RINGKASAN

Kakao merupakan salah satu komoditas andalan perkebunan yang peranannya cukup penting bagi perekonomian nasional. Upaya peningkatan produksi kakao di Indonesia menghadapi berbagai kendala, salah satunya yaitu penyakit busuk buah yang disebabkan oleh jamur *Phytophthora palmivora* Bult. *Trichoderma harzianum* Rifai dan *Pseudomonas fluorescens* Migula merupakan mikroba antagonis yang dapat digunakan sebagai pestisida hayati. Penelitian ini bertujuan untuk mengkaji keefektifan metabolit sekunder gabungan dua isolat *T. harzianum* dan tiga isolat *P. fluorescens* terhadap penyakit busuk buah kakao serta pengaruhnya terhadap komponen produksi kakao.

Penelitian dilaksanakan di Laboratorium Perlindungan Tanaman, Fakultas Pertanian, Universitas Jenderal Soedirman, Purwokerto dan di perkebunan kakao rakyat di Dusun Gumiwang, Desa Putat, Kecamatan Patuk, Kabupaten Gunung Kidul, Yogyakarta, mulai November 2016 sampai Januari 2017. Penelitian menggunakan Rancangan Acak Kelompok dengan 4 ulangan dan 7 perlakuan terdiri atas kontrol, gabungan metabolit sekunder *T. harzianum* isolat bawang merah+*P. fluorescens* P8, *T. harzianum* isolat bawang merah+*P. fluorescens* P20, *T. harzianum* isolat bawang merah+*P. fluorescens* P60, *T. harzianum* isolat jahe + *P. fluorescens* P8, *T. harzianum* isolat jahe+*P. fluorescens* P20, *T. harzianum* isolat jahe+*P. fluorescens* P60. Variabel yang diamati meliputi: kejadian penyakit, intensitas penyakit, jumlah bunga, jumlah bunga jadi buah, dan senyawa fenol.

Hasil penelitian menunjukkan bahwa perlakuan metabolit sekunder *T. harzianum* bawang merah+*P. fluorescens* P8, *T. harzianum* jahe+*P. fluorescens* P8, *T. harzianum* bawang merah+*P. fluorescens* P20, *T. harzianum* jahe+*P. fluorescens* P20, *T. harzianum* jahe+*P. fluorescens* P60, *T. harzianum* bawang merah+*P. fluorescens* P60 mampu menekan kejadian penyakit berturut-turut sebesar 80,19; 66,42%; 51,37 ; 45,93; 45,29; dan 42,31%, serta menekan intensitas penyakit berturut-turut sebesar 81,99; 75,63; 59;14; 62,43; 54,41; 47,05%. Perlakuan *T. harzianum* Jahe+*P. fluorescens* P20, *T. harzianum* jahe+*P. fluorescens* P8, *T. harzianum* jahe+*P. fluorescens* P60 dan *T. harzianum* bawang merah+*P. fluorescens* P8 mampu meningkatkan jumlah bunga jadi buah berturut-turut sebesar 27,38; 23,44; 4,90; 5,26%. Semua perlakuan belum mampu meningkatkan jumlah bunga, namun perlakuan *T. harzianum* jahe+*P. fluorescens* P20, *T. harzianum* bawang merah+*P. fluorescens* P60, *T. harzianum* jahe+*P. fluorescens* P8, *T. harzianum* jahe+*P. fluorescens* P60, dan *T. harzianum* bawang merah+*P. fluorescens* P20 cenderung meningkat berturut-turut sebesar 63,13; 22,75; 21,50; 7,63; dan 5,88 bunga. Perlakuan *T. harzianum* jahe+*P. fluorescens* P20, *T. harzianum* bawang merah+*P. fluorescens* P20 dan *T. harzianum* bawang merah+*P. fluorescens* P60 mampu mengingkatkan senyawa fenol buah kakao.

SUMMARY

Cocoa is one of the superior plantion commodities whose role is quite important for the national economy. The offorts to increase cocoa production in Indonesia face many obstacles, one of the obstacles is a cacao pod rot caused by Phytophthora palmivora *Butl.* Trichoderma harzianum *Rifai and* Pseudomonas fluorescens *Migula are antagonistics microbes than can be used as biological pesticide. This research aimed to study the effectiveness of secondary metabolites combined from two* T. harzianum *isolates and three* P. fluorescens *isolates towards pod rod disease of cocoa and their influence on cocoa production components.*

The research was conducted at the Laboratory of Plant Protection, Faculty of Agriculture, of Jenderal Sudirman University, Purwokerto and in the cocoa plantations at Gumiwang hamlet, Putat Village, Patuk Sub-District, Gunung Kidul Regency, Yogyakarta from November 2016 up to January 2017. Randomized block design was used with 4 replicates and 7 treatments consisted of control, combined secondary metabolites from T. harzianum *onion isolate*+P. fluorescen *P8,* T. harzianum *onion isolate*+P. fluorescens *P20,* T. harzianum *onion isolate*+P. fluorescens *P60,* T. harzianum *ginger isolate*+P. fluorescens *P8,* T. harzianum *ginger isolate*+P. fluorescens *P20,* T. harzianum *ginger isolate*+P. fluorescens *P60. Variables observed were disease incidence, disease intensity, number of flower, number of flower become fruit and phenolic compound.*

Result of the research indicated that the secondary metabolites of T. harzianum *shallot*+P. fluorescen *P8,* T. harzianum *ginger*+P. fluorescen *P8,* T. harzianum *shallot*+P. fluorescen *P20,* T. harzianum *ginger*+P. fluorescen *P20,* T. harzianum *ginger*+P. fluorescen *P60,* T. harzianum *shallot*+P. fluorescen *P60 could suppress the disease incidence as 80,19; 51,37; 45,93; 45,29; and 42.31%, respectively, and suppress the disease intensity as 81,99; 75,63; 59,14; 62,43; 54,41; 47,05%, respectively. Secondary metabolites of* T. harzianum *ginger*+P. fluorescen *P20,* T. harzianum *ginger*+P. fluorescen *P8,* T. harzianum *ginger*+P. fluorescen *P60, and* T. harzianum *shallot*+P. fluorescen *P8 increase the number of flower become fruit as 27,38; 23,44; 4,90; 5,26%, respectively. All the tratment could not increase the number of flower, however treatment of* T. harzianum *ginger*+P. fluorescen *P20,* T. harzianum *onion*+P. fluorescen *P60,* T. harzianum *ginger*+P. fluorescen *P8,* T. harzianum *ginger*+P. fluorescen *P60, and* T. harzianum *onion*+P. fluorescen *P20 tends to increase flowers of 63,13; 22,75; 21,50; 7,63; and 5,88 respectively. The secondary metaboluites of* T. harzianum *ginger*+P. fluorescen *P20,* T. harzianum *shallot*+P. fluorescen *P20 and* T. harzianum *shallot*+P. fluorescen *P60 increase phenolic compound in cocoa fruit.*