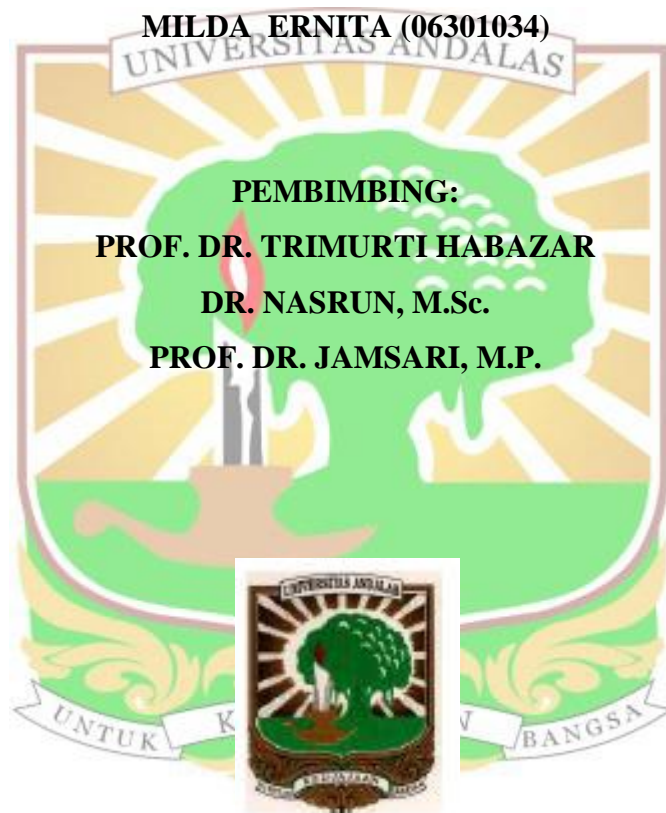


**INDUKSI KETAHANAN BAWANG MERAH (*Allium ascalonicum* L.) TERHADAP
PENYAKIT HAWAR DAUN BAKTERI (*Xanthomonas axonopodis* pv. *allii*)
DENGAN RIZOBAKTERI INDIGENUS**

Disertasi

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Induksi Ketahanan Bawang Merah (*Allium ascalonicum* L.) Terhadap Penyakit
Hawar Daun Bakteri (*Xanthomonas axonopodis* pv. *allii*)
dengan Rizobakteri Indigenus

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Prof. Dr. Jamsari, MP)

Abstrak

Bawang merah (*Allium ascalonicum* L.) merupakan komoditi unggulan hortikultura kedua setelah cabe. Produksi bawang merah Indonesia yaitu 11,18 ton/ha dan Sumatera Barat 10,32 ton/ha. Salah satu penyebab rendahnya produksi adalah serangan *Xanthomonas axonopodis* pv. *allii* penyebab penyakit hawar daun bakteri (HDB). Teknik pengendalian HDB di Indonesia belum banyak informasi. Penggunaan agen hayati kelompok rizobakteri telah dikenal efektif sebagai pengendali penyakit, meningkatkan pertumbuhan dan hasil tanaman. Penelitian ini bertujuan untuk: 1). mendapatkan isolat rizobakteri indigenus yang mampu menginduksi ketahanan bawang merah terhadap HDB, 2). mengetahui keragaman fisiologis dan jenis rizobakteri indigenus terpilih tahap 1, 3). mengkaji mekanisme respon fisiologis bawang merah yang diinduksi ketahanannya oleh rizobakteri indigenus, 4). Mendapatkan formula rizobakteri indigenus yang stabil dalam menginduksi ketahanan bawang merah terhadap HDB di daerah endemik. Penelitian dalam bentuk percobaan di laboratorium dan di lapangan. Metode penelitian di laboratorium menggunakan rancangan acak lengkap dan deskriptif, di lapangan menggunakan Rancangan Acak Kelompok. Hasil percobaan diperoleh 136 isolat rizobakteri dan secara morfologi dan fisiologis bervariasi. Seleksi 128 isolat rizobakteri indigenus (yang menunjukkan reaksi hipersensitif negatif) secara *in planta* didapatkan sepuluh isolat mampu meningkatkan ketahanan bawang merah terhadap HDB, meningkatkan pertumbuhan dan hasil. Hasil identifikasi 10 isolat rizobakteri indigenus terpilih tahap 1, tergolong genus *Bacillus*, *Stenotropomonas*, *Serratia* dan *Pseudomonas*. Karakter fisiologis sebagai biokontrol adalah: 7 isolat menghasilkan kitinase, 6 isolat menghasilkan selulase, 4 isolat menghasilkan antibiotik terhadap Xaa, sepuluh isolat menghasilkan antijamur terhadap *Colletotrichum* sp. Karakter fisiologis sebagai pemacu pertumbuhan adalah semua isolat menghasilkan IAA dan 6 isolat sebagai pelarut fosfat. Respon fisiologis tanaman bawang merah setelah diinduksi rizobakteri meningkatkan aktivitas peroksidase, polifenol oksidase dan penilalanin amonialiase pada daun dibanding akar. *Pseudomonas geniculata* strain XJUH-19 dan *Bacillus. pumilus* strain TSH22W yang diformula tepung talek, air kelapa dan kompos pada penyimpanan 2 minggu menurunkan severitas penyakit dengan efektivitas penurunan 31,37% dan hasil tertinggi introduksi *P.geniculata* strain XJUH-19 yang diformula dengan tepung talek dan disimpan selama 2 minggu yaitu 19,75 ton/ha.

Kata kunci: hawar daun bakteri, rizobakteri indigenus, bawang merah

**Induction Resistance of Onion Plants (*Allium ascalonicum* L.) Against
Bacterial Leaf Blight Disease (*Xanthomonas axonopodis* pv .*allii*)
with Indigenous Rhizobacteria**

by Milda Ernita (06301034)
(Supervised by: Prof. Dr. Trimurti Habazar, Dr. Nasrun, MSc and
Prof. Dr. Jamsari, MP)

Abstract

*Onion plants (*Allium ascalonicum* L.) is the second most important horticulture commodity. Productivity of onion in Indonesia was 11.18 ton/ha and in West Sumatra was 10.32 ton/ha, while the productivity of onion could be increased 16-20 ton/ha. Low production due to bacterial leaf blight (BLB) caused by *Xanthomonas axonopodis* pv .*allii*. Management control of BLB in Indonesia has not been developed. Using biological agents from group of rhizobacteria have been known to be effective as a control disease, improve growth and yield. The aims of this study were: 1) to obtain indigenous rhizobacteria isolates those could be used to induce resistance against BLB on onion plants, 2) to know the physiological diversity and indigenous species of rhizobacteria based on selected stages 1, 3) to know the physiological response of defence mechanism of the onion which has been induced, 4) to obtain an stable formula of indigenous rhizobacteria which is applicable to induce the resistance against BLB on onion plants in endemic areas. Research has been done in the laboratory and in the field on Alahan Panjang, West Sumatra as an endemic areas suffered from BLB. This laboratory experiment used a completely randomized design and descriptive, while field experiment of used a randomized block design. Results are obtained a total 136 isolates of indigenous rhizobacteria in which they indicated morphologically and physiologically differs. Selection of 128 isolates indigenous rhizobacteria (which showed a negative hypersensitivity reaction), obtained ten isolates which could improve resistance against BLB, and increased growth and yield. Molecular identification of ten isolates indigenous rhizobacteria indicated those belong to *Bacillus*, *Stenotropomonas*, *Serratia* and *Pseudomonas*. Physiological characteristics as a biocontrol showed by 7 isolates produced chitinase, 6 isolates produced cellulase, 10 isolates produced antifungal against *Colletotrichum* sp., and 4 isolates produced antibiotics against Xaa. Physiological characteristics of growth promoters showed by 10 isolates produced IAA and 6 isolates as phosphate solvent. Physiological response of onion plants introduced with indigenous rhizobacteria to activities of peroxidase, polyphenoloxidase and phenylalanin amonialiase in leaves was higher than the roots. *Bacillus pumilus* strain TSH22W and *Pseudomonas geniculate* strain XJUHX-19 formulated with talc powder, coconut water and compost on the storage of 2 weeks decreased severity by 31,37% effectiveness. The highest tuber yields was 19,75 ton/ha resulted from introduction *P.geniculata* strain XJUHX-19 formulated with talc powder and stored for 2 weeks.*

Keywords: Bacterial leaf blight, indigenous rhizobacteria, onion plants