

绿色木霉固态发酵产纤维素酶活力的研究

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摘要:

以麦秆和麸皮为主要原料, 通过正交试验和单因素试验优化绿色木霉Trichoderma viride固态发酵产纤维素酶的最佳工艺条件, 并研究绿色木霉对小麦秸秆纤维素降解的影响, 为绿色木霉降解小麦秸秆纤维素提供最佳条件, 进而提高小麦秸秆的利用率。结果表明, 不同条件下绿色木霉产纤维素酶活力存在显著差异(P<0.05), 最佳培养基为: 氮源为(NH4)2SO4, pH值5.5, 含水量为200%, 麦秆: 麸皮质量比为4:1; 最佳发酵条件为: 培养时间为96 h、温度35 ℃、初始pH值 6.0、含氮量0.4%、接种量15%, 培养方式为半密闭; 发酵后小麦秸秆中中性洗涤纤维(NDF)、酸性洗涤纤维(ADF)、纤维素含量和半纤维素含量比发酵前分别下降5.22%、6.88%、4.73%和4.16%, 木质素含量无明显变化。

关键词: 绿色木霉; 发酵条件; 纤维素酶活; 小麦秸秆; 纤维素

Study on cellulase activity produced by solid state fermentation of Trichoderma viride

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Abstract:

Using wheat bran and straw as raw materials, optimum technology conditions of cellulase activity produced by solid state fermentation of Trichoderma viride was optimized by orthogonal and single factor test; the effect of T. viride on cellulose degradation of wheat straw was studied. The optimum conditions were provided to the degradation of wheat straw cellulose by T. viride, and further improve the utilization rate of wheat straw. The result showed that there was significant difference in cellulase activity produced by T. viride under different conditions (P<0.05). The optimal medium contained 8 g wheat straw and 2 g wheat bran, its nitrogen source was (NH4)2SO4, water content was 200%, pH value was 5.5. The optimum fermentation conditions were as follows: 96 h cultivation time, 35 ℃, pH value 6.0, 0.4% nitrogen content, 15% inoculum and semi enclosed cultivation. The NDF, ADF, cellulose and hemi cellulose content of wheat straw after fermentation declined by 5.22%, 6.88%, 4.73% and 4.16%, respectively, and there was no significant change in lignin.

Keywords: Trichoderma viride fermentation conditions cellulase activity wheat straw cellulose

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