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Comparative study on the growth and consumption curves of *Zymomonas mobilis* NCIB 1163 and *Z. mobilis* ATCC 10988, levan producer

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Levans are fructose polymers synthesized by a broad range of microorganisms and a limited number of plant species as non-structural storage carbohydrates and they have potential applications in the pharmaceutical, food, and cosmetic industries (1-5). This study presents a comparative analysis of the growth and consumption curves of *Z. mobilis* NCIB 1163 and *Z. mobilis* ATCC 10988, levan producing microorganisms. The growth and consumption curves were performed in a liquid medium with a concentration of 5% sucrose and 5% glucose. Thus, the bacterial cells in the exponential growth phase were centrifuged at 12.000 g and the pellet was washed twice with a sterile 0.9% NaCl solution. Finally, the cells were resuspended in 1 ml of physiological saline and they were used as inoculum in 5% liquid medium, which was monitored concerning the fermentable carbohydrate consumption and the growth. The consumption curves were performed under anaerobic conditions (the culture medium was coated with a layer of sterile paraffin oil) by periodical weighing of the medium seeded with different bacterial strains of *Z. mobilis* and by the graphical representation of weight loss (due to release of carbon dioxide). Exponentially growing cells were used as the inoculum, made at approximately 107 cells/ml. Cell growth was assayed turbidimetrically at a wavelength of 600 nm. The consumption curves of *Z. mobilis* NCIB 11163 and *Z. mobilis* ATCC 10988 bacterial strains on complete sucrose substrate medium, 5% under anaerobic conditions (Figure 1) revealed that strains NCIB 11163 and ATCC 10988 exhibit a similarly kinetics of consumption's substrate. The consumption curves of *Z. mobilis* NCIB 11163 and *Z. mobilis* ATCC 10988 bacterial strains on complete glucose substrate medium, 5% under anaerobic conditions (Figure 2) show that glycolysis is more intense than hydrolysis of sucrose. From the curves profile it is observed that the strain ATCC 10988 shows a curve having a more pronounced linear decrease.

Recent Publications:

1. Park H-E, (2003) Enzymatic synthesis of fructosyl oligosaccharides by levansucrase from Microbacterium laevaniformans ATCC 15953. Enzyme Microb. Tech. 32: 820-827.
2. Rairakhwada D, (2007) Dietary microbial levan enhances cellular non-specific immunity and survival of common carp (Cyprinus carpio) juveniles. Fish Shellfish Immun. 22: 477-486.
3. Gupta S, (2008) Microbial levan in the diet of Labeo rohita Hamilton juveniles: Effect on nonspecific immunity and histopathological changes after challenge with Aeromonas hydrophila. J. Fish Dis. 3: 649-657.
4. Kang SA, (2009) Levan: Applications and perspectives. pp. 145-161. In: Microbial Production of Biopolymers and Polymer Precursors. Rehm BHA (ed). Caister Academic Press, Norfolk, UK.
5. Jathore, N. R., (2012) Microbial levan from Pseudomonas fluorescens: Characterization and medium optimization for enhanced production. Food Science and Biotechnology, 21(4), 1045–1053. doi:10.1007/s10068-012-0136-8.

Biography

Georgiana Gabriela Iordache has her expertise as a Project Responsible of different Romanian Research Projects related to Heparin Sodium for pharmaceutical and industrial purposes. This work and experience in biotechnology was attained by approximately 10 biotechnological processes, 2 patents and over 3 scientific papers published in specialized journals. She is a PhD student in the field of Biotechnology. She is working as a junior researcher at the National Chemical-Pharmaceutical for Research and Development Institute, Bucharest, Romania.

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