

RINGKASAN

Kegiatan produksi tanaman padi saat ini belum optimal disebabkan oleh penurunan bahan organik tanah akibat penggunaan pupuk kimia yang berlebihan. Penggunaan teknologi ramah lingkungan merupakan alternatif untuk meningkatkan kesuburan biologi tanah. *Plant Growth Promoting Rhizobacteria* (PGPR) merupakan teknologi ramah lingkungan dengan kemampuannya menyediakan unsur hara bagi tanaman dan lingkungan. Kombinasi bakteri PGPR mampu meningkatkan serapan hara, pertumbuhan serta produktivitas tanaman. Penelitian ini bertujuan untuk mengetahui pengaruh inokulasi kombinasi isolat PGPR terhadap tanaman padi dan mendapatkan kombinasi isolat PGPR yang mampu meningkatkan pertumbuhan dan hasil padi. Penelitian dilaksanakan di Laboratorium Agronomi dan Hortikultura Unsoed mulai bulan Oktober 2018 sampai Januari 2019. Rancangan perlakuan yang digunakan adalah Rancangan Acak Kelompok (RAK) dengan 8 perlakuan dan diulang tiga kali. Perlakuan yang dicoba yaitu kontrol tanpa inokulasi isolat PGPR (K), *Rhizobium* sp. LM-5 (A), isolat R08 (B), isolat R011 (C), *Rhizobium* sp. LM-5 + isolat R011 (AC), *Rhizobium* sp. LM-5 + isolat R08 (AB), isolat R08 + isolat R011 (BC), *Rhizobium* sp. LM-5 + isolat R08 + isolat R011 (ABC). Variabel yang diamati meliputi bobot kering akar, bobot kering tajuk, rasio tajuk akar, bobot kering tanaman, kehijauan daun, luas daun, jumlah anakan, tinggi tanaman, jumlah malai, jumlah gabah isi per malai, jumlah gabah isi per rumpun, jumlah gabah hampa per malai, bobot gabah per rumpun, bobot 1000 biji, persentase gabah isi. Data yang diperoleh dianalisis dengan ANOVA; F apabila berbeda nyata dilanjutkan dengan uji *Duncan Multiple Range Test* (DMRT) dan tingkat kepercayaan 95%. Hasil penelitian menunjukkan bahwa inokulasi kombinasi isolat PGPR mampu meningkatkan pertumbuhan dan hasil tanaman terutama pada tinggi tanaman, jumlah anakan, kehijauan daun, luas daun, bobot kering akar, bobot kering tajuk, bobot kering tanaman, jumlah malai, jumlah gabah isi per malai, jumlah gabah isi per rumpun dan bobot gabah per rumpun. Perlakuan *Rhizobium* sp. LM-5 + R011 (AC) menghasilkan bobot gabah sebesar 21,17 g per rumpun.

SUMMARY

The current activity of rice products which are not optimal is caused by a decrease in soil fertility due to excessive use of synthetic fertilizer. The use of environmentally friendly technology is an alternative in restoring soil biology fertility. Plant Growth Promoting Rhizobacteria (PGPR) is an environmentally friendly technology with its ability provide nutrients for plants and environment. The Combination of strains bacterial PGPR that can increase nutrient uptake, rice growth and yield. This research was aimed to study the effect of PGPR combination on rice plants and obtain a combination of PGPR isolates that can increase rice growth and yield. The research was held in Agronomy and Horticulture Laboratory UNSOED from October 2018 until January 2019. The research was arranged with Randomized Block Design with 8 treatments and three replications .The treatments were control without inoculation PGPR (K), Rhizobium sp. LM-5 (A), Isolate R08 (B), Isolate R011 (C), Rhizobium sp. LM-5 + Isolate R011 (AC), Rhizobium sp. LM-5 + Isolate R08 (AB), Isolate R08 + Isolate R011(BC), Rhizobium sp. LM-5 + Isolate R08 + Isolate R011 (ABC). Variables observed were root dry weight, shoot dry weight, root-shoot ratio, plant dry weight, leaf greenness, leaf area, number of tillers, plant height, number of grains per panicle, number of grains per clump, number of empty grains per panicle, grains weight per clump, percentage of grains, and 1000 grains weight. The data was analyzed by ANOVA: F. Significant different was continued by Duncan Multiple Range Test and 95% confidence levels. The result showed that inoculation of PGPR gave the effect on root dry weight, shoot dry weight, plant dry weight, leaf greenness, leaf area, number of tillers, plant height, number of grains per panicle, number of grains per clump, weight of grain per clump. The combination of Rhizobium SP. LM-5 + Isolate R011 (AC) treatment gave the highest grain weight 21,17 g per clump.