The Effect of Artificial Light at Night on Anabaena and Microcystis Growth

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Artificial light at night (ALAN) has been a growing environmental concern. In Northwest Ohio, commercial greenhouses and human development near recreational bodies of water, such as Lake Erie, have led to increasing light pollution. Two algal species, Anabaena and Microcystis, are known contributors to harmful algal blooms in the Great Lakes. In this experiment, these two species were grown under incandescent, LED warm, and LED cool lights. Specimens received 12 hours of fluorescent light in addition to their assigned variable condition. Spectrophotometric data of the biomass density was measured for six weeks. The first hypothesis was that both species of algae would show increased growth rates when exposed to the three ALAN trials compared to the dark control. This hypothesis was partially supported. Microcystis trials showed significantly greater growth from the dark control in weeks three through five for both incandescent and LED cool light (p-values ranging from .0060 to .0280). For Anabaena, there was a difference between the LED cool trials showing significantly more growth than the control for weeks two (p=.0365), four (p=.0172) and five (p=.0151). The second hypothesis that the LED trials would show a significantly increased rate of growth when compared to the incandescent trials was not supported. The results of this study support the need for continued investigations on the effect of artificial light at night as a potentially contributing factor in algal growth.

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