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Effect of ambient water conditions on microbial communities on the artificially produced aggregates: Evidence from experiments using two different seawater cultures

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Microbial communities on marine aggregates could be influenced by ambient water conditions; however, empirical data are scarce. In this study, we used fingerprint analysis of PCR-amplified 16S rRNA gene fragment to examine how microbial communities on aggregates change in response to different conditions of ambient water. We conducted two experiments using seawater cultures from surface waters of the lagoon and the anthropogenically influenced bay of Nouméa, New Caledonia: a transplant experiment in which the artificially produced aggregates from one station was added to ultra-filtered seawater culture of another station, and a water-flow experiment in which the artificially produced aggregates placed in the ultra-filtered seawater culture with or without water-flow. In a transplant experiment, bacterial community composition (BCC) on the bay and lagoon water aggregates were significantly different ($p < 0.05$, ANOSIM) at the beginning of experiment. After 11 days of incubation, BCC on the lagoon water aggregates were significantly different ($p < 0.05$) from transplanted communities. Transplantation effect was also observed in the bay water treatments. In a water-flow experiment, BCC on the bay and lagoon water aggregates were significantly different ($p < 0.05$) at the beginning of the experiment. BCC on the lagoon and bay water aggregates with and without water-flow treatments were significantly different ($p < 0.05$) at the end of incubation, and effect of water-flow on BCC were observed in the bay and lagoon water treatments. Our experimental studies suggest that changes in ambient water conditions potentially influence microbial communities on aggregates in the Bay of Nouméa.