



The ability of Japanese littleneck
clams to purify water

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Background

As natural tidal flats have been decreasing in number, the importance of tidal flats is beginning to be recognized again. Artificial tidal flats are being created as an effort to restore them.



We think it is important to quantify the purification capacity of clams in order to quantify the purification capacity of tidal flats.

The purpose of our study

Quantitatively assess the purification capacity of tidal flats by investigating Japanese littleneck clams.

From Preliminary Experiment

- ▶ An initial experiment was conducted using India ink.
- ▶ We found that the clam's ability to purify water could be assessed in three hours.
- ▶ Experiments were then conducted using a method that is not affected by false feces, and that also allow for the evaluation of purification capacity by clam mass.


Experiment

Hypotheses:

There is a positive correlation between the total mass of clams and the decreasing amount of chlorella.

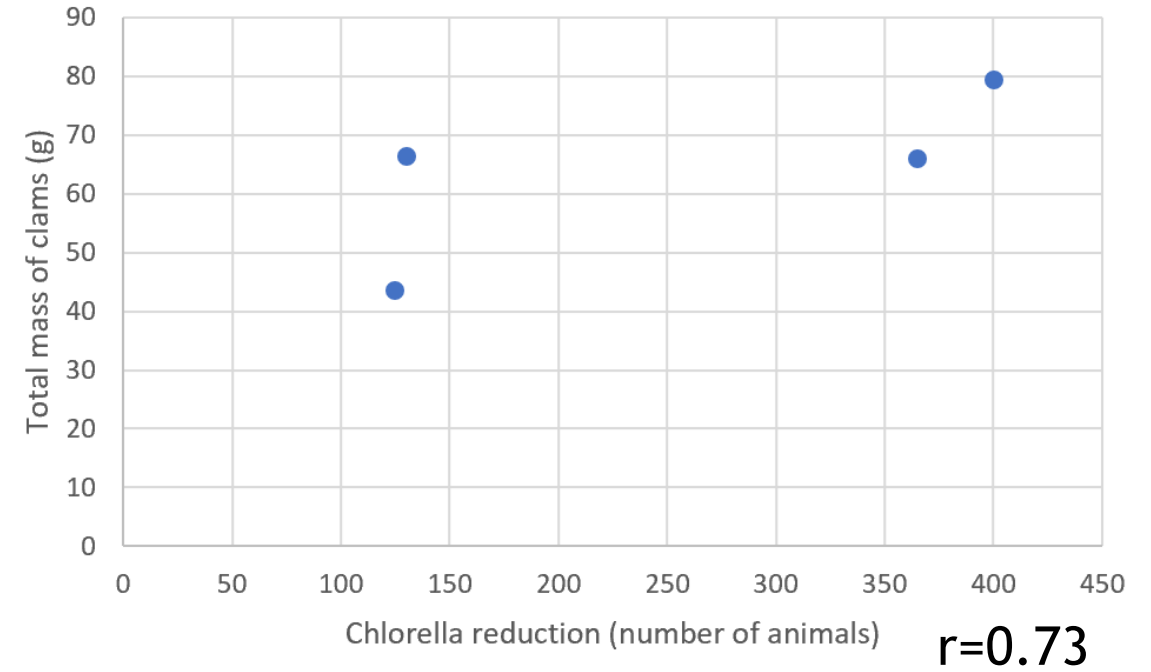
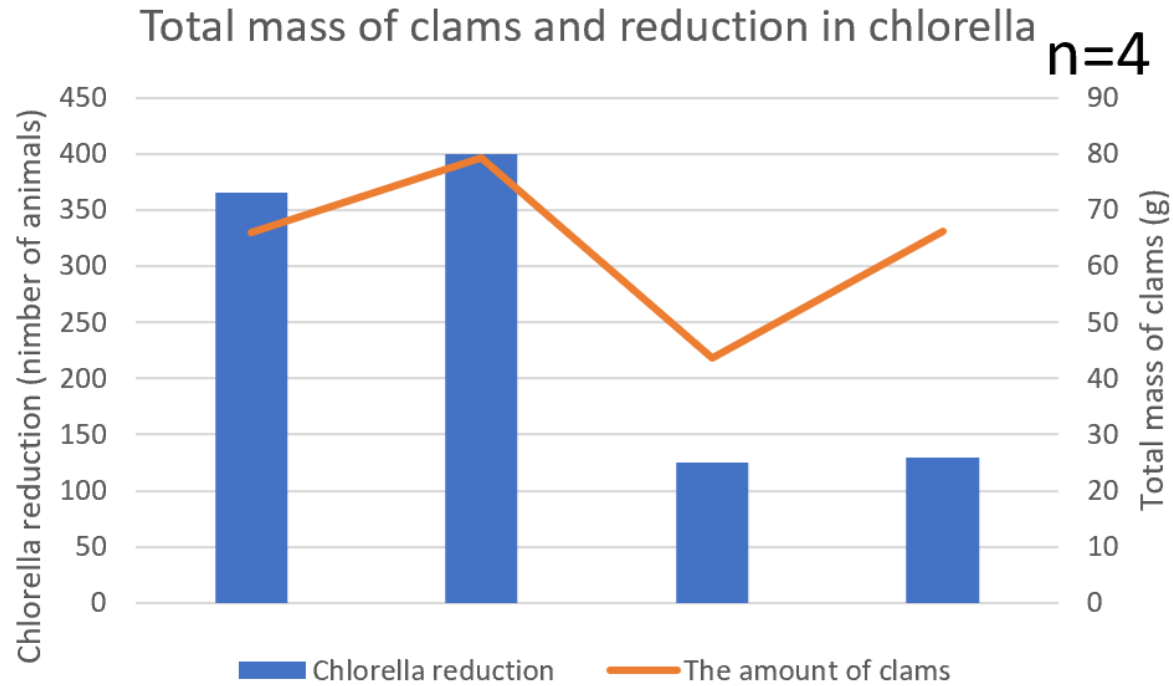
Experimental Methods

(i) Place 7L of artificial seawater, 70 mL of chlorella water diluted 10 times from the original solution, and 5 clams in a water tank; keep the water temperature at 20° C for 3 hours.



(ii) Collect seawater samples before and after incubation; calculate the number of chlorella in 1 µl of seawater using a blood cell calculator.

Result



Consideration

The greater the total mass of the five animals, the greater the reduction in chlorella.



Hypothesis (i) was verified.

The correlation coefficient was $r = 0.73$.



Strong positive correlation between the total mass of clams and the reduction in chlorella

Consideration

In this case, the experiment was conducted so that the mass of each of the five individuals was approximately the same.



Therefore...

Actual tidal flats contain individual clams with large and small masses.



But...

Need to compare Chlorella reduction with and without differences in individual mass with the same total mass

Overview

This time

Purification capacity was quantified using the amount of the reduction in chlorella

After

The method in the experiment is not affected by false feces, so it is valid for quantification.

Establish a method to evaluate the purification capacity of tidal flats by mass

Thanks

- ▶ We would like to thank Professor Ichiro Imai, Professor Emeritus of Hokkaido University, for his advice on this research.
- ▶ We would like to express our sincere gratitude to him.

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Thank you for your attention.