

# Edible Citrus Peel Candy Wrapper

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## ABSTRACT

With the growing demand for sustainable and health-conscious alternatives, Citrus Peel Edible Candy Wrap has emerged as a promising solution in the food packaging industry. This innovative wrap combines nutritional benefits with practical packaging functions, offering a biodegradable, nutritionally enriched solution for confectionery products. Made from bio-based polymers and citrus peel powder, the wrap utilizes natural preservatives that extend shelf life while providing essential nutrients. Citrus peels are rich in bioactive compounds, including flavonoids, glycosides, coumarins, volatile oils, dietary fiber, and vitamin C, which impart antioxidant and antimicrobial properties to the wrap. By repurposing citrus peel, a byproduct of the fruit processing industry, this edible wrap also contributes to food waste management. Additionally, its complete biodegradability makes it an eco-friendly alternative to conventional plastic materials like polyethylene and polypropylene, which contribute significantly to environmental pollution. The Citrus Peel Edible Candy Wrap demonstrates superior mechanical properties compared to traditional wrappers, offering flexibility, tensile strength, and tear resistance, while remaining fully edible. This solution addresses global challenges such as solid waste and food waste by reducing reliance on single-use plastics and creating a circular economy model. Ultimately, this innovation is a significant step toward sustainable, multifunctional packaging in the food industry. (Wedamulla *et al.*)

**Keywords:** Biodegradable Packaging, Bioactive Compound, Citrus Peel Powder, Edible Candy Wrap, Natural Preservative, Sustainability.

## INTRODUCTION

Edible citrus peel candy wrappers offer an innovative, eco-friendly solution to plastic packaging. Made from citrus by-products, these wrappers repurpose waste material into a functional, biodegradable film enriched with vitamins, antioxidants, and a mild citrus flavor. They address pressing global concerns of plastic pollution and food waste, aligning with consumer demand for sustainable, multifunctional products. (Bashir *et al.* 2023)

## OBJECTIVE

### Enhancing Shelf Life

To extend the usability of wraps by integrating natural preservatives from biowaste.

### Nutritional and Sensory Enhancement

To provide health benefits and stabilize taste and texture.

## METHODOLOGY

### Preparation of Natural Preservative

- Grind citrus peels into fine powder.
- Deodorize, decolorize, and sterilize to remove contaminants.
- Screen the powder for ultra-fine texture.

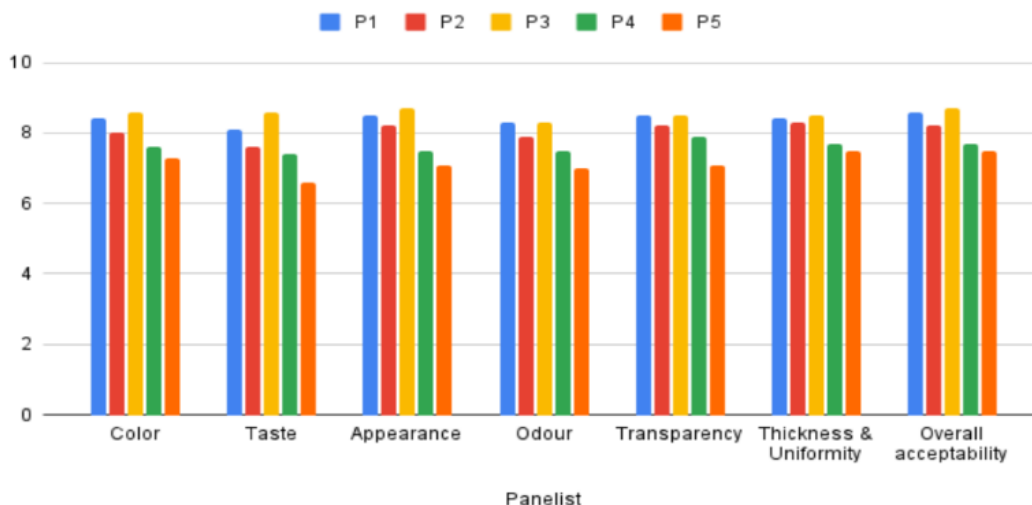
### Preparation of Wrap Mixture

- Boil 100 mL water, add 12 g gelatin and 3 mL glycerin.
- Incorporate 3 g citrus peel powder as a preservative.

- Mix until clear, simmer for 3 minutes, then pour into a mold (4 mm thickness).
- Allow to dry for 3–4 days until it forms a flexible film. (Wedamulla *et al.*) (Yusuf and Shafat 2022)

## RESULT

### SENSORY ANALYSIS



### Comparative Study

- **Sustainability:**

Unlike plastics, citrus-based wraps biodegrade through microbial activity, reducing pollution. Their production emits fewer greenhouse gases, lowering the carbon footprint.

- **Solubility Tests:**

Water Solubility: Wraps dissolved in distilled water within 4–5 days.

Alcohol Solubility: Wraps dissolved in ethanol within 1–2 days.

- **Moisture Content:**

Optimal moisture content (12–15%) ensures flexibility and microbial resistance. Lower moisture levels (25%) lead to brittleness.

- **Shear Strength and Durability:**

High shear strength ensures wraps remain intact during handling, achieved through optimized moisture and fiber structure.

- **Shelf Life:**

When stored in cool, dry, airtight conditions, wraps last 3–6 months.

## CONCLUSION

Edible citrus peel candy wrappers provide a sustainable, biodegradable alternative to plastic packaging, addressing environmental challenges like plastic pollution and food waste. By incorporating citrus by-products, they offer added health benefits such as antioxidants and dietary fiber. These wraps dissolve in water and ethanol, maintain structural integrity, and have a practical shelf life of 3–6 months. Their production supports a circular economy by repurposing waste into valuable products. This innovation represents a significant step toward sustainable food packaging and environmental changes. (Yusuf and Shafat Ahmad Khan, )

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