

Deteksi Gen *mecA* dan *femA* pada *Staphylococcus aureus* Ogston dari Sampel Air Sungai Ciliwung Depok = Detection of *mecA* and *femA* Genes in *Staphylococcus aureus* Ogston from Ciliwung Depok River Water Samples

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Abstrak

Staphylococcus aureus merupakan bakteri patogen penyebab infeksi kulit hingga pneumonia. Keberadaan *S. aureus* dengan sifat resistan antibiotik atau disebut sebagai Methicillin-Resistant *Staphylococcus aureus* (MRSA) menjadi salah satu masalah kesehatan dunia. Sifat resisten antibiotik pada *S. aureus* dimediasi oleh dua gen, yaitu *mecA* dan *femA*. Bakteri MRSA dapat menyebar di lingkungan, salah satunya melalui sungai. Isolasi dari sampel air sungai dilakukan menggunakan metode membrane filtration yang ditumbuhkan pada medium selektif mannitol salt agar (MSA). Koloni tunggal yang memiliki warna kuning serta berhasil merubah warna medium dipilih untuk analisis lebih lanjut secara molekuler. Pendeteksian molekuler menggunakan gen STPY (257 bp), *mecA* (297 bp), dan *femA* (454 bp) dilakukan untuk memastikan spesies *S. aureus* dan keberadaan gen resistan. Hasil penelitian berhasil mengisolasi 16 isolat yang melalui uji molekuler didapatkan bahwa 12 di antaranya merupakan MRSA karena positif gen STPY, *mecA*, dan *femA*, atau kombinasi keduanya. Sedangkan 4 isolat lainnya terdeteksi sebagai Methicillin Resistant *Staphylococcus non-aureus* (MRnSA) karena tidak memiliki gen STPY, tetapi menunjukkan keberadaan gen 16S rRNA Universal dan gen resistan. Empat isolat tersebut kemudian melalui tahapan sequencing dan terdeteksi sebagai *S. gallinarum* dan *S. sciuri*. Penemuan MRSA di sungai menunjukkan adanya potensi penyebaran MRSA yang mendukung perluasan pemahaman mengenai keberadaan bakteri resistan antibiotik di lingkungan yang berpotensi membahayakan kesehatan masyarakat.

.....*Staphylococcus aureus* is a pathogenic bacterium that causes skin infections and pneumonia. The existence of *S. aureus* with antibiotic-resistant properties or referred as Methicillin-Resistant *Staphylococcus aureus* (MRSA) is one of the world's health problems. The antibiotic-resistant nature of *S. aureus* is mediated by two genes, *mecA* and *femA*. MRSA bacteria can spread in the environment, one of which is through rivers. Isolation from river water samples was carried out using the membrane filtration method grown on selective mannitol salt agar (MSA). Single colonies that had a yellow color and changed the color of the medium were selected for molecular analysis. Molecular detection using the STPY (257 bp), *mecA* (297 bp), and *femA* (454 bp) genes was performed to confirm *S. aureus* species and the presence of resistance genes. The results of the study successfully isolated 16 isolates which through molecular testing found that 12 were MRSA because they were positive for the STPY, *mecA*, and *femA* genes, or a combination of both. While the other 4 isolates were detected as Methicillin Resistant *Staphylococcus non-aureus* (MRnSA) because they did not have the STPY gene, but showed the presence of the Universal 16S rRNA gene and the resistance gene. The four isolates then went through sequencing and were detected as *S. gallinarum* and *S. sciuri*. The discovery of MRSA in the river indicates the potential spread of MRSA which supports the expansion of understanding of the presence of antibiotic-resistant bacteria in the environment that could potentially endanger public health.