

# **Erect macroalgae influence epilithic bacterial assemblages and reduce coral recruitment**

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## **Abstract**

Macroalgal competition can indirectly influence the health of corals and their response to changing environmental conditions by altering their associated bacterial community. However, the effect of macroalgae on the composition of epilithic microbial biofilms, an important determinant of coral recruitment, is poorly known. In the back-reefs of Moorea (French Polynesia), we evaluated how the experimental removal of either the canopy of the seaweed *Turbinaria ornata* or that of the entire macroalgal assemblage influenced the composition of the bacterial biofilm and coral recruitment on macroalga-free substrata. The number of bacterial colonies on culture plates inoculated with dilutions of 9 d old biofilm from canopy removal sites was smaller compared with control sites. After 3.5 mo, the diversity of bacterial operational taxonomic units (OTUs) was lower at both canopy and total macroalgal removal sites. Total macroalgal removal sites had a lower relative abundance of several bacterial families, including Rhodobacteraceae, Erythrobacteraceae, Cyanobacteria Family IV and Family VIII, Flavobacteriaceae and Verrucomicrobiaceae. After 8 mo, coral recruitment was generally low, but greater at total macroalgal removal sites. The relative abundance of Cyanobacteria, Sphingobacteria and Verrucomicrobia was negatively correlated with coral recruitment and explained ~70% of variation in coral recruit density. Our study shows that the removal of *T. ornata* and understory macroalgae influences the composition of epilithic bacterial assemblages and coral recruitment. Thus, eradication campaigns are unlikely to sustain long-term reductions in the abundance of *T. ornata* and, hence, increase coral recruitment, when plant holdfasts and understory macroalgae are left in place.

## **Keyword**

Coral reefs | Macroalgae | *Turbinaria ornata* | Epilithic bacterial biofilms | Coral recruitment | French Polynesia