The effect of gravity on Slime mold

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Purpose

Mojihokori is a kind of protozoan of genuine slime mold. In this research, we use mojihokori which is the only slime mold that has an established growth method. We examine and compare the growth of slime mold under different gravitational conditions.

Method

We set the speed of rotations at 88 rpm to make the resultant force twice as strong as gravity.

① Cover heater and potter's wheel with a corrugated box to keep the temperature constant

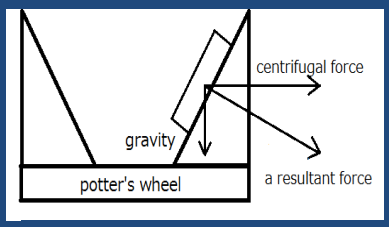

Figure 1 Model of potter's wheel

② divide the petri dish with partitions to restrict the motion of slime mold growth to a certain direction.

Ⅰ Altered gravity

③Secure a petri dish to a slope, and rotate it on a potter's wheel at a speed of 88 rpm.

④After some time, check the growth of slime mold.

⑤The experiment is over when the slime mold reaches the food. Then the process is repeated.

Ⅱ Normal gravity

③Set a petri dish horizontally at the same height as the potters wheel.

④After some time, check the growth of slime mold.

⑤ The experiment is over when the slime mold reaches the food. Then the process is repeated.

<How to measure >

At different points in time, we take out a petri dish from the potter's wheel and measure the distance from the point where we set the slime mold first , to the farthest point of the slime mold's growth.

Expectation

The slime mold that is spun feels twice the force of gravity and is therefore twice as heavy, so we expected a lower growth rate.

Result

Table1 The average and median of growth per an hour

	The average of growth per an hour(mm/h)
Normal	0.50
Altered	1.35

	The median of growth per an hour (mm/h)
Normal	0.44
Altered	1.04

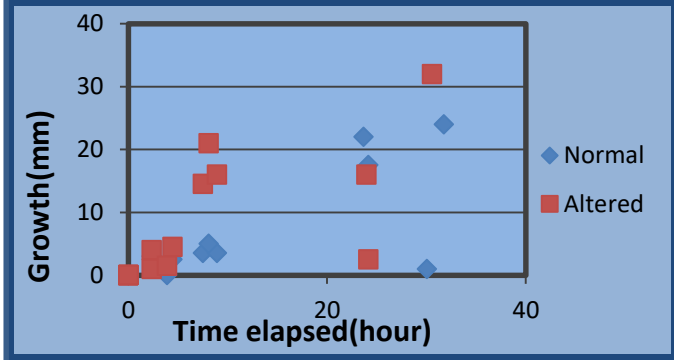

Figure 2 The relation between time and growth

Consideration

Contrary to our expectations, we found the growth of the slime molds with higher gravity is faster than that of normal slime molds. This is because the extra gravity on the slime is like a barricade to the slime's growth. Then , the slime mold sensed the danger and grew faster to escape from that situation. In short, it is the slime molds in high gravity that take the action of avoidance. However , there is little data, and it seems to be scattered on this plot. So we think individual differences and the environment in this experiment affect this result.

Summary and view of the future

- Under higher gravity, the growth of the slime mold is faster than usual.
- Next time, we want to research under low or zero gravity.
- For this experiment, we could only look at the growth speed, but, next time we want to research the slime mold's ability of solving a maze.
- Because we started this research late and we could only collect little data, so we want to add more.

Reference

https://www.riam.kyusyu-u .ac.jp/fluid/meeting/17ME-S2/papers/Article_No_10.pdf