PATNA WOMEN'S COLLEGE 1940

IRIS
Journal for Young Scientists
ISSN 2278 – 618X **(Print)**
ISSN 2278 – 6384 **(Online)**

http://www.patnawomenscollege.in/journal

Degradation of kitchen waste by cellulose degrading bacteria

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Received : November 2014
Accepted : March 2015
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Abstract : *Cellulosic biomass is one of the dominating waste materials in nature resulting from human activities. Keeping in view the environmental problems like disposal of large volumes of cellulosic wastes and shortage of fossil fuel in the world, the main aim of the present investigation was to characterize and study the cellulolytic activity of selected bacterial isolates K1, K2 and K3 isolated from kitchen wastes, on natural cellulosic substrates viz. beet root, corn stover and finely grated vegetable peels. Stanier's Basal broth containing each of the substrates was inoculated separately with selected isolates and incubated at 37°C for 7-8 days. A control for each substrate was also kept. Besides this one set of the different cellulosic substrate in basal broth and test culture as well as a control was also kept to get the optical density spectrophotometrically at 420 nm. The cellulosic substrates were weighed after incubation and the difference between the initial weight and the final weight gave the amount of substrates degraded by the isolate. Also OD was taken at 420 nm in spectrophotometer after 7 days incubation by keeping one control. The difference between the OD of control and inoculated broth gave the amount of cellulosic substrates degraded by the isolates. It was observed that K2 was the most efficient isolate for the degradation of cellulosic substrate followed by K3 and K1. Therefore K2 can be considered more efficient for kitchen waste degradation over a period of 8 days. The favourable temperature for growth was 26°- 37°C, optimum pH was 6-8 and the isolates could grow at 1% - 3% of NaCl concentration.*

Key Words: *Cellulolytic potential, cellulosic biomass, sustainable fuel, waste material.*

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Introduction :

Kitchen waste forms an important part of domestic waste. This study focused on cellulose degrading bacteria in food waste. These bacteria play an important role in the biosphere by reducing complex polymer cellulose into various economically important products like monomeric sugars, microbial biomass proteins, compost,