

**Enhancing plant nutrient availability in composted paddy husk using *Bacillus* spp.
isolated from termite (*Coptotermes curvignathus*) gut**

ABSTRACT

Paddy husk (PH) is a waste item generated from rice production that can be used as an organic fertilizer through composting. High lignin content is an issue with PH composting as it impedes the production of high-quality organic fertilizer. Improvements to the composting process can enhance the agronomic properties of compost produced from PH. The objectives of this study were to: (i) determine the ability of *Bacillus* spp. in enhancing the decomposition of PH and (ii) determine the ability of *Bacillus* spp. in increasing the macronutrient content of composted PH. Different ligninolytic active *Bacillus* spp. from termite gut (either singly or a cocktail) were added to 7 of 9 compost boxes containing PH compost mixtures and were allowed to decompose for a period of 60 days. Each treatment was represented by 3 samples, and the compost boxes were arranged in a completely randomized design (CRD) with 3 replications. Results showed that the addition of *Bacillus* spp. promoted the production of matured compost within 60 days with significantly higher amounts of phosphorus, potassium, calcium, and magnesium. Germination index (GI) of all composted PH added with *Bacillus* spp. ranged from 82.51 to 95.83%, suggesting that composted PH has lower phytotoxicity than compost without *Bacillus* spp. isolate. In general, addition of *Bacillus* spp. to PH waste promoted the production of PH composts with improved macronutrient availability and lower phytotoxicity levels.

Keyword: Compost; Paddy husk; Termite gut; Nutrient availability; Phytotoxicity