Organic Mercury and Avian Foraging: The Impact of Methylmercury Exposure on the Feeding Efficiency of Invertivorous Passerines

Gitre, Xavier (School: Blacksburg High School)

The impact of environmental exposure to methylmercury (henceforth MeHg), a potent neurotoxin, on the feeding rates of resident invertebrate-eating songbirds in winter was examined along a stretch of the South River, a waterway contaminated with mercury north of Waynesboro, Virginia. Research into the neurobiological effects of MeHg exposure in birds has established a variety of potential impediments to avian foraging, such as impeded coordination and the avoidance of high-energy behaviors. I hypothesized that invertivorous passerines with high environmental MeHg exposure would exhibit decreased feeding rates when compared to those with little or no exposure. I tested this by measuring the feeding rates of three resident species with the highest mean blood MeHg concentrations (based on Jackson et al. [2014]; see Study Species) at contaminated sites. I also quantified foraging behavior, conditions, timing, and more to control for confounding variables. I conducted statistical analyses which indicated a significant difference between the feeding rates of target species at contaminated and reference sites, a difference that was accentuated in Carolina Wrens, the species with the highest known blood MeHg concentrations at the study sites, and absent in Carolina Chickadees, a species with lower blood MeHg concentrations. However, it should be noted that the sample sizes were only large enough for preliminary findings. I plan to collect more data through a variety of methods before definitively establishing an inverse correlation between MeHg exposure and feeding efficiency. Regardless, the results of the study support the hypothesis that invertivorous passerines with high environmental MeHg exposure exhibit decreased feeding rates when compared to those with no exposure.