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### Investigation of novel chemical *in-situ* treatment methods to mitigate cyanobacteria harmful algal blooms in surface waters

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#### Abstract:

As water scarcity is becoming a universal problem to address, it is essential to maintain a high surface water quality and protect the biodiversity of current aquatic biotopes worldwide. Surface water contamination events caused by high nutrient and organic matter loads lead to the formation of cyano-HABs, which are mostly unpredictable. Therefore, highly efficient methods are required for the *in-situ* restoration of water quality. Several methods have been applied over the years to mitigate cyano-HABs with varying efficiencies. Current trends ask for more environmentally friendly approaches to be implemented in order to safeguard the overall aquatic ecosystems and reduce treatment costs. Hydrogen peroxide is currently being used as an emerging chemical alternative to copper algicides. Even though its broad application showed high efficiency on mitigating dense blooms, the required H<sub>2</sub>O<sub>2</sub> doses for each case and treatment application differ, and in some instances high doses were applied with undesirable side effects on the entire lake ecosystem. Herein, calcium peroxide granules were utilized due to their slow H<sub>2</sub>O<sub>2</sub> releasing properties, which simulate multiple liquid H<sub>2</sub>O<sub>2</sub> doses. Specifically, granules were used in surface waters spiked with *Microcystis*, *Aphanizomenon*, and *Cylindrospermopsis* sp. and in actual water samples during blooming.