

APPLICATION OF BACTERIOPHAGES AS HAND SANITIZER SPRAY AND GEL NON ALCOHOL ANTISEPTIC

ABSTRACT

Bacteriophages or phages are viruses that can infect and reproduce in bacterial cells (*Escherichia coli*). The ability of phages to lyse host bacteria is very good, and the ability of phages to survive is very good so phages can be used as the new innovation in the application of phages as additional cleaning agents for hand sanitizers. This research aim to determine the application of bacteriophage spray and gel hand sanitizer to the growth of *E.coli* O157:H7 and to determine the total microbial colonies on the palms of the hands. The method used in this research is quantitative descriptive using experimental methods, namely by testing the application of bacteriophages as hand sanitizer spray and non-alcoholic antiseptic gel. The results of the phage research in the phage treatment samples were active in lysing the host bacteria *E. Coli* O157:H7. The anti-bacterial inhibition zone test of the phage hand sanitizer had anti-bacterial activity against the host bacteria *E. Coli* O157:H7, in the control no inhibition zone was found, in the first treatment of the phage gel hand sanitizer there was an inhibition zone with an average of 3.7, in the treatment The comparison, namely commercial hand sanitizer gel, has an inhibition zone with an average of 3.1. In the second treatment, namely the phage spray hand sanitizer, there was an inhibition zone with an average of 3.2, in the comparison treatment, namely the commercial spray hand sanitizer, there was an inhibition zone with an average of 3.2. Testing the bacteriophage gel hand sanitizer and spray on the palm, in the gel hand sanitizer control, an average total of $2,28 \times 10^5$ CFU/ml microbes was obtained. In the hand sanitizer gel treatment, an average total of $5,72 \times 10^3$ CFU/ml microbes was obtained. The hand sanitizer spray control obtained an average total of $2,39 \times 10^5$ CFU/ml microbes. Hand sanitizer spray treatment resulted in an average total microbe of $1,10 \times 10^5$ CFU/ml. The results show that the hand sanitizer phage gel is more effective then hand sanitizer phage spray.

Keywords: Antimicrobial, Bacteriophage, *Escherichia coli*, Hand sanitizer

APLIKASI BAKTERIOFAG SEBAGAI *HAND SANITIZER* SPRAY DAN GEL ANTISEPTIK NON ALKOHOL

ABSTRAK

Bakteriofag atau fag sebagai virus yang dapat menginfeksi dan berkembang biak di dalam sel bakteri (*Escherichia coli*). kemampuan fag untuk melisiskan bakteri inang sangat baik, dan kemampuan fag untuk bertahan hidup sangat baik, sehingga fag dapat dijadikan inovasi terbaru dalam aplikasi fag sebagai tambahan bahan pembersih *hand sanitizer*. Tujuan penelitian ini yaitu untuk mengetahui aplikasi *hand sanitizer* bakteriofag spray dan gel terhadap pertumbuhan *E.coli* O157:H7 dan untuk mengetahui total koloni mikroba pada telapak tangan. Metode yang digunakan pada penelitian ini yaitu deskriptif kuantitatif dengan menggunakan metode eksperimental yaitu dengan uji aplikasi bakteriofag sebagai *hand sanitizer spray* dan *gel* antiseptik non alkohol. Hasil penelitian fag pada sampel perlakuan fag aktif melisiskan bakteri inangnya *E. Coli* O157:H7. Uji zona hambat anti bakteri *hand sanitizer* fag memiliki aktivitas anti bakteri terhadap bakteri inangnya *E. Coli* O157:H7, pada kontrol tidak ditemukan adanya zona hambat, pada perlakuan pertama *hand sanitizer* gel fag terdapat zona hambat dengan rata-rata 3,7, pada perlakuan perbandingan yaitu *hand sanitizer* gel komersil terdapat zona hambat dengan rata-rata 3,1. Pada perlakuan kedua yaitu *hand sanitizer* spray fag terdapat zona hambat dengan rata-rata 3,2, pada perlakuan perbandingan yaitu *hand sanitizer* spray komersil terdapat zona hambat dengan rata-rata 3,2. Uji *hand sanitizer* bakteriofag gel dan spray hasil menunjukkan bahwa *hand sanitizer* terbukti dapat mengurangi bakteri pada telapak tangan. Kontrol *hand sanitizer gel* didapat rata-rata total mikroba sebanyak $2,28 \times 10^5$ CFU/ml. Pada perlakuan *hand sanitizer gel* didapat rata-rata total mikroba sebanyak $5,72 \times 10^3$ CFU/ml. Kontrol *hand sanitizer spray* didapat rata-rata total mikroba sebanyak $2,39 \times 10^5$ CFU/ml. Perlakuan *hand sanitizer spray* didapat rata-rata total mikroba sebanyak $1,10 \times 10^5$ CFU/ml. Hasil menunjukkan bahwa *hand sanitizer* fag gel lebih efektif dibandingkan dengan *hand sanitizer* fag spray.

Kata Kunci: Antimikroba, Bakteriofag, *Escherichia coli*, *Hand sanitizer*