**Investigating factors affecting the rooting of stem-cutting**

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Bio HL

**Research Question:**

*How will a closed environment of a Basel plant affect the length of it’s root (cM) representing its cloning effectiveness?*

**Variables**

|  |  |  |
| --- | --- | --- |
| ***Idenepdent Variable*** | ***Dependent Variable*** | ***Control Available*** |
| Oxygen allowed inside of beaker | Length of basel roots (cm) | Size of Basel (cm) |
|  |  | Amount of water per breaker (mL) |
|  |  | Room temperature (C) |
|  |  | Amount of leaves per Basel |
|  |  | Size of beaker |
|  |  | # of leafes |
|  |  | Node presence |

**Background Research:**

To clone an organism's means to compose a genetically identical element from the parent cell. This can be produced by asexual organisms which do not require the formation of a zygote, meaning the allele combinations of the male and female gametes are non-existent. [[1]](#footnote-1)Thereafter, the utilization of an asexual organism, such as the basel plants, allow the vegetation propagation[[2]](#footnote-2) where plants are able to produce offsprings genetically identical to the parent. The plants undergo a process called semi-cutting

s**[[3]](#footnote-3)**, where unspecialized cells allow plants hormones**[[4]](#footnote-4)** from the original plant to be passed along from the same root identically the same.

The conditions in which the cloning occurs may have effects on the cloning results. Air, for example, is allowed to maintain a level of humidity and temperature, allowing ideal conditions as an encouragement for a faster growth of the root. If humidity of the plant is ambiguous to the requirements of the plant needed to survive, the drying or the ‘suffocated’ plants may die. Moreover, plant conditions require air to allow carbon dioxide’s functioning element for photosynthesis, allowing energy to be made for a surviving plant.[[5]](#footnote-5)

**Procedure**

1. 4 beakers of 150 mL where collected
2. Two of the beakers are labeled Model A and the other two Model B
3. 50 mL of water where poured in every breaker
4. 4 basel plants of the same length and # of leaves where collected (if too long/short, a scissor was used to equalize the lengths)
5. Each basel plant was placed in one of the four beakers
6. The two beakers labeled as ‘Model A’ were covered fully in a plastic bag
7. The four beakers where left by the window for one week
8. All basel plants where collected and measured

**Materials**

* 4 150 mL beaker
* 200 mL of water
* Plastic bag
* Basel plant
* Scissor

**Safety, Ethical & Environmental Considerations**

This lab did not encounter any of the considerations above due to its nature of simplicity and basic materials.

1. "IB Biology Course Book 2014 edition: Oxford IB Diploma ..." 2014. 1 Oct. 2015 <<http://www.oupcanada.com/catalog/9780198392118.html>> [↑](#footnote-ref-1)
2. "Stem cutting - Cactus-art." 2006. 1 Oct. 2015 <<http://www.cactus-art.biz/note-book/Dictionary/Dictionary_S/dictionary_stem_cutting.htm>> [↑](#footnote-ref-2)
3. "Propagating Basil From Stems in Water | Home Guides | SF ..." 2012. 1 Oct. 2015 <<http://homeguides.sfgate.com/propagating-basil-stems-water-29939.html>> [↑](#footnote-ref-3)
4. "PLANT TISSUE CULTURE." 2014. 1 Oct. 2015 <<http://www.apsnet.org/edcenter/k-12/teachersguide/plantbiotechnology/documents/planttissueculture.pdf>> [↑](#footnote-ref-4)
5. "What do Plants Need for Growth?." 2010. 1 Oct. 2015 <<http://www.nysipm.cornell.edu/teaching_ipm/sole/green_sci/plants_need.pdf>> [↑](#footnote-ref-5)