

Biofilm formation and amyloid production leads to ecological fitness in marine *Bacillus* in warmer environmental settings

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Abstract

Microorganisms that support higher trophic life forms are given a central place in global climate change biology. However, the impact of temperature rise on biofilms, dominant microbial life style in aquatic environments is still unclear. Here, we investigated the impact of temperature rise in the context of power plant cooling seawater system on ecological fitness of marine *Bacillus*. Our results showed that biofilm formation was significantly increased at 37 – 45 °C as compared to ambient seawater temperature of 30 °C. This was supported by increased production of extracellular polymeric substances (EPS) and amyloid in warmer waters. Amyloid, an important structural component in the EPS matrix of *Bacillus* biofilms, in turn altered the colony characteristics such as morphology, roughness and wetting behaviour facilitating fitness. We hypothesize that biofilm formation and amyloid production is a survival strategy for ecological fitness in marine *Bacillus* for thriving in the warmer environmental settings.

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