

## RINGKASAN

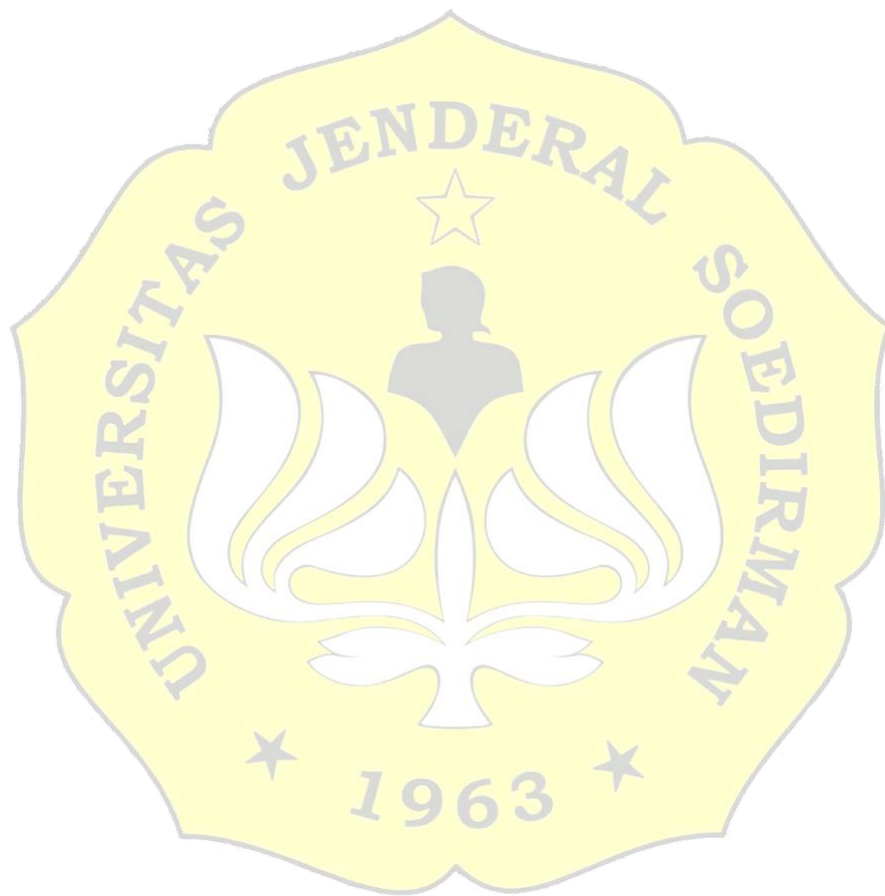
Aplikasi pestisida kimia sintetik masih banyak dilakukan dalam praktik budidaya tanaman bawang merah (*Allium ascalonicum* L.) di Kabupaten Brebes. Insektisida berbahan aktif klorfenapir berfungsi untuk mengendalikan salah satu hama utama bawang merah yaitu ulat bawang (*Spodoptera exigua*). Aplikasi pestisida sintetik secara terus-menerus serta dosis yang tidak tepat akan menurunkan tingkat kesuburan tanah dan menyebabkan resistensi pada hama. Peran mikroorganisme *indigenous* dalam mendegradasi senyawa pestisida klorfenapir sangat penting sebagai upaya untuk memulihkan tanah pertanian bawang merah yang terkontaminasi senyawa berbahaya dari residu pestisida klorfenapir. Bakteri *indigenous* memiliki sifat toleransi pada tanah terkontaminasi dan berpotensi menjadi bakteri pendegradasi. Penelitian ini bertujuan untuk mengetahui kemampuan bakteri *indigenous rhizosphere* tanaman bawang merah Kabupaten Brebes dalam mendegradasi pestisida berbahan aktif klorfenapir.

Penelitian dilaksanakan dari bulan Desember 2020 hingga Juni 2021 di Laboratorium Agroekologi Fakultas Pertanian dan Laboratorium Riset Universitas Jenderal Soedirman. Sampel bakteri yang berjumlah lima diperoleh dari lima wilayah Kabupaten Brebes, Kecamatan Ketanggungan meliputi Desa Buara (Isolat BRA<sub>1</sub>), Desa Cikeusal Lor (Isolat CKL<sub>1</sub>), Desa Cikeusal Kidul (Isolat CKK<sub>1</sub>), Desa Sindang Jaya (Isolat SJA<sub>1</sub>), dan Desa Ciseureuh (Isolat CRH<sub>2</sub>). Tahapan penelitian yang dilakukan yaitu uji resistensi dan uji degradasi isolat bakteri. Variabel yang diamati berupa nilai kerapatan dan jumlah koloni bakteri pada medium MSM (Mineral Salt Medium) padat, kadar awal dan akhir klorfenapir pada medium MSM cair, serta pengukuran nilai *Optical Density* (OD).

Hasil pengamatan uji resistensi isolat BRA<sub>1</sub>, CKL<sub>1</sub>, CKK<sub>1</sub>, SJA<sub>1</sub>, dan CRH<sub>2</sub> terhadap cekaman pestisida klorfenapir menunjukkan hasil yang berbeda. Isolat BRA<sub>1</sub> dan CKK<sub>1</sub> dapat bertahan pada kondisi tercekam pestisida klorfenapir pada konsentrasi 175 ppm, sedangkan isolat CKL<sub>1</sub>, SJA<sub>1</sub>, dan CRH<sub>2</sub> hanya mampu bertahan sampai konsentrasi 150 ppm. Hasil uji degradasi dari kelima isolat yang diujikan belum menunjukkan adanya potensi sebagai biodegradator pestisida

klorfenapir, karena tidak adanya penurunan konsentrasi klorfenapir setelah diinokulasikan kelima isolat bakteri dan inkubasi tujuh hari pada uji degradasi.

Kata kunci: resisten, klorfenapir, degradasi, bawang merah, bioremediasi.



## SUMMARY

*The application of synthetic chemical pesticides is still widely practiced in the cultivation of shallots (*Allium ascalonicum* L.) in Brebes Regency. Insecticide with the active ingredient chlorfenapyr is used to control one of the main pests of shallots, namely the onion caterpillar (*Spodoptera exigua*). Continuous use of synthetic pesticides and inappropriate doses will reduce soil fertility and cause pest resistance. The role of indigenous microorganisms in degrading the pesticide compound chlorphenapir is very important as an effort to restore the shallot farmland contaminated with harmful compounds from the pesticide residue of chlorphenapir. Local bacteria are tolerant to polluted soil and have the potential to become degrading bacteria. This study aims to determine the ability of indigenous shallot rhizosphere bacteria in Brebes Regency in degrading pesticides with the active ingredient chlorfenapyr.*

*The research was conducted from December 2020 to June 2021 at the Agroecology Laboratory of the Agriculture Faculty and the Research Laboratory of Jenderal Soedirman University. Five bacterial samples were obtained from five areas of Brebes Regency, Ketanggungan sub-district including Buara Village ( $BRA_1$  isolate), Cikeusal Lor Village ( $CKL_1$  isolate), Cikeusal Kidul Village ( $CKK_1$  isolate), Sindang Jaya Village ( $SJA_1$  isolate), and Ciseureuh Village ( $CRH_2$  isolate). The stages of the research carried out were the resistance test and the degradation test of bacterial isolates. The variables observed were the value of bacterial density and the number of bacterial colonies on solid MSM medium, initial and final levels of chlorfenapyr in liquid MSM (Mineral Salt Medium) medium, and measurements of Optical Density (OD) values.*

*The results of isolates  $BRA_1$ ,  $CKL_1$ ,  $CKK_1$ ,  $SJA_1$  and  $CRH_2$  showed varying results.  $BRA_1$  and  $CKK_1$  isolates were known to be able to withstand stress conditions with the pesticide chlorfenapyr with a concentration of 175 ppm, while isolates  $CKL_1$ ,  $SJA_1$ , and  $CRH_2$  only survived up to a concentration of 150 ppm. The results of the degradation test of the five isolates tested did not show any potential as biodegradators of the pesticide chlorphenapyre, because there was*

*no decrease in the concentration of chlorenapyre after the five bacterial isolates were inoculated and incubation for seven days in the degradation test.*

*Keywords: resistance, chlorfenapyr, degradation, shallot, bioremediation.*

