

Tittel: Bakterie og virus produksjon i havet som funksjon av temperatur

Studieretning: Mikrobiologi

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Beskrivelse av prosjektet:

The level of bacterial biomass production relative to primary production is lower in cold polar regions and the explanations argued are that low temperature affect prokaryotes more than eukaryotes, and that limited supply of biodegradable dissolved organic carbon (BDOC) restricts bacterial growth (Kirchman et al 2009). The relationship between viruses and prokaryotes may also differ as low bacterial and viral abundances and low temperature imply low contact rates and hence low lytic viral activity in Arctic waters (Steward et al. 2007, Payet and Suttle 2008). In addition, a low fraction of cells containing viral particles suggests that virus production rates may be low in the upper Arctic water column while it compares to bacterial growth rates in bottom waters (Steward et al. 1996, 2007, Wells and Deming 2006). A higher frequency of phage genes in bacterial genomes have been recorded in the Arctic Ocean compared to bacterial genomes in lower latitude oceans (Cottrell and Kirchman 2012), suggesting that the fraction of temperate viruses and lysogenic cells may be higher in the Arctic Ocean. The factors controlling viral activity and bacterial mortality may hence be very different in cold polar water compared to warmer lower latitude waters.

Praksis:

Opggaven kan inkludere feltarbeid, tokt og laboratorieeksperimenter (tilpasses etter studentens ønske og muligheter).

Arbeidet omfatter inkuberinger for å måle lytisk og lysogen virusproduksjon i ulike vannmasser og til ulike tider på året. Disse målingene sammenlignes med andre biologiske parametere (bakterietall, virustall phytoplankton / klorofyll, aktivitet (oksygen forbruk/produksjon?). Den viktigste instrumenteringen inkluderer flowcytometer og elektronmikroskopi.

Litteratur:

Cottrell and Kirchman 2012 *Aquat Microb Ecol* 66:107-116;
Kirchman et al 2009 *Nature Rev Microbiol* 7: 451-459;
Payet and Suttle 2008 *J Mar Sys* 74:933-945;
Steward et al 1996 *Mar Ecol Prog Ser* 131:287-300;
Steward et al 2007, *Deep-Sea Res I* 54: 1744-1757;
Wells and Deming 2006 *Aquat Microb Ecol* 43: 209-221; 6.