Effect of acid rain on seed germination

Aim:
To stimulate the effect of acid rain on plant life, students to set up a lab experiment to compare the effect of varying levels of acidity on plant seed germination.

Hypothesis:
As the pH of water decreases, the number of seeds germinated will reduce.

Variables:

		Units
Dependent variables	The number of seeds germinated	-
Independent variables	The pH of water	-

Controlled variables	**Units**	**Possible effects on results**
Sunlight		it will start the process of photosynthesis which accelerate the growth of seeds
Purity of water	pH	it will have an effect on the acidity of water which will ultimately affect the germination of seeds
Amount of air in zip bag		as it is one of the sources of energy for the plants, its presence will accelerate seed germination

Controlled variables	Method for control
Sunlight	The lab's to be conducted after the curtains are drawn and the bags to be placed in a wooden drawer in a cupboard
Purity of water	The vessels to be cleaned properly before use so that the water oes not get contaminated and to test the pH of water before use so that water purity can be known.
Amount of air in the zip bag	Gently press the bags before zipping them and make sure that the max amount of air is lost.

Materials:
100 radish seeds
10-15 filter papers
5 petri dishes
5 beakers, 100ml each
5 droppers
pH solutions of (0, 2, 4, 6 and 8)

Procedure:
1. Label 5 Petri dishes for each pH solution.
2. Place filter paper in each the Petri dish with 10 seeds. Cover the seeds with another piece of filter paper. Use a dropper to moisten the filter paper through all layers with the 8.0 pH solution. Put the dishes in a sealed plastic bag and place them in a dark place.
3. Repeat steps 1 & 2 for 6.0, 4.0, 2.0 & 0.0 pH Solutions.
3. 1 - 5 days later, count the number of seeds that have germinated.
4. Measure the root length of each of the seedlings. Record observations about seedling condition (color and overall growth and appearance of seedling leaves).
5. Tally class averages for each pH for germination and root length. Graph your data and the class averages. Photograph seedlings.

	Table 1.shows the seed germinated in 4 days			
PH	# of seed germinated	# of seed germinated	# of seed germinated	# of seed germinated
0%	2	6	9	10
2.00%	0	0	0	0
4.00%	0	0	0	0
6.00%	0	0	2	6
8%	0	4	7	8

	Table 2.shows the % seed germinated			
PH	# of seed germinated in day 1	# of seed germinated in day 2	# of seed germinated in day 3	# of seed germinated in day 4
0%	20	60	90	100
2.00%	0	0	0	0
4.00%	0	0	0	0
6.00%	0	0	20	60
8%	0	40	70	80

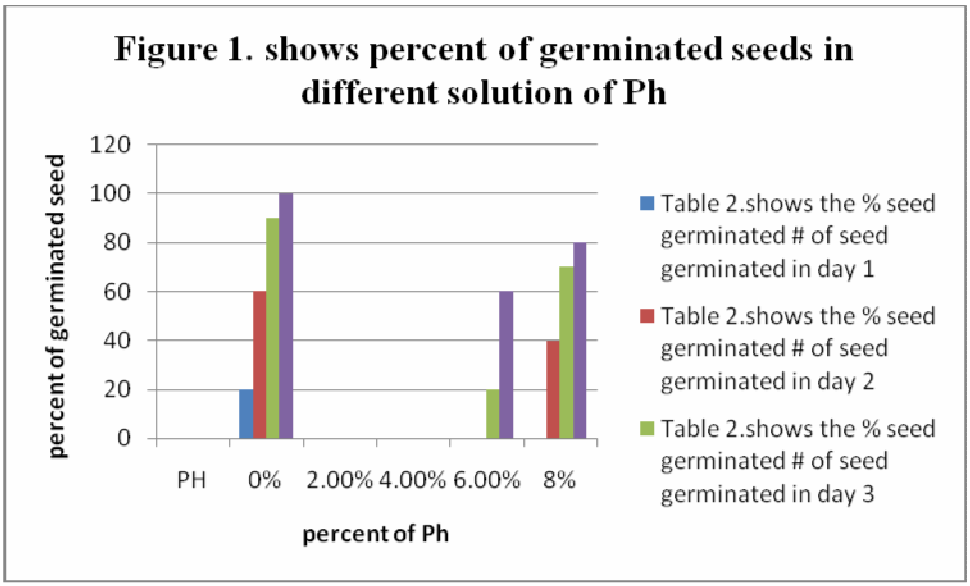
Figure 1. shows percent of germinated seeds in different solution of Ph
120
100
80
60
40
20
0
percent of germinated seed
PH
0%
2.00%
4.00%
6.00%
8%
percent of Ph
Table 2.shows the % seed germinated # of seed germinated in day 1
Table 2.shows the % seed germinated # of seed germinated in day 2
Table 2.shows the % seed germinated # of seed germinated in day 3

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Discussion-: We had only one type of seed, which is radish. We took 10 seed of Radish and every seed and inserted it in zip-lock bag and added 0 to 8% of Acid rain water in all 5 bags. Then we checked the growth of seeds everyday and took the reading.

Evaluation-: While doing the experiment my all the data was perfect. There was error, while doing the experiment. Radish should have grown in2 and 4 % but even one seed did not grow. The acid rain water of each sample at each stage was different. There may be some external substances may have entered the sample and cause a variation in the salinity of the water of the sample. There was a more effect of acid rain water in 0% and 8% as is basic. As 0 and 8% of seeds grew faster than other three.

Conclusion-: As we know that our experiment went wrong as there was an error in it. The least growth was in 2 and 4% and fastest was in 0 and 8%. And the highest percent of growing seed was in 0% in day 4 with maximum 10%.

Bibliography

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