

Accepted Manuscript

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PII: S0144-8617(17)30387-9
DOI: <http://dx.doi.org/doi:10.1016/j.carbpol.2017.04.014>
Reference: CARP 12202

To appear in:

Received date: 16-3-2017
Revised date: 3-4-2017
Accepted date: 8-4-2017

Please cite this article as: Ruiz, Encarnación., Gullón, Beatriz., Moura, Patrícia., Carvalheiro, Florbela., Eibes, Gemma., Cara, Cristóbal., & Castro, Eulogio., Bifidobacterial growth stimulation by oligosaccharides generated from olive tree pruning biomass. *Carbohydrate Polymers* <http://dx.doi.org/10.1016/j.carbpol.2017.04.014>

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Bifidobacterial growth stimulation by oligosaccharides generated from olive tree pruning biomass

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Highlights

- Olive tree pruning biomass (OTPB) can be used for oligosaccharides (OS) production
- OTPB OS of varied degree of polymerization promote the growth of bifidobacteria
- Shorter OS support higher biomass formation, OS consumption and acids production
- Bifidobacterial counts increase during OS incubation with a fecal inoculum
- OTPB OS could be used as bioactive ingredients in the formulation of functional foods

ABSTRACT

This work aims to evaluate the prebiotic potential of oligosaccharides (OS) obtained from autohydrolysis of olive tree pruning biomass (OTPB). Two selected fractions (F1 and F2) were characterized and used in *in vitro* fermentations by two *Bifidobacterium* spp. (*B. adolescentis* and *B. longum*) and one fecal inoculum. The fraction F1 presented a lower average degree of polymerization (DP) mainly with OS ranging from 3 to 6 DP, whereas the fraction F2 corresponded to a pool of unsubstituted and acetylated oligomers with DP between 4 and 19. In the fermentation by *Bifidobacterium*, F1 supported a higher biomass formation, OS consumption and organic acids production than F2. With the fecal inoculum, the accumulation of organic acids, as the sum of acetate, propionate and butyrate, was similar for F1 and F2 (107 and 101 mM, respectively). The bifidobacteria counts also increased during the incubation time for both OS fractions.

Keywords: agricultural residues; prebiotics; oligosaccharides; SCFA; , FISH

1. Introduction

The biorefinery concept refers to an integrated production of energy, materials and chemicals from biomass, as an alternative to petroleum refineries. In this context, agricultural residues are

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