

**Uji Kemampuan Isolat-Isolat Bakteri Pupuk Hayati dalam Mensubtitusi  
Kebutuhan Pupuk serta Mengendalikan Patogen Blas pada Tanaman Padi  
(*Oryza sativa* L.)**

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**ABSTRAK**

Penurunan kualitas lahan pertanian Indonesia mengakibatkan produktivitas padi semakin menurun. Perlu usaha dan strategi yang tepat untuk memperbaiki kualitas lahan, sekaligus menjaga kesuburan dan kesehatan tanah, serta mengendalikan hama dan penyakit secara hayati yang ramah lingkungan yaitu dengan pemanfaatan bakteri pupuk hayati. Bakteri pupuk hayati merupakan mikroba yang menguntungkan tanaman. Tujuan dari penelitian ini adalah mengetahui kemampuan isolat-isolat bakteri penambat N (LNO 6, EPS 8, NTT 4) dan bakteri pelarut P (083) serta pengaruh dosis pemupukan NPK bertaraf dalam (1) meningkatkan serapan N dan pertumbuhan tanaman padi (*Oryza sativa* L.) (2) meningkatkan serapan hara P tanaman padi, dan (3) mengendalikan cendawan *Pyricularia oryzae* penyebab penyakit blas pada tanaman padi. Penelitian dilaksanakan di Laboratorium Biologi dan Kesehatan Tanah, Laboratorium Kimia dan Kesuburan Tanah serta rumah kaca Balai Penelitian Tanah, Bogor. Rancangan acak kelompok faktorial digunakan dalam penelitian ini dengan dua faktor berupa jenis isolat (4 isolat bakteri) dan dosis pemupukan NPK (100% dosis rekomendasi, 75% dari rekomendasi, 50% dari rekomendasi dan 0% dari rekomendasi) yang diulang sebanyak empat ulangan. Inokulasi bakteri dilakukan secara *seed treatment* menggunakan media NB (*Nutrient Broth*). Benih padi yang telah diinokulasi bakteri kemudian ditanam di media persemaian selama dua minggu dan dipindahtanamkan ke dalam pot berisi media tanah yang telah dicampur kapur dan bahan organik. Inokulasi cendawan *Pyricularia oryzae* dilakukan 18 hari setelah tanam atau stadia 4-5. Parameter tanaman yang diamati adalah tinggi tanaman, jumlah anakan, serapan hara N dan P serta intensitas serangan blas. Hasil penelitian menunjukkan bahwa interaksi antara pemberian bakteri dengan pemupukan NPK bertaraf terdapat pada parameter serapan N tanaman, aplikasi bakteri dan pemupukan NPK bertaraf berpengaruh sangat nyata terhadap serapan N tanaman serta aplikasi bakteri maupun pemupukan NPK tidak memberikan pengaruh nyata terhadap serapan P tanaman. Bakteri LNO 6, NTT 4, EPS 8, 083 serta konsorsiumnya berpotensi menekan pertumbuhan cendawan *P. oryzae* penyebab penyakit blas dengan penghambatan terbaik pada isolat LNO 6 sebesar 62,92% pada perlakuan tanpa pemupukan NPK.

**Kata Kunci:** bakteri pupuk hayati, pengendali hayati, patogen blas

## **Capability Test of Isolates of Bacterial Biofertilizer in Substituting Fertilizer Needs and Controlling Blast Pathogen on Paddy (*Oryza sativa* L.)**

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### **ABSTRACT**

The decline of the quality of agricultural land in Indonesia resulted in decreasing rice productivity. It is needed effort and appropriate strategies to improve the quality of the land, to maintain fertility and soil health at once, as well as to control pests and diseases using a biological environmentally friendly by utilizing bacterial bio-fertilizer. Bacterial bio-fertilizer is a beneficial microbe for plant. The objectives of this study were to determine the ability of N fixing bacteria (LNO 6, EPS 8, NTT 4) and P solubilizing bacteria (083) and the effect of NPK dosage application to (1) increasing N uptake and growth of paddy (*Oryza sativa* L.) (2) increasing the P nutrient uptake of paddy, and (3) controlling the *Pyricularia oryzae* fungi causing blast disease in paddy. The research was conducted in Biology and Soil Health Laboratory, Laboratory of Chemistry and Fertility and Greenhouse of Soil Research Institute, Bogor. Factorial randomized block design was used in this study with two factors of isolates (4 bacterial isolates), and NPK fertilizer dosage (100% of recommended dosage, 75% of recommended dosage, 50% of recommended dosage and 0% of recommended dosage) repeated in four replications. Bacterial inoculation was performed by seed treatment using NB (Nutrient Broth) media. Rice seeds that have been inoculated with bacteria are then grown in a nursery medium for two weeks and transferred into pots containing soil media that has been mixed with lime and organic matter. Inoculation of *P. oryzae* fungi was done 18 days after planting or stadia 4-5. Plant parameters observed were plant height, number of tillers, N and P nutrient uptake and blast attack intensity. Research result showed that interaction between bacterial application and NPK level fertilization is indicated on N uptake of plants, application of bacteria and dosage of NPK fertilizer have significant effect on N uptake of plants and bacteria application have no significant effect on P uptake of plant. Bacteria LNO 6, NTT 4, EPS 8, 083 and its consortium have a potential to suppress the growth of *P. oryzae* causing blast disease fungi with the best inhibition by isolate LNO 6 of 62.92% without NPK fertilizer application.

**Keywords:** bio-fertilizer bacteria, biological control, rice blast disease