

Aspergillus awamori endoglucanases promote faster lignocellulosic biomass liquefaction in high-solids enzymatic hydrolysis

Roberta Pereira Espinheira¹, Vanessa Alves Lima Rocha², Tiago Martins Guimarães¹, Catarina Amorim Oliveira³, Marcella Fernandes de Souza⁴, Gilberto B. Domont², Fábio César Sousa Nogueira², Ricardo Sposina Sobral Teixeira², Elba Pinto da Silva Bon², and Ayla Sant'Ana da Silva¹

¹National Institute of Technology

²Federal University of Rio de Janeiro

³Rio de Janeiro Federal Institute of Education Science and Technology

⁴Ghent University

November 9, 2020

Abstract

Endoglucanases are necessary to improve high-solids enzymatic hydrolysis of lignocellulosic biomass by promoting liquefaction and decreasing the medium viscosity, alleviating one of the processes' major hindrances. In this study, endoglucanases produced by a particular strain of *Aspergillus awamori* were evaluated to speed up biomass liquefaction in reactions with 30% solids. Firstly, *A. awamori* crude supernatant (Aa) was assessed as a supplement to commercial enzymes, decreasing the media viscosity in 10-fold and improving glucose release by 20% after 24 h. Afterward, Aa was fractionated by size-exclusion chromatography and an endoglucanases-rich fraction was identified by liquid chromatography-mass spectrometry. This fraction was then supplemented to the most efficient commercial enzyme and its performance compared with the unfractionated Aa, resulting in the same improvement on medium viscosity and glucose release in 6 h. These data indicate that *A. awamori* endoglucanases have a powerful effect on the viscosity decrease during high-solids enzymatic hydrolysis.

Hosted file

Aspergillus awamori endoglucanase_manuscript.pdf available at <https://authorea.com/users/374319/articles/491875-aspergillus-awamori-endoglucanases-promote-faster-lignocellulosic-biomass-liquefaction-in-high-solids-enzymatic-hydrolysis>



