HASIL METABOLIT PSB (*PHOTOSYINTETHIC BACTERIA*) DARI SUMBER PROTEIN YANG BERBEDA DAN PENGARUHNYA TERHADAP TANAMAN SAWI (*Brassica rapa* L.) DI PSAMMENT YANG DIBERI PUPUK KANDANG DAN DOLOMIT

TESIS

OLEH:

RANTI PRIMA ILAHI
2220232001

PEMBIMBING:

1. Dr. Ir. GUSNIDAR, MP

2. Dr. MIMIEN HARIANTI, SP., MP

DEPARTEMEN ILMU TANAH DAN SUMBER DAYA LAHAN
FAKULTAS PERTANIAN
UNIVERSITAS ANDALAS
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HASIL METOBOLIT PSB (*PHOTOSYINTETHIC BACTERIA*) DARI SUMBER PROTEIN YANG BERBEDA DAN PENGARUHNYA TERHADAP TANAMAN SAWI (*BRASSICA RAPA* L.) DI PSAMMENT YANG DIBERI PUPUK KANDANG DAN DOLOMIT

ABSTRAK

Psamment yang merupakan tanah sub optimal dengan tingkat kesuburan rendah, dapat diatasi dengan penambahan pupuk kandang, dolomit dan penambahan PSB. Bakteri fotosintetik (PSB) menghasilkan metabolit sekunder berupa zat bioaktif seperti fitohormon Auksin (IAA), Giberelin, dan Sitokin yang berperan pemanjangan sel, pembentukan akar, serta pembentukan percabangan tanaman. Penelitian ini bertujuan untuk mengenalisa interaksi dan pengaruh utama dari input PSB, pupuk kandang dan dolomit terhadap tanaman Sawi sendok di Psamment. Penelitian dilakukan di rumah kaca dan Laboratorium Kimia Tanah Fakultas Pertanian Universitas Andalas. Penelitian menggunakan RAL Faktorial (36 satuan percobaan) faktor A (A1= pupuk kandang ayam, A2= pupuk kandang ayam + dolomit), faktor B (B0= kontrol, B1= PSB telur ayam ras, B2= PSB telur ayam kampung, B3= PSB telur bebek, B4= PSB telur keong mas, dan B5= PSB daging ikan nila, memiliki 3 ulangan untuk masing-masing perlakuan. Parameter penelitian yaitu metabolit sekunder PSB (fitohormon IAA, Giberelin, Sitokinin), kandungan N, P, K PSB. Analisis tanah (nilai pH, C-organik, N-total, P-tersedia, KTK, Ca-dd, Mg-dd, K-dd dan Na-dd), pengamatan tinggi, jumlah helai daun dan bobot segar tanaman sawi sendok. Hasil penelitian menunjukkan bahwa fitohormon tertinggi diperoleh pada PSB telur ayam ras menghasilkan IAA 85,20 ppm, Giberelin 29,52 ppm dan Sitokinin 14,56 ppm. Bakteri fotosintetik dari daging ikan nila memiliki jumlah ($N+P_2O_5+K_2O$) terbaik yaitu 3,15%. Terdapat interaksi penambahan PSB, pupuk kandang ayam dan dolomit terhadap kadar C-organik tanah, K-dd, dan jumlah helai daun sawi sendok. Terdapat pengaruh utama PSB dari sumber protein berbeda terhadap nilai pH, N-total, P-tersedia, KTK, Ca-dd, Mg-dd, Na-dd. Psamment yang diberi pupuk kandang ayam+dolomit dan pengaplikasian PSB lebih efektif dalam meningkatkan karakteritik kimia Psamment.

Kata Kunci: Bakteri fotosintetik, Fitohormon, Metabolit sekunder, Pertumbuhan Sawi sendok, Protein hewani

METABOLYTES OF PSB (*PHOTOSYINTETHIC BACTERIA*) FROM DIFFERENT PROTEIN SOURCES AND THEIR EFFECT ON MUSTARD (*BRASSICA RAPA* L.) IN PSAMMENTS WITH MANURE AND DOLOMITE APLICATION

ABSTRACT

Psamment is a sub-optimal soil with low fertility. It can be overcome by the addition of manure, dolomite, and Photosyintethic Bacteria (PSB). Photosynthetic bacteria produce secondary metabolites in the form of bioactive substances such as phytohormones Auxin (IAA), Gibberellin, and Cytokines that play a role in cell elongation, root formation, and plant branching formation. The study was aimed to analyze the interaction and main effect of PSB, manure and dolomite inputs on scoop mustard in Psamment. The research was conducted in the glasshouse and Soil Chemistry Laboratory of the Faculty of Agriculture, Andalas University. The experiment consisted of 2 factors (2×6), the 1st factor was ameliorant (A1= chicken manure, A2= chicken manure + dolomite) and the second factor was PSB (B0= control, B1= PSB of purebred chicken eggs, B2= PSB of free-range chicken eggs, B3= PSB of duck eggs, B4= PSB of goldfish eggs, and B5= PSB of tilapia meat). Each combination was repeated 3 times. The treatment hints were allocated in glasshouse based on Completedy Randomized Design (CRD). The parameters analyzed were secondary metabolites of PSB phytohormones (IAA, Gibberellin, Cytokinin), N, P, K content of PSB, soil analysis (pH value, organic-C, total-N, available-P, CEC, Ca-exchangeable, Mg-exchangeable, K-exchangeable and Na-exchangeable), then crop indicator (height, number of leaf blades and crop fresh).The results showed that the highest phytohormones produced by PSB derived from broiler eggs such as IAA was 85.20 ppm, Gibberellin was 29.52 ppm, and Cytokinin was 14.56 ppm. Tilapia meat PSB contained the highest amount of ($N+P_2O_5+K_2O$) which was 3.15%. There was an interaction between the addition of PSB and chicken manure plus dolomite on soil organic-C content, K-exchangeable, and leaf blade of scoop mustard. The main effect of PSB from different protein sources on pH, total-N, available-P, CEC, Ca-exchangeable, Mg-exchangeable, Na-exchangeable. Psamment treated with chicken manure + dolomite was the most effective in improving the chemical characteristics of Psamment.

Keywords: Animal protein, Photosynthetic bacteria, Phytohormones, Secondary metabolites, Scoop mustard growth