PROTIST PREDATION MEDIATES THE TEMPERATURE RESPONSE OF MICROBIAL COMMUNITIES

Jennifer Rocca[1], Andrea Yammine[1*], **Jean P. Gibert**[*1]
[1]Department of Biology, Duke University, Durham, NC, USA

Goals: To understand whether predation by microbial consumers mediates the temperature response of microbial communities.

Microbial communities are one of the largest biotic controls on the global carbon cycle. Understanding the top-down control that bacteria consumers, such as protists, exert on these microbial communities is thus essential to understand feedbacks on global climate. Theoretical and empirical studies have shown that temperature responses can be mediated by ecological interactions. But how microbial communities may respond to temperature in the presence of predators is poorly understood. Here, we examine the effects of protist predation on the structure and function of a freshwater microbial community at different temperatures. Microbial communities were collected from a seasonal pond at the Duke Forest, and cultured in the presence and absence of two generalist bacterial predators, the protists *Tetrahymena pyriformis*, and *Colpidium* sp, at two different temperatures (22°C and 25°C). Changes in community function were assessed over time through optical density and respirometry. Changes in structure were quantified through 16S rRNA amplicon sequencing. The larger protist (*Colpidium sp*) significantly suppressed bacterial biomass and mediated the temperature response of microbial respiration rates: predator presence decreased microbial respiration at high temperatures compared to lower temperatures. Temperature and time both had noticeable impacts on the structure and function of microbial communities, but predation did not affect structure. This suggests that predation impacts on microbial community function may occur through reductions in biomass, as observed, or other predator induced physiological responses (i.e., the landscape of fear). While bacterial impacts on the global carbon cycling are now routinely accounted for in global earth system models, biotic controls on microbial temperature responses are not. These results highlight the potential for important but largely overlooked impacts of consumption on the temperature response of microbial function, but not structure, which ought to be taken into account in future iterations of warming forecasting models.