ANALYSIS OF AUXIN-LIKE AND GIBBERELLIN-LIKE ACTIVITY IN A SEAWEED EXTRACT DERIVED FROM MACROCYSTIS INTEGRIFOLIA

Fisher, Megan, Dr. David Kristie
Department of Biology, Acadia University, Wolfville, NS

Seaweed extracts are widely used in horticulture to promote plant growth and health. A species of kelp (Macrocystis integrifolia) is harvested by West Coast Marine Bioprocessing Corp. (Vancouver, BC) and used to produce a liquid seaweed extract called Kelpgrow. The objectives of this study were to determine levels of gibberellin (GA) and auxin-like activity in Kelpgrow and compare the effects of Kelpgrow to seaweed extracts produced by other companies. GA and auxin-like activities were assessed using lettuce hypocotyl elongation and mung bean rooting bioassays respectively. Although physico-chemical analysis by NRC-IMB revealed very low levels of plant growth regulators in Kelpgrow, auxin-like rooting activity was substantial, about 1200 times higher than expected based on physico-chemical analysis. Maximal effects of Kelpgrow on root mass and root number were found at concentrations of 1% and 2% respectively. Kelpgrow induced new roots primarily in the upper 3cm of a 4cm hypocotyl. GA-like activity was small but detectable and about 2200 times higher than expected based on physico-chemical analysis. High auxin-like activity and significant GA-like activity were present in a high molecular weight fraction (HMW) of Kelpgrow (>13,000 MW) produced by dialysis. Root branching was more pronounced in the HMW fraction. Two other seaweed extracts exhibited similar but distinct rooting behavior in the mung bean bioassay. Rooting activity was retained in the HMW fraction of one product but totally lost in the other. Overall these results indicate that GA and auxin-like activity occurs primarily in the HMW fraction of Kelpgrow, and are not related to the presence of GAs and auxins in the extract.

Megan Fisher graduated from Northeast Kings Education Center in Canning Nova Scotia in 2006. Megan is currently completing her Honours thesis in her fourth year Biology at Acadia. Her Honours research was funded by West Coast Marine Bioprocessing Corp. (West Vancouver, BC). She worked for the Residence Life Department in her second and third year as a Resident Assistant, and as an Assistant Residence Director in her fourth year. She has been involved in several fund-raising initiatives at Acadia, such as Relay for Life and Shinerama. Megan plans to continue her education by pursuing a Masters degree in the field of plant physiology.