

**GENE EXPRESSION LINKED TO QUORUM SENSING-MEDIATED COAGU-  
LASE FORMATION USING ETHNOBOTANICALS AGAINST *Staphylococcus*  
*aureus* AND HUMAN CLINICAL ISOLATE MRSA**

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## ABSTRACT

**SALAMANCA, GABRIELLE T.**, Department of Biological Sciences, College of Arts and Sciences, Central Luzon State University, Science City of Munoz, Nueva Ecija, Philippines, **JUNE 2019, GENE EXPRESSION LINKED TO QUORUM SENSING-MEDIATED COAGULASE FORMATION USING ETHNOBOTANICALS IN *Staphylococcus aureus* AND HUMAN CLINICAL ISOLATE MRSA**

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Unrestrained use of antibiotics has resulted in the evolution of drug-resistant bacteria, among of which is the Methicillin-Resistant *S. aureus*. Staph infections are among the most common hospital-acquired infections worldwide. Quorum sensing in bacteria is vital to their pathogenicity and the use of QSI compounds reveals opportunities to target virulence without developing resistance and suggests a strategic approach to develop drugs against pathogenic bacteria.

Ethnobotanical crude extracts (ECEs) of the Ilongot community community of Aurora province, Philippines were tested for the QSI activity against coagulase formation in the reference strain *Staphylococcus aureus* and the clinical isolate MRSA. Antibacterial testing of extracts was done as pre-screening for coagulase formation assay whereas the extracts with no antibacterial activity were evaluated through tube coagulase assay for coagulase formation. Molecular confirmation of quorum sensing inhibition as affected by the ECEs was done through gene expression analysis of coagulase formation and methicillin-resistance related genes *agrA* and *mecA*.

Antibacterial activity was observed in SA treatments with *Urena lobata* L. leaves, *Dillenia philippinensis* leaves and *Diplazium esculentum*. Coagulation was inhibited in

tubes treated with crude extracts of *Dillenia philippinensis* bark, *Stachytarpetta jamaicensis* leaves, and *Eleusine indica* roots therefore exhibiting QSI activities against *S. aureus*. *S. jamaicensis* leaves (4.439), *E. indica* roots (2.785), and *D. philippinensis* bark (1.022) significantly downregulated *agrA* therefore confirming the QSI activity. Moreover, extracts of *D. philippinensis* bark (1.003) and *S. jamaicensis* leaves (13.09) significantly downregulated *mecA*. The results indicate the potential of these ethnobotanicals for therapeutic approach in inhibiting bacterial virulence without developing resistance.

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