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Effective Utilization of Marine Fish Industrial Processing Waste Through Co-composting Method for Producing Organic Soil Input †

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Abstract: Marine fish processing industries located in the urban region involves fish processing activities that generate a considerable amount of leftover biological residues such as solid wastes and protein-rich effluents, which are ineffectively discarded in water bodies and landfills affecting the coastal environment. The present study involves the biological treatment of industrial fish processing wastes through the co-composting method to convert the fish wastes into organic input. Fish wastes were mixed with rice husk as a bulking agent and allowed for organic matter stabilization through the co-composting process. The maturity of the co-compost was evaluated by spectroscopic techniques, nutrient analysis, and seed germination assay. UV-vis spectroscopic analysis revealed the presence of absorbance between 250 and 300 nm indicating the characteristics of increased concentration of aromatic compounds. The humification index (E_4/E_6) was calculated to be 1.2, which signified the characteristics of humified materials. Conventional fluorescence spectroscopic analysis detected emission spectra centered at 448 nm due to the development of aromatic structures as a result of increasing the humification process in the co-compost. The well-composted organic matter was found to contain macronutrients (N-1.35%; P-1.02%; K-0.51%) and micronutrients (Zn-74.07 mg/kg; Cu-16.37 mg/kg; Fe-176.07 mg/kg) respectively. Further, seed germination sassay showed growth promotion effects of the co-compost in seeds of *Vigna radiata; Vigna mungo and Trigonella foenum-graecum*, which confirmed the stability of the organic matter. The findings of the study conclude that the co-composting process of fish industrial processing wastes using rice husk could offer effective conversion of fish waste into organic co-compost for soil application.

Keywords: Fish waste; Co-compost; Humification index; Spectroscopy; Seed germination assay; organic input.

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Conflicts of Interest

The authors declare no conflict of interest.