

**DEVELOPMENT AND EVALUATION OF EDIBLE FILM FROM
BANANA PEEL AND CASSAVA STARCHES INCORPORATED WITH
MORINGA LEAF POWDER FOR PANEER PRESERVATION**

**Siddeek Fathima Rifnaath Rina^{1*}, Vaishnavy Saravanan¹, U. L. Abdul Majeed² and
Rajeetha Jeisunthar¹**

¹*Department of Biosystems Technology, Faculty of Technology, University of Jaffna, Sri Lanka.*

²*Department of Biosystems Technology, Faculty of Technology, South Eastern University of
Sri Lanka.*

Abstract

The development of biodegradable packaging has gained increasing importance due to the environmental concerns associated with synthetic plastics. The present study aimed to develop and evaluate the effectiveness of edible film coating in extending the shelf life and sensory quality of paneer during refrigerated storage at $4 \pm 1^\circ\text{C}$. The edible film was prepared by combining banana peel starch and cassava starch with distilled water and glycerol. Two formulations were prepared: T1 {banana peel starch (50%) + cassava starch (50%) + Glycerol (1%) + Distilled water (100 ml)} and T2 {banana peel starch (60%) + cassava starch (40%) + Glycerol (1%) + Moringa leaf extract with distilled water (100ml)}. The films were characterized for thickness, moisture content, water solubility, and pH. Results showed increased thickness and reduced moisture content in moringa-incorporated film (T2) compared to T1 film. Paneer samples coated with T1 and T2 films, along with an uncoated control, were stored at $4 \pm 1^\circ\text{C}$ and evaluated for physicochemical parameters and sensory attributes. During storage, coated samples showed significantly lower moisture loss (41.62% to 40.43%) and slower pH decline (5.86 to 5.68) compared to the control, with T2 indicating superior stability. Titratable acidity increased (0.29 to 0.60) across all samples; however, the coated paneer samples exhibited a markedly slower rise in acidity compared to the control. Sensory evaluation indicated that T2 maintained higher scores for appearance, texture, colour, and overall acceptability up to 10 days, whereas the control became unacceptable by day 10. The incorporation of moringa leaf powder enhanced both the functional properties of the film and the preservation quality of paneer. Overall, moringa-incorporated edible films indicated potential as a natural, biodegradable packaging material for extending the shelf life and improving the quality of paneer.

Keywords: Banana peel starch, Cassava starch, Edible film, Moringa Leaf powder, Paneer preservation

**Corresponding author: rinurifnath@gmail.com*