

P2.13

Development of the Closed-Circulation Plant at Onshore for aquaculture of bivalves and verification of the release timing

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Abstract

Short-necked clams (Thereafter, it will be referred to as clams) are well known as a fishery resource and fulfill an important role in the substance cycle of the sea. It is also an important organism for learning about the environment, for example, by tidal clamming. However, the catch of Japanese clams is decreasing every year, the causes are decrease of tidal flats which are the habitat of clams, increase of seawater temperature at a tidal flat, large-scale flood in summer, and disturbance of habitat by typhoons.

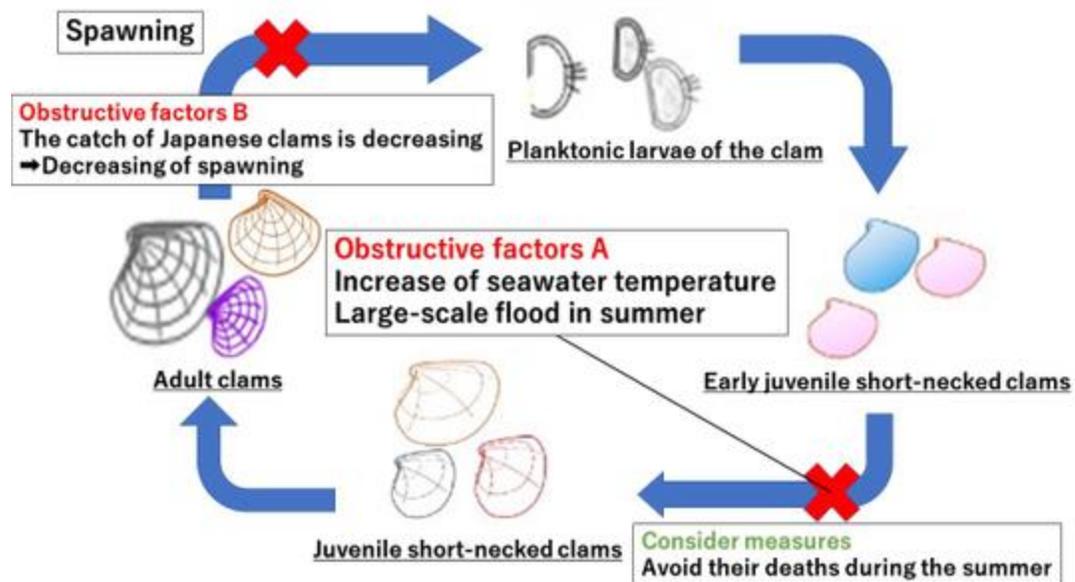


Fig.1. Factors in the decline of clams resources

In this study, The Closed-Circulation Plant at Onshore (Thereafter, it will be referred to as CCPO.) was used to cultivate clams in order to avoid their deaths during the summer. In addition, experiment of releasing clams into a tidal flat was conducted to verify the timing of the release for their, and the optimum release timing was determined from the survival rate and growth increment of the clams.



Fig.2. The Closed-Circulation Plant at Onshore for cultivate clams



Fig.3. Experiment of releasing clams

Results of the experiment of CCPO showed a survival rate of 63.5% per year and an average shell length growth of 0.137 mm per month, suggesting the need to tune the feeding speed and frequency for clam survival and growth.

Result of the experiment of releasing clams in June to September was survived 32% to 49% per month. In result of October was survived 77% per month, confirmed the most viable value during the release timing. Average shell length grew 1.1 to 3.4 mm per month in each month, 2.0 mm per month in October.

Keywords

closed-circulation plant, aquaculture of bivalves, resource of clams, tidal flat