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ARE LAMINARINS INVOLVED IN THE ROOT INITIATION ACTIVITY OF COMMERCIAL SEAWEED EXTRACTS?

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Extracts derived from various species of brown algae are widely used in horticulture as they are known to benefit plant performance. Despite numerous studies on the effects of these products, the bioactive compounds responsible for these beneficial effects remain unknown. Objectives of this study were to attempt to isolate the bioactive compounds that are responsible for the high levels of rooting activity present in two seaweed extracts (SWEs), Acadian Marine Plant Extract Fertilizer and Kelpgrow Liquid Seaweed Extract. We also examined whether commercial laminarin, a storage polysaccharide found in all species of brown algae, could induce rooting activity similar to that of the SWEs studied. Fractions of the SWEs less than and greater than 13,000 MW were obtained by dialysis and tested for activity using the Mung Bean Adventitious Rooting Bioassay. High levels of rooting activity were observed for both the high molecular weight (>13,000 MW) and the low molecular weight (<13,000 MW) fractions. Commercial laminarin, at concentrations similar to those found in the seaweeds themselves elicited root numbers comparable to the SWEs. This activity disappeared upon enzymatic digestion by laminarinase. Varying exposure times of mung bean cuttings to SWEs and laminarin revealed similar kinetics of root initiation. However, laminarin extracted from both SWEs by the McKinnon lab at NRC-IMB did not show a statistically significant effect on rooting. The possible involvement of laminarin in the rooting activity of seaweed extracts remains unclear and requires further study.

Jamie Whitcomb graduated from Rothesay Netherwood School in Rothesay, New Brunswick in 2007. She is currently completing her 4th year of her honours degree in biology at Acadia. She has also worked in the chemistry department, synthesizing and characterizing hydroxybiaryl compounds to study their potential photochemical effects in the atmosphere. Jamie has participated in various extra-curricular activities during her time at Acadia. She was a member of the Acadia Equestrian Team and volunteered with Shinerama, Relay for Life and Run for the Cure. Next year, Jamie will be beginning her master's degree at the University of Ottawa, where she will be studying how mutations of GATA4, a gene involved with heart function, can lead to congenital heart disease by altering protein-protein interactions.