

Antibiotic Sensitivity Pattern of *Staphylococcus spp.* Associated with Mastitis in Cow's Milk

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Structured Abstract

Background: Bovine mastitis is an inflammation of the mammary gland and udder tissue caused by physical trauma or bacterial infection. This condition manifests through physical changes in the udder or biochemical changes in milk, posing a concern for public health due to potential economic losses from reduced milk yield and quality. Treating bovine mastitis has become increasingly challenging due to antimicrobial resistance (AMR) developed by pathogens like *Staphylococcus aureus*, a major cause of mastitis known to acquire resistance to methicillin and other critical antibiotics. There is also a risk of transferring these resistant bacteria or their antibiotic resistance genes (ARGs) to humans and the environment. This has become a significant concern making it crucial to monitor the presence of resistance associated with mastitis in the dairy sector. This study specifically focuses on profiling antibiotic resistance patterns of *S. aureus* isolated from mastitis-infected milk samples collected from a farm in Melaka.

Methods: A total of 30 bacterial isolates were characterised using morphological and biochemical tests. Disk diffusion assay was conducted to test the susceptibility of these isolates against gentamicin (10 µg), erythromycin (15 µg), penicillin (10 µg), ceftiofur (30 µg), tetracycline (30 µg) and trimethoprim-sulfamethoxazole (25 µg), followed by 16S rDNA amplification of identified resistant isolates.

Results: All 30 isolates were observed to match the morphological and biochemical profile of *S. aureus* which is Gram positive with spherical cocci, arranged in clusters, catalase-positive, oxidase-negative and produce yellow-coloured colonies when grown on Mannitol Salt Agar (MSA). The AST result indicated that among the tested isolates, 12 were resistant to penicillin and 9 to ceftiofur. Notably, four of these isolates (UMMY 73, UMMY 127, UMMY 128, and UMMY 147) exhibited resistance to both ceftiofur and penicillin.

Conclusion: This finding underscores the significant presence of clinically important resistant strains among the dairy farm isolates, highlighting potential challenges in managing antimicrobial resistance in this setting.

Keywords: Antibiotic resistance, Dairy farm, Bovine mastitis, *S. aureus*, AST, Penicillin

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