

**Title :** Cultivation of Microalgae in Nitric Acid-Containing Medium to Assess Their Potential for Nitrogen Oxide (NO<sub>x</sub>) Reduction

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## ABSTRACT

Nitrogen oxides (NO<sub>x</sub>) aquatic environments pose a significant threat to ecosystem stability. Microalgae are promising candidates for water quality assessment and bioremediation due to their ability to assimilate nitrogen compounds. However, direct experimentation with NO<sub>x</sub> gas is limited due to its toxicity and complex regulatory constraints. When NO<sub>x</sub> dissolves in water, it generates nitric acid, which serves as a proxy for studying the effects of NO<sub>x</sub> contamination. This research investigates the effects of nitric acid, as a dissolved form of NO<sub>x</sub>, on the growth of two microalgae species, *Chlorella* sp. AARLG049 and *Desmodesmus* sp. AARLG101, to evaluate their potential for NO<sub>x</sub> reduction. The algae were cultivated in media containing nitric acid at concentrations of 14, 1.4, and 0.14 mM for 14 days. Growth dynamics was monitored by measuring absorbance at regular intervals (days 0, 2, 4, 6, 8, 10, 12, and 14) and dry weight on days 0 and 14. The study found that nitric acid concentration significantly influenced algal growth. *Chlorella* sp. AARLG049 exhibited a higher growth rate than *Desmodesmus* sp. AARLG101, particularly from days 8 onward, as evidenced by greater absorbance and dry weight values. At a concentration of 14 mM, both species exhibited significant reduction in growth, whereas at 1.4 and 0.14 mM, growth remained stable. These findings indicate that nitrogen availability in the form of nitric acid directly affects microalgal growth, with potential implications for water quality management and the development of microalgae-based NO<sub>x</sub> mitigation strategies.

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