



**THE RELATIVE SACCHARIFICATION OF DIFFERENT MASSES OF WASTE PAPER
MATERIALS INTO FERMENTABLE SUGARS BY *Trichoderma viride* CELLULASE**

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ABSTRACT

To decrease the amount of solid organic waste produced annually, waste paper can be bioconverted with cellulase enzymes into fermentable sugars like glucose. Simultaneously the process of developing alternative and renewable energy resources could be addressed as sugars produced from wastepaper can be fermented into bioethanol. The susceptibility of various paper materials including office paper, filter paper, newspaper, print paper, envelope paper and foolscap paper towards the saccharification by cellulase from *Trichoderma viride* cellulase at different incubation temperatures and during different incubation times were determined. Different saccharification patterns were obtained with the paper materials with newspaper showing the highest degree of saccharification after 7 h of incubation at 30°C, 40°C and 50°C. Maximum degradation of the other paper were obtained at 40°C with the sugar production that decreases at incubation temperatures higher and lower than 40°C. Newspaper, print paper and envelope paper produced the same levels of maximum sugar. Office paper produced the least amount of sugar at optimum degradation conditions and it was concluded that different paper materials should not be exposed to the same incubation conditions for optimum saccharification of these distinctive paper materials.

**Keywords: Solid Waste, Waste Paper, *Trichoderma viride* Cellulase, Saccharification,
Enzymatic Hydrolysis, Bioenergy**

INTRODUCTION

The development of renewable and alternative energy resources will become more topical as the effect of global warming such as climate change intensifies. Bioenergy [1] is regarded as