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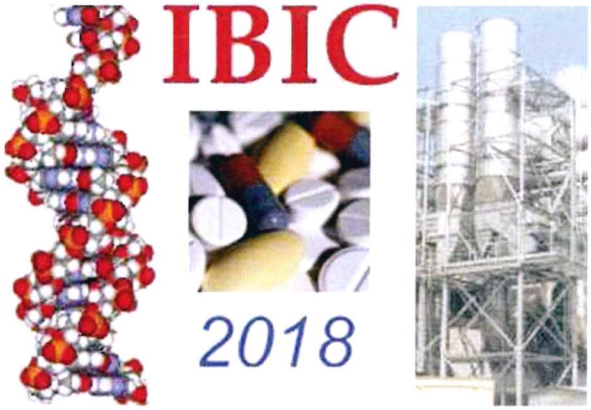

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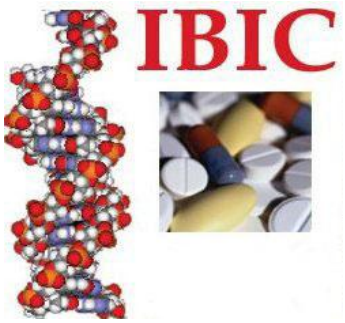

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Fermentation of *Arthrospira platensis* F&M-C256 (spirulina) biomass by *Lactobacillus plantarum* for the production of probiotics

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Abstract

A number of technologies are employed to improve the organoleptic properties, nutritional profile, and shelf life of raw vegetable products while maintaining safe microbial levels (Jaiswal and Abu-Ghannam, 2013). Fermentation by lactic acid-producing bacteria is one of such technologies. Algae (including cyanobacteria), represent a viable substrate for the production of fermented foods due to their availability and high nutritional value (Gupta et al., 2011).

The first objective of this study was to evaluate the use of lyophilized biomass of the cyanobacterium *Arthrospira platensis* F&M-C256, commonly known as spirulina, as the sole

substrate for lactic acid fermentation using *Lactobacillus plantarum* ATCC 8014. After 48 h of fermentation a concentration of 10.6 log CFU mL^{-1} was reached and lactic acid concentration increased up to 3.7 g L^{-1}. A decrease of pH to values lower than 6 was also observed. Lyophilised *A. platensis* F&M-C256 biomass was shown to be a suitable substrate for *L. plantarum* ATCC 8014 growth.

The second objective of the study was to investigate if lactic acid fermentation is able to enhance *in vitro* digestibility, antioxidant activity and total phenolic content of spirulina biomass. These parameters are important for the development of probiotics for which cyanobacterial biomasses could be considered as interesting substrates. No increase in digestibility was found, while the antioxidant activity and the total phenolic content significantly increased after fermentation.

This study highlights the potential of *A. platensis* F&M-C256 biomass for the production of probiotics and functional foods/beverages.

Bibliography

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