EFFECT OF ADDITION OF SOME PLANT EXTRACTS TO ANTIBIOTICS ON PATHOGENIC *STAPH.AUREUS*

By

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B.Sc. (Biochem. and Microb.), Fac. of Agriculture, Cairo Univ. (2009)

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ABSTRACT

Asmaa Farouk Hussein. Effect of Addition of some Plant Extracts to Antibiotics on Pathogenic *S .aureus*. Unpublished M. Sc. Thesis, Department of Agricultural Microbiology, Faculty of Agriculture, Ain Shams University, 2017.

Searches for substance with antimicrobial activity are frequent and medicinal plants have been considered interesting by some researches since they one frequently used in popular medicine as remedies for many infectious diseases. The aim of the study was to verify the antibacterial effect of aqueous, methanolic extracts and their essential oils of plants [clove (*Syzygium aromaticum),* mint *(Mentha piperita*), Thyme (*Thymus vulgaris*) , Garlic (*Allium sativium),* Sage (*Salvia officinalis*)] against 5 isolates of *S .aureus* isolated from pyogenic infections. The agar well diffusion method was the antimicrobial susceptibility performed test. *S .aureus* isolated from pleural fluid (P.F) out of five *S .aureus* (coagulase +ve, MSSA) exhibits resistant against all the concentration of Ciprofloxacin 0.5-20, Gentamycin 0.5- 5.0 µg/100µl and Amikacin 1 µg/100µl . The highest potent of phytoextracts either extracted by water or methanol was detected by clove comparing with mint , thyme , sage and garlic against all isolate, whereas garlic essential oil gave completely abolish of *S .aureus* P.F & T.B. Among 149 trials of combination between the lowest concentration of four antibiotics and different phytoextracts with different ratios against five pyogenic bacterial isolates .The combination between gentamycin and garlic essential oil with ratio 1: 3 represent high potent synergism against B.F, A.F and W.L (boils & abscess in face and wound in leg) isolates. Whereas, the combination between the same antibiotic and thyme essential oil with 1:3 gave high synergism against P.F and T.B isolates of *S .aureus* .The combination between garlic Eso + lowest concentration of Gentmycin (1:3) increment the synergism by 6.4, 2.5 and 6.0 fold against B.F , A.F and W.L isolates respectively comparing with standard concentration of gentamycin. On the

other hand, using thyme Eso (100µl/well) resulted to increase the antibacterial (IZD) activity by 2.4 and 4.4 fold comparing with standard Gentamycin against P.F and T.B isolates. Increasing the concentration of garlic essential oil (G Eso) from 10 up to 100 µl/well increment the efficacy of inhibition up to 10, 3.7 and 4.5 fold when standard dose of Gentamycin, Vancomycin and Amikacin were used individually against *S .aureus* P.F (KY859805). The minimum bactericidal concentration of garlic essential oil was recorded at 2µl/100µL as it resulted to reduce the count to be 0.04%. . Analysis of garlic essential oil by GC-MS dedicated six sulfur compounds represented 88.86% of total detected compounds in garlic essential oil.

Key Words: *S .aureus*, Antibiotics, Phytoextract, Synergistic effects, MBC, 16S r RNA, GC-MS spectrometry.

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