

## Vita

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Universities  
Attended: University of New Brunswick (2017)  
Bachelor of Science, Honours

University of New Brunswick (2020)  
Master of Science, Biology

### Publications / Conference Presentations:

Daigle NJ, Sacobie CFD. March 2017. Comparing the postprandial metabolism of diploid and triploid brook charr, *Salvelinus fontinalis*. Science Atlantic: Aquaculture and Fisheries (Antigonish, NS).

Daigle NJ, Sacobie CFD, Benfey TJ. October 2017. Comparing the postprandial metabolism of diploid and triploid brook charr, *Salvelinus fontinalis*. 10th Annual Atlantic Regional Comparative Physiology Workshop (St. Andrews, NB).

Daigle NJ, Sacobie CFD, Benfey TJ. May 2018. Specific dynamic action in brook charr, *Salvelinus fontinalis*. Canadian Society of Zoologists (St. John's, NL).

Daigle NJ, Sacobie CFD, Benfey TJ. October 2018. Specific dynamic action in brook charr, *Salvelinus fontinalis*. 11th Annual Atlantic Regional Comparative Physiology Workshop (St. Andrews, NB).

Bringloe TT, Bartlett CAB, Bergeron ES, Cripps KSA, Daigle NJ, Gallagher PO, Gallant AD, Giberson ROJ, Greenough SJ, Lamb JM, Leonard TW, MacKay JA, McKenzie AD, Persaud SM, Sheng T, Stack Mills AME, Moore TE, Saunders GW. 2018. Detecting *Alaria esculenta* and *Laminaria digitata* (Laminariales, Phaeophyceae) gametophytes in red algae, with consideration of distribution patterns in the intertidal zone. *Phycologia* 57: 1-8.

Daigle NJ, Sacobie CFD, Benfey TJ. October 2019. Specific dynamic action in brook charr, *Salvelinus fontinalis*. 12th Annual Atlantic Regional Comparative Physiology Workshop (St. Andrews, NB).

## The effect of triploidy on postprandial metabolism and ammonia excretion in 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

**Nicole Jennifer Daigle**

in the Department of Biology

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

**Wednesday, March 18<sup>th</sup>, 2020**  
**11:00 a.m.**

Bailey Hall, Room 27

Examining Committee

Drs. Tillmann Benfey & Charles Sacobie Co-Supervisors

Dr. Kurt Samways

Internal Examiner

Dr. Ben Speers-Roesch

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## Abstract

The use of sterile triploids in aquaculture is currently limited because in situations of stress (e.g., high temperature and exhaustive exercise), triploids perform poorly compared to their diploid counterparts. Therefore, many studies have attempted to find physiological differences between triploid and normal (diploid) Salmonids with the goal of increasing triploid performance for aquaculture. The objective of this thesis was to study the effects of triploidy on postprandial metabolism and net total ammonia nitrogen (TAN;  $\text{NH}_3 + \text{NH}_4^+$ ) excretion in brook charr, *Salvelinus fontinalis*. This was done by measuring oxygen uptake (aerobic metabolic rate; MR) and TAN excretion of the fish within respirometers from 48h before to 48h after being fed a single ration, measured as % body mass (BM). A first experiment was done to determine an appropriate ration size (0.2 or 0.4% BM) and to validate the tube-feeding procedure. The 0.4% BM was selected as the appropriate ration size as it resulted in significantly higher SDA parameters and net TAN excretion

than in unhandled and sham-fed control groups. The process of tube-feeding itself only affected the MR factorial scope, which was significantly higher (by 5%) in the sham-fed group than in the unhandled control. The second experiment compared the same parameters between ploidies and demonstrated that triploids had significantly lower standard metabolic rates and a higher net TAN excretion than diploids when fed 0.4% BM. Triploids may have increased difficulty with suboptimal conditions due to differences in standard metabolic rate or ammonia excretion, though further studies are required.