Biological Decomposition of Plastic

～*Activities of familiar microorganisms*～

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Team 12

【1 Introduction】

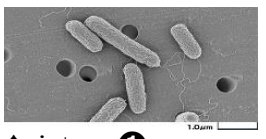
Sea water →Pollution is a major global issue

By disassembling the plastic,
We want to save the environment.

Plastic is broken down by microorganisms.

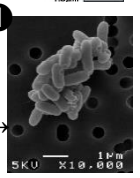
・Pseudomonas) picture❶
・Sphingomonas） picture❷

Micro plastic



↑picture❶

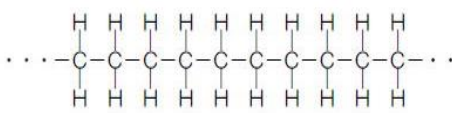
picture❷→



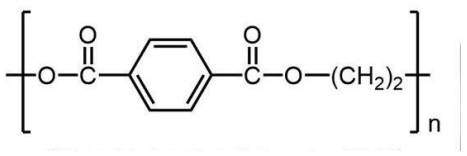
【Purpose】
Our purpose is to disassemble the plastic from microbe.

【2. Viewpoints】

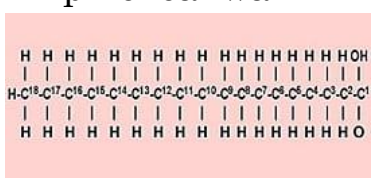
polyethylene



polyester



pine leaf wax



The structure is similar.
If we can break the bond between C and H it will be disassembled.

[3. Material and Method]

Material , apparatus

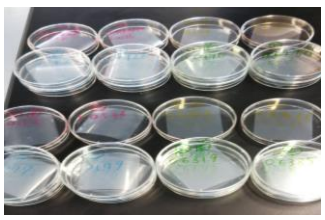
・
・Soil under a pine tree （picture❸） ・Autoclave
・Incubator・Petri dish ・Ultrasonic cleaner
・electronic balance

↑picture❸
Himalayan seeda

Method

◇1Soil collecting

◇2 Sterilizing the soil



◇3 Put in petri dish

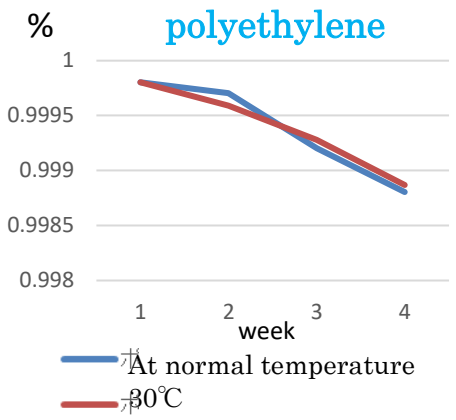
◇4 Keep temperature
30° and normal temperature

◇5 Measure the mass

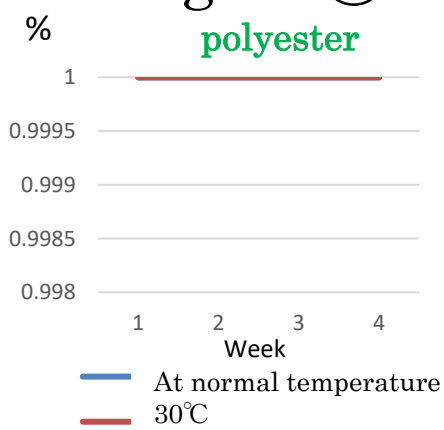
【4. Results and discussion】

Reduced mass of plastic（Non-sterile）（%）

Figure①

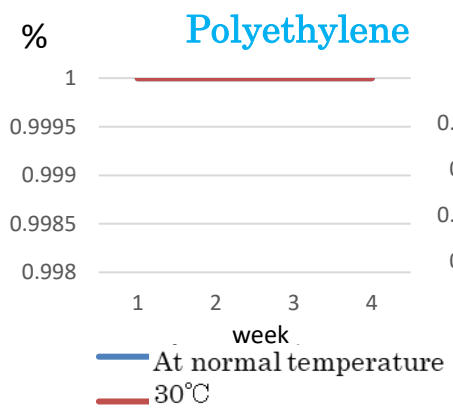


Figure②

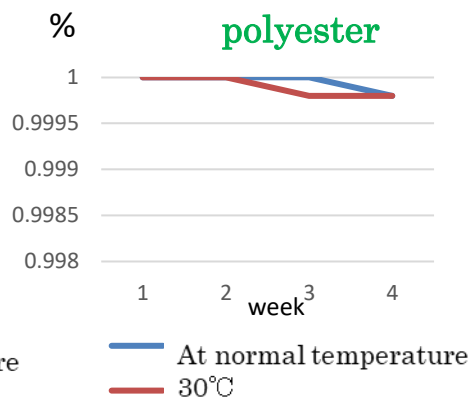


Reduced mass of plastic（sterile）（%）

Figure③



Figure④



Summary and discussion

・Polyethylene is decomposed only in soil with fungus.
➡The function of bacteria is related to the decomposition.
・Polyethylene is decomposed, but Polyester is not Decomposed.
➡There may be a microbe that breaks down hydrocarbon bonds.
・Little change due to temperature.
➡30 degrees is not the optimum temperature.

Conclusion

We disassembled the plastic with a focus on the structure of pine resin and plastic. The soil under the pine trees was divided into those that were sterilized and those that were not sterilized, and the temperature was also divided into room temperature and 30 degrees. As a result, polystyrene was decomposed by microbe.

【5. Future Work】

①We will observe structure of plastic after being decomposed by using electronic microscope.
②We will try other plastics.
③We will inspect the best temperature to decompose plastic easily.

References

Yakult company（figure❷）