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Studies on the Diversity of Microorganisms Distributed in the Ocean

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Summary

I detected bacteria cultured at different NaCl concentrations from seawater. In the PCR-DGGE (denaturing gradient gel electrophoresis) analyses, three bacteria belonging to the genera *Marinomonas*, *Shewanella*, and *Vibrio* respectively were detected in the culture at 0.35% NaCl concentration from seawater soon after sampling in Atami-seashore, but only one bacterium belonging to the genus *Vibrio* was detected at 3.5% NaCl concentration. On the other hand, only one bacterium belonging to the genus *Shewanella* was detected in the culture at 0.35% NaCl concentration from the preserved seawater at 4˚C for 5 months, but two bacteria belonging to the genera *Cobetia* and *Pseudoalteromonas* respectively were detected at 3.5% NaCl concentration. Thus, only one bacterium belonging to the genus *Shewanella* was detected in the cultures from both Atami-seashore-seawaters before and after the preservation. In addition, this bacterium was not detected in the culture at 3.5% NaCl concentration but at 0.35% NaCl. Phylogenetic analysis showed that this bacterium was closely related to the species that do not require NaCl for growth in the genus *Shewanella*. Bacteria belonging to the genus *Vibrio* were detected before the preservation but were not detected after the preservation in the PCR-DGGE analyses. In the oligonucleotide microarray analyses, *Vibrio* was not detected in the culture at 3.5% NaCl from the preserved seawater, which suggests that the bacteria belonging to *Vibrio* entered into nonculturable state during the preservation. On the other hand, the bacteria belonging to the genera *Cobetia* and *Pseudoalteromonas* were not detected before the preservation but were detected after it, which suggests that those bacteria shifted from the nonculturable state to the culturable state.