

Plant-based Probiotic Beverages with *Lactiplantibacillus Pentosus* LPG1 from Table Olives

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Abstract

Probiotics are beneficial live microorganisms that promote health when the host consumes them in adequate amounts. Nowadays, the development of plant-based foods with this type of microorganism is increasing because they can be an alternative to dairy products, offering a significant advantage for lactose-intolerant people. However, the physical, chemical, and organoleptic characteristics of these beverages, and therefore consumer acceptance of these products, are influenced by the adaptation of the probiotic strain and the selection of the substrate. In this study, four innovative formulations were developed by blending fruits and vegetables with the incorporation of a unique probiotic strain, *Lactiplantibacillus pentosus* LPG1, isolated from the olive processing industry. The results demonstrated that it is possible to reach an average probiotic count of 6.45 log₁₀ CFU/mL at 52 days of storage at 4°C without detection of Enterobacteriaceae, fungi/molds, or pathogenic bacteria such as *Staphylococcus*, *Listeria*, or *Salmonella* spp. Moreover, to comprehensively determine the potential healthpromoting properties of the formulated products, the research encompassed an analysis of their nutritional composition, antioxidant capacity, and organoleptic characteristics. In this sense, the beverages obtained can be considered high-value functional products due to their notable antioxidant activity-reaching up to 33% DPPH inhibition-and significant total polyphenol content exceeding 0.5 g gallic acid/L, along with a balanced nutritional profile. Sensory evaluation, including flash profiling, acceptance, and affective testing, indicated positive consumer responses regarding aroma, flavor, and appearance, supporting their potential for commercialization as ready-to-drink probiotic beverages.

Keywords

Probiotics, Plant-Based Beverages, *Lactiplantibacillus Pentosus*, Functional Foods, Antioxidant Activity, Polyphenols, Consumer Acceptance, Ready-to-Drink Products