

Treatment of industrial wastewater in Gebeng Area, Kuantan Pahang using Phytogreen System

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ABSTRACT

Malaysia is a vast developing country that partly relies on its oil and gas sector industries for economic growth. However, rapid industrialization has resulted in production of massive amount of wastewater daily that may contain heavy metals and other contaminants. Phytoremediation is a promising technology and reliable method that uses plants to degrade, assimilate, metabolize, or detoxify contaminant. The objectives of this study are to identify the potential of aquatic plant and the percentage of contaminant removal in treating industrial wastewater via phytogreen system. Three aquatic plants were use in this study; *Eichhornia crassipes* sp., *Pistia statiotes* sp. and *Landoltai punctata* sp. Sampling method was carried out once for every 3 days and continues for 7 weeks period. Overall, 12 parameters are used to measure the effectiveness of phytoremediation process which are; BOD, COD, DO, pH, Turbidity, Cadmium, Zinc, Iron, Cooper, Lead, Nitrate and Chromium. Analysis of data was performed by using 1-way ANOVA .The significant ANOVA ($p < 0.05$) studies shown the difference in values of the monitored 12 parameters which indicate the data obtained is accurate. The percentage removal of organic and inorganic pollutant in wastewater is also successfully determined; all three plants have 100% potential removal of Nitrate, Lead, Chromium, and Cadmium metal. Dotted Duckweed has 96.98% potential in removal of Iron metal, and 98.90% iron removal for Water Hyacinth. Water Lettuce proven high percentage of removal for BOD, 57.80% and decrement of pH value of 41.93%. In the end of this research; it is proven that all three plants are potential aquatic plant in treating Petrochemical wastewater through phytoremediation process. Consequently, the result of this study is being used to establish the basic element for designing a suitable wastewater treatment to promote sustainable management and reduce water pollution.

Keywords: Treatment; Wastewater; Phytoremediation; Effluent; Industrial area; Phytogreen system

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