

Evaluation of Preservative and Shelf-Life Quality of Probiotic-Lactobacilli Fortified Nigerian Fermented Condiments

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Abstract

Locally produced plant-based fermented condiments serving as daily dietary protein in Nigeria tend to have poor safety and shelf-life quality. This study evaluates the fermentation, preservation, and shelf-life quality of probiotic lactobacilli fermented Nigerian condiments. Three fermented condiments [Locust beans “Iru” or “Dawadawa” (*Parkia biglobosa*); Oil beans “Ugba” (*Pentaclethra macrophylla*); Castor oil “Ogiri” (*Ricinus communis*)] were produced after 72-hr spontaneous fermentation fortified with a consortium of probiotic *Lactobacillus* starter. The pH and growth kinetics of the probiotic *Lactobacillus* were monitored during the fermentation. The resulting fermented condiments were analyzed for shelf-life quality analyses including color, aroma, pH, aerobic bacteria, and fungal; and lactobacilli were monitored on weekly basis during the period of storage. The pLAB_GAC fermented condiments exhibited improved color and odor, and pH tends towards acidity (pH = 5.2). The control and pLAB fermented condiments showed higher aerobic bacteria and visible fungal growth from week 1 storage with lower Lactobacilli presence and increased spoilage when compared with the pLAB_GAC fermented condiments. After 3 weeks of storage, comparative shelf-life studies evaluated revealed the pLAB-GAC fermented condiments with improved quality and shelf-life period. Probiotic lactobacilli starter strains expressed improved preservative potential for Nigerian condiment, and this could be harnessed for biotechnological production of safe fermented condiments with improved shelf-life.

Keywords

- **Fermentation**
- **Condiments**
- ***Lactobacillus***
- **Nutrition**
- **Probiotics**