



Research Article

## Improvement in nutritional status of *Trichoderma* colonized FYM

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### ABSTRACT

This *in vitro* study was conducted to assess the potential of *Trichoderma* in improving the nutritional status of sterilized and unsterilized farm yard manure (FYM). *Trichoderma harzianum* (Th-14) was colonized on FYM and elemental analysis of colonized FYM was carried out. The data indicated that the population of *Trichoderma harzianum* in colonized compost was several folds higher ( $48.60 \times 10^{12}$  cfu/g) than non-colonized compost ( $3.00 \times 10^4$  cfu/g). The per cent macro and micro nutrient was also significantly higher in *Trichoderma* colonized FYM as compared to uncolonized FYM. The increase in nutritional status was retained even after such composts were made free from microbes by autoclaving. The finding is important as it reveals the role of *Trichoderma* in inducing nutritive value of FYM.

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## INTRODUCTION

Genus *Trichoderma* has gained immense importance since last few decades due to its biological control ability against several plant pathogens. The researchers are interested in this genus because of its novel biological properties and biotechnological applications (Shalini and Kotasthane, 2007). *Trichoderma* species are among the most frequently isolated soil fungi and present in plant root ecosystems (Harman *et al.*, 2004). The fungi are opportunistic, avirulent plant symbionts and function as parasites and antagonists of many phytopathogenic fungi, thus protecting plants from diseases. So far *Trichoderma* sp. are among the most studied fungal biocontrol agents and commercially marked as a potent biopesticides biofertilizers and also used in soil amendments (Harman, 2000; Mohiddin *et al.*, 2010). *Trichoderma* can also colonize and decompose dead organic matter. One of the most effective methods for the delivery of *Trichoderma* in soil is through colonized compost like FYM, cow dung, poultry manure etc. In addition to improving N content and the availability of other plant nutrients, these additions help to reduce the composting time considerably. Recent studies have revealed that *Trichoderma* inoculation enhances the decomposition and nutritive value of organic composts like cow dung, poultry manure and press mud. *Trichoderma harzianum* changes the colour of fresh cow dung

in five days and enhances the nutritive value of colonized cow dung / farmyard manure that serves as an excellent substrate for its multiplication. It multiplies very well on cow dung /FYM not only under laboratory conditions but also at farmers level in their compost pits (Zaidi, 2006). Farmyard manure has been used successfully as a substrate for developing formulations of *Trichoderma*. However most of the reports are confined to use of FYM for the mass production of fungal antagonists. The present research was conducted to determine the nutritive status of *Trichoderma* colonized FYM.

## MATERIALS AND METHODS

The experiment was conducted to assess the increase in the nutritive value of *Trichoderma harzianum* colonized FYM. *Trichoderma harzianum* (Th-14) isolate was collected from the repository of Biocontrol Lab in Department of Plant Pathology, G.B.P.U.A&T, Pantnagar. FYM was collected and air-dried by spreading as an approx. 1" thick layer under open shade for one week. Fifty g of air-dried unsterilized or sterilized (moisture content approx. 30 per cent when estimated by oven drying for 24 h at 40°C) FYM was taken in 250 ml Erlenmeyer flasks. Moisture content of cow dung was adjusted to 10, 20, 30, 40, 50 and 70 per cent by weight of air-dried cow dung by adding water. Two ml suspension of Th-14 spore powder (three