

RINGKASAN

Rhizobacteria merupakan jenis bakteri rhizosfer yang berhabitat di tanah sekitar perakaran berasosiasi dengan akar tanaman. Asosiasi antara *Rhizobacteria* dan akar tanaman dapat meningkatkan pertumbuhan tanaman melalui produksi fitohormon IAA (*Indole Acetyc Acid*) serta ketahanan terhadap penyakit dengan memacu induksi ketahanan sistemik (ISR). Inpari Unsoed 79 Agritan merupakan varietas padi yang toleran salinitas tinggi namun memiliki potensi hasil panen rendah dan rentan terhadap penyakit hawar daun bakteri (HDB) yang disebabkan patogen *Xanthomonas oryzae* pv. *oryzae* (Xoo). Inokulasi *Rhizobacteria* indigenous lahan salin berpotensi meningkatkan pertumbuhan dan produktivitas padi toleran salin serta sebagai agensia hayati dalam menekan serangan Xoo. Penelitian ini bertujuan untuk mengkaji pengaruh inokulasi *Rhizobacteria* indigenous lahan salin terhadap pertumbuhan dan hasil padi toleran salin serta efektivitas inokulasi bakteri dalam menekan penyakit HDB padi pada kondisi cekaman salinitas tinggi.

Penelitian ini dilakukan di Laboratorium Agronomi & Hortikultura, Laboratorium Perlindungan Tanaman dan *Screen House* Eksperimental Farm, Fakultas Pertanian UNSOED pada bulan Desember 2020 – Juni 2021. Penelitian ini menggunakan Rancangan Acak Kelompok (RAK) faktor tunggal dengan 9 taraf perlakuan dan diulang 3 kali. Perlakuan dalam penelitian ini antara lain kontrol, kontrol (diinfeksi Xoo) dan inokulasi isolat *Rhizobacteria* JA1, JB1, JB2, JD1, JE1, R08, R011 yang diinfeksi Xoo. Padi ditanam pada medium cair AB Mix sistem hidroponik apung dengan tingkat salinitas air 5,5 dS.m⁻¹. Variabel pertumbuhan yang diamati meliputi tinggi tanaman, jumlah anakan per rumpun, biomassa tanaman, panjang akar total, luas daun, luas daun spesifik (LDS), laju asimilasi bersih (LAB), indek stomata, kandungan klorofil daun, kehijauan daun serta intensitas penyakit HDB. Variabel hasil yang diamati meliputi jumlah anakan produktif, panjang malai, jumlah gabah per malai, bobot 1000 biji, bobot gabah per rumpun, kehampaan gabah dan indek panen (IP).

Hasil penelitian menunjukkan inokulasi isolat *Rhizobacteria* indigenous lahan salin mampu meningkatkan pertumbuhan dan hasil tanaman padi varietas Inpari Unsoed 79 Agritan dalam kondisi cekaman salinitas tinggi. Inokulasi isolat *Rhizobacteria* (JB2, JD1 dan R11) mampu meningkatkan pertumbuhan padi pada biomassa tanaman, panjang akar total, luas daun, kadar klorofil daun, LAB, jumlah anakan dan tinggi tanaman padi masing-masing hingga 142,5%, 106,9%, 68,2%, 34,3%, 64,7%, 61,7% dan 23,7%. Inokulasi isolat *Rhizobacteria* (JB2, JD1 dan R08) mampu meningkatkan hasil panen padi pada bobot gabah per rumpun, bobot 1000 biji dan indek panen masing-masing sebesar 47,5%, 10% dan 10,6%. Disisi lain, inokulasi isolat *Rhizobacteria* dapat menurunkan kehampaan gabah sebesar 15% dan menekan intensitas serangan penyakit HDB padi hingga 12,4%.

SUMMARY

Rhizobacteria is a type of rhizosphere bacteria that lives in the soil around the roots in association with plant roots. The association between *Rhizobacteria* and plant roots can increase plant growth through the production of phytohormones IAA (Indole Acetic Acid) and resistance to disease by stimulating the induction of systemic resistance (ISR). Inpari Unsoed 79 Agritan is a paddy variety that is tolerant of high salinity but has low yield potential and susceptible to leaf blight disease (HDB) caused by the pathogen *Xanthomonas oryzae* pv. *oryzae* (Xoo). Inoculation of indigenous *Rhizobacteria* saline land has the potential to increase the growth and productivity of saline-tolerant paddy as well as biological agents in suppressing Xoo attacks. This study aimed to examine the effect of inoculation of *Rhizobacteria* on the growth and yield of saline tolerant paddy and the effectiveness of bacterial inoculation in suppressing HDB disease under conditions of high salinity stress.

This research was conducted at the Agronomy & Horticulture Laboratory, Plant Protection Laboratory, and Screen House Experimental Farm, Faculty of Agriculture UNSOED in December 2020 – June 2021. This study used a single factor Randomized Block Design (RBD) with 9 levels of treatment and repeated 3 times. The treatments in this study included control, control (infected Xoo) and inoculation of *Rhizobacteria* isolates JA1, JB1, JB2, JD1, JE1, R08, R011 that infected with Xoo. Paddy was grown in AB Mix liquid medium with a floating hydroponic system and water salinity level of 5,5 dS.m⁻¹. The growth variables in this research included plant height, number of tillers per clump, plant biomass, total root length, leaf area, specific leaf area (SLA), net assimilation rate (NAR), stomata index, leaf chlorophyll content, leaf greenness, and leaf blight disease intensity. The yield variables included number of productive tillers, panicle length, number of grain per panicle, 1000 seed weight, grain weight per clump, grain voidness, and harvest index (HI).

The results showed that inoculation of *Rhizobacteria* indigenous saline was able to increase the growth and yield of Inpari Unsoed 79 Agritan paddy variety under conditions of high salinity stress. Inoculation of *Rhizobacteria* isolates (JB2, JD1, and R11) was able to increase paddy growth in plant biomass, total root length, leaf area, leaf chlorophyll content, NAR, number of tillers, and plant height of paddy respectively by 142,5%, 106,9%, 68,2%, 34,3%, 64,7%, 61,7%, and 23,7%. Inoculation of *Rhizobacteria* isolates (JB2, JD1, and R08) was able to increase paddy yields in grain weight per clump, the weight of 1000 seeds, and harvest index of paddy respectively by 47,5%, 10%, and 10,6%. In addition, inoculation of *Rhizobacteria* isolates could reduce grain voidness by 15% and suppress the intensity of leaf blight disease in paddy by 12,4%.