

Title: Antimicrobial potential of licorice: Leaves versus roots

Abstract

Medicinal plants play a vital role in covering the basic health needs. They may offer a new source of antibacterial agents. The aim of this study was to screen in-vitro the antimicrobial activity of some Egyptian medicinal plants against clinical methicillin-resistant *Staphylococcus aureus* (MRSA) strains isolated from different hospitals in Egypt followed by studying the MIC and cytotoxicity of the most active one. Screening of antimicrobial activities of 70% ethanolic extracts obtained from 19 plants against 59 MRSA clinical isolates were tested by agar well diffusion method. Licorice showed the highest antimicrobial effect against all 59 MRSA isolates (leaves were more active than roots). Minimum inhibitory concentrations (MICs) of licorice leaves were 8 µg/ml, whereas that of Flucloxacillin range between 32 to <128 ug/ml when tested against five MRSA strains. Colorimetric cytotoxicity assay of licorice leaves extract was done on HEPG2 and HCT116 cell lines and revealed that the IC50 were 19.5 and 15 µg/ml respectively. Separation of the components in licorice leaves using thin layer chromatography (TLC) results in two active fractions identified with the help of spectroscopic analysis as inflacoumarin A and Licochalcone A. Our results reveal that the Egyptian licorice leaves extract represent a new candidate for antimicrobial agent against MRSA more than that achieved by root. This is the first report which highlights the antimicrobial activity of licorice leaves.

Key words: Plant extracts, licorice, MRSA, antimicrobial.