

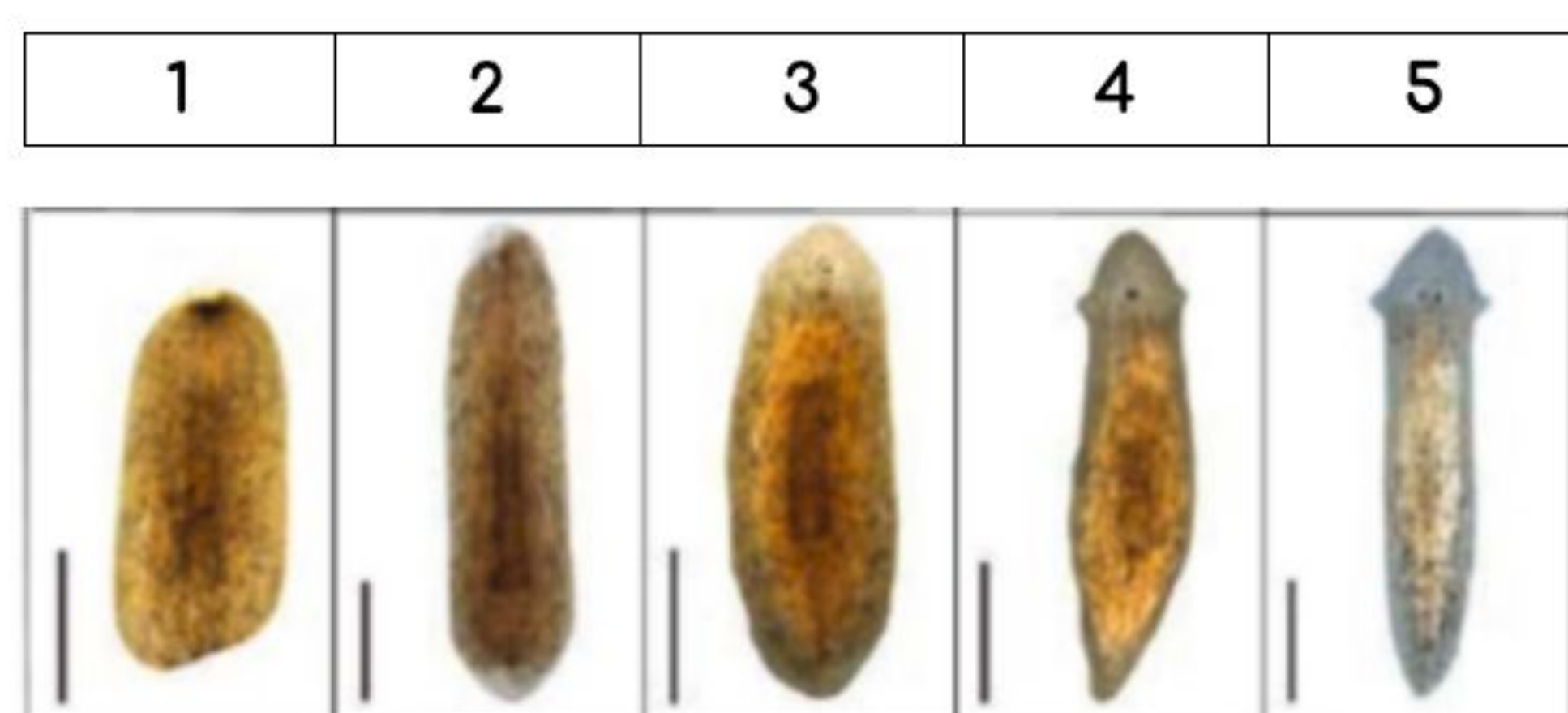
The Effect of Spring Water pH on Planaria

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Abstract

Planaria are a species of flatworms that are typically found in freshwater. They are notable for their regenerative ability; they are capable of regenerating new heads, tails, and sides from cut slices of their body in a process that can take from days to weeks. Our project aimed to find whether the pH of spring water affected the regeneration rate of planaria fragments. We filled 6 wells with water that had varying concentrations of 0.5 M Hydrochloric Acid (2 wells of no HCl, 2 wells of 1 drop of HCl, 2 wells of 4 drops of HCl). We had a positive control of uncut planaria in 6.7 pH spring water, and our negative control of cut planaria in 6.7 pH spring water. 5 uncut planaria were placed in three wells, while 5 cut ones were placed in three other wells. Our intention was to observe changes in the planaria on a daily basis. However, due to a number of confounding factors, our results were inconclusive.

Planarian Regeneration Phases



Materials

- 10 mL of 0.5 M Hydrochloric Acid
- 6 wells
- Spring Water (pH of 6.7)
- Pipettes (3)
- Planarian
- 50 mL beaker (2)
- Litmus paper (to test the pH)

Variables

- Independent Variable:** Change in pH in the spring water
Dependent Variable: The Phase of Regeneration
Positive Control: Uncut planaria in 6.7 pH spring water
Negative Control: Cut planaria in 6.7 pH spring water

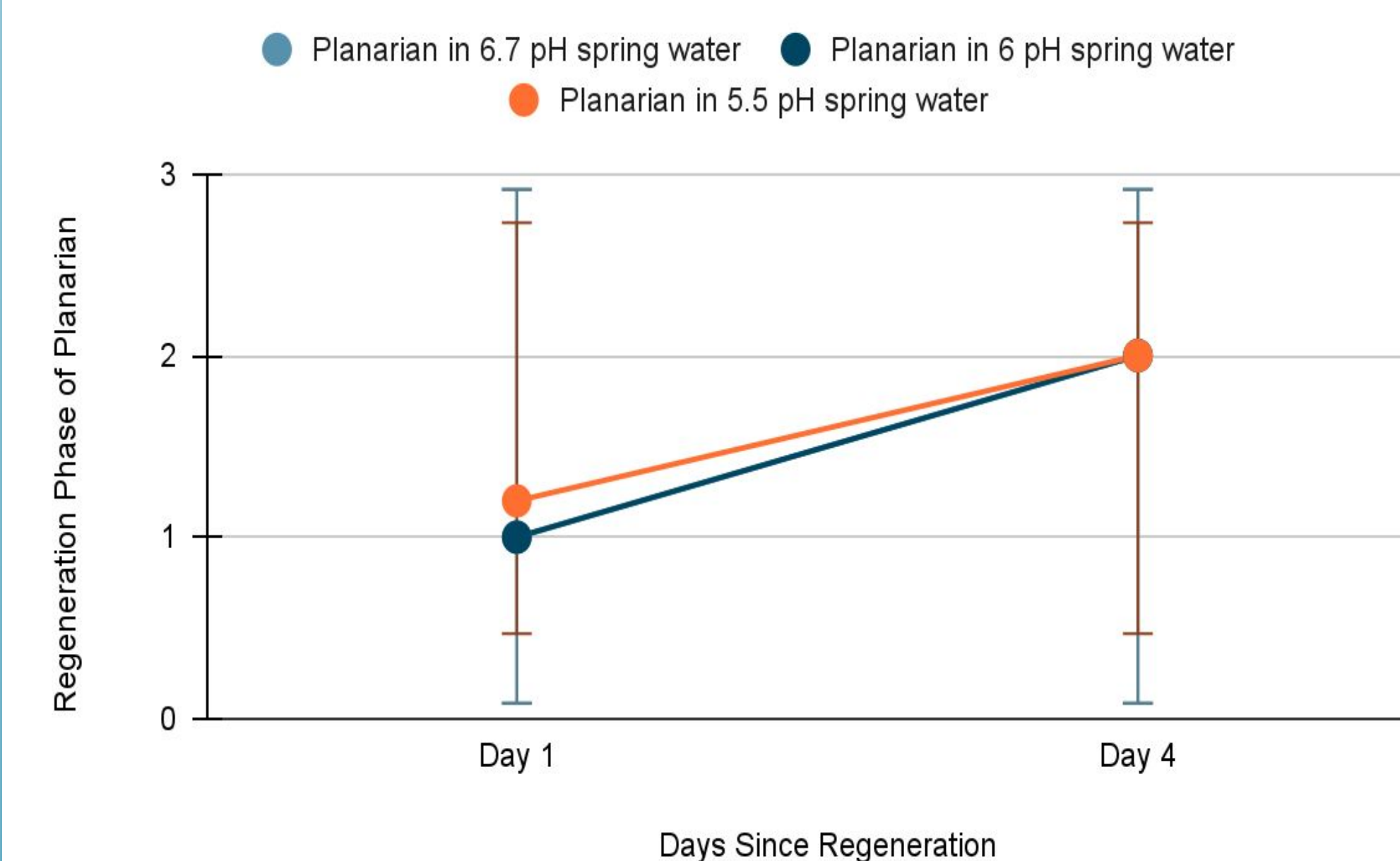
Procedure

1. Place 10 planarian with 10 mL of spring water into each of the six wells in the spot plate
2. Obtain 10 mL of 0.5 M HCl in a beaker and pipette the HCl into the wells to obtain a pH of 6 (approximately 1 drop of HCl) and a pH of 5.5 (approximately 4 drops of HCl)
3. Thoroughly mix the spring water and HCl in each well.
4. In one row of the spot plate (3 of the wells) cut the 10 planaria in half (lateral cut) so they are split into equal parts of the anterior and posterior parts
5. Label the spot plate cover with the following: Uncut control, Uncut pH 6, Uncut pH 5.5, Cut control, Cut pH 6, Cut 5.5
6. Obtain a chart of planarian regeneration phases (seen on the left) and observe the regeneration phases over the period of two weeks.

Results

Days Since Cut	No Added HCl (Average Phase of regenerated planaria)	1 drop of HCl (Average Phase of regenerated planaria)	4 drops of HCl (Average Phase of regenerated planaria)
Day 1	Phase 1	Phase 1	Phase 1.2
Day 4	Phase 2	Phase 2	Phase 2

The Effect of Changes in the pH on Planarian Regeneration



*Disclaimer

Although our experiment had faced confounding variables that led to a shortage in reliable data, from the limited numbers shown above, the planarian regeneration seems to be consistent across the different pH levels. Some confounding variable in this experiment are the mixture of different pH and the planarian swimming into other wells, making our data after day 4 inaccurate.



Discussion

Planaria grew at what appears the same rate of regeneration. However, since the different pH water mixed together sometime between day 4 and day 7, there was no reliable data available to accurately measure the rate of regeneration based on the change in pH. In the future, it would be best to use wells or petri dishes that are distanced from each other so that the planaria will not swim from well to well like they did throughout our experiment. While this experiment cannot be generalized as of yet, replication of this experiment could lead to more conclusive and reliable results.



Day 3 Cut, no HCl



Day 14 Cut, no HCl



Day 3 Cut, 4 Drops of HCl



Day 14 Cut, 4 Drops of HCl