

**EVALUATION OF DESIGNED GREYWATER FILTRATION SYSTEM
WITH TREATMENT COMPONENT USING *Moringa*
oleifera SEED POWDER**

CHARISSE B. DE MANUEL

**THESIS SUBMITTED TO THE FACULTY OF INSTITUTE OF
COMPUTING ENGINEERING AND TECHNOLOGY,
DAVAO DEL SUR STATE COLLEGE, MATTI,
DIGOS CITY IN PARTIAL FULFILLMENT
OF THE REQUIREMENT FOR
THE DEGREE OF**

**BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS
ENGINEERING**

JUNE 2024

ABSTRACT

DE MANUEL, CHARISSE B. Davao del Sur State College (DSSC) Institute of Computing, Engineering and Technology, Mati, Digos City. June 2024. **"EVALUATION OF DESIGNED GREYWATER FILTRATION SYSTEM WITH TREATMENT COMPONENT USING *Moringa oleifera* SEED POWDER"**, Undergraduate Thesis.

Adviser: Engr. Ryan Art M. Tuling, EnP

The study on the "Evaluation of Designed Filtration System with Treatment Component Using *Moringa oleifera* Seed Powder" was conducted last February – April 2024 at Sinaragan, Matanao, Davao del Sur.

A Completely Randomized Design (CRD) was used in the study. There were three treatments: T1 – 5mL/L MO seed powder stock solution, T2 – 7.5 mL/L MO seed powder stock solution, and T3 – 10 mL/L MOS seed powder stock solution, which were replicated three times. The performance of the combined grease trap, biosand filter, and *Moringa oleifera* seeds greywater filtration system was assessed based on the biochemical oxygen demand (BOD), total suspended solids (TSS), electrical conductivity (EC), and pH of the treated greywater.

The filtration system, utilizing various MOSP dosages as a treatment component, effectively enhanced wastewater quality. The results indicated

that varying the MOSP dosage significantly affected the system's performance regarding Electrical Conductivity (EC). Analysis using the Least Significant Difference (LSD) test revealed that the greywater produced by using the developed filtration system with the application of T1 notably differed from that applied with T3, with treated greywater applied with T1 achieving the lowest EC, reducing the untreated greywater's EC by 14.78%. The developed system also contributed to substantial reductions in Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS) of greywater, achieving reductions of 73.65% to 80.68% and 86.17% to 87.88%, respectively. The system was also able to maintain the pH of treated greywater at neutral level. Treatment of greywater in the developed filtration system applied with different levels of MOSP at 5 ml/L, 7.5 ml/L, and 10 ml/L can produce a similar reduction effect in BOD, TSS, and pH levels.

The system was able to reduce BOD, TSS, and EC, and retained neutral pH of treated greywater, meeting regulatory standards set by DAO 2016-08 and PAES 232:2017, confirming its overall effectiveness in treating greywater.

Keywords: *Water quality, greywater treatment, biocoagulant, filtration system, wastewater reuse*