

**EKSPLORASI DAN KARAKTERISASI BAKTERI ENDOFIT  
DARI BEBERAPA VARIETAS BENIH PADI UNTUK  
MENEKAN PERTUMBUHAN JAMUR *Rhizoctonia solani* Khun.  
DAN MENINGKATKAN PERTUMBUHAN BIBIT PADI**

**SKRIPSI**



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# **EKSPLORASI DAN KARAKTERISASI BAKTERI ENDOFIT DARI BEBERAPA VARIETAS BENIH PADI UNTUK MENEKAN PERTUMBUHAN JAMUR *Rhizoctonia solani* Khun. DAN MENINGKATKAN PERTUMBUHAN BIBIT PADI**

## **ABSTRAK**

Bakteri endofit merupakan kelompok bakteri yang hidup di dalam jaringan tanaman tanpa menimbulkan gejala penyakit pada tanaman inangnya. Bakteri endofit dilaporkan berada berbagai jaringan tanaman seperti akar, batang, daun, umbi, buah, dan benih. Laporan keberadaan bakteri endofit dalam benih padi untuk pengendalian *Rhizoctonia solani* penyebab penyakit hawar pelepah padi masih terbatas. Penelitian ini bertujuan untuk mendapatkan isolat bakteri endofit dari benih padi yang mampu menekan *R. solani* dan sebagai agens pemacu pertumbuhan tanaman bibit padi. Penelitian terdiri atas 4 tahap: (1) Ekplorasi bakteri endofit dari beberapa benih padi dan peremajaan *Rhizoctonia solani* Khun, (2) Uji antagonis bakteri endofit menekan pertumbuhan *R. solani* secara *In-vitro*, (3) Potensi bakteri endofit dari benih padi sebagai agens biostimulan pada bibit tanaman padi, (4) Karakterisasi bakteri endofit sebagai agens biokontrol dan agens biostimulan. Hasil penelitian menunjukkan bahwa diperoleh 35 isolat bakteri endofit dari 5 varietas padi . Sebanyak 11 isolat bakteri mampu menghambat pertumbuhan *R. solani* dengan daya hambat antara 8,79% - 50,14%. Sebanyak 4 isolat terbaik yang mampu meningkatkan pertumbuhan tanaman dan sebagai agens biokontrol yaitu BPI41, BI34, ADI35, dan BMI33. Sebanyak 11 isolat mampu menghasilkan siderofor, 2 isolat menghasilkan enzim kitinase, 7 isolat menghasilkan protease, 8 isolat mampu memfiksasi nitrogen dan 10 isolat mampu menghasilkan IAA. Tidak satupun dari isolat bakteri yang mampu menghasilkan HCN dan melarutkan fosfat. Hasil ini menunjukkan bahwa bakteri endofit dari benih padi berpotensi digunakan sebagai agens biokontrol dan biostimulan.

Kata Kunci : bakteri endofit, padi, *R. solani*

# EXPLORATION AND CHARACTERIZATION OF ENDOFIT BACTERIES FROM SOME VARIETIES OF RICE SEEDS TO SUPPRESS THE GROWTH OF THE FUNGUS *Rhizoctonia solani* Khun. AND IMPROVE THE GROWTH OF RICE SEEDLINGS

## ABSTRACT

Endophytic bacteria are a group of bacteria that live within plant tissues without causing disease symptoms in their host plants. These bacteria have been reported to inhabit various plant tissues, including roots, stems, leaves, tubers, fruits, and seeds. Reports on the presence of endophytic bacteria in rice seeds for controlling *Rhizoctonia solani*, the causal agent of rice sheath blight disease, remain limited. This study aimed to isolate endophytic bacteria from rice seeds capable of suppressing *R. solani* and acting as plant growth-promoting agents for rice seedlings. The research consisted of four stages: (1) Exploration of endophytic bacteria from various rice seed varieties and rejuvenation of *Rhizoctonia solani* Kuhn, (2) Antagonistic testing of endophytic bacteria to inhibit *R. solani* growth *in vitro*, (3) Evaluation of endophytic bacteria as biostimulant agents for rice seedling growth, (4) Characterization of endophytic bacteria as biocontrol and biostimulant agents. The results showed that 35 endophytic bacterial isolates were obtained from 5 rice varieties. Among these, 11 isolates were capable of inhibiting the growth of *R. solani* with inhibition rates ranging from 8.79% to 50.14%. Four of the best isolates that enhanced plant growth and exhibited biocontrol potential were identified as BPI41, BI34, ADI35, and BMI33. Additionally, 11 isolates were found to produce siderophores, 2 isolates produced chitinase enzymes, 7 isolates produced protease, 8 isolates could fix nitrogen, and 10 isolates were able to produce indole-3-acetic acid (IAA). However, none of the isolates were capable of producing hydrogen cyanide (HCN) or solubilizing phosphate. These findings indicate that endophytic bacteria from rice seeds have potential as biocontrol and biostimulant agents.

Keyword: Endophytic bacteria, *Rhizoctonia solani* Khun, rice