



**SUBMISSION FOR EVALUATION  
FINAL YEAR PROJECT 2 - RESEARCH PROJECT**

{ EXPLORING HIDDEN VITALITY: POTENTIAL OF SPENT COFFEE GROUND  
(SCG) TOWARDS BIJING GRASS (*MURDANNIA LORIFORMIS*) GROWTH  
PERFORMANCE)

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GROUND (SCG) TOWARDS BEIJING  
GRASS (*MURDANNIA LORIFORMIS*)  
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## ABSTRACT

### **EXPLORING HIDDEN VITALITY: POTENTIAL OF SPENT COFFEE GROUND (SCG) TOWARDS BEIJING GRASS (*MURDANNIA LORIFORMIS*) GROWTH PERFORMANCE**

Beijing grass (*Murdannia loriformis*) is a medicinal plant known for its high content of bioactive compounds, with potential anticancer and anti-inflammatory properties, particularly for treating psoriasis and eczema. However, the importance of phytochemical content of this plant has been underexplored. Appropriate growing medium has seen to be very important in enhancing the growth performance of Beijing grass by using soilless system. Spent coffee ground (SCG) has recently emerged as a promising organic amendment due to its nutrient-rich nature. In this study, five treatment media were prepared: T1 (100% cocopeat, control), T2 (25% RSCG:75% cocopeat), T3 (50% RSCG:50% cocopeat), T4 (25% CSCG:75% cocopeat), and T5 (50% CSCG:50% cocopeat). Mineral composition was determined using Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES), while plant growth was assessed by measuring leaf number and length. Phytochemical evaluation involved Fourier Transform Infrared Spectroscopy (FTIR), Total Phenolic Content (TPC), and Total Flavonoid Content (TFC). The results of ICP-OES revealed that potassium (K) at 147.7 mg/L and magnesium (Mg) at 93.1 mg/L in the RSCG sample are higher compared to the CSCG sample. The thermal treatment of CSCG enhanced nutrient concentration due to organic matter reduction. Among all treatments, T5 significantly improved plant growth, achieving 233.3% and 569.23% increases in leaf number and length, respectively, within 33 days. These findings suggest that the CSCG treatment shows the most effectiveness towards the growth performance of Beijing grass, as it enhances the nutrient contents and bioactive compounds. FTIR analysis confirmed higher metabolic activity in T5, with sharper peaks indicating stronger presence of O–H, C–H, C=O, and C–O functional groups. The phenolic and flavonoid content of T5 was higher in comparison with other treatments. T5 also showed the highest Total Phenolic Content ( $33.57 \pm 0.24$  mg GAE/g) and Total Flavonoid Content ( $5.17 \pm 0.11$  mg QE/g), confirming enhanced bioactive compound accumulation due to CSCG that has undergone carbonization. In conclusion, the CSCG nutrient compounds were successfully analyzed. In addition, the plant growth of Beijing grass was monitored and showed significant results on number of leaves and the analyses of bioactive compounds of Beijing grass were successfully conducted. This study highlights the sustainable use of agricultural waste and supports SDG 15 (Land of Life) by promoting land degradation neutrality and ecosystem conservation.

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