

ABSTRAK

ISOLASI, IDENTIFIKASI, DAN RESISTANSI *Escherichia coli* TERHADAP *SULFAMETHOXAZOLE-TRIMETHOPRIM* PADA SAMPEL LINGKUNGAN DI *SMART VETERINARY TEACHING FARM, PLAYEN*

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Lingkungan di sekitar tempat hidup hewan berpotensi menjadi sumber penyakit, terutama yang disebabkan oleh infeksi bakteri. *Escherichia coli* sebagai salah satu bakteri fekal koliform beresiko untuk mencemari lingkungan. Pengobatan dari infeksi bakteri ini akan menjadi sulit dilakukan apabila terjadi resistansi terhadap antibiotik, sehingga perlu dilakukan penelitian untuk mengetahui profil resistansi dari bakteri tersebut terhadap antibiotik yang umum digunakan. Penelitian ini bertujuan untuk mengetahui tingkat cemaran *E. coli* di lingkungan *Teaching Farm* FKH UGM dan mengetahui tingkat resistansinya terhadap kombinasi antibiotik *sulfamethoxazole-trimethoprim*. Pemilihan kombinasi antibiotik itu dilakukan *sulfamethoxazole* maupun *trimethoprim* merupakan antibiotik sintesis yang penggunaan dan resistansinya belum banyak ditemukan pada hewan ternak. Penelitian ini dilakukan dengan menggunakan 53 sampel lingkungan yang terdiri dari air minum, air limbah, feses, dan tanah dari zona ayam, domba, kambing, kuda, rusa, dan sapi, air kolam dan tanah dari zona ikan serta air sumber di *Teaching Farm*. Sampel air difilter menggunakan Membran Filter Nylon 25 mm 0.45 µm dan di-enrichment pada *Buffer Peptone Water* (BPW), sedangkan sampel feses dan tanah langsung di-enrichment pada media yang sama. Sampel kemudian diisolasi pada media *Eosin Methylene Blue Agar* (EMBA) dan diidentifikasi dengan pengecatan Gram, uji *Triple Sugar Iron Agar* (TSIA), uji IMViC, dan uji motilitas. Isolat yang terkonfirmasi sebagai *E. coli* diencerkan sesuai dengan standar McFarland 0,5 untuk selanjutnya dilakukan uji resistansi dengan metode *Kirby-Bauer*. Uji resistansi dilakukan menggunakan media *Mueller Hinton Agar* (MHA) yang telah diinokulasi oleh isolat *E. coli* dan cakram antibiotik *sulfamethoxazole-trimethoprim*. Hasil positif isolasi dan identifikasi *E. coli* ditemukan pada 35 dari 53 sampel lingkungan yang berhasil dikoleksi, sementara hasil uji resistansi antibiotik dari sampel yang terkonfirmasi *E. coli* menunjukkan sebanyak 19 isolat resistan, 5 isolat intermediet, dan 11 isolat sensitif. Penelitian ini menunjukkan bahwa pencemaran *E. coli* pada lingkungan *teaching farm* FKH UGM mencapai 66,04% dengan resistansi terhadap antibiotik *sulfamethoxazole-trimethoprim* sebesar 54,29%.

Kata kunci: lingkungan, *teaching farm*, *Escherichia coli*, *sulfamethoxazole-trimethoprim*, resistan

ABSTRACT

ISOLATION, IDENTIFICATION, AND RESISTANCE OF *Escherichia coli* AGAINST *SULFAMETHOXAZOLE-TRIMETHOPRIM* IN ENVIRONMENTAL SAMPLES AT SMART VETERINARY TEACHING FARM, PLAYEN

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The environment around an animal's living space is a potential source of disease, especially those caused by bacterial infections. *Escherichia coli* as one of the fecal coliform bacteria is at risk of contaminating the environment. Treatment of this bacterial infection will be difficult if there is resistance to antibiotics, so it is necessary to conduct research to determine the resistance profile of these bacteria to commonly used antibiotics. This study aims to determine the level of *E. coli* contamination in the Teaching Farm environment and determine the level of resistance to the sulfamethoxazole-trimethoprim antibiotic combination. The selection of antibiotic combinations was carried out sulfamethoxazole and trimethoprim are synthetic antibiotics whose use and resistance have not been found in livestock. This study was conducted using 53 environmental samples consisting of drinking water, wastewater, feces, and soil from the chicken, sheep, goat, horse, deer, and cow zones, pond water and soil from the fish zone and source water at the Teaching Farm. Water samples were filtered using a 25 mm 0.45 µm Nylon Filter Membrane and enriched in Buffer Peptone Water (BPW), while feces and soil samples were directly enriched in the same media. Samples were then isolated on Eosin Methylene Blue Agar (EMBA) media and identified by Gram staining, Triple Sugar Iron Agar (TSIA) test, IMViC test, and motility test. Isolates confirmed as *E. coli* were diluted according to the McFarland 0.5 standard for further resistance testing using the Kirby-Bauer method. The resistance test was conducted using Mueller Hinton Agar (MHA) media that had been inoculated by *E. coli* isolates and sulfamethoxazole-trimethoprim antibiotic discs. Positive results of isolation and identification of *E. coli* were found in 35 out of 53 environmental samples collected, while the results of antibiotic resistance tests from confirmed *E. coli* samples showed 19 resistant isolates, 5 intermediate isolates, and 11 sensitive isolates. This study showed that *E. coli* contamination in the teaching farm environment reached 66.04% with resistance to sulfamethoxazole-trimethoprim antibiotics of 54.29%.

Key words: environment, teaching farm, *Escherichia coli*, sulfamethoxazole-trimethoprim, resistance