

Isolation, identification and characterization of soil bacteria for the production of ferulic acid through co-culture fermentation

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Abstract:

Exploitation of soil bacteria for release of ferulic acid (FA) is extensively performed since bacteria are the largest soil community that have the potential in producing degrading enzymes. The current study aimed to isolate, identify and characterize the most efficient soil bacteria for high FA production from banana stem waste (BSW) via co-culture fermentation. Bacteria were isolated and screened from acclimatized mixture of soil culture and BSW. ARB programme package and biolog system were employed for identification and characterization. The results reveal that four isolates closely related to *Bacillus* spp. and one *Lysinibacillus* sp. had greater potential to produce FA in very large amounts. Specifically, the maximum FA yield of 394.76 mg/kg was achieved using co-culture of *Bacillus* sp. MB2, *Bacillus* sp. WB8A and *B. pumilus* strain WB1A, which was 2.5-fold higher than FA produced by single culture. Degradation activity was observed which suggests the possible utilization of substrate during the fermentation process. The results of the study demonstrate that exploitation of co-culture over single culture could be advantageous to facilitate improved FA production.

Keywords: Ferulic Acid; Banana Stem Waste; Co-Culture; Factorial Design; *Bacillus* Sp; *Lysinibacillus* Sp.

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