Vita

Candidate's name: Christopher Allan Baker

Universities Attended:

University of Tampa (2021)
Bachelors of Science

University of New Brunswick (2023)
Masters of Science
Biology

Conference Presentations:

Baker CA*, Benfey TJ, Kieffer JD. May 2023. The Effect of Dietary Supplementation of Astaxanthin on Acute Hypoxia and Thermal Tolerance in Triploid and Diploid Brook Charr, *Salvelinus fontinalis*. Aquaculture Canada Conference (Victoria, British Columbia).

Baker CA*, Benfey TJ, Kieffer JD. April 2023. The Effect of Dietary Supplementation of Astaxanthin on Acute Hypoxia and Thermal Tolerance in Triploid and Diploid Brook Charr, *Salvelinus fontinalis*. Conference of the Biological Sciences (Fredericton, New Brunswick).

Baker CA*, Benfey TJ, Kieffer JD. March 2023. The Effect of Dietary Supplementation of Astaxanthin on Acute Hypoxia and Thermal Tolerance in Triploid and Diploid Brook Charr, *Salvelinus fontinalis*. Science Atlantic Aquaculture & Fisheries and Biology Conference (Saint John, New Brunswick).

Baker CA*, Benfey TJ, Kieffer JD. October 2022. The Effect of Dietary Supplementation of Astaxanthin on Acute Hypoxia and Thermal Tolerance in Triploid and Diploid Brook Charr, *Salvelinus fontinalis*. Atlantic Regional Comparative Physiology Workshop (Saint Andrews, New Brunswick).

Baker CA*, Sylvia E, Middlebrooks ML. February 2021. Chemotaxis of the Sacoglossan Sea Slug, *Elysia crispata*, for Water-borne Chemical Cues Originating from the Algal Species *Bryopsis plumosa* Through Time. Florida Undergraduate Research Conference (Virtual).

The Effect of Dietary Supplementation of Astaxanthin on Acute Hypoxia and Thermal Tolerance in Triploid and Diploid Brook Charr, *Salvelinus fontinalis*

UNIVERSITY OF NEW BRUNSWICK

THESIS DEFENCE AND EXAMINATION

in Partial Fulfillment

of the Requirement for the Degree of
Master of Science

by

Christopher A. Baker

in the Department of Biology

U.N.B., Fredericton, N.B.

Tuesday, July 25th, 2023
2:00 p.m.

Bailey Hall, Room 146

Examining Committee

Dr. Tillmann Benfey	Co-Supervisor
Dr. James Kieffer	Co-Supervisor
Dr. Mike Duffy	Internal Examiner
Dr. Alex Zimmer	External Examiner
Dr. Shawn MacLellan	Chair of Oral Examination

Abstract

Triploid fish are a promising solution to prevent interbreeding between wild and farmed fish by way of their inherent sterility, but they are less tolerant to environmental stressors compared to diploids. This study investigated whether supplementing the diets of triploid and diploid brook charr (*Salvelinus fontinalis*) with the carotenoid astaxanthin (AX) could improve their tolerance towards hypoxia and elevated temperatures. Both triploids and diploids were fed experimental diets of differing AX supplementation (17, 80, and 190 mg/kg) for a minimum period of eight weeks, after which they were assessed for their acute hypoxia tolerance and their critical thermal maximum (CTmax) by steadily reducing water-dissolved oxygen and increasing water temperature, respectively. The results showed that triploids were less tolerant to hypoxia than diploids, but there was no difference between ploidies in their CTmax. Diet had no effect on either hypoxia tolerance or CTmax. This study suggests that ploidy, not diet, is more indicative of stress tolerance in brook charr, but further research is needed to examine any other possible benefits AX has on farmed fish health.