

PENGARUH PUPUK ORGANIK PADAT TERHADAP RESPON FISILOGIS DAN ANATOMIS TANAMAN PADI (*Oryza sativa* L.) PADA CEKAMAN NaCl

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INTISARI

Padi (*Oryza sativa* L.) merupakan tanaman yang memiliki nilai ekonomi sangat penting dan merupakan makanan pokok lebih dari separuh penduduk dunia. Pengembangan padi di lahan salin masih mendapat kendala dengan terbatasnya jumlah kultivar toleran terhadap salinitas. Penelitian ini bertujuan untuk mengetahui pengaruh pupuk organik padat terhadap respon fisiologis dan anatomis tanaman padi pada media dengan cekaman NaCl. Penelitian ini disusun menggunakan Rancangan Acak Lengkap (RAL) dengan pemberian perlakuan NaCl pada taraf konsentrasi 0 mM (S0), 100 mM (S1) dan 200 mM (S2). Perlakuan pupuk organik meliputi takaran 0 ton/Ha (P0), 2 ton/Ha (P1), dan 4 ton/Ha (P2). Kultivar padi yang digunakan adalah ‘Ciherang’ (V1) dan ‘Inpari Unsoed 79 Agritan’ (V2). Masing-masing perlakuan dengan 3 ulangan. Variabel yang diamati selama fase vegetatif adalah pertumbuhan, anatomis, fisiologis dan biokimia. Pengamatan parameter pertumbuhan meliputi tinggi tanaman, jumlah anakan, panjang akar, berat basah akar, berat kering akar, berat basah tajuk, berat kering tajuk, dan rasio akar tajuk. Anatomis akar tanaman yang meliputi tebal epidermis, korteks, dan stele serta parameter fisiologis yaitu kadar klorofil dan biokimia yaitu kandungan prolin. Data dianalisis dengan ANOVA pada taraf kepercayaan 95%, jika berbeda nyata dilakukan uji lanjut dengan uji DMRT (*Duncan's Multiple Range Test*) pada $\alpha=5\%$. Data kualitatif disajikan dengan gambar dan dianalisis secara deskriptif. Hasil penelitian menunjukkan bahwa penambahan pupuk organik padat 4 ton/Ha paling efektif dalam meningkatkan tinggi tanaman dan jumlah anakan tertinggi yang berkorelasi terhadap berat basah akar, berat basah tajuk, dan berat kering tajuk 2 kultivar tanaman padi ‘Ciherang’ dan ‘Inpari Unsoed 79 Agritan’ pada kondisi cekaman NaCl. Peningkatan dosis pupuk organik padat menurunkan panjang akar yang berkorelasi dengan peningkatan tebal epidermis, tebal korteks dan tebal stele akar tanaman padi 2 kultivar pada kondisi cekaman NaCl. Peningkatan dosis pupuk organik padat mampu meningkatkan kadar klorofil a, klorofil b, dan klorofil total kultivar padi ‘Inpari Unsoed 79 Agritan’ pada kondisi cekaman NaCl. Kadar prolin akar tanaman padi kultivar ‘Inpari Unsoed 79 Agritan’ lebih tinggi daripada kultivar ‘Ciherang’ pada kondisi cekaman NaCl.

Kata kunci: Pupuk organik padat, Padi (*Oryza sativa*), NaCl, pertumbuhan

EFFECT OF SOLID BIO FERTILIZERS ON PHYSIOLOGICAL AND ANATOMICAL RESPONSES OF RICE (*Oryza sativa* L.) UNDER NaCl STRESS

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ABSTRACT

Rice (*Oryza sativa* L.) is a plant that has very important economic value and the main food of more than half the world's population. Rice development in salin land has several problems with limited number of suitable cultivars tolerant to salinity. The aims of this study was to determine the effect of solid bio fertilizers to physiological and anatomical responses of rice plants in the medium with NaCl stress. This study was conducted using a completely randomized design (CRD) with 2 factors treatment : NaCl concentration of 0 mM, 100 mM, and 200 mM and solid bio fertilizers : 0 ton /Ha, 2 ton/Ha, and 4 ton/Ha. The cultivars of rice used were 'Ciherang' and 'Inpari Unsoed 79 Agritan'. Each treatment consisted of 3 replication. The following growth parameters, anatomis, physiological and biochemical variables were observed during vegetative phase. The observed variables growth parameters were plant length, number of tiller, root length, root dry weight, and plant dry weight. Root anatomy consisted of epidermis, thickness cortex and stele diameters. Physiological variables was chlorophyll content and biochemical parameters was the content of proline in root. Quantitative data were analyzed with ANOVA with significance value of 95%, and DMRT test (*Duncan's Multiple Range Test*) with significance value of 95%. Qualitative data were analyzed in descriptive way. This observation showed that addition of 4 tons/Ha of solid organic fertilizer was the effective in increasing plant height and number of tillers high correlated to weight of fresh roots and shoot, and dry weight shoot of 2 cultivars of rice 'Ciherang' and 'Inpari Unsoed 79 Agritan' on NaCl stress. Increasing the dose of solid organic fertilizer lowered root length which is correlated with increasing root epidermal, cortex, and stele thickness roots of 2 cultivars rice on NaCl stress. Increasing the dose of solid organic fertilizer increased the content of chlorophyll a, chlorophyll b, and total chlorophyll of rice cultivars 'Inpari Unsoed 79 Agritan' on NaCl stress condition. Proline levels roots of the rice 'Inpari Unsoed 79 Agritan' was higher than 'Ciherang' on NaCl stress.

Keywords : Solid bio fertilizer, Rice (*Oryza sativa* L.), NaCl, growth