O$, $^{38}Ar^{14}N$ or $^{40}Ca^{12}C$. The precision and fidelity of our Cr concentration analysis was tested on selected carbonate standards (JDo-1, CRM 513 and CRM 512) whose Cr contents are well known based on the certified or literature values [1]. Our measured Cr concentrations agree well with the published values ($R^2 = 0.9918$, $n = 3$). After verifying our approach, we analysed calcitic and aragonitic skeletons of different marine organisms (Cnidaria, Mollusca, and Algae) collected at the Lady Elliot Island, Queensland, Australia, where we expect generally low concentrations of Cr as there is no nearby riverine input of Cr from continents at this offshore and carbonate reef settings. As expected, analysed samples yielded very low Cr concentrations in a range from about 0.01 up to 0.79 ppm. As a next step, we will analyse marine skeletal carbonates from other localities (Alaska, Argentina, Italy, Norway), where we expect much higher concentration of Cr due to nearby riverine inputs of Cr from continental weathering, draining basaltic and ultramafic bedrocks. This comparison will allow us to evaluate the effect of different riverine Cr inputs to seawater on the concentration and incorporation of Cr into the marine skeletal carbonates.

[1] Bonnand et al., 2011, *J. Anal. Atom. Spec,* **26**, 528-535.