

## ABSTRACT

### **Tolerance of Multistrain Probiotic Lactic Acid Bacteria from Vegetables and Fruits against Bile Salt and Sodium Chloride**

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Lactic acid bacteria (LAB) are small parts of native microbiota from vegetables and fruits. LAB are generally used as a probiotic microorganism. Some characteristics of probiotic bacteria were tolerance to bile salts and sodium chloride (NaCl). The aim of this study is to summarize the strain of lactic acid bacteria from vegetables and fruits and their tolerance against bile salt and NaCl. A conclusion was made from reviewing 24 literatures. The results of this literature review showed that there are multistrain probiotics from lactic acid bacteria such as *Lactobacillus*, *Lactococcus*, *Leuconostoc*, *Enterococcus*, *Pediococcus*, and *Weissella* in vegetables and fruits. *Lactobacillus plantarum* is the most commonly LAB species found in vegetables and fruits. Criteria for LAB that are tolerant to bile salt and NaCl is the value of optical density, total viable count, and survival rate more than 50% of the control. Multistrain probiotics of lactic acid bacteria from vegetables and fruits tolerant to bile salts in concentration 0.015% to 4% and tolerant to NaCl between 1.5% to 9%. Therefore, multistrain probiotics lactic acid bacteria from vegetables and fruits is tolerant against bile salt and NaCl.

**Keywords** : lactic acid bacteria, multistrain probiotic, vegetables and fruits, bile salt, NaCl