

## Vita

Candidate's name: Jacob Owen Perley

Universities  
Attended: University of New Brunswick (2022)  
Bachelor of Science

University of New Brunswick (2023)  
Masters of Science

### Publications/Conference Presentations:

The Canadian Society of Plant Biologists (CSPB ) Annual General Meeting 2023 (Quebec City, Laval University) Student Symposiums: Taking the cannabinoid out of cannabis: an approach to small-scale purification and structural identification of bibenzyls and cannabinoids in *Radula complanata* and *Amorpha nana*

# Purification of natural metabolites from *Radula complanata* and towards the elucidation of perrottetinene's biosynthetic route

UNIVERSITY OF NEW BRUNSWICK  
THESIS DEFENCE AND EXAMINATION

in Partial Fulfillment

of the Requirement for the Degree of  
Master of Science

by

**Jacob O. Perley**

in the Department of Chemistry

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

**Tuesday, December 5<sup>th</sup>, 2023  
12:30 p.m.**

Toole Hall, Room 3

Examining Committee

Dr. Yang Qu

Supervisor

Dr. Larry Calhoun

Internal Examiner

Dr. Bryan Crawford

Int-Ext Examiner

Dr. Gilles Villemure

Chair of Oral Examination

## Abstract

The Bryophyte *Radula complanata* is a non-vascular plant and a unique source of medicinal metabolites. The plant is particularly rich in aromatic bibenzyls, which are likely generated to deal with environmental stressors, herbivory attacks, and plant pathogens. Particularly, the bibenzyl perrottetinene (isolated from related species *R. marginata* and *R. perrottetii*) is structurally similar to the well-known psychoactive cannabinoid tetrahydrocannabinol and is shown to have cannabinoid receptor agonism. In this study, two major bibenzyl compounds in *R. complanata* were purified and structurally elucidated by mass spectrometry and various Nuclear Magnetic Resonance (NMR) techniques. While perrottetinene biosynthesis remains elusive, several enzymes from *R. complanata* are biochemically characterized. The findings are the first steps towards the elucidation of the complete biosynthesis of perrottetinene and related bibenzyl cannabinoids.