

**PEMBUATAN FILM KOMPOSIT KITOSAN/GLISEROL SERTA UJI  
AKTIVITASNYA SEBAGAI *INSECT OVIPOSITING REPELLENT*  
TERHADAP LALAT BUAH HAMA *Bactrocera carambolae* PADA BUAH  
JAMBU BIJI MERAH *Psidium guajava***

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**INTISARI**

Pembuatan film kitosan dan film komposit kitosan/glisерol serta uji aktivitasnya sebagai *Insect Ovipositing Repellent* (IOR) terhadap lalat buah hama *Bactrocera carambolae* pada buah jambu biji merah *Psidium guajava* telah dilakukan. Tujuan penelitian ini adalah untuk mengetahui komposisi film kitosan dan film komposit kitosan/glisерol yang dapat dibuat film kitosan dan film komposit kitosan/glisерol dengan nilai kuat tarik dan elongasi optimum, serta potensi film kitosan dan film komposit kitosan/glisерol sebagai *Insect Ovipositing Repellent* (IOR).

Film kitosan dibuat dengan variasi konsentrasi 0,5; 1,0; 1,5; dan 2,0% (b/v) masing-masing dengan cara melarutkan 0,05; 0,10; 0,15 dan 0,20 g kitosan dalam 10 mL asam asetat 1%. Film komposit kitosan/glisерol dibuat dengan cara 0,15 g kitosan dilarutkan dalam 9,5 mL asam asetat 1% kemudian ditambah 0,5 mL glisерol dengan variasi konsentrasi glisерol 1,3; 2,0; 2,7; dan 3,0% (v/v). Untuk membuat film, 10 mL dari masing-masing larutan tersebut dituang dalam cawan petri 9 cm dan diuapkan pada suhu 60 °C selama 24 jam. Film dianalisis sifat mekanik yang meliputi kuat tarik, elongasi, dan ketebalan film dengan menggunakan UTM (*Universal Testing Machine*). Film dianalisis gugus fungsi dengan menggunakan FTIR (*Fourier Transform Infra Red*), dianalisis morfologi permukaannya menggunakan SEM (*Scanning Electron Microscope*) dan dilakukan uji aktivitas repelensi terhadap *B. carambolae*. Uji repelensi menggunakan larutan yang menghasilkan film dengan kuat tarik dan elongasi optimum dengan cara disemprotkan pada permukaan kulit buah jambu biji merah. Pengujian dilakukan selama 4 hari, masing-masing 4 kali pengulangan.

Film kitosan dengan nilai kuat tarik 29,16 MPa dan nilai elongasi 4,53% merupakan film kitosan dengan sifat mekanik terbaik diperoleh dari larutan kitosan 1,5% (b/v). Film komposit kitosan/glisерol dengan nilai kuat tarik 26,06 MPa dan nilai elongasi 8,48% merupakan film komposit kitosan/glisерol dengan sifat mekanik terbaik diperoleh dari penambahan glisерol 2,7% (v/v) dalam larutan kitosan 1,5% (b/v). Hasil uji repelensi diketahui bahwa film kitosan dan film komposit kitosan/glisерol berpotensi sebagai repelen terhadap lalat buah hama *B. carambolae*.

**Kata kunci:** film kitosan, *plastisizer*, komposit kitosan/glisерol, *repellent*

**PREPARATION OF CHITOSAN/GLYCEROL COMPOSITE FILM AND ITS ACTIVITY TEST AS *INSECT OVIPOSITING REPELLENT* AGAINST *Bactrocera carambolae* FRUIT FLY PEST AT RED GUAVA FRUIT *Psidium guajava***

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**ABSTRACT**

Preparation of chitosan film and chitosan/glycerol composite film and its activity test as Insect Ovipositing Repellent (IOR) against *Bactrocera carambolae* fruit fly pest at red guava fruit *Psidium guajava* have been studied. The purpose of this study was to know the composition of chitosan film and chitosan/glycerol composite film could be made chitosan film and chitosan/glycerol composite film with optimum of tensile strength and elongation value, as well as the potential of chitosan film and chitosan/glycerol composite film as Insect Ovipositing Repellent (IOR).

Chitosan film was made with various concentrations of 0.5; 1.0; 1.5; and 2.0% (w/v) respectively by dissolving 0.05; 0.10; 0.15 and 0.20 g of chitosan in 10 mL of acetic acid 1%. Composite film of chitosan/glycerol was prepared by 0.15 g chitosan was dissolved in 9.5 mL of 1% acetic acid and then added 0.5 mL of glycerol with various concentrations of glycerol 1.3; 2.0; 2.7; and 3.0% (v/v). To prepared the film, 10 mL of each solution was poured into a petri dish of 9 cm and evaporated at 60 °C for 24 h. Mechanical properties of films include tensile strength, elongation, and film thickness were analyzed using Universal Testing Machine (UTM). Film functional group was analyzed using FTIR (Fourier Transform Infra Red), the morphology of the surface was analyzed using SEM (Scanning Electron Microscope) and repellency activity was tested against *B. carambolae*. Repellency test using a solution that produces films with optimum tensile strength and elongation by spraying on the surface of the skin red guava fruit. Tests were conducted over 4 days, 4 times each repetition.

Chitosan film with a tensile strength value of 29.16 MPa and elongation value of 4.53% were the optimum mechanical properties of chitosan film from chitosan solution 1.5% (w/v). The composite film of chitosan/glycerol with a tensile strength value of 26.06 MPa and elongation value of 8.48% were the optimum mechanical properties of chitosan/glycerol composite film in the addition of glycerol with concentration 2.7% (v/v) in a solution of chitosan 1.5% (w/v). The result of repellency test was known that chitosan film and chitosan/glycerol composite film were potentially as a repellent for *B. carambolae* fruit fly pest.

Keywords: chitosan films, plasticizers, composite of chitosan/glycerol, repellent