

Storage Stability of Lactic Acid Bacteria Preserved with Coconut Powder as a Drying Carrier Medium

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Abstract

Fermentation is of great importance to the food industry as it preserves food and extend their shelf life while imparting desirable sensory properties. Numerous reports have identified fermenting microorganisms in indigenous foods. However, there is paucity of work that investigated the effect of carrier media on the extended storage of fermenting microorganisms isolated from indigenous foods, for future use as starter cultures. The aim of this work was to investigate the storage stability of lactic acid bacteria (LAB) prepared by freeze-drying using coconut powder (25 %) as a carrier medium. Skim milk powder (SMP) was used as control and cell viability, cell vitality, water activity and moisture content were monitored in vacuum-packaged samples stored at 4 °C for 84 days. Further, scanning electron microscopy (SEM) was used to monitor changes in cell morphology during storage. With cell viability, approx. 1.09 log cfu/ml reduction in LAB counts occurred with cells preserved in coconut powder after 84 days, while cells in SMP showed approx. 2.17 log cfu/ml reduction after the same period. A significantly ($p < 0.05$) higher acidification power ($AP = \Delta pH_{10min}$) was observed with cells in SMP than those in coconut powder. The water activity and moisture content of LAB in coconut powder and SMP were similar at the end of storage which suggests that packaging did not negatively influence storage. LAB in coconut powder maintained a similar cell structure throughout storage, while shrinkage of cells was observed with SMP. In conclusion, this work suggests that coconut powder can potentially be used as a carrier medium for the preservation of LAB.