

Investigation into the distribution of the algae pleuraclocis

This was an investigation to find the side of a tree which Pleurococcus, an algae lives on most, in order to find out which conditions it prefers to live in.

Background Knowledge and Method

Pleurococcus is an alga, which is a type of protocist, which have cell walls and chlorophyll, like plants, and thus they feed by photosynthesis. Most algae live in water, but some such as Pleurococcus live on moist tree trunks. These green algae live in colonies, and contain both chlorophyll a and chlorophyll b, the same as green plants.

Equipment List

- 12cm*12cm quadrat
- 4m string
- Compass
- 1m ruler

Method

50cm was measured up a tree using the metre ruler, and the string was tied around it to show the height. Next, the compass was used to find which direction the side of the tree was facing, and then the quadrat was placed so that the bottom of it was resting on top of the string. Then, the amount of squares in the quadrat that had the algae Pleurococcus in it were counted, and the direction faced by the section noted. These numbers were then converted into percentages. This was repeated all the way around the tree, and graphs and charts were formed to show the results.

Results

Results

The results of the above test were written down, and then entered into the computer to tabulate them. The results in red are my personal results, whereas the others are those of the rest of the class.

0.5m

	North	East	South	West
1	97	100	100	83
2	100	50	13	38
3	100	64	5	21
4	100	29	50	71
5	80	71	45	51
6	100	64	65	69
7	96	81	9	34
8	90	50	40	50
9	88	75	70	85
10	100	94	87	90
11	73	67	25	70
12	97	76	46	54
Average	93	68	46	60

1.5m

	North	East	South	West
1	100	100	43	66
2	98	42	27	38
3	97	3	3	7
4	100	70	48	64
5	98	65	63	72
6	73	68	41	9
7	94	93	14	15
8	85	70	60	40
9	91	60	97	36
10	100	86	75	92
11	76	60	27	69
12	83	64	34	13
Average	91	65	44	43

Conclusions, evaluation and biological significance

Conclusions

I can conclude from these results that the alga *Pleurococcus* prefers to live on the North side of trees, and then the East. At 0.5m, it next prefers to be on the West side, and then the South, whereas at 1.5m, it would prefer to be on the South side to the West. This would be because, as I stated in my background knowledge, algae prefer to stay in moist, shady places, and the North facing side of a tree is the shadiest part, as the Sun would pass from the East to the West, and thus would never shine directly on the North side.

My results are fairly good at 0.5m, except for the value for East, which is too low according to the average and my other results at this height. The results for this are all higher than the average, though the pattern is not too far off. At 1.5m, my result for the West is too high - according to the average it should have been lower than the result for the South.

Anomalous Results

The results in the above tables that have a blue background are anomalous, relative to the averages, assuming that the averages have shown the correct pattern. The results for the North side should be the highest, and then the East. For the 0.5m results, the next highest should be the West, and then the South should be the lowest. For the 1.5m results, the South should come next, and the West should be the lowest. The anomalous results either do not concur with these patterns, or are simply too low.

Evaluation

This test was carried out fairly accurately, and the possibilities for human error were fairly small - all that had to be done was count squares and measure a distance up a tree. However, what was not taken into account by this experiment is that other obstacles may have been casting shadows over the trunk of the tree, which would make the conditions more favourable for the growth of *Pleurococcus*. Also, some places are sheltered, so no rain, or less rain would get to them, so it would get less water, which it requires.

Also, the compasses used to determine which face was being examined were not very accurate at all. They had to be laid on a perfectly flat surface to read them properly, but there were no such surfaces available as the experiments were all conducted in the field.

Another factor is that because the experiments were conducted in a school, pupils pass the trees every day, and brush into them, possibly rubbing off some algae on certain sides, making our subjects untrue representations of normal inhabited trees.

Biological Significance

Pleurococcus is an alga, and thus it prefers to be in the damp, and in the shade. However, the majority of algae would rather live in water, such as seaweed. Indeed, the half of the carbon dioxide fixation on the planet is carried out by algae on the surface of the oceans, and also half of the oxygen released.

Algae may also be used as a direct food source for both humans and marine animals, they may also be used for fertilisers on coastal farms, and they also provide oxygen for the anaerobic bacteria which break down sewage. Furthermore, alginic acids found in the cell walls of algae are used to thicken products, such as ice cream, hand cream, polish, paint, ceramic glazes and confectionery.

An unfortunate effect of algae is eutrophication. This is when fertilisers are washed into streams and rivers, and they speed-up the growth of algae. This soon covers the surface of the water, which stops light getting through to the bottom, where the photosynthetic organisms need it. This stops photosynthesis from occurring, which means that oxygen would not be produced. This oxygen would normally aerate the water, allowing the aquatic animals to breathe, but because none would be produced, the animals would die.