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In vitro screening for antibacterial properties and phytochemical analysis of ethanol extract of flower of *Lawsonia inermis*

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In vitro screenings of antibacterial activity and phytochemical analysis were conducted to examine the efficacy of ethanol extract of flower of *Lawsonia inermis*. The test extracts at different concentrations of 1 mg, 10 mg, 20 mg, 40 mg and 60 mg / 100 µl were obtained with the mixture of acetone (30%) and ethanol (70%) and bioassayed using agar well diffusion method against *Staphylococcus aureus, Bacillus subtilis, Klebsiella* sp, *Escherichia coli* and *Pseudomonas aeruginosa*. Streptomycin (50 µg / 100 µl) was used as standard and the solvent mixture (30% Acetone with 70% ethanol) was used as control. Antibacterial activity was evaluated by measuring the diameters of inhibition zone after 24 hours incubation at 37 ^{0}C. All samples were tested in triplicate and mean values were recorded. The data were analyzed by one-way analysis of variance (ANOVA), P value < 0.05 was considered as significant and mean values were compared by using Least Significant Difference (LSD) test. A small portion of the dry ethanol extract was used for the phytochemical tests to find out the constituents such as alkaloids, terpenoids, cardiac glycosides, saponins, tannins, flavonoids, phlobatannins and steriods. The results revealed that the all the test concentrations of ethanol extract produced better inhibitory activity on all test pathogens. *Klebsiella* sp, *Staphylococcus aureus* and *Pseudomonas aeruginosa* were found to be highly susceptible to the test extract at the test concentrations. *Escherichia coli* were found to be the least sensitive to the test extract. Dose response study revealed that the inhibitory effect increased with increasing the extract concentration and significantly ($p<0.05$) suppressed the growth of the test bacteria at different concentrations. The inhibitory effect of ethanol extract on *Staphylococcus aureus* and *Escherichia coli* was found to be higher, at the test concentrations except 1 mg / 100 µl, than streptomycin (50 µg / 100 µl). The ethanol extract revealed the presence of bioactive compounds terpenoids, cardiac glycosides, saponins, tannins and flavonoids.

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