



GROWTH AND CHLOROPHYLL-A RESPONSES OF TWO CYANOBACTERIA TO VARYING LIGHT INTENSITY AND PH

Elizabeth Abdulmalik¹, Zubeidat Precious Ahmed¹, Mathias Ahii Chia²

¹Postgraduate Program in Ecology, University of São Paulo, SP, Brazil

²Department of Ecology, University of São Paulo, SP, Brazil

E-mail: alizzie@usp.br

Cyanobacterial blooms and eutrophication have increased globally due to climate change. These blooms are highly influenced by environmental factors such as light intensity and pH. This study investigated the effects of different light intensities and pH on the growth and chlorophyll-a of *Microcystis aeruginosa* and *Sphaerospermopsis aphanizomenoides*. The experiment was carried out for 7 days; cultures were grown in ASM-1 medium in 30 ml glass tubes. The cultures were exposed to high light ($90 \mu\text{mol m}^{-2} \text{s}^{-1}$), low light ($10 \mu\text{mol m}^{-2} \text{s}^{-1}$), pH 6.5 (acidic), pH 10 (highly alkaline), and their combinations (high light & pH 6.5, high light & pH 10, low light & pH 6.5, and low light & pH 10) with control conditions at normal light ($30 \mu\text{mol m}^{-2} \text{s}^{-1}$) and neutral pH 7. Cell density was monitored daily, and chlorophyll-a content was measured on days 1, 3, 5, and 7. The results showed that *M. aeruginosa* and *S. aphanizomenoides* responded to growth and chlorophyll-a similarly on treatment basis, exhibiting higher cell density and chlorophyll in acidic conditions (pH 6.5) and decreased responses in highly alkaline conditions (pH 10) across all light intensities. However, both species reacted to only light intensity differently. Generally, *S. aphanizomenoides* showed more tolerance to stress, exhibiting higher final cell densities and chlorophyll-a content than *M. aeruginosa* in most of the treatments. These findings provide introductory insights on cyanobacteria species-specific responses to light and pH at varying levels, while informing future studies on how these environmental factors affect cyanobacteria bloom and toxin production.

Palavras-chave: Cyanobacteria; Light intensity; pH; *Microcystis aeruginosa*; *Sphaerospermopsis aphanizomenoides*