QUORUM SENSING INHIBITORS FROM MICRO-ALGAE COMMONLY USED IN AQUACULTURE

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Quorum sensing, bacterial cell-to-cell communication with small signal molecules such as acyl-homoserine lactones, regulates the virulence of many (aquatic) pathogenic bacteria (Schauder and Bassler, 2001; Waters and Bassler, 2005). Therefore, interfering with quorum sensing is currently being explored as a novel biocontrol strategy to fight bacterial infections. In this study, the effects of different marine and freshwater micro-algal strains on acyl-homoserine lactone-regulated phenotypes of three reporter strains were investigated. Two freshwater micro-algae inhibited violacein production of quorum sensing reporter strain *Chromobacterium violaceum* CV026. Further tests using *Escherichia coli* JB523 showed that micro-algal extracts inhibited or stimulated quorum sensing, depending on the algal strain. One freshwater and 5 marine algae showed quorum sensing inhibitory activity, whereas two algae stimulated quorum sensing-regulated gene expression. Micro-algal strains that showed inhibitory activity in the previous assays also inhibited acyl-homoserine lactone-regulated bioluminescence in the aquaculture pathogen *Vibrio harveyi*. The growth of all reporter strains was found to be unaffected by the micro-algal samples. The most promising micro-algal strain was found to be *Chlorella saccharophila* CCAP211/48, as its extracts inhibited quorum sensing-regulated gene expression in all three reporter strains. This study revealed that micro-algae are able to act as a biocontrol agent against pathogenic bacteria in aquaculture.

References

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