

APPLICABILITY OF BROWN SEAWEED SPECIES

(Sargassum crassifolium) **FOR TREATING LOBSTER**

FARM WASTE WATER



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by

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ABSTRACT

Waste water generation in aquaculture farms, including all lobster culture practices are a serious issue in the industry. The present study was carried out at lobster farm located at Northern Province in Sri Lanka. Approximately 756,000 L of waste water is generated on this farm annually and discharges waste water without proper treatments to the natural environment. The waste water discharged from the lobster farm consists of organic and inorganic chemical components that can be caused potential environmental problems. Present study focused on investigate applicability of Brown seaweed, *Sargassum crassifolium* biomass to efficient removal of nutrients from the lobster farm waste water. The *S. crassifolium* abundant in Northern Province, Sri Lanka. Seaweed biomass optimization was performed by three different seaweed biomasses, viz., 20 g, 30 g and 40 g and then 20 g (1 g L^{-1}) identified as the efficient seaweed biomass. Initial physicochemical parameters of the waste water pH, Temperature, Salinity, Dissolved Oxygen, Biological Oxygen Demand, Ammonia, Nitrite, Nitrate and Phosphate were analyzed using the standard methods. Then collected waste waters were transferred to six glass tanks of 50 L capacity each. The seaweed was used at 1 g L^{-1} density in each tank except in the control tank. Three replicates were used. Ammonia, Nitrite, Nitrate and Phosphate were analyzed once in three days from beginning to the end of the treatment period (28 days) to investigate the initial waste water final qualities and quality changes after Phycoremediation. Final quality of Waste water, physiochemical parameters pH (7.4), Temperature (29°C), Salinity (36 ppt), Dissolved Oxygen (5.74 mg L^{-1}), Biological Oxygen Demand (95 mg L^{-1}). *S. crassifolium* removed $1.194 \pm 0.34 \text{ mg L}^{-1}$ of Ammonia, $0.129 \pm 0.03 \text{ mg L}^{-1}$, of Nitrite, $0.147 \pm 0.04 \text{ mg L}^{-1}$ of Nitrate and $2.40 \pm 0.72 \text{ mg L}^{-1}$ of Phosphate. Nutrient removal amounts were significantly differed ($P < 0.05$) between control and after seaweed treatment. The weight gains of *S. crassifolium* during the study period was 8.7 g of biomass of *S. crassifolium*. Thus, the seaweed has been utilized the nutrients present in the discharged waste waters. The results of the study concluded that the nitrogen and phosphorus in the lobster farm waste waters, can be effectively removed through *S. crassifolium*.

Keywords: Lobster, *Sargassum crassifolium*, Seaweed, Phycoremediation.