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BIOL 120-50

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1. What was the main overall hypothesis tested in this study?

The less mineral nutrient accessibility, the quicker *Arabidopsis thaliana* blooms*.*

2. BRIEFLY describe the methods used to test this hypothesis.

Three genotypes of *Arabidopsis thaliana* were grown in a hydroponic system. Plastic containers were filled with a 4.25 mineral nutrient solution and renewed regularly when the plants were 3 weeks old. After 3 weeks went by, the solution was replaced with a diluted solution and was updated every 2 weeks. Containers were aerated for 15 minutes every 3 hours using an aquarium air pump and had a white polyethylene cover with 10 holes, mineral wool cylinders inserted into each one in while in contact with the solution. The seeds were stratified in deionized water at 4 degrees Celsius for 3 days. Then, 4-5 seeds were sown on the upper surface of each cylinder. Plants were cultivated in growth chambers at 20 degrees Celsius with 75% air humidity. The fluorescent lights’ intensity were controlled depending on the amount of time used (light intensity for long days, high intensity for short days).

3. What were the controls in this study? Why were they considered controls?

The controls in this study were the medium and the hydroponic containers with the mineral nutrient solution.

The medium is considered the control because it was replaced with the same solution at the same times.

The hydroponic containers with the mineral nutrient solution is considered the control because it is the standard (has the same covers, wool cylinders, and solution).

4. What were the dependent and independent variables?

The independent variable was the amount of time that the plant was susceptible to the fluorescent lights and the level of the water’s nutrients. The dependent variable was the amount of time it took *Arabidopsis thaliana* to bloom.

5. What were the most important interpretations/ conclusions drawn from this study?

* The method used to cultivate control plants was successful.
* Long days accelerate *Arabidopsis thaliana* growth.
* Photoperiodic induction may interact with nutrient stress.
* Severe reduction of diluted mineral solution accelerated bud growth. Dilution also changes osmotic potential which could affect flowering.
* Time of bud appearance and type of medium are a direct positive relationship.
* As mineral nutrient decreases, flowering speed of *Arabidopsis thaliana* increases

6. What are pitfalls in this study? (What could have been done differently to make this experiment more accurate/better?)

* Growing plants may have gradually depleted nutrients from soil in unfertilized variants, so the exact timing and severity of the nutrient stress cannot be assessed.
* Preliminary experiments in sand show that a flowering of *Arabidopsis Thaliana* was delayed when plants were cultivated under severe nutrient stress from germination.
* With the methods, I would rather have one paragraph with all the steps, not for it to be split into multiple paragraphs because it makes it harder to follow.