

عنوان مقاله:

Effect of α -Fe γ O γ nanoparticle supplementation on Chlorella Sorokiniana performance: wastewater bioremediation capability and gene expression

محل انتشار:

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خلاصه مقاله:

Microalgae have been receiving growing attention for bioremediation of wastewater due to their multi-applications of CO γ bio-fixation, high value bio-products generation and biofuel production. In this study, we investigated the impact of α -Fe γ O γ nanoparticles (NPs) addition to real municipal wastewater (RMWW) on bioremediation ability of Chlorella sorokiniana. According to the results, ۱۰ mg/L of α -Fe γ O γ NPs increased the maximum biomass concentrations and productivity of C. sorokiniana from ۱ to ۱.۲۷ g/L and from ۰.۱۸ (at day ۴) to ۰.۳۳ (at day ۳) m/g/d, respectively. It was observed that the nutrients uptake ability of C. sorokiniana cells was also improved approximately ۱۰% by RWMM pre-treatment with ۱۰ mg/L after α -Fe γ O γ nanoparticles. The gene analysis revealed that the expression of rbcL and rccD genes were increased after α -Fe γ O γ nanoparticles supplementation. These genes are well known for lipid production and photosynthetic activities suggesting better nutrient consumptions by the microalgal cells through Calvin cycle. Our finding suggested that wastewater supplementation with α -Fe γ O γ NPs can significantly improve C. sorokiniana performance in particular bioremediation ability of microalgae.

کلمات کلیدی:

Microalgae; Wastewater, Bioremediation, gene expression

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