

Research Paper :

Bio-conversion of korai waste (*Cyperus rotundus*) into vermicompost utilizing a temperate earthworm, *Eisenia foetida*

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ABSTRACT

The vermibeds were prepared by mixing the processed korai wastes with cured cow dung in different proportions viz., 50:50, 60:40, and 70:30 (each concentration in triplicates) and they were filled in the plastic trays, individually. Simultaneously, a control for each of these concentrations was prepared and maintained. Sixty *Eisenia foetida* adult worms were introduced into each of these trays excepting the controls. The conversion ratio of wastes into vermicompost was found to be high in 50:50 proportions (68%). The cocoons and young ones production was found to be higher in 50:50 proportion than the other two proportions. Further the results also reveal that 50:50 concentrations retained all the adult worms (60) when compared to the other two concentrations. Further, vermicompost obtained from 50:50 concentrations had desired level of chemical nutrients when compared to the other two concentrations viz., 60:40 and 70:30. The results of the present study obviously suggest that the korai wastes with cow dung at 50:50 concentrations can very well be used for converting into value added vermicompost by utilizing *E. foetida*.

Key words : Vermicompost, Korai waste, *Cyperus rotundus*, *Eisenia foetida*, Vermicast, Macro and Micronutrients

Cyperus rotundus (the Korai crop) is cultivated in few localities of Tamil Nadu including Musiri, Tiruchirappalli district. The Korai is used chiefly for the production of mats. On an average, from a single mat weaving machine 250 mats are produced / day and during this process 45 kg of wastes is generated. The generated wastes are of great concern of environment of our area as they are mostly burnt. Further, in order to alleviate the deleterious effects of inorganic fertilizers on soil and environment scientists advocate developing of novel technologies to produce organic manures from agro-industrial and other organic wastes.

In recent years, earthworms have been identified as one of the important organisms to process the biodegradable organic matters. An important feature of vermicompost is that during the processing of various organic wastes by earthworms many of the nutrients that the wastes contain are changed to plant available forms (Edwards, 1998). 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. rotundus* (korai waste) into vermicompost, organic manure by using an epigeic earthworm, *Eisenia foetida* and to assess its nutrients' status.

MATERIALS AND METHODS

The present study was carried out between March

2007 and July 2007 in vermiculture unit of Nehru Memorial College (Autonomous), Puthanapatti, Trichy district, Tamil Nadu, India. *E. foetida* was selected for the present study because of its surface eating behaviour. The selected korai wastes were collected from the Arumugam Mat industries, Vellur, Musiri Taluk, Trichirappalli district. The korai wastes were shredded into small pieces. Later, they were cured both in the open area and in a shade for 20 days. Water was sprinkled on the wastes twice in a day in order to hasten the pre-digestion process. Similar method was adopted for curing cow dung.

Plastic trays of 45x15x30cm size were bought and used for the present study. At the bottom of the tray a hole was made to drain the excess water in the experimental medium. The vermibeds were prepared by mixing the processed korai wastes with cured cow dung in different proportions viz., 50:50, 60:40, and 70:30 they were filled in the trays, individually. A control experimental medium was also prepared in the same proportions and filled in the trays, individually. All the above experiments were repeated for three times. After 10 days of the preparation of the experimental media in the trays, 10 clitellate *E. foetida* worms were introduced into each of these trays. The worms entered into the media immediately after the inoculation. On the subsequent day 50 worms were additionally introduced into each tray, excepting the control ones. These trays were kept undisturbed in a shady place. Watering was done regularly