Effects of LED Light Sources on Ammonia Removal from Water by Photosynthetic Bacteria.

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ABSTRACT

The rapid development of optoelectronic technology since mid-1980 has signi?cantly enhanced the brightness and ef?ciency of light-emitting diodes (LEDs). Light-emitting diodes (LEDs) provide a useful alternative for illuminating photobioreactors (PBR) because they have a long life expectancy and consume low energy. Additionally LED light is characterized by its narrow wavelength band, wherein LED lamps can be tailored for a specific wavelength band to match the photosynthetic absorption spectra of Photosynthetic bacteria (PSB). This study investigated the effects of five light sources on growth and NH4+-N removal of photosynthetic bacteria. Light sources were incandescent lamp (IL) and light-emitting diodes (LEDs) of white (LW), red (LR), blue (LB), and green (LG). Dark condition served as the control. For bacterial growth, light sources ranked greatest to least bacterial growth effect were LG > LW > IL > LR > LB > Dark. Additionally, The results showed that RL and BL can promote PSB on efficiency of NH4+-N remvoal，achieve approaching 100% in the aeration area.

Keywords : Ammonia、Nitrification、Photosynthetic Bacteria、Light-emitting diode

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