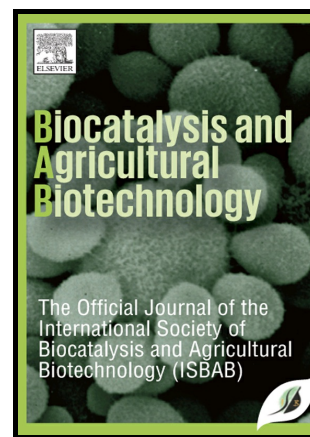


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***In vitro* evaluation of lignocellulolytic activity of thermophilic bacteria isolated from different composts and soils of Iran**

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Abstract

Microorganisms with cellulolytic and ligninolytic activities have important roles in the composting process but they may not tolerate thermophilic phase. Using thermophilic microbes possessing lignocellulolytic activity could facilitate the composting process. In this study, soil and compost samples were collected from different regions of Iran. The sample dilutions were cultured on nutrient agar at 58 ± 2 °C for five days for isolating thermophiles. They were then screened according to their qualitative ligninolytic and cellulolytic activities at 25 °C and 58 °C. The superior isolates were then quantitatively assayed for cellulase, ligninase, amylase, β -glucosidase, xylanase and mannanase activities in crude enzyme extracts. The efficient isolates were identified by molecular methods. Among 327 thermophilic isolates, 118 and 137 isolates were lacking ligninase and cellulase activity, respectively. The isolates 1 vermicompost (VC), 12 compost (C), 47 Yazd soils (YZ) and 13 compost (C) had the highest ligninase activity and the highest cellulase activity was observed in isolates 194 Tabriz soils (TB), 104C and 12C. With increasing temperature from 25 °C to 58 °C, both enzymatic activities increased in all thermophilic isolates. The isolates 1VC, 12C, 13C, 47YZ, 151VC and 104C were thermophilic bacteria possessing both the highest ligninase and cellulase activities. They were identified as *Paenibacillus validus*, *Paenibacillus koreensis*, *Paenibacillus thailandensis*, *Paenibacillus cellulositrophicus*, *Paenibacillus lautus*, *Bacillus nealsonii*, respectively.

Keywords: Ligninase, Cellulase, composting, Thermophilic bacteria.

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