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## An Eco-Friendly Harvesting of Microalgae Using Combination of Microbial Flocculant and Chitosan in Simulated Eutrophic Water

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### Abstract

Cyanobacteria usually occurred in eutrophic waters, but the harvesting of microalgal biomass by flocculation was still facing a major technological and economic challenge. In order to solve this problem, the combination of microbial flocculant (MBF) and chitosan was used to flocculate the biomass of *Microcystis aeruginosa*. The addition sequence of MBF and chitosan had an important influence on flocculation, and the best flocculation method was as follow: MBF (5 mL/L) was added firstly into algal culture, then the chitosan (30 mg/L) was added, MBF (5 mL/L) was added again at last. In this way, all the algal cells aggregated together, and the algal flocs floated on the surface of solution and the algal flocs could be harvested by net (0.15 mm) easily, which exhibited the highest separation efficiency of 98.33 %, the lowest total phosphorus of 0.74 mg/L and neutral pH (6.61) of supernatant. Zeta potential measurement confirmed the flocculation mechanism was charge neutralization. Microscopic observation revealed that some bubbles attached to the algal flocs which increased buoyancy of flocs. Some advantages above proved that combination of chitosan and MBF was a promising technology to harvest cyanobacteria.

**Keywords:** *Microcystis aeruginosa*; microbial flocculant; chitosan; flocculation; zeta potential