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Fermentation of orange-passion fruit juice using fruit-origin strains of *Lactobacillus rhamnosus* and *Fructobacillus tropaeoli*

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Fruits and vegetables have a short shelf-life and are usually consumed fresh or minimally processed. The prevailing preservation technologies may cause undesirable physical and nutritional changes in the food matrices. Lactic acid fermentation of fruits and vegetables has become an attractive alternative for their conservation. Further, fermented fruits can be an excellent choice to satisfy the increasing demand for non-dairy functional drinks. The rational selection of strains with interesting metabolic profiles is crucial to preserve and/or improve the sensory quality, safety, and health-beneficial characteristics of the raw material through fermentations. Therefore, the behavior, survival, and sensorial effects of a starter culture composed of the fruit-origin strains *Lactobacillus rhamnosus* H3F-210 and *Fructobacillus tropaeoli* FYP-H3-450 (1:1) for the fermentation of a natural orange-passion fruit (50:50) juice was evaluated. The strains, selected for their ability to synthesize ethyl esters (*Lb. rhamnosus*) and mannitol (*F. tropaeoli*), acidifying capacity, and capability to survive under the juice conditions, were cultured (2%, v/v) at 30°C for 24 h in the juice (initial pH= 3.2). The starter culture survived the culture conditions, although no significant increase in bacterial counts or pH change were noticed. Also, a low decrease in the glucose and fructose contents (~25% each) with a concomitant but limited mannitol, lactic acid and acetic acid production was found. The fermented (FJ) and non-fermented (control, CJ) juices were evaluated for their nutrient and sensory profiles. Although the nutrient composition of both juices was similar, the protein, phenolic compound, and flavonoid contents were lower in the FJ than in the CJ. No differences in the volatile compound profile (SPME-GC-MS) were noticed, detecting 8 main flavor compounds corresponding to the raw fruit juice. The sensory analysis (paired comparison test) showed that fermentation significantly modified only the taste attribute; the FJ was perceived with a dairy taste, while the CJ as fresh one. Regarding the consumer acceptability test (112 panelists, 9-point hedonic scale), the grades of global acceptance of both FJ (5.91) and CJ (6.21) were not significantly different, showing that fermentation did not affect the sensory properties of the matrix. During the shelf-life (60 days, 4°C) the microbial counts slightly decreased (< 1 log CFU/mL), the pH remained constant, and no



deteriorating microorganisms were detected along the storage period. In conclusion, fermentation with the selected cultures preserved the nutritional, sensorial, and global acceptability features of the orange-passion fruit juice. Additionally, this matrix could be used as vehicle for lactic acid bacteria with specific properties. Thus, lactic fermentation may provide added value to fruit, contributing to the development of novel functional fermented fruit products for the market.

Keywords: lactic acid bacteria, fermented fruit juice, functional foods.