

RESEARCH PAPER:

Ex situ bioconversion of coir waste (*Cocos nucifera*) predigested with *Pleurotus* sp. by using an epigeic earthworm, (*Eudrilus eugeniae*)

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SUMMARY

The processed coir waste *i.e.*, predigested with *Pleurotus* sp. were mixed with cured cow dung in different proportions *viz.*, 50:50, 60:40, 70:30, 80:20, and 90:10 (each concentration in triplicates) and they were filled in plastic trays, individually. Simultaneously, a control was prepared with 50:50 concentration and maintained. Hundred healthy *Eudrilus eugeniae* adult worms were introduced into each of these trays excepting the control. The conversion ratio of waste in to vermicompost was found to be high in 50:50 proportion (61%). The cocoons and young ones production was found to be higher in 50:50 proportion than the other four proportions. Further, vermicompost obtained from 50:50 concentration was found to have desirable level of nutrient composition when compared to the other four concentrations. The results of the present study obviously suggest that the coir waste with cow dung at 50:50 proportions can very well be used for converting into value added vermicompost by utilizing *E. eugeniae*.

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Key words :

Coir waste
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Vermicompost.

Coconut palm (*Cocos nucifera*) is mainly cultivated for nuts. Two important commercial products *viz.*, copra and fibre are obtained from this crop. *C. nucifera* is cultivated in 93 countries across the world and the total area under *C. nucifera* cultivation is 12.05 million hectares. India occupies third place in terms of area under cultivation and production *i.e.*, 1.89 million hectares and 12.821 million nuts/annum, respectively. In India it is primarily a small land holders crop and around 5 million holdings are distributed in 18 states and three union territories (Rathinam, 2005). Coir waste have more moisture retention property (500-600%) and K content, thus they could be exploited for agricultural use. Annual production of coir dust is about 1.39 million tonnes in India and Karnataka alone produces about 140-150 thousand tonnes (Kadalli *et al.*, 2000).

The biological degradation and stabilization of organic wastes by earthworms and microorganisms is termed as vermicomposting. Vermicompost is an excellent plant growth media or soil amendments (Edwards, 1988). Various authors (Bhawalker, 1994; Buchanan *et al.*, 1988;

Edwards and Burrows, 1988; Tomati *et al.*, 1987), have identified vermiculture as one of the major techniques in which earthworms do the job of composting *i.e.*, to convert waste in to rich humus. *Pleurotus sajor-caju* showed good potentials for degrading the coir waste (Bisaria *et al.*, 1987; Ragunathan and Swaminathan, 2003).

Application of vermicompost to crop fields can improve the physico-chemical and biological properties of the soil (Kale, 2006). In the present study, an attempt has been made to convert *C. nucifera* (coir waste) in to vermicompost with the following objectives: to compute the magnitude of conversion of coir waste (*C. nucifera*) into vermicompost using an epigeic earthworm, *E. eugeniae*, to enumerate the number of cocoons and young ones present in various proportions (of coir waste and cow dung) and to analyse and compare the nutrients' composition of raw coir waste, control and vermicompost.

MATERIALS AND METHODS

The present study was carried out

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