LACTOBACILLUS PLANTARUM FERMENTATION OF ARTHROSPIRA PLATENSIS F&M-C256 AND TETRASELMIS SUECICA F&M-M33 BIOMASSES FOR THE PRODUCTION OF FUNCTIONAL FOODS

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The first objective of this study was to evaluate the cyanobacterium Arthrospira platensis F&M-C256 and the green alga Tetraselmis suecica F&M-M33 (lyophilised and frozen biomasses) as substrates for lactic acid fermentation using Lactobacillus plantarum ATCC 8014. Within 48 h of fermentation, 10 and 9 log CFU mL-1 concentrations were reached in lyophilised and frozen substrates, respectively. Microalgal biomass appears to be a suitable substrate for L. plantarumgrowth in both forms. Considering most photosynthetic microorganisms of commercial importance (mainly Chlorophyceae, such as T. suecica) have rigid cell walls that reduce their digestibility, the second objective was to investigate whether lactic acid fermentation enhanced in vitro digestibility. Fermentation increased digestibility, but only in the frozen form (A. platensisfrom 77.3% to 85.4% and T. suecicafrom 54.2% to 60.3%). Fermentation increased total phenolic content. Between 0 and 24 h,lyophilised T. suecica biomass increased from 5.54 to 11.90 mg GAE g-1 and frozen from 3.33 to 9.94 mg GAE g -1. Between 0 and 48 h,lyophilised A. platensis biomass increased from 4.17 mg GAE g-1 to 17.36 mg GAE g-1. Total phenolic content of frozen A. platensisbiomass continued to increase up to 72 h (1.81 to 11.84 mg GAE g-1 from 0 to 72 h). DPPH radical scavenging capacity increased from 0 to 72 h in A. platensis from 20.5% to 36.6% (lyophilised) and from 17.9% to 30.1% (frozen).This study highlights the potential of fermented A. platensis and T. suecica biomasses for the production of economically valuable functional foods.

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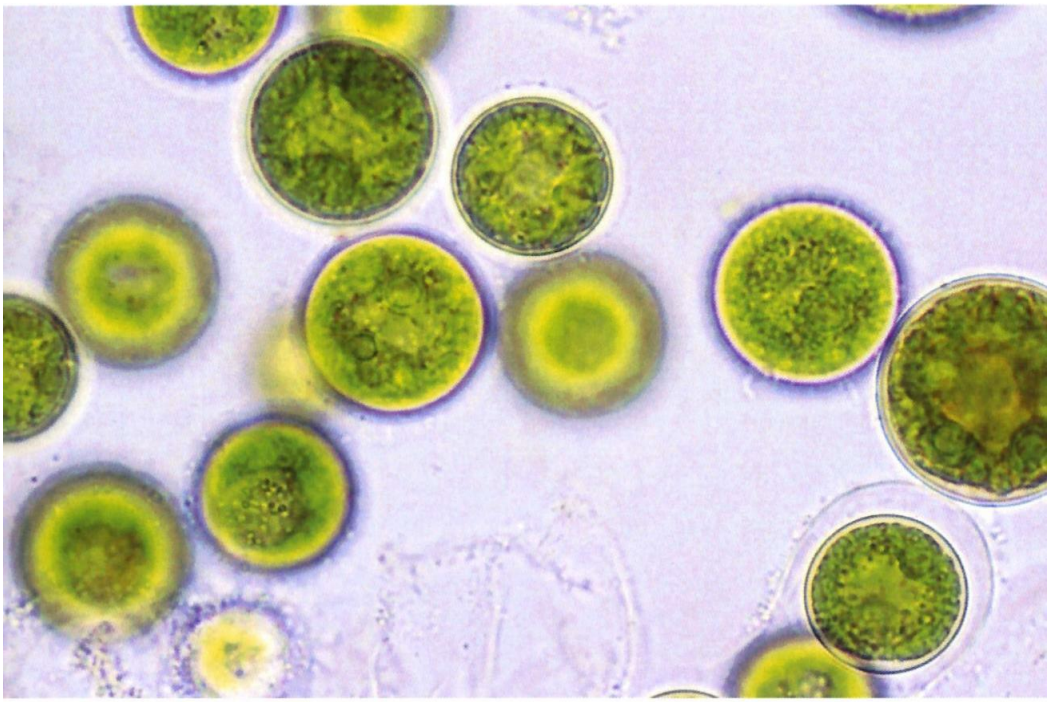

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