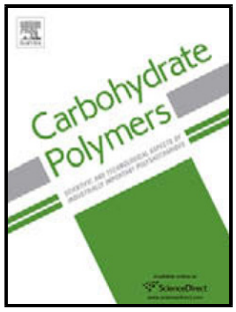


Title: Single-step production of arabino-xylooligosaccharides by recombinant *Bacillus subtilis* 3610 cultivated in brewers' spent grain

Authors: Cláudia Amorim, Sara C. Silvério, Soraia P. Silva, Elisabete Coelho, Manuel A. Coimbra, Kristala L.J. Prather, Lígia R. Rodrigues

PII: S0144-8617(18)30808-7
DOI: https://doi.org/10.1016/j.carbpol.2018.07.017
Reference: CARP 13817

To appear in:

Received date: 11-4-2018
Revised date: 25-6-2018
Accepted date: 6-7-2018

Please cite this article as: Amorim C, Silvério SC, Silva SP, Coelho E, Coimbra MA, Prather KLJ, Rodrigues LR, Single-step production of arabino-xylooligosaccharides by recombinant *Bacillus subtilis* 3610 cultivated in brewers' spent grain, *Carbohydrate Polymers* (2018), https://doi.org/10.1016/j.carbpol.2018.07.017

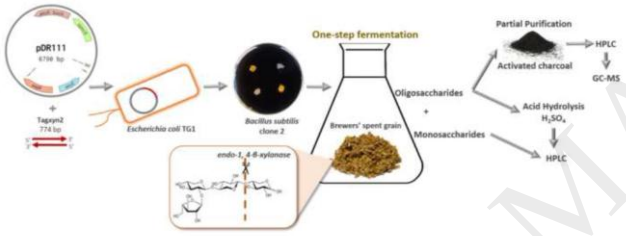
Single-step production of arabino-xylooligosaccharides by recombinant *Bacillus subtilis* 3610 cultivated in brewers' spent grain

Cláudia Amorim[a], Sara C. Silvério[a], Soraia P. Silva[b], Elisabete Coelho[b], Manuel A. Coimbra[b], Kristala L. J. Prather[c], Lígia R. Rodrigues[a*]

[a]CEB-Centre of Biological Engineering, Universidade do Minho, Campus de Gualtar, 4710-057 Braga, Portugal
[b]QOPNA, Departamento de Química, Universidade de Aveiro, 3810-193 Aveiro, Portugal
[c]Department of Chemical Engineering, Massachusetts Institute of Technology (MIT), 77 Massachusetts Ave, Cambridge, MA 02139, United States

[*] Corresponding author: Lígia R. Rodrigues. E-mail: lrmr@deb.uminho.pt; Tel + 351 253 601978; Fax (+351) 253 604429

Graphical abstract



Highlights

- *B. subtilis* 3610 wild type and mutants harboring the *T. reesei xyn*2 gene produced AXOS.
- The mutant containing a secretion tag coupled to *xyn*2 presented the highest yield.
- Optimal conditions were 20 g/L BSG, pH 7.0 and 45 °C at 12 h of fermentation.
- A mixture of AXOS with low amount of monosaccharides was produced.
- BSG one-step fermentation proved to be an effective approach for AXOS production.

Abstract. Brewers' spent grain (BSG) is an inexpensive and abundant brewery by-product that can be used to produce prebiotic arabino-xylooligosaccharides (AXOS). In this study, *Bacillus subtilis* 3610 was used, for the first time, to produce AXOS through direct fermentation of BSG. Additionally, the microorganism was genetically modified to