

A Comparative Study of Shellfish Assemblage Patterns between an Artificial and a Natural Sandy Tidal Flat

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The Marinpia sandy seashore located in Tokushima City, southwestern Japan, was created in March 2007 to compensate for the loss of the adjacent natural seashore to land reclamation. Because the main objective for creating this seashore was to provide a habitat for the endangered tiger beetle *Cicindela lewisi* inhabiting the natural shoreline and vegetation, there is less ecological information on the intertidal benthic species. We conducted seasonal quantitative sampling of intertidal shellfish (mollusks and crabs) from May 2008 to October 2010 to investigate the differences in assemblage structure and recruitment pattern between the artificial and natural habitats.

The seawater quality, sediment particle size distribution, and topographical characteristics were almost similar between the 2 habitats. The number of species was almost always lower in the artificial habitat, and the dominant species composition differed between the 2 habitats. In particular, a mud snail *Batillaria cumingi*, which was the most dominant species in the natural habitat, was not observed in the artificial habitat during the 3 years of survey. Moreover, in the artificial habitat, the species rank-abundance pattern was unstable compared to that in the case of the natural habitat, and the recruitment pattern of the dominant bivalve differed between the 2 habitats, suggesting that the ecological conditions of the artificial habitat were different from that of the natural one even after 43 months of its creation.

However, the shellfish assemblage of the artificial habitat appeared to be rich during our study period. The 2 exclusively dominant clams drastically declined by the end of 2009, and the density of some species gradually increased with an increase in the biodiversity index.

From our findings, we infer that the assemblage structure of the artificial habitat was not enough to compensate for the lost natural habitat in the current situation. Because several physical characteristics were common between the 2 habitats, biological factors such as variation in recruitment amount and modes of recruitment (planktonic or direct development) seem to play a crucial role in the observed differences. Continuous survey is therefore needed for a better ecological understanding of the artificial tidal flat.

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