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Antibacterial Potential of Methanolic Extracts Obtained from *Syzygium aromaticum* Against Selected Bacteria (TNR 14)

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Structured Abstract

Background: *Syzygium aromaticum* or commercially known as clove, is an aromatic dried flower bud from the *Myrtaceae* family that were used as traditional medicine for over 2000 years in Chine and Ayurveda. Clove can be found abundant in Northern Nigeria, known locally as Konafuru. Historically, clove have been utilised as antimicrobial, antifungal, antiviral, and antiseptic agent. FDA have recognised clove essential oil as a safe food supplement. Cloves contains important phenolic compounds such as eugenol and acetyl eugenol which responsible for its antimicrobial activities. Clove also shows antiviral activity against hepatitis C, influenza, and herpes strains including antibacterial activity against various bacteria such as *Escherichia coli* and *Staphylococcus aureus*. Furthermore, clove also exhibit antifungal and antiprotozoal properties.

Methods: This study aimed to investigate the antimicrobial potential of methanolic extracts of *S. aromaticum* against Methicillin-resistant *Staphylococcus aureus (MRSA), Staphylococcus epidermidis, E. coli*, and *Pseudomonas aeruginosa*. In this study, disc diffusion assay was used to determine the effectiveness of the methanolic extracts. The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) assays were used to evaluate the extract's antibacterial efficacy.

Results: This study showed that the methanolic extracts of *S. aromaticum* were able to inhibit the growth of all tested bacteria. It was notable that the extracts demonstrated effective bactericidal activity, successfully neutralized all the bacterial species. The MIC and MBC results indicated potential of using the clove extract as a potent alternative antimicrobial agent.

Conclusion: In conclusion, the outcomes of this study shows that there is considerable antimicrobial properties of *S. aromaticum* methanolic extracts against the selected bacteria, exposing the spice's potential as a natural alternative to conventional antibiotics. This study suggest that clove extract could be used and developed as a treatment for antibiotic-resistant infections and may help the global effort to fight against antimicrobial resistance.

Keywords: *Syzygium aromaticum,* antibacterial activity, methanolic extract, antimicrobial resistance, natural antimicrobial agents

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