

USE OF THE LACTOCOCCUS LACTIS IO-1 FOR DEVELOPING A NOVEL FUNCTIONAL BEVERAGE FROM COCONUT WATER

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Abstract

The goal of this work was to add value to the coconut water (CW) by fermentation with the potential probiotic *Lactococcus lactis* subsp *lactis* IO-1 in order to produce fermented CW beverages. Unpasteurized coconut water (UPW) was fermented with *Lactococcus lactis* subsp *lactis* IO-1 for 48 h at 30°C, and the viable cell counts, total acidity, pH, degree of polymerization, antioxidant activity, antibacterial bioassay and lethality bioassay were studied at 24 and 48 h. We revealed that the fermentation process of UPW with probiotic *L. lactis* IO-1 increased the viable cell counts. The total phenolic compound exhibited a higher antioxidative ability in fermented UPW at 48 h (65.79µg/mL gallic acid equivalence). The fermented UPW exhibited the highest ferric reducing antioxidant power (FRAP) and 2,2-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging abilities at 48 h (67.62 and 63.03%), The culture extracted from fermented UPW inhibited all the tested pathogenic foodborne such as *Listeria monocytogenes*, *Salmonella typhi*, *Staphylococcus aureus*, and *Escherichia coli*, although the degree of antagonistic varied between the pathogens. Furthermore, fermented UPW extract sample at 48 h, exhibited lower potent activity against the brine shrimp with LC₅₀ values (7158.2 µg/mL). Comparatively, pasteurized coconut water (PCW90) fermented by *Lactococcus lactis* subsp *lactis* IO-1 produced a fermented beverage PCW90 with similar properties as the fermented UPW. Adding 0.4% (w/v) of coconut flavor and 20% pure honey (v/v) into the fermented CW gave the beverage a better taste. The obtained results showed that the CW product fermented by *Lactococcus lactis* subsp *lactis* IO-1 may be used as a novel functional beverage comprising both probiotics and electrolytes, which can serve as a good vehicle for developing a wider range of novel products.

Keywords: Antibacterial activity, antioxidant activity, brine shrimp lethality test, coconut water, cytotoxicity.