

Novel symbiotic approach against pathogenic bacteria for the development of new food using enzymatically hydrolysed *avena sativa* and *Fagopyrum esculentum* flours



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Abstract

Scientific results describing the symbiosis between different origin carbohydrates and fermentation is still fragmented. Moreover, new lactic acid bacterial fermentation using birch sap and Tibetan kefir grains as starters are a novel approach using different plant materials. This study aimed biochemical and microbiological investigation of enzymatically hydrolyzed *Avena sativa* and *Fagopyrum esculentum* flour water extracts (Brix 11%) interaction with Tibetan kefir grains and birch sap. Prototype batches of 20l of oats (*Avena sativa*) and common buckwheat (*Fagopyrum esculentum*) using multienzyme water-assisted extraction before the fermentation were performed. Continuously, the filtered (50 microns) liquid phase was mixed with fresh birch sap (1:1 %w/w) and kefir grains (1:10 %v/w). Five days of aerobic fermentation at 28°C was performed. Results of samples indicate a high potential of antimicrobial activity against seven pathogenic bacteria, including *Escherichia coli* ATCC 25922, *Staphylococcus aureus* ATCC 25923, *Listeria monocytogenes* ATCC 19115, *Staphylococcus epidermidis* ATCC 12228, *Klebsiella pneumoniae* ATCC 13883, *Proteus vulgaris* ATCC 8427, and *Bacillus cereus* ATCC 11778 which was evaluated via an agar well diffusion assay. Moreover, a practical approach for inhibition of *Saccharomyces cerevisiae* which binds the aflatoxins was performed using ozone.

In conclusion, significant application using birch sap and Tibetan kefir grains was investigated using different water extracts of *A. sativa* and *F. esculentum*, indicating that sugars, oligosaccharides and polysaccharides origins interact with different bacterial cultures differently characterized by divergent antimicrobial properties.

Biography

Paulina Streimikyte is a PhD student of the Lithuanian Research Centre for Agriculture and Forestry. Graduated degrees in Food and beverages technology (B.Sc. and M.Sc.) of the Kaunas University of Technology. The science field also includes microbiology and fermentation using bacteria and enzymes. Presenter of scientific data in 5 national and international conferences and published scientific articles in reputed journals. Has over three years of practical experience in optimizing and developing probiotic and plant-based beverages production technologies under real conditions and delivery to the end-user. She carried out eight outsourced works and scientific projects of the economic entities.



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