Bacterial Key Species Maintaining an Aquaculture Environment

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In an aquaculture environment, as fishes are cultured in a high density, organic loads such as leftover feed and feces often exceed the environmental capacity and induce heavy organic pollutions. Among the various factors that determine the environmental capacity, bacterial biodegradation process would be the key factor. Therefore, it is important to understand well about the bacterial community in the aquaculture environment. Seawater and sediment samples were collected from the coastal aquaculture site of Kinki University in May, July, September and November 2009 and January and March 2010. Bacterial cells were collected and subjected to DNA extraction and bromodeoxyuridine (BrdU) and PCR-DGGE analysis. BrdU, halogenated nucleoside and thymidine analogue, has been used to monitor DNA-synthesizing or actively growing bacteria in natural environments. Both community structures of total and actively growing bacteria in the water and sediment samples showed seasonal variations. Interestingly, some bacteria were always present and growing actively throughout the year, even though bacterial community structures and environmental factors such as water temperature and chlorophyll *a* concentration changed seasonally. These bacteria belonged to uncultured alphaproteobacteria (*Roseobacter* group), which would be responsible for the environmental capacity in this aquaculture area. They should be regarded as key species maintaining this aquaculture environment.

Keywords: Aquaculture, bromodeoxyuridine, actively growing bacteria