

Determination of antibacterial activity of 6 β -hydroxybetunolic acid and interaction with oxacillin

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Various strides have been undertaken with successful results in the treatment and cure of significant number of bacterial infections. However, many bacteria are becoming resistant to some of the prevailing drugs due to either the misuse or the prolonged use of the available antibiotics increasing the necessity for discovering new antibiotics to combat resistant microorganisms. Plants and their secondary metabolites can be considered as good sources of scaffolds to provide structurally diverse bioactive compounds as potential therapeutic agents and combination of them with standard antibiotic to obtain synergistic effect. The objective of this study was to determine the antibacterial activity of one of a lupeol type triterpenoid (6 β -hydroxybetunolic acid) isolated from the bark of *Schumacheria castaneifolia* Vahl. which is an endemic plant to Sri Lanka and to determine the synergistic effect with Oxacillin. Antimicrobial activity of 6 β -hydroxybetunolic acid was evaluated utilizing micro broth dilution assay in 96 well plates against two standard strains of *Staphylococcus aureus*, 4 strains of clinically isolated Methicillin resistant *S. aureus*, standard strains of *Enterococcus faecalis*, *Escherichia coli*, *Pseudomonas aeruginosa*, carbapenemas producing *Kebsiella pneumonia* and carbapenemas non-producing *Kebsiella pneumonia* and four strains of clinically isolated *Acinetobacter* sp. Synergistic effect of the combination of 6 β -hydroxybetunolic acid and Oxacillin was tested against Standard strain of *S. aureus* and MRSA using checker board method. Results revealed that 6 β -hydroxybetunolic acid shows significant antibacterial activity only against the Gram positive strains; MIC values of *S. aureus* (ATCC 29213), *S. aureus* (ATCC 29213), *E. faecalis* (ATCC 29212) and four MRSA strains were 32, 16, 32, 32, 32, 16 ppm respectively. However MIC value of Oxacillin against *S. aureus* (ATCC 29213) was 0.25 ppm. 6 β -hydroxybetunolic acid has synergistic effect with Oxacillin against *S. aureus* and additive effect against all the tested MRSA. These results concluded that the antibacterial activity of 6 β -hydroxybetunolic acid is predominantly depending on the cell wall difference of the bacteria.

Keywords: 6 β -Hydroxybetunolic acid, Antibacterial activity, Synergistic effect

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