High effective harvesting of microalgae Chlorella prothotocoides via flocculation with cationic starch

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High effective harvesting of microalgae *Chlorella protothecoides* via flocculation with cationic starch

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**Introduction**

Microalgal harvesting step accounts up to 30% of the total cost of biomass production. The aim of the study was to investigate the effect of an organic polymeric flocculant, Greenfloc 120, to flocculate microalgal species *Chlorella protothecoides*. Effect of pH on the flocculation process under optimal flocculant level was also investigated.

**Materials and Methods**

Flocculation efficiency (FE) was calculated as:

\[
FE (\%) = \frac{OD_{550}(t_0) - OD_{550}(t)}{OD_{550}(t_0)} \times 100
\]

where:

- \(OD_{550}(t_0)\): OD550 before flocculant addition
- \(OD_{550}(t)\): OD550 after flocculant addition

**Results**

**Conclusions**

This study demonstrated Greenfloc 120 as a promising agent for flocculation of *Chlorella protothecoides* at neutral and high pH. It can be concluded that:

- 40 mg flocculant/L: optimal level (FE> 80%) for biomass concentrations 0.44-0.72 g/L
- 80 mg flocculant/L: optimal level (FE> 80%) for biomass concentration 0.78 g/L

The best results were obtained at:

- pH 10 (FE=60-73%) in absence of flocculant
- pH 7.7 and pH 10 (FE=91-98%) in presence of flocculant (40 mg/L)

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