

Paramylon of Euglena

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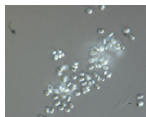
<Motive>

- We researched euglena; which have properties similar to plants and animals.
- While we researched euglena, paramylon turned out to be only in euglena.
- Paramylon has many effects, for example, anticancer, detoxification, and protection from infection.
- We think paramylon has antibacterial properties because it has protection from infection.



<Purpose>

- We compare content of paramylon from euglena with that from white euglena to know which euglenas have more paramylon.
- We do experiments to know whether paramylon has antibacterial properties.



<The way of raising>

We used equipment which can operate brightness and temperature.

	Time	Brightness	Temperature
Daytime	12h	1314Lx	20 degrees
Night	12h	0Lx	20 degrees

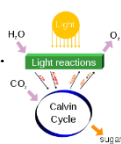
<About raising>

1. Natural water and Hyponex, Chlorogonium culture fluid
→We failed because of mold.
2. Chlorogonium culture fluid
→We succeeded and could get a lot of euglena.
3. K&H culture fluid
→We could raise euglena best.

<Extraction of paramylon>

We extracted paramylon with this way.

- I. We separated euglena by using a cyclone separator and got a thick precipitate.
- II. We mashed I by using a homogenizer.
- III. We added II to a 1mass % SDS solution and kept it at 95°C for 1 hour.
- IV. We separated III by using a cyclone separator for 15 minutes.
- V. We washed precipitate with clean water.
- VI. We skimmed off the precipitate by using acetone.
- VII. We dried it and we got pure paramylon.



<Content of paramylon>

We extracted paramylon and compared the content.

Euglena	0.11 g from 200ml of K&H culture fluid.
White euglena	0.090 g from 200ml of K&H culture fluid.

Euglena has more paramylon than white euglena.

We think this may be because euglena does photosynthesis.

<Observation>

We used NiCl₂ aqueous solution. (0.001mol/L)

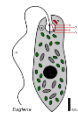
NiCl₂ has a property of stopping flagellum movement on microbes.

We tried to observe euglena by using this property.

However, we couldn't observe euglena well, because as time went by, the water started to evaporate and the concentration of NiCl₂ got too high, so the euglena was squashed by osmotic pressure.



Now we use Vaseline and observe them.



<Precipitation of paramylon by neutralizing>

Paramylon was not aqueous but it dissolves into a basic solution or an organic solvent.



We dissolved paramylon into NaOH aqueous solution (1.0mol/L), and neutralized it with HCl aqueous solution (1.0mol/L), then we checked the precipitation of paramylon.



<Result>

We found something in the bottom of the beaker.

But we couldn't make the decision if it was paramylon or not by a using digital microscope.

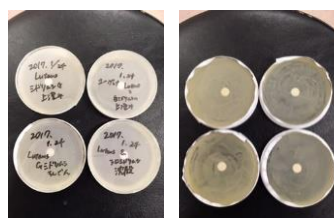


We found that there was a little paramylon dissolved in the aqueous solution after neutralizing.

<Antibacterial action of paramylon>

- I. We spread out *Luteus* on the 4 petri dishes.
- II. We put 4 kinds of paperdisk on the petri dishes.
- III. We put petri dishes into 30.5 degrees' incubator.

<Result>



We could not admit inhibition ring in any petri dishes. We checked all, but we couldn't see any antibacterial action from the solutions.

<Consideration>

We thought 4 things from this experiment.

1. Paramylon doesn't have antibacterial action.
2. We didn't understand this experiment, so we failed.
3. Property of paramylon had changed because of the basic aqueous solution it was in.
4. *Luteus* isn't influenced by antibacterial action of paramylon.

So, we need to know about paramylon more and more.

<References>

Function of paramylon from *Euglena gracilis* as filer

https://www.jstage.jst.go.jp/article/sptj/50/10/50_728/_pdf

Suzuki Kengo, Nakano Ryouhei, Yamaguti Hideki, Maruta Ayako, Nakano Yoshihisa