

PGM Book Prize



NUR FAIHAA BT YUSOF
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Nur Faihaa binti Yusof was born on 12th July 1999 in Gerik, Perak. She received her early education in Sekolah Kebangsaan Mahkota Sari in Gerik, Perak. Then she continued her study in MARA Junior Science College (MRSM) in Pengkalan Hulu until 2016. Faihaa further her study in Perak Matriculation college for a year before enrolled her undergraduate study in Universiti Sultan Zainal Abidin (UniSZA) in 2018. She enrolled into the program of Bachelor in Production and Animal Health and currently she is in her final year. Concerned and interested in addressing the rising global threat of AMR in human and animals, she decided to conduct her final year project looking into detecting and characterizing virulence genes in MRSA. Faihaa conducted her project under the supervision of Ts. Dr. Mohd Faizal Ghazali from the Department of Animal Science. The project involves molecular work such as primer synthesis, DNA and RNA extractions, and Polymerase Chain Reaction (PCR). Currently, she is undergoing her industrial internship in Farm Fresh dairy farm in Pahang and expecting to graduate in September 2022.

**The PGM Book Prize is awarded to final year university students who have accomplished outstanding final year project in the field of genetics. The award, which carries a gift voucher worth RM500, is established to bring increasing recognition of the scholarly interests and to promote the culture of research among students. Universities will be invited to submit their nominations for the winners of the prize. At present, 10 students have been awarded the book prize from various universities since its establishment in 2011.*

ABSTRACT

Detection of adhesins and biofilm formation-encoding genes in multi-drug resistant *Staphylococcus aureus* isolated from animal and animal handlers in Peninsular Malaysia

Nur Faihaa bt Yusof and Mohd Faizal Ghazali

Staphylococcus aureus (*S. aureus*) has the ability to acquire resistance to the majority of antibiotics used in clinical practice in a short period of time. Since these bacteria produces virulence factors such as adhesin, they are able to bind to the surface, invade or suppress the immune system which eventually harmful toxic effects in the majority of hosts. Apart from that, biofilm formation act as resistant mechanism towards antimicrobial therapy and host natural defenses such as phagocytosis resistant to neutrophils and macrophages as well as resistant to antimicrobial peptide killing. This subsequently making antibiotics difficult to treat the infection. The objectives of this study were to determine and compare the prevalence of adhesins and biofilm formation-encoding genes in multi-drug resistant *Staphylococcus aureus* (MDRSA) isolated from animal and animal handlers in Peninsular Malaysia. A total of 30 *S. aureus* isolates from the animal handler group and 27 from the animal group consisting of various animal species that had a positive *nuc* gene result were collected and subjected to genotypic identification using DNA extraction using the boiling method, PCR amplification to confirm the presence and prevalence of adhesin and biofilm formation-encoding genes. In this study, for animal handler group, 11/30 (37%) strains shown positive of adhesin genes was *icaA* while for biofilm formation-encoding the most predominant genes was *sdrC* with 3/30 (10%). While *S. aureus* isolates from animal group, 11/27 (41%) shown adhesin positive with the most predominant gene was *fnbA*. As biofilm formation the most predominant gene was *sdrC* as well presented with 3/27 (11%). However, result analysis shows that there are no significant differences between *S. aureus* isolates from animal handlers and those from animals. *S. aureus* adhesion and colonization are basic essential of the establishment of bacterial pathogenesis in human and animal. Hence, more prevalence studies should be conducted on various species of animals and human with different occupational background to understand the molecular epidemiology of MDRSA in Malaysia.