# Evaluating the Detrimental Effects of Mask Leachates on the Growth of Anabaena Cyanobacterium Through Spectrometry and Chlorophyll Analysis

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Cyanobacteria are one of the most primitive organisms to exist on Earth, catalyzing the shift in Earth's atmosphere from carbon dioxide rich to oxygen rich. Cyanobacteria are able to perform photosynthesis, and although small in size, cyanobacteria play a critical role in marine ecosystems by composing the foundation of the marine food chain, fixing nitrogen, and providing nutrients, biologically-active compounds, and vitamins supporting the diversity and prosperity of the marine ecosystem. With the COVID-19 pandemic, the use of disposable plastic face masks became prolific. Poor management of wastes and disposal protocols led to pollution of plastics in bodies of water. When submerged in water and agitated, disposable plastic masks leach out high concentrations of heavy metals and microplastics, referred to as "mask leachates". In this study, cyanobacteria was grown in varying concentrations of mask leachates to determine the effect on its growth. To evaluate growth, daily absorbance values at 440 nm were recorded on a spectrometer, and chlorophyll concentrations were analyzed. Results showed that cyanobacteria exposed to high concentrations of mask leachates had significantly lower rates of change in absorbance values, total change in absorbance values, and chlorophyll concentration. Therefore, mask leachates have a detrimental effect on cyanobacteria by inhibiting its growth. Such a consequence can cause a disturbance and imbalance in the entire ecosystem. Thus, it is imperative to develop proper disposal infrastructure and encourage the widespread use of environmentally-friendly face masks.

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