

ABSTRACT

Antibacterial and Antibiofilm Potential of Synthesized Silver Nanoparticle using Langsat Leaf Extract (*Lansium domesticum* var. *pubescens* Kooders et Valeton) as Bioreductor Against *Escherichia coli*, *Escherichia coli* ESBL, *Staphylococcus aureus*, and Methicillin-resistant *Staphylococcus aureus* (MRSA)

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The emerging of antimicrobial resistance causes the urgency to find new alternative agents. Another mechanism of microorganism to form biofilm also manifesting difficulties to eradicate bacteria and increases resistancy towards antimicrobial. The application of silver in the form of silver nanoparticles (AgNP) begins to be studied again. The less toxic and eco-friendly method to synthesize AgNP is the green synthesis approach using plant extract. Langsat is one of the endemic plants from South Kalimantan and its leaf provides secondary metabolites to synthesized AgNP. The synthesis of AgNP prepared using AgNO₃ and Langsat Leaf extract as bioreductor. The prepared AgNP was characterized by UV-Vis spectroscopy. The MIC study was done by the broth macrodilution method with 6 different concentrations followed with the MBC study on agar plates. The antibiofilm assay was done by *microtiter plate assay*. The AgNP successfully inhibited the growth of *Escherichia coli*, *Escherichia coli* ESBL, *Staphylococcus aureus*, and MRSA in concentration 3,125%, 3,125%, 6,25%, and 3,125%, respectively. The AgNP also shows bactericidal activity on *Escherichia coli* and *Escherichia coli* ESBL in concentration 25% and 12,5%, respectively but shows no MBC on Gram positives bacteria. The AgNP inhibited the growth of biofilm of *Escherichia coli*, *Escherichia coli* ESBL, *Staphylococcus aureus*, and MRSA in concentration 49,597±0,203%, 63,789±0,251%, 81,749±0,012%, 81,295±0,052%, respectively. The AgNP also shows eradication activity on preformed biofilm of *Escherichia coli*, *Escherichia coli* ESBL, *Staphylococcus aureus*, and MRSA in concentration 25,918±0,074%, 56,779±0,022%, 36,812±0,098%, 38,976±0,071%, respectively. This result indicates AgNP has antibacterial and antibiofilm potential against the test bacteria.

Keywords: Antibacterial, Antibiofilm, Green Synthesis, *Lansium domesticum*, Silver Nanoparticles