ANTIBACTERIAL AND ANTIFUNGAL ACTIVITIES OF *PUNICA GRANATUM* PEEL EXTRACTS AGAINST CERTAIN MULTI DRUG RESISTANT PATHOGENS

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ABSTRACT

The present research work was conducted to evaluate the antibacterial and antifungal activities of different peel extracts of *Punica granatum* against certain multidrug resistant bacterial and fungal strains. The study was carried out against fourteen bacterial strains and eight fungal strains. All isolated strains were identified according to standard protocol. Disc diffusion assay was performed for antibacterial and antifungal sensitivity, while agar well diffusion assay was carried out to determine the antibacterial and antifungal activities of different peel extracts of *Punica granatum*. Antimicrobial sensitivity showed that Amoxicillin+ clavulanic acid was the most effective antibiotic with zone of inhibition 10-32 mm against almost all tested bacterial strains followed by Levofloxacin 12-29, Ciprofloxacin 10-31, Cefradine 11-29, Tetracycline 12-19, Penicillin 10-13, while Nalidixic acid showed 18mm ZI against *S. aureus* and was resistant to eleven (11) tested bacterial strains. Oxacillin was completely ineffective against all tested bacterial strains. The study showed that most of bacterial strains were resistant to antibiotics ranging from 25%-86%. Antifungal sensitivity showed that Voriconazole was the most effective and produce the largest ZI 25mm against *penicillium*. Nystatin was (44%) effective against almost all tested fungal strains and produced ZI ranging from 10-22 mm. The study showed that most of the tested fungal strains were resistant to antifungals ranging from 33%-100%. The ethyl acetate, methanol and hot water extracts showed 100% antifungal activities against all tested fungal strains. In case of antibacterial activity of *Punica granatum* peel extract, ethyl acetate extract showed 100% activity against all tested bacterial strains and produced (34mm) ZI against *Enterobacter aerogenes* followed by *Vibrio cholera* (31mm), *Pseudomonas aeruginosa* (28mm) *Salmonella para typhi* (28), *Shigella dysentreiae* (28mm), *Staphylococcus epidermidis* (27mm), *Citrobacter freundii* (26mm), *Bacillus subtilis* (25mm), *Providencia stuartii* (23mm), *Escherichia coli* (22mm), *Salmonella typhi* (22mm), *Klebsiella Pneumonia* (21mm), *Proteus mirabilis* (20mm) and *Staphylococcus aureus* (18mm). The Hot water extract was the second most effective (93%) extract and produced ZI ranging from 10-33 mm against all tested bacterial strains. Methanolic extract produced maximum ZI against *Providencia stuartii* (33mm), followed by *Enterobacter aerogenes* (32mm), *Salmonella para typhi* (29mm), *Staphylococcus epidermidis* (28mm), *E. coli* (27mm), *Pseudomonas aeruginosa* (27mm), *Salmonella typhi* (27mm), *Shigella dysentriae* (26mm), *Vibrio cholera* (26mm), *Citrobacter freundii* (23mm), *Bacillus subtilus* (22mm) and *Klebsiella pneumonia* (21mm), while *Proteus mirabilis* and *Staphylococcus aureus* were founded completely resistant. Our results showed that the peel extract of *Punica granatum* have potent antibacterial and antifungal activities against MDR strains so, it can be used as alternative therapy against bacterial and fungal infection.