### Abstract:
Background and Objective: Galbanic acid, a sesquiterpene coumarin from Ferula szowitsiana, and conferol, another sesquiterpene coumarin from F. badrakema, were evaluated for their effects on the reversal of multi-drug resistance in clinical isolates of Staphylococcus aureus and Escherichia coli, respectively. Neither galbanic acid (up to 1000 ug/ml) nor conferol (up to 400 ug/ml) by itself shows any antibacterial activities against tested strains.

Materials & Methods: Galbanic acid and conferol were isolated from F. szowitsiana and F. badrakema. Six isolated samples of S. aureus and seven isolated samples of E. coli were obtained from Imam Reza and Ghaem University Hospitals, S. aureus ATCC 29737 and E. coli ATCC 8739 were used as standard strains. The minimum inhibitory concentrations (MICs) of ciprofloxacin and tetracycline were determined using macro dilution technique in the presence and absence of sub-inhibitory concentrations of galbanic acid (31.25-1 000 ug/ml) or conferol (50-400 ug/ml), however they caused no change in MICs of the antibiotics.

Results: Galbanic acid did not show any inhibitory effect on efflux phenomenon of E. coli. This can be related to the outer membrane of gram-negative bacteria which is impermeable to lipophilic compounds or another mechanism rather than efflux responsible for resistance in tested E. coli strains. An inhibitory effect of conferol on the efflux was compared with verapamil as a positive control. Because efflux is the only known mechanism of resistance to ethidium bromide (model efflux substrate) and verapamil reduced MIC of ethidium bromide, efflux mechanism can be considered as one of the resistance mechanisms in tested S. aureus strains. Conferol, however, did not enhance the antibiotic efficacy mediated by inhibiting efflux pumps in bacteria.

Conclusion: Galbanic acid, a sesquiterpene coumarin from F. szowitsiana, and conferol, a sesquiterpene coumarin from F. badrakema, did not show any effect as modulators of antibiotic resistance on clinical isolates of E. coli or S. aureus, respectively.

Keywords: Conferol; Escherichia coli; Ferula; Galbanic acid; Multi-drug resistance; Staphylococcus aureus.