

ANTI-BIOFILM EFFECT OF *Tetradenia riparia* AGAINST MRSA *Staphylococcus aureus*

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Abstract

Factors that lead to growth inhibition of biofilm or its breakup or eradication is required since bacteria embedded in biofilms are more difficult to eradicate than planktonic cells. Single-drug treatment for MRSA related infections is becoming less effective and natural products may be an alternative for future antibacterial medicine development. In order to prevent biofilm formation, several studies have been performed to find antimicrobial agents that affect the viability of bacteria in biofilms. Natural products from plants have been shown to influence microbial biofilm formation. In this study, activity of *Tetradenia riparia* extract was determined against planktonic and biofilm cells of *Staphylococcus aureus* ATCC 29213 and 13 clinical isolates, being 10 MRSA and 3 MSSA. Congo Red agar (CRA) and Tissue Culture Plate (TCP) methods were used to screening for biofilm formation by *Staphylococcus* isolates. MIC and MBC values were determined by microdilution technique. Checkerboard method was used to assess synergic interactions between extract and penicillin against planktonic cells. The effect of the extract on pre-formed biofilms of MRSA was determined by MTT reduction assay and Scanning Electron Microscopy. All these strains showed black colonies on CRA plates and were moderate or high biofilm producers. Good antibacterial effect was obtained, MICs values ranged from 31,2 to 125 µg/ml and MBC values ranged from 125-250 µg/ml. Synergic interaction between extract and penicillin occurred with 64% of the strains. Pre-formed biofilms were also inhibited by *T. riparia* extract, BIC₅₀ values ranged from 40 to 90 µg/ml. SEM images showed reduction on biofilm cells after treatment with the extract when compared to control cells. These data indicated a potential application of *T. riparia* in the development of strategies against *S. aureus*.

Keywords: MRSA, anti-biofilm, *Tetradenia riparia*

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