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CHARACTERIZATION OF DIURNAL RHYTHMS IN STEM AND LEAF ELONGATION RATES IN BARLEY, OATS, AND CORN, USING ROTARY MOTION SENSORS

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Diurnal rhythms in stem elongation rates (SER) have been studied extensively in many dicots, particularly in the floriculture literature (Neily *et al.*, 2000, HortScience 35(1):39-42). In contrast, there have been few studies on the diurnal rhythms of SER and leaf elongation rate (LER) in monocots. In this project, the diurnal rhythms of SER and LER in barley (*Hordeum vulgare* L. cv. 'Chapais'), oats (*Avena sativa* L. cv. 'Triple Crown'), and corn (*Zea mays* L. cv. 'Miracle'), were examined under greenhouse conditions during the summer of 2010 and 2011. Plant growth was also measured in growth chambers under constant light conditions. All measurements were made using rotary motion sensors (RMSs) connected to a LabPro interface. Under greenhouse conditions, corn LER showed a peak during the mid-day, with a trough occurring primarily at night. Oat LER, however, exhibited a broad peak in growth rate during the night. Barley showed a peak in LER during the day for leaves 2 through 4; however, the peak gradually shifted to the night for leaves 5 through 7. The stem elongation rate for both barley and oats showed a peak in elongation during the night. A well-defined rhythm for SER in corn could not be obtained. Under constant light conditions, it was found that barley LER exhibited a free running period of approximately 24 hours. Oats LER also exhibited a free running period of approximately 24 hours under constant light conditions. A free running period of approximately 24 hours indicates that the rhythm in LER in barley and oats is endogenously generated and is under circadian control.



James Ross graduated from Charles P. Allen High School in Bedford, Nova Scotia in 2008. Jimmy is currently completing his Honours thesis in his fourth year of Biology at Acadia. James has been dedicated to his academics throughout his time here at Acadia and has been awarded the Dean's List distinction within his last three consecutive years of study. James is highly involved within the Acadia community and has served on ROJO house council for the last two years. James is also actively involved in the SMILE program at Acadia University as a SMILE instructor for the last two years. He also dedicates his time to volunteer at the Hants Community Hospital in Windsor, Nova Scotia, where he helps to run an exercise program for patients in the transitional unit. James hopes to one day pursue a career in Medicine.

