

Abstract

Agro-industrial wastes pose great economic and environmental hazards, while the economic success of aquaculture is threatened by the unsustainability of fishmeal use. The aims of the present study were to bio-convert agro-industrial wastes through vermicomposting, and then evaluate the potential of the by-products in promoting aquaculture nutrition. Coffee husks (CH), barley wastes (BW), and kitchen wastes (KW) were pre-composted and inoculated with earthworms, *Eisenia fetida*, and then vermicomposted for 70 days under a controlled environment. The vermicomposting by-products, *i.e.*, earthworms and vermicast, were amalgamated in the ratio of 1:5 into bedding and then analyzed. There were neither earthworm mortalities nor significant difference ($P>0.05$) in cocoons produced by *E. fetid* in all treatments. The earthworms grown in KW attained the highest average weight gain of 27.8 ± 0.7 g, followed by CH (24.9 ± 0.6 g) and BW (24.8 ± 0.7 g). Earthworms grown in CH and BW had significantly higher ($P<0.05$) nutritional attributes. All experimental wastes produced vermicast with carbon and nitrogen ratios within the preferred agronomic limit of 20. The nutritional profile of the BW bedding was comparable with that of *Caridina nilotica* meal and was within the recommended dietary requirements of fish. The wastes can be bio-converted through vermicomposting into various forms appropriate for providing aquaculture nutrition.