

**PEMBUATAN *EDIBLE FILM* KITOSAN TERTAUT SILANG
TRIPOLIFOSFAT DAN UJI POTENSI SEBAGAI *INSECT OVIPOSITING*
REPELLENT TERHADAP LALAT BUAH HAMA
*Bactrocera carambolae***

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INTISARI

Penelitian pembuatan *edible film* kitosan tertaut silang tripolifosfat (kitosan-TPP) dan uji potensi sebagai *Insect Ovipositing Repellent* (IOR) terhadap lalat buah hama *Bactrocera carambolae* telah dilakukan. Penelitian ini bertujuan untuk mempelajari pembuatan kitosan-TPP, membuat film kitosan-TPP dan mengetahui sifat mekanik serta mengetahui potensi film kitosan-TPP sebagai IOR terhadap lalat buah hama *B. carambolae*.

Penelitian ini diawali dengan pembuatan larutan kitosan-TPP dengan metode gelasi ionik dalam pelarut asam asetat 1,0% v/v. Kitosan-TPP dikeringkan dengan *freeze drier* yang kemudian dikarakterisasi dengan *Fourier Transform Infrared Spectroscopy* (FTIR) dan *Scanning Electron Microscopy* (SEM). Larutan kitosan dan emulsi kitosan-TPP dibuat dalam pelarut asam asetat 1,0% v/v pada variasi konsentrasi 0,5; 1,0; 1,5 dan 2,0% b/v. Film diperoleh dari larutan tersebut yang dicetak dalam cawan petri dan dikeringkan dalam oven pada temperatur 60 °C selama ± 7 jam. Film yang terbentuk kemudian dianalisis dengan *Universal Testing Machine* (UTM), FTIR dan SEM. Potensi sebagai IOR dilakukan dengan menghitung telur yang diletakkan lalat buah *B. carambolae* betina pada jambu biji merah selama 7 hari (4 kali ulangan).

Hasil penelitian menunjukkan bahwa serbuk kitosan-TPP yang dihasilkan berwarna putih kecoklatan. Film kitosan-TPP konsentrasi 0,5% mempunyai sifat mekanik terbaik dengan ketebalan $8,50 \pm 1,41 \mu\text{m}$, nilai kuat tarik sebesar $24,65 \pm 8,57 \text{ MPa}$ dan persen perpanjangan $8,49 \pm 3,96\%$. Hasil uji IOR secara statistik menunjukkan bahwa film kitosan-TPP berpotensi sebagai IOR terhadap lalat buah hama *B. carambolae*.

Kata kunci : Kitosan, tripolifosfat, *edible film*, IOR.

PREPARATION OF CHITOSAN TRIPOLYPHOSPHATE CROSSLINKED EDIBLE FILM AND ITS POTENTIAL ASSAY AS INSECT OVIPOSITING REPELLENT AGAINST *Bactrocera carambolae* FRUIT FLY

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ABSTRACT

The preparation of chitosan tripolyphosphate crosslinked (chitosan-TPP) edible film and its potential assay as Insect Ovipositing Repellent (IOR) against *Bactrocera carambolae* fruit fly has been carried out. This research aims were to study the preparation of the chitosan-TPP, to make chitosan-TPP film and determine its mechanical properties and to know the potential of chitosan-TPP film as IOR against *B. carambolae* fruit fly.

This research was initiated by making chitosan-TPP solution using ionic gelation method in 1% v/v acetic acid. Chitosan-TPP was dried by freeze drier and characterized by Fourier Transform Infrared Spectroscopy (FTIR) and Scanning Electron Microscopy (SEM). The solution of chitosan and chitosan-TPP was made in 1% v/v acetic acid at various concentrations 0.5; 1.0; 1.5; and 2.0% w/v. Film was casted on a petri dish and dried in an oven at 60 °C for ± 7 h. The film was analyzed by Universal Testing Machine (UTM), FTIR and SEM. Its potential as IOR was done by counting eggs laid by *B. carambolae* female fruit flies in guava for 7 days (4 replications).

The results showed that the chitosan-TPP powder was white brownish. Chitosan-TPP 0.5% film has the best mechanical properties with thickness $8.50 \pm 1.41 \mu\text{m}$, tensile strength $24.65 \pm 8.57 \text{ MPa}$ and percent elongation $8.49 \pm 3.96\%$. Statistical repellent results showed that the chitosan-TPP film had potential as IOR against *B. carambolae* fruit fly.

Keywords : chitosan, tripolyphosphate, edible film, IOR.