

Evaluation of Cellulase Production by Yeast Isolates and Application on Enzymatic Hydrolysis of Delignified Cellulose

GIESE, E.C.¹, CADETE, R.M.², PIEROZZI, M.¹, PHILIPPINI, R.R.¹, MARTINIANO, S.E.¹, PAGNOCCA, F.C.³, ROSA, C.A.², SILVA, S.S.¹

1 - Depto. de Biotecnologia, Escola de Engenharia de Lorena, Universidade de São Paulo, Lorena – SP, Brasil; 2 - Depto. de Microbiologia, Universidade Federal de Minas Gerais, Belo Horizonte – MG, Brasil; 3 - Depto. de Bioquímica e Microbiologia, Universidade Estadual Paulista “Júlio de Mesquita Filho”, Rio Claro – SP, Brasil

The interest in the practical applications and biodiversity of yeasts has been increased in the last decade to new biotechnological applications avoid brewing and winemaking technology. On the other hand, there is great interest for the conversion of cellulose from lignocellulosic biomass into glucose aimed at producing second-generation ethanol. Although a large number of fungi are capable of degrading cellulose, only a few yeasts have been described as producer of cell-free enzymes capable of completely hydrolyzing crystalline cellulose in vitro. The objectives of the present work were isolate cellulase producer yeast species from Brazilian ecosystem, evaluate biochemical and physiological parameters to promote cellulases (endoglucanase, exoglucanase and beta-glucosidase) production by submerge fermentation and evaluate the action of these enzymatic complexes on bagasse delignified cellulose hydrolysis. The yeasts were isolated from rotting wood samples collected from natural parks from Minas Gerais, Rio de Janeiro, Rondônia and São Paulo states; and each sample was placed separately in flasks and plates containing carboximetilcellulose as sole carbon source to cellulase activity evaluation. Eight selected isolates (identified as *Cryptococcus*, *Trichosporon* and *Pichia* species) were cultured in 125mL Erlenmeyer flasks containing 25mL Vogel's minimum salts medium, carboximetilcellulose and/or Avicel 1% (m/v) under shaking conditions (200rpm) at 30°C. Endoglucanase, exoglucanase, cellobiase and β -glucosidase titres were evaluated. All yeast isolates growth and produced cellulolytic enzymes in different extents according the strain evaluated. Bagasse from five different sugarcane varieties (CTC-9, CT99-1906, SP81-3250, RB86-

7515 and CT99-1902) were milled (20 mesh) and used to obtainment of cellulose under acidic and alkaline pretreatments. These celluloses were utilized to carry out enzymatic hydrolysis which resulted in partial saccharification (<50%) after 48h of incubation. The results are important in determining the biotechnological potential of these new species to produce cellulases.

Supported by FAPESP and FAPEMIG

This document was created with Win2PDF available at <http://www.win2pdf.com>.
The unregistered version of Win2PDF is for evaluation or non-commercial use only.
This page will not be added after purchasing Win2PDF.