

NITROGEN AND PHOSPHORUS REMOVAL FROM WASTEWATER BY MICROALGAE CULTIVATION

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Microalgae culture appears to be a feasible way to remove from wastewaters nitrogen and phosphorous, which are responsible for eutrophication. Cultivation of photosynthetic microorganisms on treated effluents can be a cheap process for the production of high value proteins for animal feeding and compounds of pharmaceutical interest. Various systems have been investigated to improve the effectiveness and economic feasibility of such a biotreatment. Additional advantages of this technology are: lack of environmental danger, oxygen release, ability to remove heavy metals and xenobiotic compounds, secondary pollution reduction. The actual possibility of using *Spirulina platensis* for nitrogen and phosphorus removals is investigated. Although nitrate is conventionally employed, the use of cheaper sources like urea or ammonium salts, which are abundant in wastewater, is attractive from both the economic and the environmental viewpoints. Urea, which is a residue from metabolic activity, would offer an energetic gain, due to its spontaneous hydrolysis to ammonia under alkaline conditions. Since the microorganism needs the energy consuming reduction of nitrate to ammonia, the microalga prefers to use reduced nitrogen, which however is toxic at high concentrations. The fed-batch addition of reduced nitrogen has recently been shown to prevent its inhibition on *S. platensis* growth, therefore this operation has been selected in this study.