

Symbioses or associations? Disentangling the dynamic microbiome of marine copepods

Talk by Associate Professor Pia Moisander,
College of Arts and Sciences,
University of Massachusetts Dartmouth

Wednesday 28th August at 13:00
Technical University of Denmark, bldg. 221, room 237+241

Information on the natural variability and functions of microbial associations with copepods – the most abundant group of crustacean mesozooplankton in marine environments - has started to emerge over the past years. Our research has viewed these associations primarily through the lens of bacterial associate community composition and participation in biogeochemical cycles. Copepod-associated bacteria are diverse but generally dominated by a few distinct groups. We have termed the zone surrounding a copepod that is sustaining bacteria the copepod ‘zoosphere’, to view these communities alike the plant root-associated rhizosphere where bacteria retain free-living characteristics while living in association with the host. Copepods influence surrounding bacteria both via selective nutrient enrichment and ‘farming’; yet, copepod diet also plays a major role in driving the community composition. The zoosphere and microbiome bacteria benefit from the copepod host via elevated growth rates and may provide host-benefitting roles by using chemical defenses against predatory bacteria and by initiating a trophic cascade. Evidence of copepod zoosphere/microbiome metabolisms include nitrate respiration, denitrification, nitrogen fixation, and alkaline phosphatase activity - all originating from Gammaproteobacteria (generally Vibrionaceae and Pseudoalteromonadaceae). Due to the sheer abundance of copepods, these associations may be fundamentally important as a bacterial metapopulation stepping stone and in driving bacterial evolution in marine environments.

Pia Moisander received her MSc degree from University of Helsinki and her PhD degree in 2002 from University of North Carolina at Chapel Hill, Department of Marine Sciences. She has been a research associate at University of California Santa Cruz and a visiting scientist at the Marine Biology Section, University of Copenhagen. Since 2010, she has been a faculty member at University of Massachusetts Dartmouth. Pia studies marine microbial ecology and works on nitrogen fixation and metabolism as well as on toxigenic cyanobacteria. She uses molecular and biogeochemical approaches in her microbiomes studies.

