

Research Article

Development and Evaluation of Agro-waste Biodegradation Formulation

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Abstract

In the study, twenty strains of cellulose degrading microbes (*Pseudomonas* spp., *Bacillus* spp., *Aspergillus* spp. etc.) were isolated from the gut of termites and earthworms collected from different locations. The cellulolytic activity of the isolates of *Aspergillus* spp. were determined based on the formation of clear zone on CMC (Carboxymethyl cellulose) media. The strain C18 of *Aspergillus flavus* isolated from the gut of termite produced the largest zone with maximum cellulolytic index of 7.64. All the purified strains were subjected to *in vitro* cellulase activity through DNS (3,5-dinitrosalicylic acid) method which showed that strain C18 of *Aspergillus flavus* produced the maximum amount of glucose (0.507 mg ML⁻¹) and the cellulase enzyme (IU ML⁻¹) was recorded as 0.187 IU ML⁻¹. Out of twenty microbial strains, ten best microbial strains were selected and subjected to *in vitro* FPA (filter paper assay). *Aspergillus flavus* strain C18 was found most effective with maximum glucose (1.059 mg ml⁻¹) and cellulase enzyme (0.196 IUML⁻¹) production after 9 days of inoculation and therefore the consortium was made from two most effective *Aspergillus flavus* strains (C12 and C18) which were found best effective in degradation of wheat straw substrate *i.e.*, 61 per cent degradation of initial substrate weight. After evaluation of each strain, effective strains (C12 & C18) were used to prepare consortium formulations for commercial use in the field. These cellulolytic microbes have significant role in agro-waste management by degradation without harming the land and environment.

Key words: Agro-waste, *Aspergillus flavus*, biodegradation, cellulolytic microbes, formulation

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