Selected Abstracts

Abstract 1

Research articles:

Kam W Tang, Walker O Smith, Jr, Amy R Shields, and David T Elliott

Survival and recovery of *Phaeocystis antarctica* (Prymnesiophyceae) from prolonged darkness and freezing

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Abstract **Full Text** **Full Text (PDF)**

Abstract 1 of 1

Research articles

Survival and recovery of *Phaeocystis antarctica* (Prymnesiophyceae) from prolonged darkness and freezing

The colony-forming haptophyte *Phaeocystis antarctica* is an important primary producer in the Ross Sea, and must survive long periods of darkness and freezing temperature in this extreme environment. We conducted experiments on the responses of *P. antarctica*-dominated phytoplankton assemblages to prolonged periods of darkness and freezing. Chlorophyll and photosynthetic capacity of the alga declined nonlinearly and independently of each other in the dark, and darkness alone would potentially reduce photosynthetic capacity by only 60 per cent over 150 days (approximately the length of the Antarctic winter in the southern Ross Sea). The estimated reduction of colonial mucous carbon is higher than that of colonial cell carbon, suggesting metabolism of the colonial matrix in the dark. The alga quickly resumed growth upon return to light. *Phaeocystis antarctica* also survived freezing, although longer freezing durations lengthened the lag before growth resumption. Particulate dimethylsulfoniopropionate relative to chlorophyll increased upon freezing and decreased upon darkness. Taken together, the abilities of *P. antarctica* to survive freezing and initiate growth quickly after darkness may provide it with the capability to survive in both the ice and the water column, and help explain its repeated dominance in austral spring blooms in the Ross Sea and elsewhere in the Southern Ocean.

Full Text

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