

The Effect of Salt Water on Photosynthesis

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Research question-

What is the effect of salt water on photosynthesis?

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Hypothesis

If we put the leaf disk into salt water then they won't be able to carry out photosynthesis as well because salt is going to interfere with their homeostasis.




Materials-

- Syringes
- Spinach leaves
- Hole puncher
- Graduated cylinder
- Soap solution
- Straws
- Beakers
- Salt solution
- Distilled water
- Light
- Timer



Procedure

1. Hole punch leafs with a hole puncher so they are little disk of leaves
2. Make salt water solution of 1%, 5%, and 10%
3. Put 60 ml of each salt water solution into a cup 
4. Put 60 ml of distilled water into a cup
5. Blow into all four cups for 60 seconds each to add CO₂
6. Get four syringes
7. Put 10 leaf disk into each syringe with each of the different liquid inside the syringe
8. Suck all the air out of the syringe like a vacuum and make sure all the disk are at the bottom of the syringe
9. Take each of the syringes and pour them into the liquid/solution that was inside that syringe
10. Turn on the light and put all 4 cups underneath it
11. Start the timer and check every minute to see if the leaf disk float and record this data



Data Table (Minutes 1-7)

Time	Distilled Water (0%)		1% Salt Water		5% Salt Water		10% Salt Water	
	# floating	# sinking	# floating	# sinking	# floating	# sinking	# floating	# sinking
1	0	10	0	10	1	9	0	10
2	0	10	0	10	1	9	0	10
3	2	8	0	10	1	9	0	10
4	8	2	0	10	1	9	0	10
5	10	0	1	9	1	9	0	10
6	10	0	4	6	2	8	0	10
7	10	0	4	6	3	7	0	10

Data Table (Minutes 8-14)

Time	Distilled Water (0%)		1% Salt Water		5% Salt Water		10% Salt Water	
	# floating	# sinking	# floating	# sinking	# floating	# sinking	# floating	# sinking
8	10	0	4	6	3	7	0	10
9	10	0	5	5	3	7	0	10
10	10	0	6	4	3	7	0	10
11	10	0	7	3	5	5	0	10
12	10	0	7	3	5	5	0	10
13	10	0	7	3	5	5	0	10
14	10	0	7	3	5	5	0	10

Data Table (Minutes 15-20)

Time	Distilled Water (0%)		1% Salt Water		5% Salt Water		10% Salt Water	
	# floating	# sinking	# floating	# sinking	# floating	# sinking	# floating	# sinking
15	10	0	7	3	5	5	0	10
16	10	0	8	2	5	5	0	10
17	10	0	9	1	5	5	0	10
18	10	0	10	0	5	5	0	10
19	10	0	10	0	6	4	0	10
20	10	0	10	0	7	3	0	10



Results:

The salt had a negative effect on photosynthesis. This occurred, because salt decreases homeostasis. With the high percentage of the salt solution, there was less photosynthesis, but with the lowest percentage, there was a slightly higher rate of photosynthesis. The 1% salt solution had all of the leaves float at the end. The 10% had no leaves float in the disk.



Improvements/Errors



- 1) Something that could be done to improve the experiment is to add a few more soap droplets to the solutions. This could improve it because some of the spinach disks seemed to be stuck to the bottom of the beaker which could have messed with the results.
- 2) Another improvement could be using a better method for getting the oxygen out of the plants first because some of the disks immediately went back up after the lights went on so we probably didn't get all of it out which messed with the data slightly.
- 3) We could also use more varieties of salt %s because the 5% and the 10% had very different results so adding more %s in between these numbers could show more accurately the results of salt.



- One of the disks in the 5% solution immediately rose so it wasn't properly deoxidised.
- Some of the disks in the 5% and 10% solutions seemed to be stuck to the bottom of the cups.

Conclusion

In this lab you can conclude that salt water does affect the homeostasis of a plant cell, therefore photosynthesis cannot take place.

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