

Fisheries-based Evaluation of Carrying Capacity for Scallops in Ogatsu Bay

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Scallop farming is one of major aquaculture industries in the Sanriku coast of northern Japan. The earthquake and tsunami on March 11 in 2011 brought devastating losses in the scallop culture as well as oyster, sea squirt and marine alga etc. In the process of recovering and reconstructing the aquaculture farm lost by the natural disasters, evaluation of environmental carrying capacity in each farming site is an essential task to guarantee a sustainable production of filter feeders like a scallop in the future. We focused on a transition of scallop farming after the disaster in Ogatsu Bay where scallops are predominantly produced and recovering began first in the coast of Miyagi prefecture. We investigated productivity based on the number of facility and annual production in the bay, and growth state compared to pre-quake state with annual food availability. The decrease in productivity of scallop resulting from a low growth of scallops in deeper layer was observed in Ogatsu Bay in 2014, suggesting that a food availability reducing with depth was not sufficient for the increasing scallops farmed in deeper layer in Ogatsu Bay in 2014. It may be a time that the farmers need to reconsider and regulate the amount of production to accomplish a sustainable and efficient production of scallop as a filter feeder on the basis of environmental carrying capacity estimated in Ogatsu Bay.



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Professor, Laboratory of Aquacultural Biology. Bivalve mollusks is commercially important as an aquaculture organism in the world. The artificial seed production of bivalves based on reproductive control is required for improvement of productivity in aquaculture. I focus on gonial cell multiplication, oocyte growth, and spawning (oocyte and sperm release) in bivalve mollusks, in which these processes are precisely regulated by endocrine systems. Some of endocrine regulatory molecules are shared among animals with some homology to vertebrates and others possess unique molecules to regulate reproduction.

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