Analisis Prevalensi dan Karakterisasi Extended Spectrum Beta-Lactamase Producing Escherichia Coli (ESBL-Ec) pada Air Limbah Tidak Terolah di Kawasan DKI Jakarta = Prevalence Analysis of Extended Spectrum Beta-Lactamase Producing Eschericia coli (ESBL-Ec) In Untreated Wastewater In DKI Jakarta

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Abstrak

Resistensi antibiotik terjadi karena adanya penyalahgunaan antibiotik. Salah satu dari dampak resistensi antibiotik adalah produksi enzim ESBL (Extended Spectrum Beta-Lactamase) pada bakteri. WHO menciptakan tricycle protocol untuk pengawasan global pada bakteri E.coli penghasil ESBL (ESBL-Ec) salah satunya di lingkungan. Penelitian ini memilih objek studi air drainase dan air sungai di Kawasan DKI Jakarta berdasarkan standar ekonomi. Tujuan penelitian ini adalah untuk menganalisis konsentrasi E.coli, ESBL-Ec, rasio ESBL-Ec terhadap E.coli, dan pengaruh lokasi pengambilan sampel terhadap konsentrasi E. coli dan ESBL-Ec. Metode prevalensi E.coli dan ESBL-Ec dilakukan dengan metode spread plate dan antibiotic susceptibility test (AST). Hasil pengujian menunjukkan rata-rata konsentrasi E.coli kategori menengah atas sebesar 4,8x106 CFU/100 mL, menengah sebesar 3,9x106CFU/100 mL, dan menengah bawah sebesar 6,5x106 CFU/100 mL dengan nilai konsentrasi terbesar 9,1x106 CFU/100 mL pada kategori menengah bawah. Rasio ESBL-Ec terhadap E.coli pada setiap sampel berada diangka 0,74%-12,24%. Terdapat tiga lokasi yang tidak ditemukan konfirmasi ESBL-Ec sehingga rasio 0%. Lokasi pengambilan sampel mempengaruhi tinggi rendahnya konsentrasi E.coli dan ESBL-Ec terutama lokasi sampel dengan kategori menengah bawah yang memiliki kepadatan penduduk yang tinggi dan sanitasi yang rendah. Masih adanya prevalensi ESBL-Ec di DKI Jakarta menunjukkan perlu adanya pengawasan penggunaan antibiotik oleh fasilitas kesehatan dan peningkatan sanitasi masyarakat seperti penyuluhan kepada masyarakat demi kesehatan dan keamanan.

.....Antibiotic resistance occurs due to the misuse of antibiotics. One of the impacts of antibiotic resistance is the production of ESBL (Extended Spectrum Beta-Lactamase) enzymes in bacteria. WHO has established the tricycle protocol for global surveillance of ESBL-producing E. coli (ESBL-Ec) bacteria, including in the environment. This study selected drainage water and river water in the Jakarta area based on economic standards as the study objects. The aim of this research is to analyze the concentration of E. coli, ESBL-Ec, the ratio of ESBL-Ec to E. coli, and the effect of sampling locations on the concentration of E. coli and ESBL-Ec. The prevalence method for E. coli and ESBL-Ec was conducted using the spread plate method and antibiotic susceptibility test (AST). The test results showed the average concentration of E. coli in the upper-middle category was 4.8×106 CFU/100 mL, middle category was 3.9×106 CFU/100 mL, and lower-middle category was 6.5×106CFU/100 mL, with the highest concentration value of 9.1×106CFU/100 mL in the lower-middle category. The ratio of ESBL-Ec to E. coli in each sample ranged from 0.74% to 12.24%. There were three locations where ESBL-Ec was not detected, resulting in a 0% ratio. The sampling location influenced the concentration of E. coli and ESBL-Ec, particularly in lower-middle category locations with high population density and poor sanitation. The continued prevalence of ESBL-Ec in Jakarta indicates the need for monitoring antibiotic use in medical facility and improving community sanitation for public health

and safety.