

Dual wield even on the sea

-Pursuing high fishing gear performance and excellent environmental consideration-
“UMI”&“NAGISA”Foundation

We are currently developing fishing gear (pipes) used for oyster farming using "polylactic acid" as a raw material. It is difficult to completely stop the pipes as they flow out into the sea due to accidental events such as storms or collisions of ships with oyster rafts. In response to this situation, we are developing so-called "dual wield" pipes that have high performance as fishing gear and environmentally friendly properties. Specifically, we are working on the development of pipes (fishing gear) that are digested in the stomach even if they are eaten by seabirds and whales, and are decomposed by bacteria after a certain number of years in the sea.

Conditions for "new oyster pipe"

- ① The existing production line can be used
- ② The price is the same as the current product
- ③ Be strong
- ④ Do not spread after outflow
- ⑤ Non-toxic or low toxicity
- ⑥ Being able to digest quickly in the body
- ⑦ Biodegradation is gradual

We have selected "polylactic acid," a plant-derived material, as a material that has the potential to meet the above seven conditions.

At the time of manufacture, oyster pipes made of polylactic acid met the above conditions ①, ④, ⑤ and ⑥.

For this reason, we verified ③ and ⑦ of the above conditions in the verification test at the oyster farm.

As a result of the verification, it was found that the condition ③ is not sticky and easily cracked. Regarding condition ⑦, it was found that the biodegradation speed was too fast (weight decreased by 30% in 1.5 years in seawater).

For this reason, regarding ③, we asked Nichimo Co., Ltd. to improve it and provided us with a new oyster pipe made by adding a plasticizer to polylactic acid.

The results of the on-site verification were good, and we were able to meet the condition ③ without any problems. On the other hand, in order to satisfy the condition of ⑦, further ingenuity is required in the future.

The possibilities of "polylactic acid" are further expanded

- This material can be used not only for oyster pipes, but also for other types of fishing gear.
- Nichimo Co., Ltd., which cooperates with us, made prototypes of conger eel cylinders, octopus traps, squid needles, etc. using this material and conducted a fishing test. The results were good, and the performance and catch performance were similar to those of existing petroleum-derived plastic fishing gear.

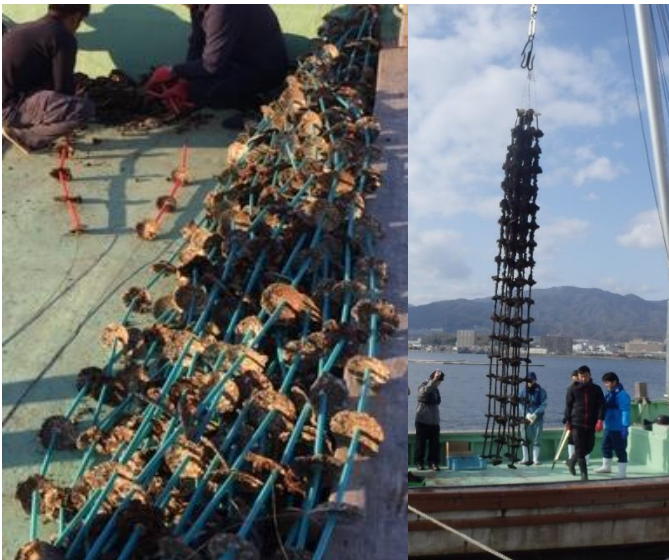
"To conclude"

- The price of polylactic acid is high, and reducing manufacturing costs is an issue for the future.
- Regarding condition ⑦ (gradual biodegradation), we will further cooperate with the manufacturer to realize it.
- We would like to express our deep gratitude to the Fisheries Agency, Government of Japan for financially supporting this demonstration test, Nichimo Co., Ltd., and the aquaculture company in Hiroshima for providing the prototype of the oyster pipe and the place for the demonstration test.

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Drifting oyster pipe



Poly-lactic acid oyster pipe test



Poly-lactic acid + additives

Poly-lactic acid

polyethylene
(Material currently used)

Prototype sample (dyes added for distinction)