

## **Abstract**

This project explores how biodegradable bioplastics can be developed when we extract starch directly from food waste sources, specifically rice and bread. During preparation, bioplastic films had varying glycerin and acetic acid concentrations. Their physical, mechanical, and thermal properties were evaluated then. Results showed that 25% starch had been extracted from bread as well as 20% from rice. The bioplastic films were prepared from extracted starches by altering the amount of glycerin and acetic acid. Since glycerin is hygroscopic, the moisture content increased upon glycerin addition, reaching up to 36.5% in bread-based films and 29.36% in rice-based films. Acetic acid stabilized it, while glycerin increased solubility. Tensile tests revealed that moderate acetic acid concentration improved both strength and ductility in rice-based films, while excessive levels weakened films made from bread. Thermal analysis (TGA) showed that samples having higher glycerin and acetic acid content exhibited improved thermal resistance, and rice-based bioplastics showed better overall stability. The results show that food waste starch represents a useful feedstock. It is able to produce functional, eco-friendly bioplastics for short-term applications such as packaging, which also contributes to waste valorization plus sustainability. 2

## **Table of**