

Cost Effective Method for Sustainable Vermicompost Production

M V Durai,

Scientist Division of Tree Improvement & Genetics, Institute of Wood Science & Technology 18th Cross, Malleswaram, Bengaluru – Karnataka, India

Abstract

Vermicompost production and seed earthworm separation is laborious and time consuming process. A novel technique was developed for sustainable vermicompost production and seed earthworm separation from vermicompost based on inherent characters of earthworm and sieves.

KEYWORDS: earthworm, vermicompost, sieve, harvest, method

Introduction

Vermicompost is humus like materials produced using earthworms. It is made of excreta of earthworms. Earthworms decompose organic residues at a shorter duration and that earthworm castings can be used as plant initiator (Edwards *et al.*, 2008). Earthworm casts are loosely packed granular aggregates containing thousands of bacteria, enzymes and remnants of plant materials and animal manure. Earthworms can consume organic wastes 2 to 5 times of their body weight and after using 5-10% of the feed stock for their growth. It is estimated that 1000 tonne of moist organic wastes converted into 300 tonne of vermicompost (Gunathilagaraj, 1994). Vermicompost have high levels of total and available nitrogen, phosphorous, potassium (NPK) and micro nutrients, microbial and enzyme activities and growth regulators (Chaoui *et al.*, 2003) and continuous and adequate use with proper management can increase soil organic carbon, soil water retention and transmission and improvement in other physical properties of soil like bulk density, penetration resistance and aggregation (Zebarth *et al.*, 1999) as well as beneficial effect on the growth of a variety of plants (Atiyeh *et al.*, 2002). To avoid damage to earthworms and loss of earthworm eggs, vermicompost, generally, manually harvested. The manual harvest is not only laborious but also time consuming process and unsustainable one. Further, as it requires manual harvest, many people shy to touch worms though they have keen interest on vermicompost. Hence, the present study was aimed to develop simple cost effective technique for sustainable vermicompost.

Hypothesis

The present technique was developed based on three inherent behaviour of earthworm viz., earthworms are voracious eater of cow dung and organic matter, photo-sensitive organisms and move downward in the bed for search of food. The technique is developed by exploiting these characters.

Methodology

Two identical circular size shapes of sieves (4mm) were used for this technique. These sieves were filled up to rim of the sieve with cow dung and organic matter mix. The sieves arranged one above other vertically. About 100g of earthworm (*Eisenia fetida*) was introduced in top sieve and this set was left for 5- days as such. At end of 5th day after formation of vermicompost, present of earthworms were checked in top and bottom sieves.

Results and discussion

At end of 5th day, it was found that all earthworms (100%) except a few weak and young worms were entered into bottom sieve automatically due to dearth of food in the top sieve. Thereafter, this bottom sieve was placed over another cowdung filled sieve for vermicompost production and worm separation. At end of 5th day, earthworm presence was checked in top sieve (Fig 1). Thus, this experiment was repeated thrice. Same result was found in all experiment. Thus, earthworms and vermicompost can be separated naturally in sustainable manner without incurring any expenditure by this novel technique at small and commercial level.



Step -1



Step -2



Step -3



Step -4

Fig 1 Steps of sustainable vermicompost and earthworm separation

Reference

- Atiyeh, R. M., Lee, S., Edwards, C.A., Arancon, N.Q, Metzger, J. D. (2002) The influence of humic acids derived from earthworms- processed organic wastes on plant growth. *Bioresource Technology*. **84**, pp. 7-14.
- Chaoui, I., Zibiliske, M., Ohno, T. (2003) Effects of earthworm casts and compost on soil microbial activity and plant nutrient availability. *Soil Biology and Biochemistry* **35**, pp. 295-302.
- Edwards, C.A and Bohlen, P.J. (1996) *Biology and Ecology of Earthworms* 3rd edition, Chapman and Hall, London, pp 35-55.
- Gunathilagaraj K and Ravignanam T (1996). Vermicomposting of sericultural wastes. *Madras Agril J*. **83**, pp. 455-457.
- Zebarth, B. J., Neilsen, G. H., Hogue, E., Neilsen, D., 1999. Influence des amendements faits de dechets organiques surcertains proprietes physiques etchimiques due sol. *Canadian Journal Soil Sciences*, **79**, pp. 501- 504.