

RESEARCH NOTES

剪切力影响药用蘑菇灵芝的细胞生长和代谢物生产  
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摘要 By investigating the shear effect on submerged cultivation of a traditional Chinese medicinal herb Ganoderma lucidum, a relatively high cell concentration of 13.8 g·L<sup>-1</sup> by dry mass was obtained in bioreactor at an impeller tip speed (ITS) of 0.51m·s<sup>-1</sup>. At an ITS of 0.51, 1.02 and 1.53m·s<sup>-1</sup>, a maximal production titer of intracellular polysaccharide was 2.64, 2.20 and 2.28g·L<sup>-1</sup> and that of ganoderic acid was 306, 299 and 273g·L<sup>-1</sup>, respectively. Under these ITSs, the maximal mean projected area of dispersed hypheue was 3.70, 2.54 and 2.13 × 10<sup>-4</sup>μm<sup>2</sup>, and that of pellets was 0.91, 0.67 and 0.55 mm<sup>2</sup>, respectively. The information obtained is useful for efficient submerged cultivation of mushrooms on a large scale.

关键词 剪切应力 代谢物 蘑菇 灵芝属 多糖糖 生物化学

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Hydrodynamic Shear Stress Affects Cell Growth and Metabolic Production by Medicinal Mushroom Ganoderma lucidum

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Abstract By investigating the shear effect on submerged cultivation of a traditional Chinese medicinal herb Ganoderma lucidum, a relatively high cell concentration of 13.8 g·L<sup>-1</sup> by dry mass was obtained in bioreactor at an impeller tip speed (ITS) of 0.51m·s<sup>-1</sup>. At an ITS of 0.51, 1.02 and 1.53m·s<sup>-1</sup>, a maximal production titer of intracellular polysaccharide was 2.64, 2.20 and 2.28g·L<sup>-1</sup> and that of ganoderic acid was 306, 299 and 273g·L<sup>-1</sup>, respectively. Under these ITSs, the maximal mean projected area of dispersed hypheue was 3.70, 2.54 and 2.13 × 10<sup>-4</sup>μm<sup>2</sup>, and that of pellets was 0.91, 0.67 and 0.55 mm<sup>2</sup>, respectively. The information obtained is useful for efficient submerged cultivation of mushrooms on a large scale.

Key words Ganoderma lucidum, mushroom cultures, shear effect, Ganoderma polysaccharide, ganoderic acid.

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