

## **Evaluation of toxicity effect of palm oil mill effluent final discharge by using *Daphnia magna***

### **ABSTRACT**

Palm Oil Mill Effluent (POME) final discharge has a risk to the ecosystem due to various harmful contaminants including organic and inorganic materials. In this study, biological monitoring method was used to evaluate the toxicity effects of POME final discharge using *Daphnia magna*. The physical and chemical nature of toxicants present in the effluent were characterized through acute Whole Effluent Toxicity (WET), and Toxicity Identification Evaluation (TIE) tests. The Toxicity Unit (TU) and median lethal concentration (LC50) of the POME sample were 11.09 and 9.02% (v/v) respectively. From TIE test, the toxicants present in the effluent can be characterized as filterable and oxidisable through filtration and aeration treatment. The presence of cationic metals, chlorine and disinfection by-products were also determined by the toxicity reduction of the effluent after treatment using ethylenediaminetetraacetic acid (EDTA) and sodium thiosulphate. From TIE test, the filtration treatment at pH 10 of the POME final discharge was the most effective method in reducing the toxicity of the effluent with a value of TU, 1.16 and LC50, 86.34% (v/v). It is recommended that biological tests using *Daphnia magna* can be made as potential methods to indicate the effects of POME final discharge to the aquatic ecosystem.

**Keyword:** Nitrogen fixing bacteria; Plant growth promotion; Biosorption; Phytohormones; Heavy metals