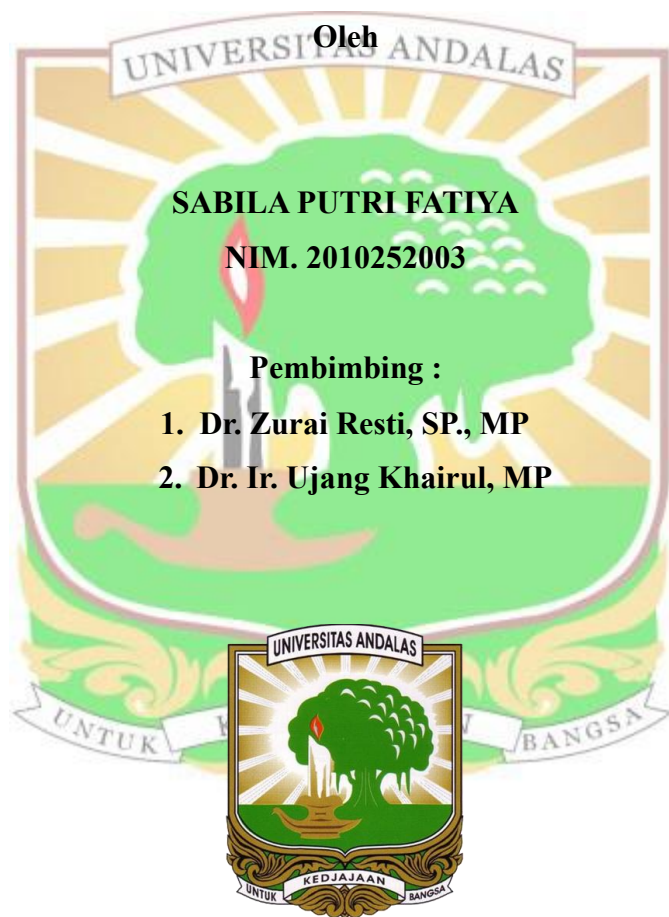


**EFEKTIVITAS METABOLIT SEKUNDER BEBERAPA
SPESIES *Bacillus* UNTUK MENEKAN PERKEMBANGAN
GEJALA BUSUK LUNAK PADA BATANG BUAH NAGA
(*Erwinia* sp.)**

SKRIPSI



**FAKULTAS PERTANIAN
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EFEKTIVITAS METABOLIT SEKUNDER BEBERAPA SPESIES *Bacillus* UNTUK MENEKAN PERKEMBANGAN GEJALA BUSUK LUNAK PADA BATANG BUAH NAGA (*Erwinia* sp.)

Abstrak

Penyakit busuk lunak yang disebabkan oleh *Erwinia* sp. merupakan salah satu penyakit penting pada batang buah naga. Alternatif pengendalian penyakit busuk lunak yaitu menggunakan metabolit sekunder beberapa spesies *Bacillus*. Penelitian bertujuan untuk mendapatkan metabolit sekunder beberapa spesies *Bacillus* yang memiliki efektivitas tertinggi dalam menekan pertumbuhan *Erwinia* sp. dan menekan perkembangan gejala busuk lunak pada batang buah naga. Penelitian ini terdiri dari 2 tahap, (1) uji mekanisme antibiosis metabolit sekunder beberapa spesies *Bacillus* terhadap pertumbuhan *Erwinia* sp. menggunakan Rancangan Acak Lengkap dengan metode difusi kertas cakram-agar dengan 6 perlakuan yaitu metabolit sekunder *Bacillus cereus* Se07, *Bacillus cereus* P14, *Bacillus* sp. HI, *Bacillus* sp. SJI, *Bacillus subtilis* dan kontrol, dan 4 ulangan. Perlakuan yang mampu menunjukkan zona hambat dilanjutkan ketahap dua. (2) uji kemampuan metabolit sekunder beberapa spesies *Bacillus* untuk menekan perkembangan gejala busuk lunak pada batang buah naga secara *in vivo* menggunakan Rancangan Acak Lengkap dengan 5 perlakuan yaitu metabolit sekunder *Bacillus cereus* Se07, *Bacillus cereus* P14, *Bacillus* sp. HI, *Bacillus* sp. SJI dan kontrol, 5 ulangan dan 2 unit perlakuan. Parameter pengamatan yaitu indeks hambat, masa inkubasi, kejadian penyakit, dan perkembangan gejala penyakit. Hasil penelitian menunjukkan bahwa metabolit sekunder dari empat spesies *Bacillus* yaitu *Bacillus cereus* Se07, *Bacillus cereus* P14, *Bacillus* sp. HI, dan *Bacillus* sp. SJI mampu menekan pertumbuhan *Erwinia* sp. dan menekan perkembangan gejala busuk lunak pada batang buah naga. Metabolit sekunder *Bacillus cereus* Se07 memiliki efektivitas tertinggi dalam menekan pertumbuhan *Erwinia* sp. dengan indeks hambat 1,15 dan menekan perkembangan gejala busuk lunak dengan efektivitas 57,16 %.

Kata kunci: *Erwinia* sp., Indeks hambat, Kejadian Penyakit, Masa inkubasi

EFFECTIVENESS OF SECONDARY METABOLITES OF SOME *Bacillus* SPECIES TO SUPPRESS THE DEVELOPMENT OF SOFT ROT DISEASE ON DRAGON FRUIT STEMS (*Erwinia* sp.)

Abstract

Soft rot disease caused by *Erwinia* sp. is one of the important diseases on dragon fruit stems. An alternative to control soft rot is to use secondary metabolites of some *Bacillus*. This research aimed to obtain secondary metabolites of some *Bacillus* with the highest effectiveness to suppress the growth of *Erwinia* sp. and suppress the development of soft rot symptoms in dragon fruit stems. This research consisted of 2 stages: (1) test the mechanism of antibiosis secondary metabolites of some *Bacillus* against the growth of *Erwinia* sp. using a Completely Randomized Design with a paper disc agar diffusion method with 6 treatments, namely secondary metabolites *Bacillus cereus* Se07, *Bacillus cereus* P14, *Bacillus* sp. HI, *Bacillus* sp. SJI, *Bacillus subtilis* and control, and 4 replications. Treatments that were able to show the inhibition zone were continued to stage two. (2) test the ability of secondary metabolites of some *Bacillus* *in vivo* to suppress the development of soft rot symptoms in dragon fruit stems using a Completely Randomized Design with 5 treatments, namely secondary metabolites *Bacillus cereus* Se07, *Bacillus cereus* P14, *Bacillus* sp. HI, *Bacillus* sp. SJI and control, 5 replications and 2 treatment units. The parameters observed were inhibition index, incubation period, disease incidence, and disease symptom development. The results showed that secondary metabolites of four species of *Bacillus*, namely *Bacillus cereus* Se07, *Bacillus cereus* P14, *Bacillus* sp. HI, and *Bacillus* sp. SJI were able to suppress the growth of *Erwinia* sp. and suppress the development of soft rot symptoms in dragon fruit stems. The secondary metabolite of *Bacillus cereus* Se07 has the highest effectiveness to suppress the growth of *Erwinia* sp. with an inhibition index of 1,15 and suppress the development of soft rot symptoms with an effectiveness of 57,16%.

Keywords: Disease incidence, *Erwinia* sp., Incubation period, Inhibition index