# ABSTRAK

Penelitian ini bertujuan untuk mengetahui konsentrasi kitosan terbaik untuk memperkaya *Bacillus* sp. asal rizosfer jagung terhadap jamur *R. solani* secara *in vitro*, mengetahui kemampuan *Bacillus* sp. asal rizosfer jagung yang diperkaya kitosan dalam mengendalikan penyakit hawar pelepah jagung dan meningkatkan pertumbuhan tanaman jagung. Penelitian dilaksanakan di Laboratorium Perlindungan Tanaman dan *Screen house* Fakultas Pertanian, Universitas Jenderal Soedirman, Purwokerto dari bulan Februari - Juni 2020. Uji *in vitro* menggunakan Rancangan Acak Lengkap dengan 5 perlakuan dan 4 ulangan, yaitu kontrol, *Bacillus* sp. tanpa diperkaya kitosan, *Bacillus* sp. + kitosan 1%, *Bacillus* sp. + kitosan 2%, dan *Bacillus* sp. + kitosan 3%. Uji *in planta* menggunakan Rancangan Acak Kelompok dengan 7 perlakuan dan 4 ulangan, yaitu kontrol, fungisida (mankozeb 80%), *Bacillus* sp. tanpa diperkaya kitosan, *Bacillus* sp. + kitosan 1%, *Bacillus* sp. + kitosan 2%, *Bacillus* sp. + kitosan 3%, dan larutan kitosan 1%. Variabel *in vitro* yang diamati yaitu daya hambat dan zona bening. Variabel *in planta* yang diamati yaitu tinggi tanaman, jumlah daun, bobot segar akar, bobot segar tanaman, masa inkubasi, kejadian penyakit, intensitas penyakit, uji saponin, uji tanin, dan uji hidrokuinon. Hasil penelitian *in vitro* menunjukkan penambahan kitosan tidak mampu meningkatkan aktivitas penghambatan *Bacillus* sp. terhadap jamur *R. solani*, namun mampu meningkatkan aktivitas enzim kitinase dari *Bacillus* sp. *Bacillus* sp. dengan kitosan dan tanpa kitosan mampu menekan perkembangan penyakit hawar pelepah jagung *in planta*, yaitu mampu menunda masa inkubasi antara 57,81-64,32%, menurunkan kejadian penyakit antara 41,67-66,67%, menurunkan intensitas penyakit 38,95-68,64% dan penambahan kitosan 2%, 3% mampu meningkatkan kandungan fenol tanaman. *Bacillus* sp. dengan penambahan kitosan belum dapat digunakan sebagai alternatif pengendalian penyakit hawar pelepah dan meningkatkan pertumbuhan tanaman jagung.



**Kata kunci**: *Bacillus* sp., kitosan, jagung, penyakit hawar pelepah

## *ABSTRACT*

*This research aimed to know best concentration of chitosan to enrich* Bacillus sp. *corn rizosphere against* R. solani in vitro*, ability of* Bacillus *sp. corn rizosphere enriched chitosan to controlling corn stem blight disease and increase the growth of corn crop. The research was conducted at the Plant Protection Laboratory and the* screen house*, Faculty of Agriculture, Jenderal Soedirman University, Purwokerto from February - June 2020.* In vitro *tests used a completely randomized design with five treatments and four replicates consisted of control,* Bacillus sp. *unenriched chitosan,* Bacillus sp. *+ 1% chitosan,* Bacillus sp. *+ 2% chitosan,* and Bacillus sp. *+ 3% chitosan.* In planta *test used a randomized block design with seven treatments and four replicates. The treatments were of control, fungicide (mancozeb 80%),* Bacillus sp. *unenriched chitosan,* Bacillus sp. *+ 1% chitosan,* Bacillus sp. *+ 2% chitosan, and* Bacillus sp. *+ 3% chitosan,* 1*% chitosan solution.* In vitro *variables observed were inhibition ability and clear zone.* In planta *variables observed were incubation period, disease intensity, incedence of disease, crop height, number of leaves, root fresh weight, crop fresh weight, saponin, tanin, and hidroquinone test. Result of* in vitro *test showed that the addition of chitosan on* Bacillus sp. *couldn't increase inhibit activity, but chitosan able to increase chitinase enzym activity* Bacillus sp. *Result of* in planta *showed* Bacillus sp. *with or without addition of chitosan could lengthen incubation period of 57,81-64,32%, reducing the disease incidence between 41,67-66,67%, decreasing disease intensity between 38,95-68,64% and addition of chitosan 2%, 3% able to increase phenolic compound content qualitatively*. Bacillus sp. *enriched with chitosan couldn't yet be used to controlling stem blight disease and increase corn plant growth.*



***Keywords****:* Bacillus sp.*, chitosan, corn, stem blight disease*