Algal bloom: A Threat to the Environment – Control Strategies using a Non-oxidizing Agent

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Rationale

- In the recent years, unfettered growth of algae in sources water have resulted in serious challenges for water utilities. Oxidizing chemical agents have been traditionally used for controlling waterborne pathogens and invasive biological agents such as mussels/snails and algae. However, use of oxidizing chemical comes with their caveats such as disinfection by-products.

Objectives

- The main objective of this study is to evaluate the efficacy of a non-oxidizing biocide for controlling algae. We are evaluating a formulation which is based on a polyhexanide polymer.

Approach

- Bench scale experiment performed to test the efficacy of polyhexanide based polymer for controlling blue green algae and green algae. Experiments planned by considering the following variables
  - Different concentrations of polymer
  - Efficacy determination after different exposure time

Key Deliverables

- Study will bridge the knowledge gaps on the effectiveness and applicability of non-oxidizing biocides for controlling fresh water algae.

Key Findings

- After 12 hour exposure to 0.05% PHMGH, only 4.4% of green algae and 52% of cyanobacteria were viable. Whereas after 48 hour exposure 99.4% green algae and 99.99% Cyanobacteria were killed.
- The biocidal effect is long lasting under the laboratory conditions.
- The PHGMH spiked at 0.05% concentration continued to fully inactivate new population of green algae entering the reactor for a minimum of 3 weeks.
- The product has the applicability for controlling algal growth.
- The product has shown potential as surface disinfectant, which need further investigation of its inefficacy under different application scenarios.

Budget Requested: to continue the experiments and apply the non-oxidizing agent for algal bloom treatment in open water.

- $27,000

Project Duration

- January 2018 – December 2018