

4037175 SCEB/M : MAJOR ENVIRONMENTAL BIOLOGY;
M. Sc. (ENVIRONMENTAL BIOLOGY)

KEY WORDS : ARSENIC REMOVAL/ ALGAE/ *Chlorella sp.*

PIRALADA BUNNAG : REMOVAL OF ARSENIC FROM WATER BY
USING FRESHWATER ALGAE. THESIS ADVISORS : PORNSAWAN
VISOOTTIVISETH, Ph.D., JUWADEE SHIOWATANA, Ph.D., YAWALAK
AMPORNRAT, M.Sc., ANONG PAIJITPRAPAPON, M.Sc. 134 P. ISBN 974-664-
054-2

Alga is reported as a valuable tool for removing metals from polluted water. In this study alga is used to remove arsenic from water. Among the algae obtained from arsenic polluted water in Ron Phibun district, Nakhon Si Thammarat province, the green alga *Chlorella sp.* exhibited the best arsenic (As(V)) tolerant ability. It could survive at 500 mg l⁻¹ As(V). The growth of the alga was not affected by As(V) in the medium up to the level of 50 mg l⁻¹. The capacity of As(V) removal by the isolated *Chlorella sp.* was investigated. Approximately 35% As(V) was removed within the 1st day of exposure. The As(V) removal by the isolated *Chlorella sp.* was caused by accumulation of arsenic in the cell. The arsenic accumulated in the cell was directly proportional to the As(V) level in the medium. The higher the As(V) levels in the medium, the higher the arsenic accumulation in the cell. Heat-killed cells did not possess the ability to accumulate arsenic. Factors which were involved in removal and accumulation of As(V) by the isolated *Chlorella sp.* were algal cell concentrations, growth stages of the algae, pH, and phosphate concentrations of the medium. The removal and accumulation was best when using small amounts of cells whose growth was at the middle of the exponential stage. The optimum pH observed was at 5-7. The removal efficiency of the algae was inversely proportional to the concentration of phosphate in the medium. The As(V) removal capacities of the free and immobilized cells of the isolated *Chlorella sp.* were compared. The removal efficiency of the immobilized cells was directly proportional to both cell concentration and exposure time. This was opposite to the free cells which showed inverse relationship after day 1.