# Impacts of environmental stress on the resistance and resilience of algal-associated bacterial communities

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## Abstract

Algal associated bacteria are fundamental to the ecological success of green macroalgae such as Caulerpa. The resistance and resilience of algal-associated microbiota to environmental stress can promote algal health and genetic adaptation to changing environments. The composition of bacterial communities has been shown to be unique to algal morphological niches. Therefore, the level of response to various environmental perturbations may in fact be different for each niche-specific community. In situ experiments were set up to investigate the effect of nutrient enrichment and temperature stress on the bacterial communities associated with Caulerpa cylindracea. Bacteria associated with separate morphological niches along the thallus were characterised using the 16S rRNA gene and community similarities were compared. Resistance and resilience were calculated to further understand the initial changes and recovery of microbial composition in response to different abiotic stresses. The results of this study provide evidence that nutrient enrichment has a significant influence on the taxonomic and functional structure of the epimirocbiota. Temperature stress had a significant effect on the rhizomicrobiota taxonomic composition, with the combined stress potentially having additive effects on the functional performance of the rhizomicrobiota over time. This further contributes to our understanding of algal microbiome dynamics in response to environmental changes.

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