Theme Session F

Complexity and structure of planktonic foodwebs: who really eats whom?

Conveners:
Elaine Fileman, UK (ESE@pml.ac.uk)
Ann Bucklin , USA (ann.bucklin@uconn.edu)
Pennie Lindeque, UK (PKW@pml.ac.uk)
Janna Peters, Germany (janna.peters@uni-hamburg.de)

Feeding and avoiding being eaten are fundamental processes that govern the structure and function of pelagic ecosystems. This is a broad and complex topic, but it must be better understood in order to predict how planktonic foodwebs may respond to global change. Warming may drive predator/prey and grazer mismatches by changes in relative timing of their life cycles; shifting biogeographical boundaries may alter prey selection and impacts of grazing; predicted smaller body sizes of zooplankton may result in mismatches in predator/prey and grazer size ratios. After decades of zooplankton research, there are many and diverse viewpoints on the controls and impacts of trophic relationships in planktonic foodwebs, including several different paradigms. Among these are: (1) predator/prey size ratios are key in structuring food webs; (2) metazoans can switch from eating bloom-forming species (e.g. diatoms) to eating their main competitor (e.g. protozoans), thus stabilizing the foodweb; and (3) nutrient stress (i.e., food quality) may determine grazing pressure on phytoplankton. Clearly, a more holistic framework is needed for understanding trophic relationships throughout the planktonic foodweb. Key to success will be the coordinated use of diverse approaches (modelling, experimentation, direct observation) and techniques (molecular, stable isotopes) to reveal changing predator/prey and grazing relationships.

This session encourages submissions on a range of topics and particularly welcomes the following:

- Laboratory, field, and model studies of critical processes structuring planktonic foodwebs (e.g., prey selectivity, prey switching, adaptive behaviours, functional responses);
- Quantification of natural diets and feeding rates, including molecular approaches to prey detection and quantification (PCR, QPCR, NGS, FISH, etc.);
- Novel and combined analyses of food web structure and complexity (e.g., RNA/DNA, isotopes, models);
- Analyses of changes in predator/prey and grazing associations in the zooplankton assemblage, including roles of protists, nano-, micro-, and mesozooplankton in controlling prey populations;

- Applications of results from laboratory culture studies to the natural environment (e.g. studies of food quality, observations of natural behaviour);
- Discoveries of new or unknown trophic relationships (e.g., diets of fish larvae, role of protists, grazing on picoplankton);
- Ecological, evolutionary, and cost-benefit studies of mortality, selection, predator avoidance, feeding behaviour, etc.