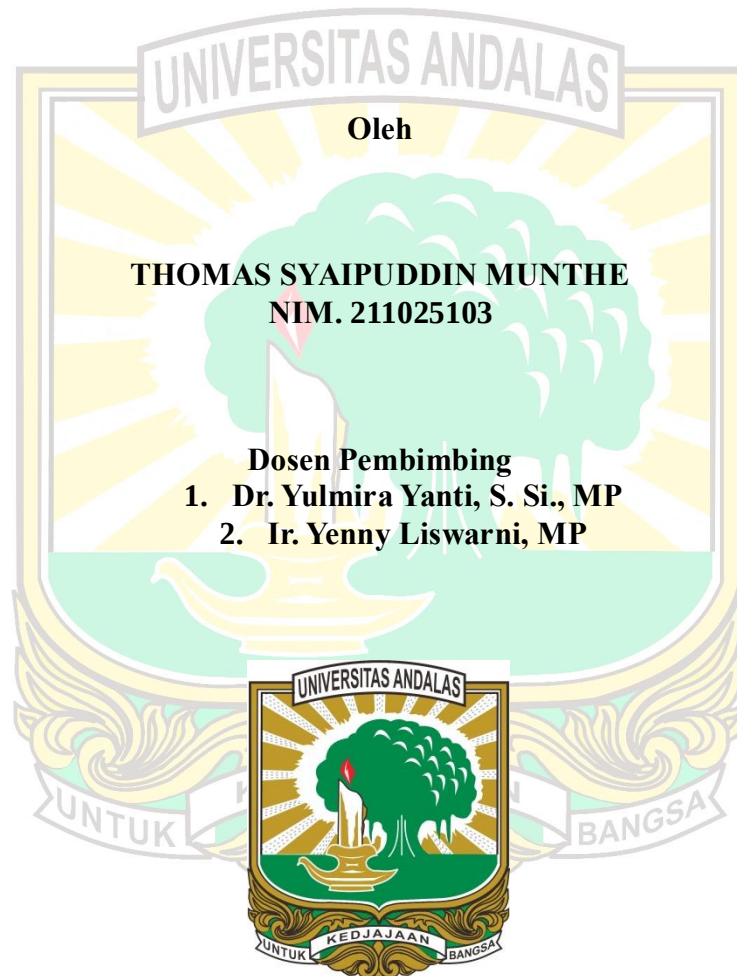


**PENAPISAN RIZOBAKTERI RIZOSFER PISANG UNTUK
PENGENDALIAN PENYAKIT BUSUK PANGKAL BATANG
(*Fusarium oxysporum* f.sp *cepae*) DAN MENINGKATKAN
PRODUKSI TANAMAN BAWANG MERAH**

SKRIPSI



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PENAPISAN RIZOBAKTERI RHIZOSFER PISANG UNTUK PENGENDALIAN PENYAKIT BUSUK PANGKAL BATANG (*Fusarium oxysporum* f.sp *cepae*) DAN MENINGKATKAN PRODUKSI TANAMAN BAWANG MERAH

Abstrak

Fusarium oxysporum f. sp. *cepae* merupakan salah satu patogen tanaman bawang merah yang menyebabkan kerusakan hingga mencapai 80%. Salah satu pengendalian yang dapat dilakukan adalah menggunakan mikroorganisme dari kelompok rizobakteri. Tujuan penelitian untuk mendapatkan isolat rizobakteri rhizosfer pisang yang berpotensi menekan penyakit busuk pangkal batang dan meningkatkan pertumbuhan serta produksi bawang merah secara *in planta*. Penelitian terdiri atas 2 tahap yaitu, 1) isolasi dan karakterisasi rizobakteri, 2) seleksi rizobakteri untuk menekan penyakit busuk pangkal batang dan meningkatkan pertumbuhan tanaman serta hasil tanaman bawang merah. Hasil isolasi rizobakteri didapat 75 isolat yang dilanjutkan dengan uji keamanan hayati sehingga diperoleh 56 isolat yang tidak patogen bagi tanaman. Hasil uji hemolisis didapat 25 isolat yang tidak patogen terhadap mamalia dan digunakan untuk uji *in planta*. Penelitian disusun dalam Rancangan Acak Lengkap (RAL) dengan 26 perlakuan, 3 ulangan, serta 3 unit tanaman dengan total tanaman sebanyak 234. Perlakuan yang digunakan yaitu 25 isolat rizobakteri serta kontrol positif (+) dan negatif (-). Variabel yang diamati yaitu morfologi koloni rizobakteri, uji Gram, uji keamanan hayati (reaksi hipersensitif dan hemolisis), perkembangan penyakit (masa inkubasi, insidensi, severitas penyakit serta AUDPC) dan pertumbuhan serta hasil bawang merah. Hasil penelitian didapat 9 isolat yang berpotensi dalam menekan perkembangan penyakit busuk pangkal batang serta meningkatkan pertumbuhan dan hasil tanaman bawang merah yaitu ST1.2, SG3.1, ST5.3, ST7.1, SG9.1, SG3.3, SBD6.2, SBD5.1, dan SG2.4, dengan masa inkubasi (24,93-35,05 hsi), insidensi penyakit (55,56%-61,11%), severitas penyakit (17,17%-24,81%), AUDPC (55,24%-77,53%), tinggi tanaman (39,21-52,15 cm), jumlah daun (37,51-49,49 helai), berat segar umbi (66,67-83,91 g), dan berat kering umbi (62,05-78,55 g).

Kata kunci : Busuk pangkal batang, *Fusarium oxysporum* f.sp *cepae*, penapisan, pengendalian hayati, dan rizobakteri

Screening of Banana Rhizosphere Rhizobacterials to Control Base Stem Rot Disease (*Fusarium oxysporum* f.sp *cepae*) and Increase Shallot Production

Abstract

Fusarium oxysporum f. sp. *cepae* is one of the major pathogens of shallot plants that can cause yield losses of up to 80%. One of the control strategies that can be applied is the use of microorganisms from the rhizobacteria group. This study aimed to obtain rhizobacterial isolates from the banana rhizosphere with potential to suppress basal rot disease and to enhance the growth and yield of shallot plants under in planta conditions. The research was conducted in two stages: (1) isolation and characterization of rhizobacteria, and (2) selection of rhizobacteria to suppress basal rot disease and promote plant growth and yield. A total of 75 rhizobacterial isolates were obtained from the isolation process and subsequently subjected to biosafety tests, resulting in 56 isolates that were non-pathogenic to plants. Hemolysis testing further identified 25 isolates that were non-pathogenic to mammals, which were then used for in planta evaluation. The experiment was arranged in a Completely Randomized Design (CRD) with 26 treatments, three replications, and three plants per experimental unit, giving a total of 234 plants. The treatments consisted of 25 rhizobacterial isolates along with positive (+) and negative (–) controls. The observed variables included rhizobacterial colony morphology, Gram reaction, biosafety tests (hypersensitive reaction and hemolysis), disease development (incubation period, disease incidence, disease severity, and AUDPC), as well as the growth and yield of shallot plants. The results showed that nine isolates were effective in suppressing basal rot disease and enhancing plant growth and yield, namely ST1.2, SG3.1, ST5.3, ST7.1, SG9.1, SG3.3, SBD6.2, SBD5.1, and SG2.4. These isolates resulted in an incubation period of 24.93–35.05 days after inoculation, disease incidence of 55.56%–61.11%, disease severity of 17.17%–24.81%, AUDPC of 55.24%–77.53%, plant height of 39.21–52.15 cm, number of leaves of 37.51–49.49 leaves, fresh bulb weight of 66.67–83.91 g, and dry bulb weight of 62.05–78.55 g.

Key words : Basal stem rot, biological control, *Fusarium oxysporum* f.sp. *cepae*, rhizobacteria, screening