BOOK of ABSTRACTS

25th Congress of Chemists and Technologists of Macedonia

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CXTM

Сојуз на хемичарите и технолозите на Македонија

Society of Chemists and Technologists of Macedonia

25th Congress of SCTM
with international participation

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BFT P-1

POSSIBILITY OF USING MICROBIAL ENZYMES PRODUCED BY *Streptomyces fluvissimus* CKS7 IN HYDROLYSIS PROCESS

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The microbial enzymes are biological catalysts that perform reactions in bio-processes in an economical and environmentally-friendly way as opposed to the use of chemical catalysts. Microbial enzymes, obtained by different microorganisms are of great importance for application in industrial bioprocesses [1,2]. The use of microbial enzymes in various industries (e.g., food, agriculture, chemicals, and pharmaceuticals) is increasing rapidly due to reduced processing time, low energy input, cost effectiveness, nontoxic and eco-friendly characteristics [3]. Cellulase are the largest group of industrially important enzymes with a potential to convert cellulose into fermentable sugars [4]. Amylases represents a second largest group of industrial enzymes which are used for the degradation of starch to glucose, maltose, dextrins…[5]. Xylanase are important for pentose production, fruit juice clarification…while pectinase degrade pectic substances in the cell wall of higher plants.They are important in food-processing industries, mainly for extraction and clarification of fruit juices and wines, extraction of tomato pulp, oil extraction, and tea and chocolate fermentation [1,2]. All these enzymes (cellulase, amylase, xylanase and pectinase) could be used for agro-industrial residues utilization that lead to bioethanol production.

In this study a crude "enzymes cocktail" that produce *Streptomyces fluvissimus* CKS7 was used in a hydrolysis process of different lignocellulosic waste materials. The strain CKS7 produced cellulase (CMC-ase and Avicelase), amylase, pectinase and xylanase during solid state fermentation (SSF) on agricultural by-product – rye bran. Obtained crude enzymes were used for hydrolysis of different lignocellulosic substrates: corn stalk waste, *Equisetum arvense* waste, *Gentiana lutea* waste, cotton fabric and corona treated cotton fabric. Released reducing sugars was measured during 3 days of hydrolysis at 50 °C. The results revealed that the concentration of reducing sugars was increasing during hydrolysis in all tested lignocellulosic substrates. Although the concentration of released reducing sugars are relatively low (~ 1.9 mg/ml) in all tested samples, this is the first study that deals with enzymatic potential of the *S. fluvissimus*. Further experiments should be focused on optimization of enzymatic hydrolysis of lignocellulosic substrates.

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