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Bacteria as biological control agents of freshwater cyanobacteria: is it feasible beyond the laboratory?

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ABSTRACT:

Biological control of cyanobacteria is a well-researched area with a central focus on laboratory-scale studies. Numerous reports have been made on algicidal isolates, with bacteria as a major component of the antagonists. The research in this review draws a brief summary of what is currently known in the area of freshwater cyanobacteria being inhibited by bacterial isolates. Proteobacteria, Bacteroidetes and Firmicutes are among the most commonly reported phyla of bacteria associated with or employed in this research area. However, there are limited reports of upscaling these control measures beyond the laboratory scale. Lytic control agents are the most commonly reported in the literature with subsequent cyanotoxin release. From a water quality perspective, this is not feasible. Based on the available literature, temperature, pH and nutrient changes have been explored in this short review as possible contributors to less optimal bacterial performance. Moreover, the investigation into optimising some of these parameters may lead to increased bacterial performance and, therefore, viability for upscaling this biological control. Through the compilation of current research, this review offers insight to live predator-prey cell interactions between cyanobacteria and algicidal bacteria.