Environmental Engineering and Management Journal October 2012, Vol.11, No. 10, 1849-1855
http://omicron.ch.tuiasi.ro/EEMJ/

"Gheorghe Asachi" Technical University of Iasi, Romania

ENZYMATIC PROCESSING OF CHITINACEOUS WASTES FOR N-ACETYL-D-GLUCOSAMINE PRODUCTION: AN EXAMPLE OF GREEN AND EFFICIENT ENVIRONMENTAL MANAGEMENT

Sancharini Das[1], Ramkrishna Sen[1*], Debasis Roy[2]

Indian Institute of Technology Kharagpur,
[1]Department of Biotechnology, [2]Department of Civil Engineering, Kharagpur 721302, India

Abstract

Chitin from chitinaceous prawn shell waste, fungal biomass of *Aspergillus fumigatus* and *Penicillium waksmanii* was used as natural substrate for partially purified chitinase of *Trichoderma harzianum* to produce N-acetyl-D-glucosamine (GlcNAc), a medically important amino sugar. The isolated chitins were characterized with FTIR and XRD for quality check. The enzymatic hydrolysis of isolated chitins was optimized at pH 5 and 37 ºC. For GlcNAc production from prawn waste, the standardized incubation duration was 4 days, while that for the fungal biomass was 3 days. The standardized enzyme concentration for biocatalytic based hydrolysis of isolated chitin was 4U/mL, irrespective of their source. The substrate amount was standardized at 17.5 mg/mL of reaction mixtures. The GlcNAc production was confirmed by TLC and HPLC and 80% conversion of isolated chitin from prawn wastes, 68% conversion of isolated chitin from *Penicillium waksmanii* biomass and 77 % conversion of isolated chitin from *Aspergillus fumigatus* biomass into GlcNAc were established by enzymatic hydrolysis.

Key words: Chitinase, N acetyl-D-glucosamine production, *Trichoderma harzianum*, waste chitin

Received: April, 2012; Revised final: September, 2012; Accepted: September, 2012

[*] Author to whom all correspondence should be addressed: email: rksen@yahoo.com, Phone (O): +913222283752, Fax: +913222278707