

Xylo-oligosaccharides Production fo Submerged Fermentation by the Different Medicinal Fungi Using Corn Cob Substrate

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ABSTRACT

Most medicinal fungi are rich in polysaccharides, which have been shown to have anti-tumor functions and inhibit cancer cell growth, strengthen the immune system or adjust the balance of the body, and exhibit other medicinally relevant properties such as anti-inflammatory or cholesterol regulatory properties. In addition, scholars have pointed out that medicinal fungi has a variety of enzymes, of which some like xylanase hemicellulose material produce xylooligosaccharides used in the pharmaceutical, cosmetics and food industries. Corn cob contains a lot of cellulose; a good source of raw materials for the production of xylooligosaccharides. In this experiment, cultures of *Trametes versicolor*, *Antrodia camphorata*, *Grifola frondosa*, *Phellinus igniarius* were placed in different media (corn cob as a carbon source, adding RO water; red sugar as the carbon source, adding peanut powder extract as a nitrogen source to explore xylooligosaccharide generation; corn cob and red sugar as a carbon source, adding add peanut powder extract as nitrogen source) employing temperatures (22 , 25 , 28) and oscillation rates (50rpm, 100rpm, 150rpm). The results show that at a temperature of 25 and an oscillation rate of 150rpm, *Trametes versicolor* can achieve a biomass and high extracellular polysaccharide and xylanase production, 2.59mg/mL, 0.99mg/mL and 32.57U/100mL respectively. Under the different temperatures condition, it was found that for *Trametes versicolor* the optimal temperature was 25 , the biomass and extracellular polysaccharide and xylanase production were 3.63mg/mL, 2.96mg/mL and 43.08U/100mL respectively. Different oscillation rates proved to be optimal for *Grifola frondosa*, however, as the biomass and production of extracellular polysaccharides were higher at 150rpm, but the xylanase enzyme activity was higher at 100 rpm (2.53mg/mL 0.89mg/mL and 31.30 U/100mL, respectively). In different culture conditions in different media, the corn cob and red sugar as a carbon source with the addition of peanut powder extract as a nitrogen source, *Antrodia camphorata* was found to achieve a higher biomass and extracellular polysaccharide and xylanase activity (3.46mg/mL, 1.17mg/mL and 41.65U/100mL, respectively). With corn cob as the carbon source, *Trametes versicolor* achieved the highest biomass and xylooligosaccharides production (4.82mg/mL 54.32mg/mL, respectively), while *Phellinus igniarius* had the best extracellular polysaccharide production (1.48mg/mL). The highest xylanase activity was found in *Antrodia camphorata* in the corn cob as a nitrogen source (35.83U/100mL).

Keywords : medicinal fungi、corn cob、xylanase、xylooligosaccharides

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