

PENGARUH KOMBINASI EKSTRAK PERASAN DAUN MINDI (*Melia azedarach*) DAN BUAH BERENUK MATANG (*Crescentia cujete*) SEBAGAI INHIBITOR UREASE DAN NITRIFIKASI PADA *Xanthomonas campestris*

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INTISARI

Nitrifikasi pupuk oleh mikrobia patogen tanah penyebab inefisiensi pemanfaatan nitrogen yang seharusnya diperuntukan untuk tanaman. Upaya pencegahan dilakukan dengan penggunaan bahan penghambat atau inhibitor yang dicampurkan selama proses pemupukan. Penelitian ini bertujuan untuk mengetahui pengaruh kombinasi ekstrak perasan daun Mindi (*Melia azedarach*) dan buah Berenuk matang (*Crescentia cujete*) sebagai bahan inhibitor urease dan inhibitor nitrifikasi pada *Xanthomonas campestris* dengan sumber nitrogen 5% urin kelinci, 0.02% amonium sulfat (NH₄)₂SO₄, 1% natrium nitrit (NaNO₂), dan 0.5% natrium nitrat (NaNO₃). Penentuan daya penghambatan berdasarkan pada konsentrasi ekstrak perasan daun Mindi dan buah Berenuk matang yang dipergunakan 0%, 5%, 10%, 20%, 50%, 60%, 75%, 80%, dan 100%. Pengujian pertumbuhan *Xanthomonas campestris* dengan menggunakan kemampuan urease dan nitrifikasinya menghasilkan pertumbuhan lebih tinggi dibanding medium kontrol berupa 1/10 nutrien (Oxoid CM0001) dengan pengukuran densitas sel menggunakan UV-VIS spektrofotometer. Daya hambat urease dan nitrifikasi kombinasi ekstrak ditunjukkan dengan zona bebas bakteri tidak dapat tumbuh akibat difusi ekstrak tersimpan di kertas cakram pada medium padat agar yang diinkubasi selama semalam, metode *Kirby Bauer test*. Hasil uji daya hambat menunjukan kombinasi ekstrak perasan daun Mindi dan buah Berenuk matang lebih baik hasilnya dibandingkan ekstrak perasan tunggal daun Mindi. Ekstrak yang dicampurkan dengan substrat urin dan nitrifikasi medium pertumbuhan sel mempengaruhi fisiologis sel bakteri ditunjukkan pada hasil uji viabilitas sel untuk memperlihatkan kemampuan tumbuh sel membentuk koloni pada medium padat agar setelah diinkubasi 12 jam atau hingga fase stasioner. Konsentrasi 100% kombinasi ekstrak perasan daun Mindi dan buah Berenuk matang 1:1, terbaik menekan viabilitas sel koloni *Xanthomonas campestris*. Bukti tersebut merupakan sebagian kecil penggambaran besarnya potensi bahan alami sebagai bahan inhibitor pertumbuhan bakteri patogen tanaman.

Kata kunci: Urin, amonium, nitrit, nitrat.

**EFFECT COMBINATION SQUEEZING EXTRACT OF MINDI LEAVES
(*Melia azedarach*) AND RIPENING BERENUK (*Crescentia cujete*)
AS INHIBITOR OF UREASE AND NITRIFICATION BY
*Xanthomonas campestris***

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ABSTRACT

Fertilizer nitrification by soil pathogen microbes causes inefficiency utilizing nitrogen during plants grow. Application of inhibitor agent in fertilizer is useful to avoid unexpected nitrification. This study aims to determine a natural inhibitor agent from Mindi leaves and Berenuk fruit in ripe age, dark brown fruit flesh, which was extracted by squeezing and filtered as urease inhibitor and nitrification inhibitor of *Xanthomonas campestris* growth in several nitrogen urine and nitrification sources as rabbit urine 5%, ammonium sulphate 0.02%, sodium nitrite 1%, and sodium nitrate 0.5%. Inhibition measures based on extract concentration applied from 0%, etc 100%. *Xanthomonas campestris* growth by nitrification ability in nitrogen urine and nitrification substrates utilization is higher compared to medium control only contain 1/10 nutrient (oxid CM0001) observed by UV VIS Spectrophotometry. The extract combination of mindi leaves and ripening berenuk showing ability to inhibit *Xanthomonas campestris* growth described on free zone bacterial cell as a response of diffusion extract liquid held by disc paper into agar solid medium during one night incubation, Kirby Bauer test. Resulting of inhibition test using extract combination mindi leaves and ripening berenuk is higher than mindi leaf extract only. Extract urine and extract nitrification substrate mixed as *Xanthomonas campestris* growth medium during 12 hours or until stationary phase incubation was changed cells physiology to viability cells grow by forming a colony. The extract combination mindi leaves and ripening berenuk 1:1, on concentration 100% is the best perform to repress *Xanthomonas campestris* viability cell colony. This result is able to figure out huge potential natural products as inhibitor agent of plant pathogen bacterial.

Keywords: Urine, ammonium, nitrite, nitrate.