



Applicability of highly branched isoprenoids as a sea ice proxy in the Ross Sea

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Sea ice is an integral component of the polar climate system, constraining the effect of changing surface albedo, ocean–atmosphere heat exchanges, the formation of deep and intermediate waters that participate in driving the meridional overturning circulation and thus global climate. In recent years, a mono-unsaturated highly branched isoprenoid (HBI) alkene which is biosynthesised by certain sea ice diatoms during the spring bloom and, upon ice melt, deposited into underlying sediments, has been uniquely observed in Arctic sea ice and in Arctic sediments. Hence, the term IP25 (ice proxy with 25 carbon atoms) was proposed to distinguish this compound from other HBI isomers and has become an established proxy for the reconstruction of Arctic sea ice. In contrast, a monounsaturated HBI alkene, i.e. IP25, has not been observed in sea ice or sediments from the Antarctic. Hence, the application of diene and triene HBI concentrations and the resulting diene/triene (D/T) ratio was alternatively introduced as sea ice/open water indicators in the Southern Ocean. However, there is still lack of data covering the wide areas around the Antarctic, especially from the Ross Sea. Hence, we investigated surface sediment samples from the Ross Sea (n=14) collected during the R/V ARAON cruise in 2015 as well as from the Antarctic Peninsula (n=17) collected during several R/V ARAON cruises between 2001 and 2013. We will present our preliminary results and will discuss the applicability of the HBI in the Ross Sea.