

Abstract presentation Willem van de Poll 28-5-2009

Can photoprotection via xanthophyll cycle pigments determine species composition in marine phytoplankton?

Algae deploy photoprotective mechanisms that limit the hazardous effects of excess PAR and UVR exposure. Xanthophyll cycle pigments play a crucial role in photoprotection via the development of non photochemical fluorescence quenching (NPQ) during excess radiation exposure. Considerable variation has been observed in xanthophyll cycle pigment content between different algal species. Therefore, it has been suggested that the photoprotective capacity can determine species composition in the upper mixed layer. The photoprotective capacity of Antarctic phytoplankton was investigated during lab and field experiments. Lab experiments with the Antarctic diatom *Chaetoceros brevis* will be presented that show the effects of excess PAR (400-700 nm) and UV radiation (UVR: 280-400 nm) and the photoprotective role of the xanthophyll cycle after cultivation under different radiation and nutrient conditions. Furthermore, differences in xanthophyll cycle activity between *Chaetoceros brevis* and *Phaeocystis antarctica* are presented. In addition, UV radiation effects on the xanthophyll cycle of these species were investigated. Finally, the photoprotective capacity of Antarctic phytoplankton was determined during PAR and UV exposure for assemblages that were collected from contrasting light environments in Potter Cove, King George Island. The idea that photoprotective capacity can determine species composition will be discussed.