

## ABSTRAK

*Pseudomonas aeruginosa* merupakan salah satu bakteri penyebab infeksi nosokomial yang sering ditemukan di saluran air dental unit. Bakteri tersebut membentuk biofilm yang mengakibatkan resistensi terhadap beberapa jenis antibiotik. Kulit manggis (*Garcinia mangostana* L.) mengandung flavonoid, asam fenolik, dan *xanthone* sehingga diduga berpotensi menghambat pembentukan biofilm *P. aeruginosa*. Tujuan penelitian ini adalah untuk mengetahui pengaruh ekstrak kulit manggis terhadap pembentukan biofilm *P. aeruginosa* ATCC 10145 *in vitro*. Uji MIC telah dilakukan untuk ekstrak kulit manggis terhadap *P. aeruginosa* ATCC 10145 dan didapatkan hasil pada ekstrak kulit manggis 10%.

Pembentukan biofilm dideteksi menggunakan metode *static microtiter biofilm assay*. BHI, ekstrak kulit manggis 10%, 15%, 20% dan kontrol negatif (DMSO 2%) dimasukkan dalam *microplate* kemudian bakteri diinokulasikan ( $1,5 \times 10^7$  CFU/ml) dengan total volume sebanyak 200  $\mu$ l di setiap *wells*, kemudian diinkubasi selama 18 jam pada suhu 37°C. *Microplate* dicuci dengan *phosphate buffer saline* kemudian diwarnai dengan *crystal violet* 0,1%. Nilai densitas optik (OD) diukur menggunakan *microplate reader* dengan panjang gelombang 540 nm, selanjutnya dianalisis berdasarkan persentase penghambatan pembentukan biofilm.

Hasil analisis *Robust Brown-Forsythe* ( $p < 0,05$ ) menunjukkan ekstrak kulit manggis berpengaruh menghambat pembentukan biofilm *P. aeruginosa*. Persentase penghambatan ekstrak 10%, 15% dan 20% berturut-turut sebesar 38,98%; 52,78%; dan 67,22%. Hasil uji *Post Hoc Tukey HSD* menunjukkan adanya perbedaan signifikan antar kelompok perlakuan. Disimpulkan bahwa kulit manggis dapat menghambat pembentukan biofilm *P. aeruginosa* dengan daya penghambatan paling efektif pada konsentrasi ekstrak 20%.

Kata kunci: Biofilm, Ekstrak kulit manggis, *Pseudomonas aeruginosa*.

## ABSTRACT

*Pseudomonas aeruginosa* is known as a bacteria that causes nosocomial infection and could easily found in dental unit waterline. This bacterium formed biofilm that causes bacteria resistance towards several antibiotics. Mangosteen pericarp (*Garcinia mangostana* L.) contains flavonoid, phenolic acid, and xanthone, therefore mangosteen pericarp is predicted to inhibit the biofilm formation of *P. aeruginosa*. The aim of this study was to investigate the effect of mangosten pericarp extract toward the biofilm formation of *P. aeruginosa* ATCC 10145 in vitro.

The biofilm formation was detected by static microtiter biofilm assay. BHI, mangosten pericarp extract 10%, 15%, 20%, and negative control (DMSO 2%) were added into microplate then the bacteria was inoculated ( $1,5 \times 10^7$  CFU/ml) with total volume 200  $\mu$ l each wells, then was incubated for 18 hours at 37°C. Microplates were irrigated with phosphate buffer saline then were stained using 0,1% crystal violet. Optical density was measured using microplate reader at 540 nm wavelength followed by determination of biofilm formation inhibition percentage. MIC determination of mangosten pericarp extract towards *P. aeruginosa* ATCC 10145 had been done and resulted 10%.

Robust Brown-Forsythe ( $p < 0,05$ ) analysis showed mangosten pericarp extract was capable to inhibit the biofilm formation of *P. aeruginosa*. Percentage of inhibition mangosten pericarp extract 10%, 15%, and 20% were 38,98%; 52,78%; and 67,22% respectively. Tukey HSD analysis showed significant difference between groups. It is concluded that mangosten pericarp extract may inhibit biofilm formation of *P. aeruginosa* and 20% extract showed the best effectiveness compared to 10% and 15%.

Keywords: Biofilm, Mangosten pericarp extract, *Pseudomonas aeruginosa*.