

# Study on the Promotion of Cellulase Production by *Bacillus Subtilis* Using Macroporous Adsorption Resin D301

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## Abstract

To enhance the cellulase production capability of *Bacillus subtilis*, an adsorbent was employed for extractive fermentation. By comparing the fermentation outcomes with various adsorbents, it was established that the macroporous adsorption resin D301 is the most effective. This resin does not adversely affect bacterial growth and promotes cellulase production. Notably, the cellulase activity yield increased by 38.6% compared to the control group that did not include an adsorbent. Furthermore, through compositional analysis of the fermentation broth, protein electrophoresis, and the assessment of the adsorption characteristics of macroporous adsorption resin D301, it is speculated that the resin adsorbs organic acids, acidic amino acids, and other compounds present in the fermentation broth. This adsorption process reduces the synthesis of impurity proteins, thereby enhancing cellulase activity and specific enzyme activity. Ultimately, the optimal addition range of macroporous adsorption resin D301 was determined to be between 2 g/L and 4 g/L, with the number of recycling cycles not exceeding three. This study aims to provide a reference for research pertaining to microbial extraction and fermentation.

## Keywords

Extraction Fermentation, Cellulase, Macroporous Adsorption Resin, Recycling and Reusing