**Effects of Microplastics (LDPE, PLA; natural and synthetic fibers) in combination with temperature on Mysid Shrimp (*Americamysis bahia*): A physiological perspective**

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Research and concerns about the toxicity of microplastics has increased recently, however, there is still a lack of understanding concerning effects on aquatic wildlife. Especially there’s still a knowledge gap in the context of fiber effects.

In this study, mysid shrimp (*Americamysis bahia*), a key species in estuarine and marine food chains, were exposed to particle concentrations (5, 50, 200, 500 particles/ml), the lowest being environmentally relevant, with a size of 1-20 microns. In the context of climate change, three different temperatures 22, 25, and 28 °C were investigated at a salinity of 15 ppt. Endpoints measured in response to low density polyethylene (LDPE), polylactic acid (PLA), and microfibers at 3 p/ml (in average 200 µm long; cotton, nylon, polyester PES, biodegradable HEMP) included mortality, particle uptake, organismal growth, weight, and swimming behavior, as well as concentrations of reactive oxygen species (ROS). As part of this study, we also evaluated post-fiber-exposure swimming behavior within an oxygen deficient environment, to represent physical attributes of microplastic exposure, such as microfibers clogging the gills evaluated via microscopy.

We hypothesize that microplastics cause negative effects on fitness-relevant endpoints, in a concentration-dependent manner, resulting in impaired swimming activities, feeding, growth, and performance in low oxygen environments. The warmest treatment is expected to cause more stress due to potentially increased metabolism and therefore uptake. Preliminary data of this study shows greater swimming activity with increasing temperature. The evaluation of microplastic exposure across a range of temperatures is important as it is expected that increased temperatures will pose a greater challenge to aquatic wildlife also coping with pollutant exposure.