MICRO BIOTEC 23

CONGRESS OF **MICROBIOLOGY**
AND **BIOTECHNOLOGY 2023**

BOOK OF ABSTRACTS

DECEMBER
7TH - 9TH

UNIVERSIDADE DA **BEIRA INTERIOR**
Covilhã

MICRO BIOTEC 23

Congress of Microbiology and Biotechnology 2023

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P2.19 - ASSESSING THE PREBIOTIC POTENTIAL OF XYLOOLIGOSACCHARIDES PRODUCED BY ONE-STEP FERMENTATION USING AGRO-RESIDUES

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Keywords: Coffee silver skin; Human faecal inocula; Olive Stones; Prebiotic Effect; Xylooligosaccharides.

ABSTRACT

The prebiotic effect is a fundamental concept in the fields of nutrition and gut health, referring to the beneficial effects of specific non-digestible dietary components on the gut microbiota, including xylooligosaccharides (XOS). These compounds function as food sources for beneficial gut bacteria, fostering their growth and activity. In this work, *in vitro* studies were performed to evaluate the prebiotic potential of XOS produced from olive stones (OS) and coffee silver skin (CSS) via a one-step fermentation using a recombinant *Bacillus subtilis* 3610 harbouring the xylanase gene *xyn2* from *Trichoderma reesei*. This potential was compared with a commercially available prebiotic oligofructose (Orafti®, BENEO, Germany). A mixture of human faeces from four healthy donors aged between 24 and 28 years old was used as inoculum. The pH variation and the production of short-chain fatty acids (SCFAs), gases, and ammonia were analysed during the 48 hours fermentations. The prebiotic supplementation resulted in a reduction of the pH value over time, with oligofructose presenting the most significant pH drop at 48 hours (ΔpH=3.65). The addition of prebiotics also significantly increased the production of beneficial SCFAs, with oligofrutose exhibiting a notable increase in the production of lactic and acetic acid production after 48 hours (28.0±0.1 and 28±1 mM, respectively), while OS-XOS and CSS-XOS demonstrated a more prominent rise towards the production of acetic acid (14.8±0.4 and 20.4±0.1 mM, respectively), butyric acid (2.5±0.3 and 3.29±0.04 mM, respectively), and valeric acid (75±1 and 110±14 mM, respectively) at 48 hours. Remarkably, the gas analysis revealed that the addition of OS/CSS-XOS fully suppressed the production of CH_4 and increased the CO_2 generation after 48 hours (2.6±0.7 and 5.20±0.05 $mmol.L^{-1}$medium, respectively). These findings strongly suggest that the XOS produced from OS and CSS holds potential prebiotic properties for human health.

Acknowledgements:
CA, AC and JS acknowledge the junior researcher contract (CEECIND/00293/2020) and the PhD scholarships (UI/BD/153689/2022 and 2022.11695.BD), respectively, from the Portuguese Foundation of Science and Technology (FCT). This study was supported by FCT under the scope