New aspects of microalgae-based wastewater treatment

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ABSTRACT:

Microalgae-based wastewater treatment has been an emerging technology that is well suited for the treatment of livestock wastewaters. In addition, some industrial wastewater can also be treated with microalgae-based system at a high efficiency. Specific mixotrophic microalgae are able to grow on varieties of wastewater with the capacity of COD reduction and nutrients (N and P) removal. The strength of using microalgae for wastewater treatment mainly relies on their excellent ability to remove N and P from wastewater even in the absence of COD. For the wastewaters containing high content of antibiotics or other micro-pollutants, microalgae-based treatment could be more effective than the conventional bacteria-based activated sludge systems. The microalgal biomass produced during wastewater treatment could be utilized as biofuels, fertilizers or animal/aquacultural feeds after appropriate pre-treatments to gain additional benefits through biorefinery and circular economy concepts. In this speech, the performance and characteristics of using microalgae to treat a variety of wastewaters will be presented. The feasibility and challenges of the microalgae-based wastewater treatment will be discussed. Finally, new aspects of using microalgae to treat wastewater will be addressed.

KEYWORDS:

Microalgae; Wastewater treatment; Mixotrophic growth; Nutrient removal; Biorefinery