

Vita

Candidate's name: Charlotte Anne Brown Bartlett

Universities
Attended: University of New Brunswick (2018)
Bachelors of Science Honours

University of New Brunswick (2023)
Masters of Science
Biology

Conference Presentations:

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.

Bartlett, C.A., Garber, A.F., Gonen, S., Benfey, T.J. 2022. Acute critical thermal maximum does not predict chronic incremental thermal maximum in Atlantic salmon (*Salmo salar*). *Comparative Biochemistry and Physiology, Part A (Molecular and Integrative Physiology)* 266: 111143.

Benfey, T.J., Gonen, S., Bartlett, C.B., Garber, A.F. In review. Thermal tolerance has high heritability in Atlantic salmon, *Salmo salar*. *Aquaculture Reports*: submitted.

Bartlett, CA*, Benfey, TJ., Garber, AF. October 20, 2019. Thermal physiology of farmed Atlantic salmon in a commercial breeding program. 12th Annual Atlantic Regional Comparative Physiology Workshop (Saint Andrews, NB)

Bartlett, CA*, Benfey, TJ, Garber, AF. October 15th, 2022. Critical thermal tolerance does not predict chronic incremental thermal tolerance of Atlantic salmon. 13th Annual Atlantic Regional Comparative Physiology Workshop (Saint Andrew, NB)

Comparisons between fresh- and seawater critical thermal maximum (CTmax), and seawater CTmax and incremental thermal maximum (ITmax), for individual farmed Atlantic salmon (*Salmo salar*)

UNIVERSITY OF NEW BRUNSWICK

THESIS DEFENCE AND EXAMINATION

in Partial Fulfillment

of the Requirement for the Degree of
Master of Science

by

Charlotte A. B. Bartlett

in the Department of Biology

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

Wednesday, October 18th, 2023
12:30 p.m.

Bailey Hall, Room 22

Examining Committee

Dr. Tillmann Benfey
Dr. Amber Garber
Dr. Charles Sacobie
Dr. Kurt Samways
Dr. Shawn MacLellan

co-Supervisor
co-Supervisor
Internal Examiner
External Examiner
Chair of Oral Examination

Abstract

Atlantic salmon is an important aquaculture species farmed in ocean net-pens and therefore subjected to changing environmental conditions, including rising temperatures, creating a need for research on the thermal tolerance of this species for the future of sustainable aquaculture. I investigated this by assessing the predictability of an individual's seawater critical thermal maximum (CT_{max}) from previous freshwater CT_{max} (Chapter 2), and of seawater incremental thermal maximum (IT_{max}) from previous seawater CT_{max} (Chapter 3), using tagged Atlantic salmon. I also measured various health and physiological metrics (body mass, fork length, condition factor, blood hemoglobin, hematocrit, and absolute and relative ventricle mass) to determine their relationship with thermal tolerance. I found no relationship between an individual's initial and second thermal tolerance test in either experiment. Although there were significant relationships between some of the health metrics and thermal tolerance, mixed results from my study and

in the literature suggest that more work is needed on this. Considering the scarcity of IT_{max} testing in the field of fish physiology, further exploration into these tests should be completed.