

Alcohol's effect on blue mold

Kobe high school 1st grade

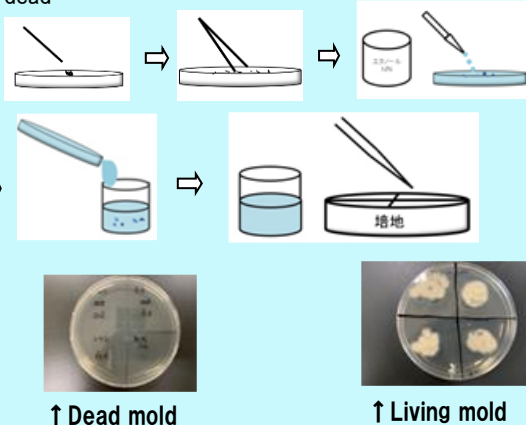
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Background and purpose

In general, alcohol has a bactericidal effect. Its effect depends on the type and concentration of alcohol, and it works on mold as well. Therefore, we changed the concentration and type of alcohol, and examined which concentration exerted the best inhibitory effect.

Method

- ① Put mold in watch glass, then break it apart
- ② Add a drop of alcohol to the mold
- ③ After a certain time, wash the mold with pure water, and then inoculation it on culture media (KMB Saburo dextrose agar)
- ④ Over a few days, observe the mold and determine if it is alive or dead



Hypothesis

Previous studies have shown that ethanol has the highest effect when its concentration is 70%. The reason is said when the concentration of ethanol is 70%, the ratio of ethanol to water become 1:1. And then, ethanol form a cluster structure.

With a similar calculation, the most effective concentration of 2-propanol is 80%.

Ethanol \Rightarrow most effective at 70%

2-propanol \Rightarrow most effective at 80%

Result

concentration(%) time(min)	0	10	20	30	40	50	60	70	80	90	100
1					○	○	○	○	○	×	
2					○	○	○	×	×	×	
3					○	○	○	×	×	×	
4					○	○	○	×	×	×	
10	○	○	○	○		○				○	○
20	○	○	○	○		○				×	○
30	○	○	○	○		○				×	○
40	○	○	○	○		○				×	×

Table1

Relationship between concentration of ethanol and mold survival time

concentration(%) time(min)	0	10	20	30	40	50	60	70	80	90	100
1								○	○		
2								○	○		
3								○	○		
4								○	○		
10					○	○	○			○	○
20					○	○	○			○	○
30					○	○	○			○	○
40					○	○	○			○	○

Table2

Relationship between concentration of 2-propanol and mold survival time

In ethanol

- The bactericidal effects become maximum at 70% like the hypothesis
- When the concentration is less than 70%, the effects are diminished sharply
- When the concentration is more than 70%, it works, but the effects are diminished

In 2-propanol

- All the mold was alive



Not only in 2-propanol, but also in experiments of ethanol mold often lived

Consideration

- In ethanol, the bactericidal effects become maximum at 70%



- In 2-propanol, the bactericidal effects could not be observed

It is expected that our hypothesis is correct



bactericidal effect of 2-propanol become maximum at 80%

- The bactericidal effect of 2-propanol is weaker than that of ethanol
- Mold used in experiments may have been changed its trait because of long-term incubating

\Rightarrow incubate new blue mold

Works Cited

MEXT mold control manual

<https://www.mext.go.jp>

Kao Corporation talk of alcohol and sterilization <https://www.kao.co.jp>

(Retrieved November 12,2019)