

STUDY ON THE CULTIVATION OF *SPIRULINA* IN WASTEWATERS TO SIMULTANEOUSLY REMOVE POLLUTANTS AND HARVEST PROTEIN-RICH ALGAL BIOMASS.

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Spirulina is a blue-green algae which is rich protein. Currently, it has been commercial cultivation all over the world to supply for human diet supplements, pharmaceuticals or cosmetics. Beside that, cultivating *Spirulina* in wastewater help to reduce production cost and reuse high concentration of Nitrogen and Phosphorus for algal biomass production, simultaneously reducing the cost of wastewater treatment. This process has produced protein-rich biomass which could be used in many applications and fields, such as for animal feed, agricultural fertilizer, bioplastic or biofuel feedstock. The study aims to optimize conditions of *Spirulina* cultivation in wastewater for enhancing algal biomass productivity, improving protein-rich biomass and simultaneously reducing pollutants in wastewater. In this study, wastewaters were rice wine stillage and swine waste with high N and P content. Factors included nutrient ratios, light intensity and temperature which affected the development of *Spirulina* in two types of wastewater will be investigated. The N:P and C:N:P ratio of wastewater mediums will be determined to maximize algae growth. The preliminary results show that the highest biomass yield (i.e. 1.8 g/l) was achieved in the mixed wastewater with a N:P molar ratio of 20/1. Consequently, removal efficiency of NH_4^+ , PO_4^{3-} and NO_3^- were 97.5%, 86.6% and 98.8% respectively. The study is going to examine the ratio of C:N:P, the effects of temperature, light intensity and spectrum on the biomass productivity of *Spirulina* and induce protein accumulation, concomitantly determine the removal efficiencies of pollutants.

Key words: *Spirulina*, protein-rich biomass, pollutant removal, wastewater treatment, reuse nitrogen