

PROTEOMIC ANALYSIS OF ANTIMICROBIAL EFFECTS OF LUPINIFOLIN IN VANCOMYCIN-RESISTANT ENTEROCOCCI

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INTRODUCTION:

Enterococci are recognized as serious nosocomial pathogens that can produce biofilms, which contribute to their virulence and antimicrobial resistance. The organisms have confirmed the worldwide emergence of multiple-drug resistant (MDR) enterococci, particularly to vancomycin. Our previous studies have reported that lupinifolin, a prenylated flavonoid isolated from *Albizia myriophylla* Benth., showed great antibacterial properties against biofilm formers, MDR- and vancomycin-resistant enterococci (VRE). However, the detailed mechanisms of lupinifolin remained poorly understood.

OBJECTIVES:

The aim of this study was to assess the lupinifolin effects against VRE growth, biofilm formation, and proteome profile and gene expression changes.

METHOD / DESIGN:

The proteomic analysis using liquid chromatography-tandem mass spectrometry (LC-MS/MS) was performed on untreated control and VRE exposed to lupinifolin. Gene expression alterations after treatment were investigated by quantitative real-time PCR. Effect of various concentrations of the compound on the bacterial growth was assessed by time-kill analysis. Biofilm quantification after treatment were conducted using a crystal violet assay.

RESULTS:

The proteome profile changes involved in cell division and cell wall biosynthesis, cell membrane, stress response, cell surface antigen and virulence factor, and various metabolic pathways. Moreover, biofilm formation and the survival rate of the bacteria were reduced after exposure to lupinifolin in a dose-dependent manner.

CONCLUSIONS:

The data obtained in this study provide further evidence and knowledge of the anti-bacterial and anti-virulence properties, and the mechanism of action of lupinifolin. The findings may lead to the development of an effective and safe antimicrobial agents for treatment of VRE and MDR bacterial infections.