

ISOLASI DAN UJI PATOGENISITAS BAKTERI *Lysinibacillus sphaericus* NEIDE DARI TANAH SEKITAR PERAKARAN TERHADAP LARVA *Culex quinquefasciatus* SAY

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INTISARI

Lysinibacillus sphaericus merupakan bakteri entomopatogen karena dapat menghasilkan protein toksin misalnya Bin, Mtx dan Cry48/49. Penelitian ini bertujuan untuk mengisolasi bakteri *Lysinibacillus sphaericus* dari tanah sekitar perakaran dan melakukan uji patogenisitas isolat yang diperoleh terhadap larva *Culex quinquefasciatus*. Dari 296 isolat bakteri yang diperoleh dari 81 sampel tanah, terdapat 226 isolat dengan morfologi seperti *L. sphaericus*, 64 isolat dengan morfologi tidak seperti *L. sphaericus*, dan 6 isolat sisanya mengalami kontaminasi. 226 isolat yang diperoleh diperbanyak pada media Embrapa selama 5-8 hari menggunakan *shaker incubator* dengan putaran 150 rpm, suhu 30°C hingga sebagian besar bakteri telah mengalami sporulasi. Kemudian, hasil kultur bakteri diujikan pada larva nyamuk *Culex quinquefasciatus* instar III. Tahapan skrining menghasilkan 3 isolat yang dianggap paling patogen yaitu isolat 6.2, 15.4, dan 21.3. Terakhir, dilakukan uji patogenisitas sesuai prosedur WHO terhadap ketiga isolat tersebut. Sebagai kontrol positif digunakan isolat 1593 dan 229C. Mortalitas nyamuk pada 48 jam setelah perlakuan dicatat dan kemudian dilakukan analisis Probit. Dari uji patogenisitas tersebut diketahui bahwa nilai LC50 dari isolat 1593, 229C, 6.2, 15.4, dan 21.3 masing-masing sebesar $4,17 \times 10^{-3}$ ml FWC/100 ml air pengujian; $3,29 \times 10^{-3}$ ml FWC/100 ml air pengujian; $3,79 \times 10^{-3}$ ml FWC/100 ml air pengujian; $2,02 \times 10^{-3}$ ml FWC/100 ml air pengujian; dan $8,26 \times 10^{-3}$ ml FWC/100 ml air pengujian. Isolat 15.4 memiliki tingkat patogenisitas yang lebih tinggi dibandingkan kedua isolat kontrol, sehingga dengan demikian isolat tersebut potensial untuk digunakan sebagai agensia hayati untuk mengendalikan nyamuk vektor penyakit.

Kata Kunci : Isolasi, *Lysinibacillus sphaericus*, Patogenisitas, Perakaran, Pengendalian vektor.

ISOLATION AND PATHOGENICITY TESTS OF *Lysinibacillus sphaericus* NEIDE BACTERIA FROM SOIL'S RHIZOSPHERE ON *Culex quinquefasciatus* SAY LARVA

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ABSTRACT

Lysinibacillus sphaericus is an entomopathogenic bacterium capable of producing toxin proteins such as Bin, Mtx and Cry48/49 toxins. This study aims to isolate the *Lysinibacillus sphaericus* bacteria from rhizosphere and to test the pathogenicity of obtained isolates against the larvae of *Culex quinquefasciatus*. Of the 296 bacterial isolates obtained from 81 soil samples, there were 226 isolates morphologically confirmed as *L. sphaericus*, 64 isolates with morphology unlike *L. sphaericus*, and the remaining 6 isolates were contaminated. 226 isolates obtained were propagated on Embrapa media for 5-8 days using a shaker incubator with a rotation of 150 rpm, a temperature of 30°C until most bacteria had undergone sporulation. Then, the results of bacterial culture were tested on *Culex quinquefasciatus* instar III mosquito larvae. The screening stages resulted in 3 isolates considered the most pathogenic, namely isolates 6.2, 15.4, and 21.3. Finally, pathogenicity tests were carried out according to WHO procedures for the three isolates. As positive controls, isolates 1593 and 229C were used. Mosquito mortality at 48 hours after the treatment was recorded and Probit analysis was then carried out. From the pathogenicity test it is known that the LC50 values of isolates 1593, 229C, 6.2, 15.4, and 21.3 are respectively $4,17 \times 10^{-3}$ ml FWC/100 ml water; $3,29 \times 10^{-3}$ ml FWC/100 ml water; $3,79 \times 10^{-3}$ ml FWC/100 ml water; $2,02 \times 10^{-3}$ ml FWC/100 ml water; and $8,26 \times 10^{-3}$ ml FWC/100 ml water. Isolate 15.4 has a higher level of pathogenicity compared to the two control isolates, so that the isolate is potential to be used as biological agents to control mosquito vector disease.

Keywords: Isolation, *Lysinibacillus sphaericus*, Pathogenicity, Rhizosphere, Vector Control.