

**ANTI QUORUM SENSING EKSTRAK ETANOL DAN MINYAK
ATSIRI BUAH ANDALIMAN (*Zanthoxylum acanthopodium* DC)
TERHADAP *Pseudomonas aeruginosa***

Annisa Sekar Rahmadhani

Abstrak

Pseudomonas aeruginosa merupakan penyebab infeksi nosokomial yang memiliki kemampuan membentuk biofilm dan menghasilkan faktor virulensi, seperti *pyocyanin* dan *pyoverdin* melalui sistem *Quorum sensing* (QS). Gangguan pada sistem *quorum sensing* merupakan salah satu pendekatan untuk mengurangi virulensi tanpa menimbulkan resistensi. Buah Andaliman (*Zanthoxylum acanthopodium* DC.) mengandung senyawa flavonoid, terpenoid, tanin, alkaloid, saponin dan minyak atsiri yang berpotensi sebagai agen anti *quorum sensing*. Penelitian ini bertujuan untuk mengetahui aktivitas ekstrak etanol dan minyak atsiri buah andaliman dalam penghambatan pembentukan biofilm, produksi *pyocyanin* dan *pyoverdin* pada *Pseudomonas aeruginosa*. Rangkaian pengujian yang dilakukan antara lain KHM, KBM, pengujian formasi biofilm, produksi *pyocyanin*, dan produksi *pyoverdin*. Hasil penelitian ini menunjukkan nilai KHM ekstrak etanol dan minyak atsiri yang didapatkan sebesar 2500 ppm, sedangkan nilai KBM ekstrak etanol sebesar 2500 ppm dan minyak atsiri > 5000 ppm. Ekstrak etanol dan minyak atsiri buah andaliman mempengaruhi aktivitas penghambatan formasi biofilm, produksi *pyocyanin*, dan produksi *pyoverdin* dengan persentase pembentukan terendah pada konsentrasi 5000 ppm (2 KHM) masing-masing sebesar $25,916 \pm 0,8335\%$, $13,404 \pm 0,56293\%$, $10,259 \pm 0,60585\%$ dengan signifikansi p-value < 0,001 dan hasil uji korelasi antara penghambatan formasi biofilm dengan produksi *pyocyanin* dan produksi *pyoverdin* berkorelasi positif sangat kuat dan positif kuat.

Kata kunci: Biofilm, Buah Andaliman, *Pseudomonas aeruginosa*, *Pyocyanin*, *Pyoverdin*.

ANTI QUORUM SENSING ETHANOL EXTRACT AND ESSENTIAL OIL ANDALIMAN FRUIT (*Zanthoxylum acanthopodium* DC) AGAINST *Pseudomonas aeruginosa*

Annisa Sekar Rahmadhani

Abstract

Pseudomonas aeruginosa is a cause of nosocomial infection that has the ability to form biofilms and produce virulence factors, such as pyocyanin and pyoverdinin through the Quorum sensing (QS) system. Disrupting the quorum sensing system is one approach to reduce virulence without causing resistance. Andaliman fruit (*Zanthoxylum acanthopodium* DC.) contains flavonoids, terpenoids, tannins, alkaloids, saponins and essential oils that have potential as anti-quorum sensing agents. This study aims to determine the activity of ethanol extract and essential oil of andaliman fruit in inhibiting biofilm formation, pyocyanin and pyoverdinin production in *Pseudomonas aeruginosa*. The series of tests carried out include KHM, KBM, biofilm formation testing, pyocyanin production, and pyoverdinin production. The results of this study indicate the KHM value of ethanol extracts and essential oils obtained at 2500 ppm, while the KBM value of ethanol extracts is 2500 ppm and essential oils > 5000 ppm. Ethanol extract and essential oil of andaliman fruit affect the inhibitory activity of biofilm formation, pyocyanin production, and pyoverdinin production with the lowest percentage of formation at a concentration of 5000 ppm (2 KHM) of $25,916 \pm 0,8335\%$, $13,404 \pm 0,56293\%$, $10,259 \pm 0,60585\%$ with significance $p\text{-value} < 0.001$ and the results of the correlation test between biofilm formation inhibition and pyocyanin production and pyoverdinin production showed a very strong positive correlation and a strong positive correlation.

Keywords: Andaliman Fruits, Biofilm, *Pseudomonas aeruginosa*, Pyocyanin, Pyoverdinin.