POSTER PRESENTATION

EFFECTS OF TEMPERATURE AND VELOCITY FLUCTUATIONS ON DIATOM COMMUNITY COMPOSITION IN STREAMS

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Water temperature and discharge associated with hydroelectric-dam operation can influence diatom communities. We examined the effects of temperature and fluctuating velocities on diatom communities grown on unglazed ceramic tiles in artificial streams, for a total of 38 weeks. We imposed 3 velocity treatments (6 replicates each): stable (15 $cm \cdot s^{-1}$), low fluctuating velocities (22.12 to 45.45 $cm \cdot s^{-1}$) and high fluctuating velocities (10.5 to 66.7 $cm \cdot s^{-1}$). The 18 streams were divided into 2 temperature treatments maintained at 10°C and 15°C (9 replicates each). We focused on the prevalence of upright taxa, because they have been shown to be preferentially consumed by invertebrates. We tracked changes in community composition at week 7, week 19, and the end of the experiment. At week 7, there was a strong temperature effect ($p=0.004$) with more upright diatoms in 15°C streams. At week 19, there was a strong velocity effect ($p=0.022$) with more upright diatoms in high fluctuating streams. At the end of the experiment, both temperature ($p=0.003$) and velocity ($p=0.001$) were strong drivers, with more upright diatoms in 15°C streams with high velocity fluctuations. At week 20, *Gammarus lacustris* from the Colorado River were added to the streams and allowed to graze until the end of the experiment. There were significantly more upright diatoms in *Gammarus* gut contents than on the tile substrates, confirming the importance of upright taxa in invertebrate diets. Water temperature and velocity significantly influence the composition of diatom communities, an important basal food resource in aquatic ecosystems, and have important implications for dam management.