

PENGARUH EKSTRAK DAUN KELOR (*Moringa oleifera*) SEBAGAI INHIBITOR PERTUMBUHAN DAN AKTIVITAS UREASE BAKTERI *Xanthomonas campestris*

INTISARI

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Limbah industri peternakan ayam *layer* menghasilkan ekskreta yang menimbulkan pencemaran udara pada lingkungan. Pencemaran udara ditimbulkan karena adanya gas amonia akibat reaksi antara urea yang terdapat dalam ekskreta dengan enzim urease yang dihasilkan oleh bakteri. Pencemaran udara tersebut dapat dikurangi dengan menghambat terbentuknya enzim urease menggunakan urease inhibitor. Daun kelor yang mempunyai senyawa bioaktif dapat digunakan sebagai urease inhibitor. Penelitian ini bertujuan untuk mengetahui pengaruh ekstrak daun kelor sebagai inhibitor pertumbuhan dan aktivitas urease pada bakteri *Xanthomonas campestris* yang telah dibuktikan dapat menghasilkan enzim urease penghasil amonia. Penelitian ini menggunakan rancangan acak lengkap (RAL) pola searah dengan perlakuan lima level konsentrasi ekstrak daun kelor yaitu P₀ (0%), P₁ (25%), P₂ (50%), P₃ (75%), dan P₄ (100%). Dilakukan pengulangan tiga kali pada setiap perlakuan. Variabel penelitian yang diamati adalah penghambatan pertumbuhan bakteri pada medium padat, penghambatan pertumbuhan bakteri pada medium cair, viabilitas sel bakteri, dan penghambatan aktivitas enzim urease. Hasil yang diperoleh menunjukkan bahwa terjadi penghambatan pertumbuhan bakteri secara signifikan ($P < 0,05$). Penghambatan pertumbuhan bakteri paling optimal pada perlakuan P₃ (75%) pada medium padat dan perlakuan P₂ (50%) pada medium cair. Konsentrasi amonia dan aktivitas enzim urease terjadi peningkatan seiring bertambahnya persentase daun kelor yang ditambahkan ($P < 0,05$). Daun kelor menambah jumlah N pada medium sehingga meningkatkan konsentrasi amonia. Berdasarkan hasil tersebut dapat disimpulkan bahwa ekstrak daun kelor dapat menghambat pertumbuhan bakteri tetapi tidak dapat berfungsi sebagai urease inhibitor.

Kata Kunci : Ekstrak daun kelor, antibakteri, urease inhibitor, *Xanthomonas campestris*.

EFFECT OF MORINGA LEAVES EXTRACT (*Moringa oleifera*) AS AN GROWTH AND UREASE INHIBITOR FROM *Xanthomonas campestris*

ABSTRACT

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Layer chicken farming industrial waste produces excreta which causes air pollution in the environment. Air pollution is caused by the presence of ammonia gas due to the reaction between urea contained in excreta and the urease enzyme produced by bacteria. Air pollution can be reduced by inhibiting the formation of the enzyme urease using urease inhibitors. Moringa leaves which have bioactive compounds can be used as a urease inhibitor. This study aims to determine the effect of Moringa leaf extract as a growth inhibitor and urease activity on *Xanthomonas campestris* bacteria which have been proven to produce ammonia-producing urease enzymes. This study used a Completely Randomized Design (CRD) using One Way ANOVA with five levels of concentration of Moringa leaf extract, namely P0 (0%), P1 (25%), P2 (50%), P3 (75%), and P4 (100%). Three repetitions were performed for each treatment. The research variables observed were inhibition of bacterial growth in solid medium, inhibition of bacterial growth in liquid medium, bacterial cell viability, and inhibition of urease enzyme activity. The results obtained indicated that there was significant inhibition of bacterial growth ($P < 0.05$). The most optimal inhibition of bacterial growth was in the P3 treatment (75%) in solid medium and the P2 treatment (50%) in liquid medium. The concentration of ammonia and the activity of the urease enzyme increased as the percentage of moringa leaves was added ($P < 0.05$). Moringa leaves increase the amount of N in the medium thereby increasing the concentration of ammonia. Based on these results it can be concluded that moringa leaf extract can inhibit bacterial growth but cannot function as a urease inhibitor.

Keyword : Moringa leaves extract, antibacteria, urease inhibitor, *Xanthomonas campestris*