# SYNERGISTIC STUDY OF *Lawsonia inermis* (HENNA) LEAVES EXTRACT AND *Citrus limonum* (LEMON) JUICE AGAINST BACTERIA CAUSING SKIN INFECTIONS

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# ABSTRACT


## SYNERGISTIC STUDY OF *Lawsonia inermis* (HENNA) LEAVES EXTRACT AND *Citrus limonum* (LEMON) JUICE AGAINST BACTERIA CAUSING SKIN INFECTIONS

Bacterial invasion through the skin layers can cause various types of Skin and Soft Tissue Infections (SSTI) that mainly caused by *S. aureus* and *P. aeruginosa*. Recent study also found that *E. coli* causes a rare type of SSTI. Pharmaceutical industries have manufacture many types of synthetic antibiotics to treat SSTI but prolonged usage of these antibiotic treatment will lower its effectiveness due to the increasing in bacterial resistance cases towards the common antibiotics. The aim of this study is to determine the antibacterial activity of *Citrus limonum* (Lemon) juice and *Lawsonia inermis* (Henna) leaves combination extract by using agar well-diffusion method and 96-well microtiter plate for MIC test. The samples used were pure lemon juice and henna leaves that were extracted by using 100% methanol. Phytochemical component in the extract that possess antibacterial properties such as saponin, tannin, alkaloid, flavonoid, steroid and phenolic were also determined. The result of antibacterial screening test shows that combination extract has higher antibacterial activity towards *S. aureus* and lower effect towards *P. aeruginosa* and *E. coli* with diameter of inhibition zone of 18.67 ± 1.53 mm and 13 ± 1.73 mm, 13 ± 1.0 mm respectively. The MIC result shows higher antibacterial activity against *S. aureus* at 1.5625 mg/ml and lower effect towards *P. aeruginosa* and *E. coli* at 3.125 mg/ml. Overall, combination extract shows higher antibacterial effect towards the chosen bacteria compared to single usage of extract.