PLASMOLYZED YEAST CELLS AS A POTENTIAL WALL MATERIAL FOR PROBIOTIC BACTERIA

Ana B. Todorović, Nikola D. Bajčetić, Jovana R. Bundalo, Steva M. Lević, Milica M. Mirković, Viktor A. Nedović[1]

University of Belgrade, Faculty of Agriculture, Belgrade, Serbia

The beneficial effects of probiotics are severely limited due to their low stability during production and storage. Encapsulation of probiotic cells remains the main strategy to overcome this problem, and in this regard, the use of yeast cells may have potential. Viable, sonicated and thermally treated yeast cells as well as yeast cell wall polymers have been shown to promote the growth and survival of probiotic bacteria; however, the effects of plasmolyzed yeast have not yet been investigated. Therefore, the aim of this work was to evaluate the potential of plasmolyzed yeast cells for maintaining the viability of probiotic bacteria. Plasmolysis of *Saccharomyces uvarum* yeast cells was performed using a 10% NaCl solution (55 °C, 48 h). The cells were then washed, spray-dried and mixed with a previously prepared *Lactiplantibacillus plantarum* 299v culture (DSM 9843) in two ratios (1:1 and 2:1, w/w). Finally, the mixtures were freeze-dried. The viability of the probiotic cells was assessed after encapsulation and every two weeks during three months of storage under refrigerated conditions using the plate count method. In addition, water activity and morphology analyses were performed and the auto/coaggregation properties of the cells were investigated. After storage, the number of viable cells in both formulations remained above 7 log CFU/g, i.e. above the minimum required for probiotic benefits. The obtained powders showed satisfactory water activity, while optical microscopy and aggregation assays indicate that the protective effect of the yeast may be due to direct cell-to-cell contact. The results suggest that plasmolyzed yeast cells have the potential to serve as wall material for probiotic bacteria by maintaining their viability during freezing and storage. Further studies are needed to gain a better insight into the properties of the encapsulates under gastrointestinal conditions and in food matrices.

Key words: yeast cells; plasmolysis; probiotic bacteria; encapsulation; wall material.

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[1] Corresponding author, vnedovic@agrif.bg.ac.rs