AN INVESTIGATIVE STUDY ON THE USE OF DRAGON FRUIT FOLIAGE AS NATURAL COAGULANT TO TREAT WASTEWATER FROM ELECTRICAL CABLE MANUFACTURING PLANT

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ABSTRACT

The potential of the dragon fruit foliage (DFF) as bio-coagulant to treat wastewater from electrical cable factory was investigated. Dragon fruit foliage represents as a part of the overall dragon fruit plant system. The study used a Jar test experiment to investigate the three main parameters which were chemical oxygen demand (COD), suspended solids (SS), and turbidity in copper electrical cable industry wastewater. The experiment was performed by varying the pH, with fixed dosage of coagulant to find optimum pH and varying the dosage of coagulant with fixed pH to find optimum dosage of coagulant. The highest recorded percentage removals of COD, SS and turbidity observed for optimum pH 2 and optimum dosage at 100 were mg/L 94.53, 89.413 and 88.59%, respectively. It is proven that dragon fruit foliage has tremendous potential in treating copper electrical cable wastewater. Therefore, the dragon fruit foliage can be used in the wastewater treatment of Malaysian electrical cable manufacture industry.

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CHAPTER 1

INTRODUCTION

1.0 Project Overview

In recent years, the electrical cable industry has incredibly developed as the importance of most technologies introduced to the world. This study investigates the ability of the dragon fruit foliage bio-coagulant to treat wastewater from electrical cable manufacturing plant as substitute to the chemical based coagulant. The study compares the behaviour of common characteristics of the raw electrical cable wastewater. The study also describes the effectiveness of the dragon fruit foliage as natural based coagulant to treat other wastewaters based on the previous studies. The increase in acidity of wastewater enhances removal efficiency of the contaminants. The study uses the Jar test experiment as a treatment method to reduce the COD, TSS and turbidity in electrical cable wastewater.

1.1 Research Background

In recent years, the pollution and waste have abundantly grown in our environment. Through analysis, the population growth, increased economic activity and industrialisation have created various contaminants in water. The security of water in the country has become main concern to government, society, and nation. The increment to the downgraded water resources in the country is because of over exploitation, poor management and ecological degradation. The contaminant is drained directly to the lake, rivers and sea. Thus, the water resource is not safe to be consumed.

Instead of that, the increase in the water pollution also caused by the wastewater generated by the urban industries such as chemical plant industries, electrical industries and food industries has led to the environmental and health problems. Electrical cable