Environmental Engineering and Management Journal

March 2012, Vol.11, No. 3, Supplement, S81
http://omicron.ch.tuiasi.ro/EEMJ/

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SELECTION OF CELLULASE PRODUCER MICROMYCETES OF THE SOUTH CAUCASUS FOR THE PRODUCTION OF HIGH TECHNOLOGY SWEETENERS FROM AGRARIAN WASTES

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Abstract

One of the promising ways of producing sweeteners from non-edible raw material is enzymatic hydrolysis of cellulose. Selection of cellulases with suitable biotechnological characteristics is essential for the development of industrial technologies of this process. Active producers of high technological cellulases *Aspergillus versicolor* D1, *Aspergillus wentii* Z9-7, *Sporotrichum pilverulentum* S1, *Aspergillus terreus* 4-9, have been selected from the collection of micromycetes (2300 strains) of Durmishidze Institute of Biochemistry and Biotechnology that were isolated from different ecological zones of south Caucasus. Crude preparations of cellulases were obtained by ethanol precipitation from the cultural liquid. Ethanol precipitation allows retaining 80-85% of total activity of cellulase as compared to the total activity of the cellulase in the cultural liquid. The industrial properties of selected crude enzyme preparations: heat stability, temperature optimum of action, mechanism of cellulase inhibition by the reaction products, enzymes ability of deep hydrolysis of cellulose containing agrarian wastes (tea wastes, tobacco wastes, wine wastes, citrus wastes**)** forming low molecular reducing sugars and glucose have been studied. The temperature optimum of action of cellulases for *A. versicolor* D1 and *A. wentii* Z 9-7 was at 60^{o}C, while for strains *Sporotrichumpilverulentum* S1 and, *Aspergillus terreus* 4-9 at 55^{o}C. Cellulases from *Aspergillus versicolor* D1 and *Aspergillus wentii* Z 9-7 retained 50% of initial activity after 3 hours of incubation at 63°C in substrate free media. In all cases inhibition was weak and of noncompetitive type. Degree of hydrolysis of agrarian wastes was in the range of 32-72% for reducible sugars and 15- 65% for glucose. Thus, the cellulases meet the biotechnological demands of enzymatic hydrolysis of cellulose and are applicable at industrial scale.