THE RESPONSE OF SHADE-TOLERANT SPECIES *MYOSOTIS SYLVATICA* AND *ACER SACCHARUM* VERSUS SHADE-INTOLERANT SPECIES *CHENOPODIUM ALBUM* TO ELEVATED CO$_2$

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The current rise in atmospheric CO$_2$ concentration will have a direct positive effect on plant growth in that CO$_2$ is a substrate of photosynthesis. The extent to which elevated CO$_2$ enhances plant growth varies widely among species and environments. This research attempts to explain some of this variation by examining the effect of CO$_2$ on representative shade-tolerant and -intolerant species. Plants preferentially absorb red light so plants grown in shade experience a low ratio of red to far-red light (R:FR). R:FR is used as a developmental signal by plants. When grown in a low R:FR shade-intolerant plants grow tall and thin to avoid the shade of competitors. We hypothesize that a shade-intolerant plant will not respond as well to elevated CO$_2$ at a low R:FR as a shade tolerant species because it will attempt to avoid shade by increasing allocation to height growth at the expense of roots. This will cause nitrogen and other mineral resources to become limited reducing response to elevated CO$_2$. Plants were grown in growth chambers at ambient (380 ppm) elevated CO$_2$ (760 ppm). Within each chamber pots were arranged under far-red and incandescent lamps to achieve a range of R:FR values that simulated full sun and shade light conditions. As predicted, the growth response of the shade-tolerant species to elevated CO$_2$ was greater at a high R:FR than at a low R:FR, while the response of the shade tolerant species did not vary with R:FR. However, R:FR had no significant effect on root allocation. We conclude that although shade-tolerant and shade-intolerant species do differ in their response to elevated CO$_2$, the mechanism behind this response is unclear.

**Kelly Moores** graduated from Central Kings Rural High School in Cambridge, Nova Scotia in 2005. Kelly is currently completing her honours thesis funded by NSERC. This year Kelly will graduate with an honours in Environmental Science with co-op option. During her work terms Kelly was employed with the Geological survey of Canada, the Nova Scotia Nature Trust and Acadia University doing her honours research. In addition to academics Kelly has been a teaching assistant, served as the department representative for the Environmental Science Students Organization, as well as served as the student representative on the Environmental Science Program Advisory Council. Another role that Kelly loves at university is that of Resident Assistant. Kelly has been an RA for 3 years in the residences Cutten House and Crowell Tower. In 2009-2010 she was nominated for the RA of the Year Award. Kelly also volunteers her time as the Secretary for the Sherbrooke Lake Camp Council.