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**Investigation of a suitable formulation for *Trichoderma harzianum*
in different compositions of solid carrier materials at two temperatures**

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In sustainable agriculture, the application of *Trichoderma* spp. is a widely accepted, eco-friendly method. But, in the commercialization process, the effectiveness of *Trichoderma* spp. as a biological control agent, plant growth promoter, and as a decomposing agent affects the selection of the carrier material and the formulation procedure. The present investigation was carried out in an attempt to develop an effective organic carrier material using abundant natural solid materials in which the viability and the effectiveness of *T. harzianum* could be maintained for a sufficient duration at an optimum temperature for product stabilization. Previously isolated and identified *T. harzianum* (KT852821.1), which can enhance the growth of many crops (e.g.: *Pisum sativum*, *Cucumis sativus*, *Solanum lycopersicum*, and *Tulipa gesneriana*), was selected for the present investigation. Five carrier formulations were made using different compositions of compost, straw, clay, and cow urine. Inocula taken from pure cultures of *T. harzianum* grown on PDA media were introduced separately into sterilized polypropylene bags containing different proportions of carrier materials. They were then incubated at 25°C for 7 days and then stored at room temperature (28°C) and in the refrigerator (4°C) for 12 months. Viability was determined at frequent intervals of 2, 6, 9, and 12 months for the formulations kept at 28°C and 4°C separately. Colony-forming units per gram of substrate were calculated following the dilution plate method in 10 replications for each formulation. Among the five different formulations used for formulating *T. harzianum*, the formulation consisting of compost 50%, straw 25%, clay 12.5%, and cow urine 12.5% (V/W) stored at 4°C for a 12-month time period, proved to be significantly the most effective composition for the commercialization of *T. harzianum*, which gave a colony count of 6.99 log CFU/g whereas the other formulations provided the values of 6.36 log CFU/g, 6.26 log CFU/g, 6.91 log CFU/g, and 6.45 log CFU/g. The present investigation highlighted the significance of using the formulation consisting of compost 50%, straw 25%, clay 12.5%, and cow urine 12.5% (V/W) to develop *T. harzianum* as a commercial product.

Keywords: Formulations, Optimum temperature, Solid carrier material, *Trichoderma harzianum*, Viability.

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