

## **ABSTRACT**

### **EFFECTS OF CHITOSAN AND STORAGE TEMPERATURES AS A 'CALIFORNIA' PAPAYA CONTROLLING TREATMENT ON FUNGAL DISEASE *Colletotrichum gloeosporioides* (Penz.) Sacc.**

**By**

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'California' papaya is a climacteric fruit, that is characterized by high respiration rate, so the storage period of the fruit is short. Due to degradation of starch into sugars, plant tissues are more susceptible to disease. Treatments of chitosan and temperature are ways to increase the storage period and suppress the growth of fungi *Colletotrichum gloeosporioides* (Penz.) Sacc.

This study was aimed at studying (1) the coating effect of chitosan as a fungicide to control fungus *C. gloeosporioides* on *in vitro* and *in vivo* condition, (2) the effect of low storage temperature to decrease the growth of fungi *C. gloeosporioides* and (3) studying the interaction effects of fruit chitosan and storage temperature treatments in decreasing the growth of fungus *C. gloeosporioides*.

This research was conducted in the Plant Protection Laboratory and Laboratory of Horticultural Postharvest , Department of Agrotechnology, Faculty of Agriculture, University of Lampung. The experiment was conducted in July-September 2015, and consisted of two sub experiments of *in vitro* and *in vivo*. Treatments were arranged in a completely randomized design, with six treatment combinations, consisting of fruit coatings of chitosan (1,25 and 2,50%) and storage temperatures (room and low temperatures). The combination of each treatment was repeated three times so that the number of units of the experiments was 18 units.

The results showed that (1) the application of chitosan *in vitro* was able to suppress effectively the growth of fungi *C. gloeosporioides* up to 100%, but not effective in the condition *in vivo*, (2) low storage temperature treatment decreased significantly the fungal growth *in vitro* and reduced disease percentage *in vivo*, and (3) there was interaction of chitosan and storage temperature to suppress the growth of fungi *C. gloeosporioides*. In the condition of *in vitro*, the application of chitosan was able to 100% suppress the growth of fungi *C. gloeosporioides* in room and low storages. In the condition of *in vivo*, the fungi of *C. gloeosporioides* grew well in room and low storages.

Keywords: chitosan, fungi, *in vitro*, *in vivo*, papaya, temperature

## **ABSTRAK**

### **PENGARUH KITOSAN DAN SUHU SIMPAN SEBAGAI UPAYA PERLINDUNGAN BUAH PEPAYA ‘CALIFORNIA’ TERHADAP JAMUR *Colletotrichum gloeosporioides* (Penz.) Sacc.**

Oleh

**RINI SEPTIANI INDRA**

Buah pepaya ‘California’ merupakan buah klimakterik, yang dicirikan dengan laju respirasinya yang tinggi, sehingga masa simpan buah menjadi pendek. Akibatnya pemecahan pati menjadi gula semakin tinggi yang dapat menyebabkan jaringan lebih peka terhadap serangan penyakit. Perlakuan kitosan dan suhu merupakan salah satu cara untuk meningkatkan masa simpan dan menekan pertumbuhan jamur *Colletotrichum gloeosporioides* (Penz.) Sacc.

Penelitian ini bertujuan untuk mempelajari pengaruh (1) kitosan sebagai fungisida dalam mengendalikan jamur *C. gloeosporioides* pada kondisi *in vitro* dan *in vivo*, (2) suhu simpan rendah dalam menekan pertumbuhan jamur *C. gloeosporioides* dan (3) interaksi pelapisan kitosan dan suhu simpan dalam menekan pertumbuhan jamur *C. gloeosporioides*.

Penelitian ini dilaksanakan di Laboratorium Proteksi Tanaman dan Laboratorium Pascapanen Hortikultura, Jurusan Agroteknologi, Fakultas Pertanian, Universitas

Lampung. Penelitian dilaksanakan pada Juli hingga September 2015 dengan dua sub-penelitian, yaitu secara *in vitro* dan *in vivo*. Penelitian ini menggunakan Rancangan Teracak Sempurna (RTS), dengan enam kombinasi perlakuan, yaitu kombinasi dari pelapis buah kitosan (1,25% dan 2,50%) dengan suhu {suhu ruang (27-28°C) dan suhu dingin (6-18°C)}. Kombinasi masing-masing perlakuan diulang sebanyak tiga kali sehingga jumlahnya adalah 18 satuan percobaan.

Hasil penelitian menunjukkan bahwa (1) Aplikasi kitosan secara *in vitro* mampu secara efektif menekan pertumbuhan jamur *Colletotrichum gloeosporioides* (Penz.) Sacc. hingga 100%, tetapi tidak efektif dalam kondisi *in vivo*, (2) perlakuan suhu dingin mampu menekan keparahan penyakit antraknosa secara *in vitro* dan *in vivo*, dan (3) terdapat interaksi antara perlakuan kitosan dan suhu simpan dalam menekan pertumbuhan jamur *C. gloeosporioides*. Dalam kondisi *in vitro*, aplikasi kitosan mampu 100% menekan pertumbuhan jamur *C. gloeosporioides* baik dalam kondisi suhu ruang maupun suhu dingin. Dalam kondisi *in vivo*, jamur *C. gloeosporioides* masih tetap tumbuh dengan baik dalam kondisi suhu ruang maupun suhu dingin.

Kata kunci: *in vitro*, *in vivo*, jamur, kitosan, pepaya, suhu