

The importance of the little things: Bacteria-diatom interactions in intertidal mudflats

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Estuaries are one of the most valuable ecosystems on earth; their productivity at times even matching those of coral reefs and tropical forests. This, largely due to their microscopic component. The estuarine mudflat biofilms, in particular, are hotspots of primary production, nutrient cycling and microscopic diversity. Diatoms, eukaryotic microalgae, are one of the main primary producers in the biofilms. They share the biofilm with large numbers of bacteria (10^9 cells/ml of sediment). We have shown that these bacteria and diatoms interact in numerous ways, ranging from antagonistic to synergistic. The bacteria-diatom interactions are complex as they are highly specific and condition-dependent. They can have important ecological implications for the composition and functioning of the biofilm community. We can conclude, that whilst occurring on a microscopic scale, these interactions might be powering the mudflat ecosystem and might thus be one of the main reasons why these systems are so exceptionally productive and valuable.

Keywords: microbial interactions; bacteria; diatoms; mudflat; biofilm; interkingdom signalling