

PENGARUH KEPADATAN INOKULUM *Lactobacillus* sp. GMP1 TERHADAP PERTUMBUHAN *Raoultella ornithinolytica* TN5 DENGAN METODE CO-CULTURE

Penelitian ini bertujuan untuk mengetahui pengaruh kepadatan *Lactobacillus* sp. GMP1 pada metode *co-culture* terhadap laju pertumbuhan dan persen reduksi *Raoultella ornithinolytica* TN5. *Lactobacillus* sp. GMP1 dan *R. ornithinolytica* TN5 ditumbuhkan secara bersama pada medium TFIB dengan perlakuan jumlah inokulum $10^4:10^6$ CFU/mL, $10^6:10^6$ CFU/mL, dan $10^8:10^6$ CFU/mL yang diinkubasi pada suhu 37°C selama 12 jam. Pada pengujian dilakukan perhitungan jumlah bakteri dengan perhitungan TPC. Data jumlah bakteri ini digunakan dalam perhitungan persen reduksi bakteri. Persen reduksi terbesar didapatkan pada perlakuan tiga dengan jumlah inokulum *Lactobacillus* sp. GMP1 dan *R. ornithinolytica* TN5 $10^8:10^6$ CFU/mL pada medium EMBA sebesar 64,598%. Selanjutnya data pertumbuhan log CFU/mL dan waktu inkubasi diplot dalam program DMFit. Pada laju pertumbuhan didapatkan laju pertumbuhan tertinggi pada perlakuan satu dengan jumlah inokulum *Lactobacillus* sp. GMP1 dan *R. ornithinolytica* TN5 $10^4:10^6$ CFU/mL pada medium TSA sebesar 0,127, medium EMBA sebesar 0,087, dan medium MRSA sebesar 0,168. Kadar histamin yang terbentuk selama waktu inkubasi dianalisis menggunakan Kromatografi Lapis Tipis (KLT) dan program imageJ dengan kadar histamin tertinggi yang terbentuk pada perlakuan satu sebesar 801 ppm. Nilai pH pada masing-masing perlakuan dilakukan pengujian menggunakan pH meter dengan nilai pH tertinggi yang didapatkan pada perlakuan satu sebesar 5,3. Selanjutnya dilakukan observasi morfologi bakteri pada sampel kontrol BAL, kontrol BPH, dan perlakuan tiga menggunakan SEM dan didapatkan hasil adanya perubahan morfologi sel bakteri pada perlakuan tiga.

Kata kunci: *co-culture*, *Lactobacillus* sp. GMP1, laju pertumbuhan, persen reduksi, *Raoultella ornithinolytica* TN5

THE EFFECT OF INOCULUM DENSITY OF *Lactobacillus* sp. GMP1 ON THE GROWTH OF *Raoultella ornithinolytica* TN5 WITH THE CO-CULTURE METHOD

This study aims to determine the effect of *Lactobacillus* sp. GMP1 density in the co-culture method on the growth rate and percentage reduction of *Raoultella ornithinolytica* TN5. *Lactobacillus* sp. GMP1 and *R. ornithinolytica* TN5 were grown together on TFIB medium with inoculum treatments of $10^4:10^6$ CFU/mL, $10^6:10^6$ CFU/mL, and $10^8:10^6$ CFU/mL which were incubated at 37°C for 12 hours. In the test, the number of bacteria was calculated using the TPC calculation. This bacterial count data is used in calculating the percentage of bacterial reduction. The largest percentage reduction was obtained in treatment three with the amount of *Lactobacillus* sp. GMP1 and *R. ornithinolytica* TN5 inoculum $10^8:10^6$ CFU/mL in EMBA medium was 64,598%. Furthermore, the log CFU/mL growth data and incubation time were plotted in the DMFit program. In terms of growth rate, the highest growth rate was obtained in treatment one with the amount of *Lactobacillus* sp. GMP1 and *R. ornithinolytica* TN5 inoculum $10^4:10^6$ CFU/mL in TSA medium was 0,127, EMBA medium was 0,087, and MRSA medium was 0,168. The levels of histamine formed during the incubation time were analyzed using Thin Layer Chromatography (TLC) and the imageJ program with the highest histamine levels formed in treatment one of 801 ppm. The pH level in each treatment was tested using a pH meter with the highest pH level obtained in treatment one of 5,3. Furthermore, observations of bacterial morphology were carried out on BAL control, BPH control, and treatment three using SEM and the results obtained were changes in bacterial cell morphology in treatment three.

Keywords: co-culture, *Lactobacillus* sp. GMP1, growth rate, percent reduction, *Raoultella ornithinolytica* TN5