Investigating Global Climate Change with Fast Plants: A Laboratory Exercise. (A01-sherman160741-Poster)

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Abstract:

The impact of rising carbon dioxide concentrations on our biosphere is a topic discussed in many classes addressing global climate change. An illustrative and enjoyable laboratory experiment has been developed using Wisconsin Fast Plants (Brassica Rapa). Students construct pots which allow for hydroponic feeding and place them in simple custom-made growth chambers after seeding. In the treatment chamber, carbon dioxide is continuously piped at a concentration chosen to match climate model predictions of emissions in 2100. Ambient air is piped through the control chamber. After 10 days (prior to flowering), students remove the plants and make observations of physical attributes. The students then harvest the leaves and stain them with a dilute iodine solution to show presence of starch. The treatment plants are observed to be slightly more sturdy and express darker leaf color. Starch content is measurably greater in the treatment plants. Students conclude that the increased starch content reflects a greater rate of photosynthesis in the treatment plants. They are challenged, however, to reflect on how the experiment compares to realistic conditions in our global environment.

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