

# Succession Process in the Structure for the Environmental Restoration Applied to Enclosed Sea Areas.

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## 1. INTRODUCTION

Various marine organisms inhabiting seashore play an important role in the material cycle through their feeding activities. However, artificial vertical structures with uniform surface texture, which are constructed in a port and harbor, have proved to have poor habitats for marine organisms. In addition, epibenthic organisms on the vertical structures are often dropped on the bottom and turned to rich organic sources, causing deterioration of sediment and low oxygen concentrations in bottom water.

## 2. OBJECTIVE

Attempts were made to devise a new type of structures in order to solve the above problems by modifying form and texture of structures in a port and harbor. This structure provides habitat for benthic organisms on the bottom by supplying space in the depth in order to have enough oxygen concentration in summer, and facilitates settlement and recruitment of benthos by using porous concretes with numerous voids for infaunal animals.

## 3. METHODS

The test structure was set in December 1999 at Komatsushima port of Tokushima, western Japan. Water quality and benthic fauna related to the test structure were surveyed along the depths in each season and compared with those at the original breakwater in the neighborhood. As for the benthic fauna, biomass and number of species were measured, the observation was done with respect to common organisms inhabiting inner bay.

## 4. RESULTS

Biomass related to the test structure per unit meter was larger than that at the breakwater after 8 months. Typical species inhabiting inner bay were found. *Mytilus galloprovincialis*, *Charybdis japonica* and *Acanthogobius frarimanus* were observed in summer, while *Stichopus japonicus* and *Crassostrea gigas*, in winter. The number of species on the test structure was lower than that at the breakwater in February 2001. Since the number of species on the test structure tended to increase through the year, it is expected that biodiversity and biomass would increase to activate material cycles as the succession on the test structure will proceed.