Monday, October 8
Poster Session 1
16:00–18:00

Poster 57

NANO- AND MICRO-PLANKTON DIVERSITY ACROSS LATITUDINAL GRADIENTS IN THE NORTH PACIFIC

Phytoplanktonic cyanobacteria, diatoms, coccolithophores, as well as microzooplanktonic ciliates and dinoflagellates are the main plankton resident in the surface layers of the North Pacific Ocean. In this heterogeneous biome, spanning the oligotrophic subtropics to the HNLC regions of the subarctic, species have developed a variety of trophic strategies including N_2 fixation, symbiosis and mixotrophy to alleviate the limitation of nutrients. We have used the Imaging Flow CytoBot (IFCB) to examine nano- and micro-plankton diversity in the North Pacific and have found strong evidence of tightly coupled trophic dynamics across biomes. The diversity and particle size distribution of the autotrophic community vary predictably with biomes: large centric diatoms like Asterolampra and Thalassiosira dominate the nutrient-rich subarctic whereas symbioses of Rhizosolenia or Chaetoceros with the cyanobacteria Richelia dominate the oligotrophic subtropical gyre. This N_2 fixer is associated with mesoscale eddies in the subtropical gyre, like Trichodesmium and Crocosphaera. Under nutrients depletion, picoplanktonic bacteria feed mixotrophic dinoflagellates, leading to the coupling of their temporal and spatial distributions within the oligotrophic biome and at the transition zone between biomes. This way mixotrophic dinoflagellates (specifically Lepidodinium and Heterocapsa spp.) serve as a trophic link between small autotrophs, numerically dominant in the Pacific Ocean, and microzooplanktonic organisms like Balanion (ciliate) or Gyrodinium (heterotrophic dinoflagellate). The North Pacific biomes have evolved to optimize the efficiency of CO_2 assimilation and its transfer within the food web, yielding to flexible estimates of Net Community Production.

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