



**University
of Victoria**

Graduate Studies

Notice of the Final Oral Examination
for the Degree of Master of Science

of

DAVID MINKLEY

BSc (University of Victoria, 2011)

“Transposable Elements in the Salmonid Genome”

Department of Biology

Wednesday, April 18, 2018

10:00 A.M.

Hickman Building

Room 120

Supervisory Committee:

Dr. Ben Koop, Department of Biology, University of Victoria (Supervisor)

Dr. Juergen Ehling, Department of Biology, UVic (Member)

Dr. John Taylor, Department of Biology, UVic (Member)

External Examiner:

Dr. Caren Helbing, Department of Biochemistry and Microbiology, UVic

Chair of Oral Examination:

Dr. Juan Ausio, Department of Biochemistry and Microbiology, UVic

Abstract

Salmonids are a diverse group of fishes whose common ancestor experienced an evolutionarily important whole genome duplication (WGD) event approximately 90 MYA. This event has shaped the evolutionary trajectory of salmonids, and may have contributed to a proliferation of the repeated DNA sequences known as transposable elements (TEs). In this work I characterize repeated DNA in five salmonid genomes. I find that over half of the DNA within each of these genomes is derived from repeats, a value which is amongst the highest of all vertebrates. I investigate repeats of the most abundant TE superfamily, Tc1-Mariner, and find that waves of proliferation of this element began shortly after salmonid WGD and continued during salmonid speciation, where they have produced dramatic differences in TE content between extant salmonid lineages. This work provides important resources for future studies of salmonids, and advances the understanding of two important evolutionary forces: TEs and WGDs.