

## A persistent algal bloom from a tropical eutrophic reservoir

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### Abstract

Algal bloom have known to cause water quality threats to lakes and reservoirs worldwide. Studies focus on temperate regions but scarce in tropical countries. Algal bloom from Semberong reservoir, Malaysia, a shallow eutrophic reservoir was characterized in 2012 and associated to physico-chemical parameters. Findings showed that a filamentous cyanobacteria, *Aphanizomenon* sp. dominated this reservoir with densities up to  $2.8 \times 10^6$  cells/mL, beyond the World Health Organization Alert Level 2 ( $1 \times 10^5$  cells/mL), leading to concerns of contaminated drinking water. Temperatures at the surface was 28.1 to 31.7°C, with low variation between the surface and the bottom layers (3 to 4°C). In the day, pH and DO was higher at the surface from the release of oxygen during photosynthesis by algae, while at night, pH and DO reduced as algae and aquatic species respire and produce carbon dioxide. As DO reduces with depth, pH gets acidic. Therefore a good correlation between pH and DO concentrations was discovered. Nevertheless pH and DO were both poorly correlated with cyanobacteria density as pH and DO were both influenced by water quality and hydrodynamic factors. Cyanobacteria density and turbidity had only moderate correlation, as turbidity is also influenced by a mix of organics other than algae. High nutrient (TN, TP and  $\text{NO}_3^-$ ) concentrations occurred at reservoir, despite that TN and TP had low negative correlation with cyanobacterial density as cyanobacteria was homogeneously distributed throughout the depth of the reservoir. Remediation should therefore, directly suppress the algae regardless of the nutrient levels.

**Keywords:** algal bloom, cyanobacteria, eutrophic, reservoir, tropical