

ABSTRAK

PENGARUH JENIS *PLASTICIZER* & RASIO *PLASTICIZER* TERHADAP PEKTIN KULIT JERUK MANIS PADA PEMBUATAN *EDIBLE FILM* BERBASIS PATI TAPIOKA

Dwi Septi Rusmarini, 2025, 52 Halaman, 8 Tabel, 14 Gambar, 4 Lampiran

Penggunaan plastik konvensional sebagai kemasan makanan menimbulkan dampak negatif terhadap lingkungan karena sifatnya yang sulit terurai. Sebagai alternatif ramah lingkungan, dikembangkan *edible film* berbasis biopolimer dari pektin kulit jeruk manis (*Citrus sinensis* L.) dan pati tapioka dengan penambahan *plasticizer* berupa gliserol dan sorbitol. Penelitian ini bertujuan untuk mengetahui pengaruh jenis dan rasio *plasticizer* terhadap karakteristik fisik, mekanik, dan biodegradasi *edible film*. *Edible film* dibuat menggunakan variabel tetap berupa 5 gram pati tapioka dan 1 gram pektin, serta variasi rasio *plasticizer*:pektin antara 1:1 hingga 5:1 (v/w). Parameter yang dianalisis meliputi ketebalan, kuat tarik, persen elongasi, kelarutan air, laju transmisi uap air, dan biodegradasi. Hasil penelitian menunjukkan bahwa gliserol cenderung meningkatkan ketebalan, elongasi, kelarutan air, dan laju transmisi uap air, namun menurunkan kuat tarik. Sebaliknya, sorbitol menghasilkan film yang lebih tipis dengan kuat tarik lebih tinggi dan ketahanan air lebih baik. Formulasi terbaik diperoleh pada *edible film* dengan sorbitol rasio 1:1, yang memiliki ketebalan 0,16 mm, kuat tarik 15,328 MPa, elongasi 5%, dan laju transmisi uap air 0,10 g/m²·24h, serta memenuhi standar *Japanese Industrial Standard* (JIS). Dengan demikian, *edible film* ini berpotensi sebagai solusi kemasan pangan yang biodegradable dan ramah lingkungan.

Kata kunci: edible film, pektin, kulit jeruk manis, tapioka, gliserol, sorbitol, plasticizer.

ABSTRACT

THE EFFECT OF PLASTICIZER TYPE & PLASTICIZER RATIO ON SWEET ORANGE PEEL PECTIN IN MAKING TAPIOCA STARCH BASED EDIBLE FILM

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*The widespread use of conventional plastic as food packaging has raised environmental concerns due to its non-biodegradable nature. As an eco-friendly alternative, this study developed edible films based on biopolymers derived from sweet orange peel pectin (*Citrus sinensis* L.) and tapioca starch, incorporating glycerol and sorbitol as plasticizers. The objective was to examine the effects of plasticizer type and ratio on the physical, mechanical, and biodegradability characteristics of the edible film. The films were formulated using 5 grams of tapioca starch and 1 gram of pectin, with plasticizer-to-pectin ratios ranging from 1:1 to 5:1 (v/w). Parameters evaluated included thickness, tensile strength, elongation, water solubility, water vapor transmission rate (WVTR), and biodegradability. Results showed that glycerol increased film thickness, elongation, water solubility, and WVTR, but decreased tensile strength. In contrast, sorbitol produced thinner films with higher tensile strength and lower water solubility. The optimal formulation was found in the film using sorbitol at a 1:1 ratio, yielding 0.16 mm thickness, 15.328 MPa tensile strength, 5% elongation, and 0.10 g/m²·24h WVTR, meeting the Japanese Industrial Standard (JIS). Therefore, this edible film has potential as a biodegradable and environmentally friendly food packaging solution.*

Keywords: *edible film, pectin, sweet orange peel, tapioca, glycerol, sorbitol, plasticizer.*