



Isolation, screening and selection of cellulolytic fungi for the production of cellulase using agricultural wastes as substrates

• Firdaus Rasool • Vineeta Anand

• Shireen Jamil

Received : November 2013

Accepted : March 2014

Corresponding Author : Shireen Jamil

Abstract : Cellulolytic fungi synthesize cellulase enzyme for biodegradation of cellulose. Cellulase production from fungi is advantageous as the enzyme production rate is higher as compared to other microorganisms. In the present investigation, our aim was to isolate novel cellulase producing fungi from local fruit dump wastes so as to reduce the production cost of cellulase by optimizing the production medium and using an alternative carbon source. Four fungal strains were isolated from fruit dump's soil and screened for cellulase efficiency of which *Aspergillus niger* was found to be the most potent cellulase producer showing maximum hydrolysis zone. This strain has been mutagenized and genetically modified to obtain an organism capable of producing high levels of cellulases. Growth of the isolate was found to be maximum at 26°C and at pH 6.2. Different

agricultural wastes (wheat straw, sugarcane bagasse, corncob, paddy straw and rice husk) were used for fermentation. Cellulase enzyme was produced by all out of which paddy straw showed maximum activity of 0.025 U/ml/min followed by corncob (0.024 U/ml/min), bagasse (0.011 U/ml/min), wheat bran (0.009 U/ml/min) and rice husk (0.01 U/ml/min).

Key words: *Aspergillus niger*, CMCase, Solid state fermentation, Cellulases.

Introduction :

India is an agriculture based country where a lot of agricultural waste is available. The agriculture wastes contain a high proportion of cellulosic matter which may be decomposed by a combination of physical, chemical and biological processes. Some common examples of agricultural waste in India include rice husk, wheat straw, corn cob, sugarcane bagasse, paddy straw, etc. These are considered to be the cheapest source for the production of different utilizable products throughout the world (Saleem et al., 2012).

Firdaus Rasool

B.Sc. III year, Industrial Microbiology (Hons.),
Session : 2011-2014, Patna Women's College,
Patna University, Patna, Bihar, India

Vineeta Anand

B.Sc. III year, Industrial Microbiology (Hons.),
Session : 2011-2014, Patna Women's College,
Patna University, Patna, Bihar, India

Shireen Jamil

Asst. Professor, Deptt. of Industrial Microbiology,
Patna Women's College, Bailey Road,
Patna – 800 001, Bihar, India.
E-mail : shireenjamil18@gmail.com