

ABSTRACT

Background: *Escherichia coli* is a bacterium that causes extraintestinal diseases, such as urinary tract infections, abdominal infections, pneumonia, bacteremia, and meningitis. The identification and isolation of this bacterium in the laboratory utilize MacConkey Agar as a selective differential medium because it selectively supports Gram-positive bacteria and can distinguish bacteria based on their ability to ferment lactose. However, it is relatively expensive to use as a teaching medium in educational laboratories. One alternative is to modify the medium by replacing the pH indicator with phenol red, thereby creating a modified MCA medium that functions similarly to standard MCA.

Objective: This experiment aimed to determine the differences in the growth of *Escherichia coli* bacteria on modified MacConkey Agar (MCA) medium with a phenol red indicator and standard MCA medium through descriptive, analyst and statistical analysis.

Methods: This experiment is a True experimental using a Posstest Only Control Design.

Results: The modified MCA medium had an average diameter measurement of 1.9 mm, while the standard MCA medium had an average of 1.4 mm. The difference in average colony diameter between the two media was 0.5 mm. The characteristics of colonies on the modified medium were round in shape, yellow in color, with smooth edges, a convex elevation, a soft consistency, and a smooth surface. smooth, whereas on standard MCA media, the colonies were round, pink in color, with uneven edges, convex elevation, soft consistency, and a wavy colony surface. Both media showed similarities in Gram staining, namely rod-shaped, in chains, and Gram-negative.

Conclusion: There was a significant difference in the diameter of *Escherichia coli* colonies grown on modified MCA medium with phenol red indicator and standard MCA medium. The modified medium had a larger average diameter compared to the standard MCA medium.

Keywords: *Escherichia coli* bacteria, MacConkey Agar medium, Modified medium, Phenol red indicator, colony diameter.

ABSTRAK

Latar Belakang: Bakteri *Escherichia coli* adalah bakteri yang menyebabkan penyakit ekstraintestinal, seperti infeksi saluran kemih, infeksi perut, pneumonia, bakteremia, dan meningitis. identikasi dan isolasi bakteri di laboratorium menggunakan media *MacConkey Agar* sebagai media selektif diferensial karna selektif terhadap bakteri Gram positif dan dapat membedakan bakteri dengan kemampuan fermentasi laktosa. Namun, harganya relatif mahal untuk digunakan sebagai media pembelajaran di laboratorium pendidikan. Salah satu alternatif yang dapat digunakan yaitu memodifikasi media dengan mengganti indikator pH menggunakan *phenol red*, sehingga diharapkan dapat membuat media modifikasi MCA yang menyamai fungsi media MCA.

Tujuan: Penelitian ini bertujuan untuk mengetahui perbedaan pertumbuhan bakteri *Escherichia coli* pada media modifikasi *MacConkey Agar* (MCA) dengan indikator *phenol red* dan media standar MCA dengan dilakukan analisis secara deskriptif, analitik dan statistik.

Metode Penelitian: Penelitian ini merupakan penelitian *True Experiment* dengan desain penelitian *Posstest Only Control Design*.

Hasil Penelitian: Media modifikasi MCA didapatkan rerata hasil pengukuran diameter sebesar 1,9 mm dan media MCA standar sebesar 1,4 mm. Selisih rata-rata diameter koloni antara kedua media adalah 0,5 mm. Karakteristik koloni pada media modifikasi koloni berbentuk bulat, bewarna kuning, tepian rata, elevasi cembung, konsistensi lunak, permukaan koloni halus, sedangkan pada media MCA standar koloni berbentuk bulat, bewarna merah muda, tepian tidak rata, elevasi cembung, konsistensi lunak, permukaan koloni halus. Pada kedua media terdapat persamaan pada pewarnaan Gram yaitu berbentuk batang, formasi berderet dan Gram negatif.

Kesimpulan: Terdapat perbedaan signifikan diameter koloni bakteri *Escherichia coli* yang ditanam pada media modifikasi MCA dengan indikator *phenol red* dan media MCA standar. Media modifikasi memiliki rerata diameter lebih besar dibandingkan dengan media MCA Standar.

Kata Kunci: Bakteri *Escherichia coli*, Media *MacConkey Agar*, Media Modifikasi, Indikator *phenol red*, diameter koloni.