



# Biology @ Acadia

## DAMSELFLIES IN DISTRESS: EFFECTS OF METHYLMERCURY-CYSTEINE ON FORAGING BEHAVIOUR AND ESCAPE RESPONSE; AQUATIC INVERTEBRATE PREDATORS (ORDER ODONATA)

Larkin, Amy, Dr. Kirk Hillier, Dr. Nelson O'Driscoll<sup>1</sup>

Department of Biology, Acadia University, Wolfville, NS; Department of Earth & Environmental Science, Acadia University, Wolfville, NS

Transfer of mercury from aquatic to terrestrial ecosystems occurs primarily via consumption of invertebrates by birds and fish. As intermediate predators, dragonfly and damselfly nymphs (Order Odonata) are important



invertebrates in littoral zones and wetlands. I tested for changes in foraging behaviour, responses to a predatory stimulus, and neuroanatomy of damselfly naiads as a result of mercury bioaccumulation. Damselfly naiads were acquired from Big Dam East and Big Dam West Lakes of Kejimikujik National Park, Nova Scotia. Injections of methylmercury cysteine were administered into the abdominal thoracic articulations of naiads. Foraging and predatory response tests were completed at 24 hours and one-week intervals. Trials were performed on naiads that had been injected with one of five dilutions of methylmercury cysteine (100 ng of MeHg, 500 ng of MeHg, 1000 ng of MeHg, 2500 ng of MeHg, 5000 ng of MeHg) or a saline cysteine solution. Results suggest that MeHg has no biologically significant effect on foraging behaviour. Results show that there was not a biologically significant reduction of MeHg in damselfly bodies at 24-hr and one-week, however, a decrease in concentrations of MeHg was observed. MeHg-Cys injections lead to a biologically significant increase in velocity. MeHg-Cys injections did not have a biologically significant effect on angular movement in this experiment. The role of invertebrates in the food chain and how they respond to environmental contaminations are the major gaps in research this thesis will address.



**Amy Larkin** graduated from Charlottenburgh-Lancaster District High School in Williamstown, ON in 2007. Amy is currently completing the fourth year of her Biology degree with Honours at Acadia University. Amy has been employed as a teaching assistant for Organisms and Their Environment, an introductory biology course. She has also been involved in the Sensory Motor Instructional Leadership Experience (S.M.I.L.E.) program as an instructor for the past year. Amy has participated in the Acadia Jewish Society and the Acadia Intra-mural Soccer League. During her time at Acadia, Amy developed a passion for entomology and hopes to continue collecting samples from around the world. Next year Amy hopes to pursue a Doctor of Chiropractic Degree at the Canadian Memorial Chiropractic College in Toronto, ON.

