

**PENGARUH PUPUK KANDANG AYAM TERHADAP
PENINGKATAN PRODUKSI CABAI DENGAN APLIKASI
BAKTERI *Serratia marcescens* AR1 PADA ULTISOL**

SKRIPSI



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ABSTRAK

Pemanfaatan Ultisol sebagai lahan budidaya tanaman cabai memiliki beberapa keterbatasan dalam sifat fisik, kimia dan biologi tanah sehingga diperlukan penambahan bahan organik untuk meningkatkan kesuburan tanahnya. Penelitian ini bertujuan untuk mengkaji pengaruh pemberian beberapa dosis pupuk kandang ayam dengan aplikasi bakteri *Serratia marcescens* AR1 terhadap peningkatan produksi tanaman cabai merah (*Capsicum annum* L) pada Ultisol. Penelitian ini dilaksanakan pada bulan April hingga September 2022 di Rumah Kawat dan Laboratorium Kimia dan Kesuburan Tanah Fakultas Pertanian Universitas Andalas. Penelitian ini menggunakan metode Rancangan Acak Lengkap (RAL) yang terdiri dari 6 perlakuan dan 3 ulangan melalui perendaman benih cabai dengan 10 ml suspensi bakteri endofit kecuali kontrol. Perlakuan terdiri dari kontrol, 0 ton/ha pupuk kandang ayam, 5 ton/ha pupuk kandang ayam, 10 ton/ha pupuk kandang ayam, dan 15 ton/ha pupuk kandang ayam. Data analisis tanah dan tanaman dilakukan uji lanjut menggunakan uji *Duncan's New Multiple Range Test* (DNMRT) pada taraf 5%. Perlakuan terbaik yaitu pada perlakuan F (10 ml bakteri endofit + 20 ton/ha pupuk kandang ayam), terjadi peningkatan nilai pH sebesar 0,61 unit, P-tersedia 23.12 ppm, C-organik 1.47%, N-total 0.37%, KTK 16.99 cmol⁽⁺⁾ kg⁻¹, total populasi bakteri tanah 9.27×10^7 , dan Al-dd menjadi tidak terukur jika dibandingkan dengan kontrol. Pertumbuhan tanaman optimum diperoleh pada perlakuan F (10 ml bakteri endofit + 20 ton/ha pupuk kandang ayam), mampu meningkatkan tinggi tanaman sebesar 28.13 cm, jumlah cabang sebanyak 6 buah, jumlah bunga sebanyak 21 buah, jumlah buah sebanyak 24 buah, berat total buah sebesar 85.26 g, berat basah tanaman sebesar 108 g, berat kering tanaman 26 g dan angkutan hara N sebesar 3.85 mg/tanaman, hara P sebesar 0.79 mg/tanaman, dan hara K sebesar 1.02 mg/tanaman jika dibandingkan dengan kontrol.

Kata Kunci : Bakteri *Serratia marcescens* AR1, Cabai, Produksi Tanaman, Pupuk Kandang Ayam, Ultisol

THE EFFECT OF CHICKEN MANURE ON PRODUCTION IMPROVEMENT OF CHILI TREATED WITH *Serratia marcescens* AR1 BACTERIA AT ULTISOL

ABSTRACT

Ultisols has some problems either for its physical, chemical, or biological properties. Therefore, it is necessary to add organic matter to increase the soil fertility. This study was aimed to study the effect of chicken manure on increasing the production of chili (*Capsicum annum* L) treated with *Serratia marcescens* AR1 bacteria at Ultisols. This experiment was carried out from April to September 2022 at the wire house, as well as at the Soil Chemical Laboratory, Faculty of Agriculture, Andalas University. This experiment consisted of 6 treatments ((control (no endophytic bacteria and chicken manure), B (soaking seeds with 10 ml endophytic solution), C (soaking seeds with 10 ml endophytic solution + 5 tons/ha of chicken manure), D (soaking seeds with 10 ml endophytic solution + 10 tons/ha of chicken manure), E (soaking seeds with 10 ml endophytic solution + 15 tons/ha of chicken manure), F (soaking seeds with 10 ml endophytic solution + 20 tons/ha of chicken manure)) with 3 replicates. The experimental units were allocated based on Completely Randomized Design (CRD) in the wire house. The parameters analyzed were soil pH, P-available, organic-C, total-N, CEC, Al-exchangeable, total bacterial population, plant height, number of branches, fruit flower, fruit number, fruit weight total, fresh weight of biomass, dry weight of biomass, and N,P,K uptake. The data resulted were analyzed the variance using F test (5%), then the test was continued using Duncan's New Multiple Range Test (DNMRT) at 5% level if F calculated > F table. The result showed that the best treatment was found under F treatment (10 ml of bacteria solution of *Serratia marcescens* AR1 + 20 tons/ha of chicken manure). It was indicated by an increase in soil pH by 0.61 unit, P-available content by 23.12 ppm, organic-C content by 1.47%, total-N by 0.37%, CEC by 16.99 cmol⁽⁺⁾ kg⁻¹, and a decrease in Al-exchangeable into unmeasured. Then, the total bacterial population was 9.27 x 10⁷ CFU, if compared to the control. The F treatment also showed optimum plant growth, it was able to increase plant height by 28.13 cm, number of branches by 6, fruit flower by 21, fruit number by 24, fruit weight total by 85.26 g, fresh weight of biomass by 108 g, dry weight biomass by 26 g, as well as nutrient content by 3.85, 0.79, and 1.02 mg/plant for N, P, K respectively, if compared to the control.

Keywords : Chicken manure, Chili, Plant production, Serratia marcescens AR1 bacteria, Ultisol