



Impact of ice melting on distribution of particulate sterols in glacial fjords of Chilean Patagonia

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We analyzed variability in abundance and composition of sterols in waters of the fjord adjacent to glacier Jorge Montt, one of the fastest retreated glaciers in Patagonian Icefields. The study was carried out between August 2012 and November 2013 under different meltwater scenarios. Distribution of sterols in surface and bottom waters was determined by Gas Chromatography coupled to Mass Spectrometry. Sterol concentration ranged from 18 to 1726 ng/L in surface and bottom waters and was positive correlated with chlorophyll-a concentration. Under high melting conditions in austral summer, surface meltwaters showed high concentrations of sterols and were dominated by methylene-cholesterol, a representative sterol of centric diatoms. In the area near open ocean and in austral autumn, winter and spring in proglacial fjord, lower sterol concentrations in surface waters were accompanied by other microalgae sterols and an increase in relative abundance of plant sterols, evidencing a different source of organic matter. In autumn, when high meltwater flux was also evidenced, presence of stanols and an uncommon tri-unsaturated sterol suggests influence of meltwaters in composition of sterols in the downstream fjord. We conclude that ice melting can modify sterol composition by setting conditions for development of a singular phytoplankton population able to thrive in surface meltwater and by carrying glacier organic matter into Patagonian glacial fjords. In projected ice melting scenario, these changes in organic matter quantity and quality can potentially affect availability of organic substrates for heterotrophic activity and trophic status of glacial fjords.

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