

## INTISARI

Kulit bawang merah merupakan salah satu limbah bahan alami yang dapat meningkatkan kemampuan makrofag dalam fagositosis bakteri. *Pseudomonas aeruginosa* ATCC 9027 merupakan salah satu bakteri Gram negatif yang dapat menurunkan sistem imun tubuh. Tujuan dari penelitian ini yaitu untuk mengetahui efek ekstrak kulit bawang merah terhadap kemampuan makrofag dalam fagositosis bakteri *P. aeruginosa* ATCC 9027 *in vitro*.

Sampel penelitian terbagi dalam 2 kelompok yaitu kontrol positif (Imboost®) dan kontrol negatif (RPMI komplit), serta perlakuan (ekstrak kulit bawang merah konsentrasi 2,5%, 5%, dan 10%). MIC ekstrak kulit bawang merah adalah konsentrasi 10%. Pengujian fagositosis dilakukan dengan penambahan larutan uji dalam sumuran, lalu diinkubasi selama 4 jam. Sampel dicuci RPMI sebanyak 1 kali, kemudian ditambahkan *P. aeruginosa*, diinkubasi kembali selama 60 menit. Sampel dicuci dengan PBS sebanyak 3 kali, ditambahkan methanol 30 detik, dilanjutkan pengecatan Giemsa selama 30 menit, dicuci dengan akuades dan dikeringkan. Perhitungan Indeks Fagositosis (IF) dilakukan dengan mengamati jumlah bakteri yang difagositosis oleh makrofag pada *coverslip* menggunakan mikroskop perbesaran 1000x. Analisis data menggunakan *one-way* ANOVA dan *LSD test* signifikansi  $\leq 0,05$ .

Hasil uji *one-way* ANOVA dan *LSD test* menunjukkan terdapat perbedaan IF yang signifikan antar kelompok. Hal ini mengindikasikan bahwa ekstrak kulit bawang merah dapat meningkatkan aktivitas makrofag. Peningkatan kemampuan makrofag dalam fagositosis bakteri *P. aeruginosa* ATCC 9027 seiring dengan peningkatan konsentrasi ekstrak kulit bawang merah 2,5%, 5%, dan 10%.

Kata kunci: Kulit Bawang Merah, *Pseudomonas aeruginosa*, Indeks Fagositosis

## ABSTRACT

Red onion skin is one of natural waste material which may increase the ability of macrophage. *Pseudomonas aeruginosa* ATCC 9027 is one of the Gram negative bacteria which decrease the immune system. The purpose of this study is to determine the effect of red onion skin extract on the ability of macrophages in phagocytosis of bacteria *P. aeruginosa* ATCC 9027 in vitro.

Samples of study were divided into 2 groups, control groups which were a positive control group (Imboost®) and negative control (complete RPMI), and treatment groups (red onion skin extract 2,5%, 5%, and 10%). The MIC of this study was on the red onion skin extract of 10%. Testing of phagocytosis was done by adding test solution into the well which was then incubated for 4 hours. The sample was washed with RPMI once, then added with *P. aeruginosa*, and reincubated for 60 minutes. Samples were washed with PBS three times, then given methanol for 30 second, followed by 30 minutes of Giemsa staining, washed with aquadest and finally dried. The calculation of Phagocytosis Index (IF) were performed by firstly observing number of bacteria are phagocytosed by macrophage on the coverslip using a 1000x magnification microscope. Data analysis used one-way ANOVA and LSD test with significance  $\leq 0.05$ .

The results of one-way ANOVA and LSD test showed significant IF differences between groups. This indicates that red onion skin extract could increase macrophage activity. Enhancement ability of macrophages in phagocytosis of *P. aeruginosa* ATCC 9027 along with increased concentration of red onion skin extract 2,5%, 5%, and 10%.

Keywords: red onion skin, *Pseudomonas aeruginosa*, phagocytosis index