

***In Vitro* Antistaphylococcal Activity of Xanthorrhizol Isolated from the Rhizome of Temulawak (*Curcuma xanthorrhiza* Roxb.)**

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ABSTRACT

Staphylococci are common inhabitants of skin, skin glands and mucous membranes of mammals and birds. Certain *Staphylococcus* species are found as aetiological agents of a variety of human and animal infections as well. In this study, we present the activity of xanthorrhizol (XTZ) against staphylococcal planktonic and biofilm cells. XTZ was isolated as the pure form from the ethylacetate fraction of the methanol extract of *Curcuma xanthorrhiza* Roxb. The MICs and MBCs of XTZ on planktonic cells were determined in tryptic soy broth (TSB) using a broth microdilution method in polystyrene flat-bottomed microtitre plates according to Clinical Laboratory Standards Institute guidelines (CLSI). Time-kill curve were performed in TSB medium. The effect of different concentrations of XTZ (ranging from 0.25× MIC to 1× MIC) on biofilm-forming ability was tested on polystyrene flat-bottomed microtitre plates. The MICs and MBCs of xanthorrhizol against *S. aureus* KCCM 11335, *S. aureus* KCCM 11764, *S. epidermidis* ATCC 12228, *S. haemolyticus* KCTC 3341, *S. warneri* KCTC 3340 and *S. xyloso* KCTC 3342 planktonic cells were 8-, 8-, 10-, 16-, 14-, 4- and 16-, 16-, 20-, 32-, 20-, 8 µg/ml, respectively. Killing time of xanthorrhizol against all species tested was also fast acting; less than 4 h at 2× MIC. BICs (biofilm inhibition concentration) and BECs (biofilm eradication concentration) values of xanthorrhizol on established staphylococcal biofilms were twofold to tenfold greater than the concentration required to inhibit planktonic growth; 32-, 32-, 20-, 64-, 20-, 16- and 64-, 64-, 80-, 128-, 80-, 32 µg/ml, respectively. Effect of xanthorrhizol on *S. aureus*, *S. aureus*, *S. epidermidis*, *S. haemolyticus*, *S. warneri* and *S. xyloso* biofilms formation at 1× MIC was reduced of 78.37%, 74.93%, 91.15%, 75.32%, 87.96%, and 73.15%, respectively. These results suggest that xanthorrhizol can be used to inhibit the growth of staphylococcal planktonic and biofilm cells.

Keywords: Antibacteria, antibiofilm, planktonic cells, *Staphylococcus*, xanthorrhizol