

## ABSTRAK

### ISOLASI, IDENTIFIKASI, DAN STUDI PATOGENISITAS *Escherichia coli* YANG DIISOLASI DARI AYAM BROILER TERDIAGNOSIS KOLIBASILOSIS DI FARM KEMITRAAN MALINDO, KALIBAWANG

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*Escherichia coli* merupakan salah satu agen bakteri penyebab kolibasilosis yang berdampak serius terhadap produktivitas dan kesehatan ayam broiler di industri perunggasan. Infeksi ini dapat menyebabkan peradangan sistemik seperti perikarditis, perihepatitis, dan peritonitis, serta meningkatkan angka mortalitas dan kerugian ekonomi. Penelitian ini bertujuan untuk mengisolasi, mengidentifikasi, serta mengkaji tingkat patogenisitas *E. coli* yang diambil dari ayam broiler dengan gejala klinis kolibasilosis di *farm* kemitraan Malindo, Kalibawang, Kulon Progo, Daerah Istimewa Yogyakarta. Penelitian ini dilakukan dengan melakukan nekropsi terhadap tiga ekor ayam broiler berumur tiga minggu yang menunjukkan gejala klinis berupa kelesuan dan gangguan pernapasan. Pengamatan terhadap lesi makroskopis pada organ menunjukkan lesi perihepatitis dan perikarditis. Sampel diambil dari organ hati dan jantung satu ekor ayam dengan kondisi klinis paling parah. Sampel kemudian dikultur pada media *Eosin Methylene Blue* (EMB). Koloni dengan morfologi yang mengarah ke dugaan bakteri *E. coli* di-*replating* secara bertahap hingga diperoleh biakan murni. Pengecatan Gram dilakukan pada setiap tahap *replating*. Biakan murni kemudian diuji dengan uji biokimia meliputi TSIA, *indole*, *methyl red*, urease, *Voges-Proskauer*, sitrat, serta fermentasi karbohidrat (glukosa, laktosa, dan sukrosa). Uji patogenisitas dilakukan menggunakan metode *Embryo Lethality Assay* (ELA) dengan menyuntikkan isolat ke dalam rongga allantois telur embrio ayam umur 12 hari. Hasil kultur menunjukkan koloni berwarna *green metallic sheen* pada media EMB. Isolat merupakan basil Gram-negatif, dengan hasil biokimia positif pada TSIA (*slant* dan *butt* kuning, produksi gas), *indole*, dan *methyl red*, serta negatif pada urease, *Voges-Proskauer*, dan sitrat. Isolat mampu memfermentasi glukosa, laktosa, dan sukrosa. Uji ELA menunjukkan tingkat kematian embrio sebesar 95% dengan disertai lesi makroskopis berupa perdarahan dan kerusakan jaringan, yang mengindikasikan sifat virulensi tinggi isolat. Berdasarkan hasil tersebut, isolat yang diperoleh dapat disimpulkan sebagai *E. coli* patogen.

**Kata kunci:** APEC, ayam broiler, *embryo lethality assay*, *Escherichia coli*, identifikasi.

**ABSTRACT**

**ISOLATION, IDENTIFICATION, AND PATHOGENICITY STUDY OF *Escherichia coli* ISOLATED FROM BROILER CHICKENS DIAGNOSED WITH COLIBACILLOSIS AT A MALINDO PARTNERSHIP FARM IN KALIBAWANG**

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*Escherichia coli* is one of the bacterial agents responsible for colibacillosis, a disease that significantly affects the productivity and health of broiler chickens in the poultry industry. This infection can cause systemic inflammation such as pericarditis, perihepatitis, and peritonitis, as well as increase mortality rates and economic losses. This study aimed to isolate, identify, and evaluate the pathogenicity level of isolates obtained from broiler chickens showing clinical signs of colibacillosis at a Malindo partnership farm in Kalibawang, Kulon Progo, Special Region of Yogyakarta. Necropsy was performed on three broiler chickens aged three weeks that exhibited clinical symptoms such as lethargy, respiratory distress, and abnormal feces. Macroscopic lesions observed in the organs included perihepatitis and pericarditis. Samples were taken from the liver and heart of the chicken with the most severe clinical condition for bacterial isolation. The samples were cultured on Eosin Methylene Blue (EMB) agar. Colonies with morphology suspected to be *E. coli* were gradually replated to obtain pure cultures. Gram staining was performed at each replating step to ensure morphological consistency and prevent possible contamination. The pure isolates were then subjected to a series of biochemical tests, including TSIA, indole, methyl red, urease, Voges-Proskauer, citrate, and carbohydrate fermentation (glucose, lactose, and sucrose). Pathogenicity testing was conducted using the Embryo Lethality Assay (ELA) method by injecting the isolates into the allantoic cavity of 12-day-old chicken embryos. The culture results showed green metallic sheen colonies on EMB agar, characteristic of *Escherichia coli* with strong lactose fermentation. The isolate was identified as Gram-negative bacilli, with positive biochemical results for TSIA (yellow slant and butt, gas production), indole, and methyl red, and negative for urease, Voges-Proskauer, and citrate. The isolate was also capable of fermenting glucose, lactose, and sucrose. The ELA test showed an embryo mortality rate of 95%, accompanied by macroscopic lesions such as hemorrhage and tissue damage, indicating high virulence of the isolate. Based on these results, the isolate was concluded to be a pathogenic strain of *E. coli*.

**Keywords:** APEC, broiler chickens, embryo lethality assay, *Escherichia coli*, identification.