SUMMARY

Urinary tract infection is a relatively common problem attacking human being in different ages and genders all over the world. UTI is an infection of the urethra, bladder, and/or kidneys, the major structures composing the urinary tract. This infection in most cases may lead to renal failure due to kidney damage. Pyuria is the main features of UTI. Women are susceptible to infection with UTIs due to the movement of bacterial pathogens from gastrointestinal flora through fecal contamination and then enter to female urethra because of the closest of the anus to urethra in female which increase the chance of incidence of urinary tract infection.

In the present study a total of 138 urine samples were taken from patients who were examinated for UTIs in Zagazig University hospitals or attending Zagazig University outpatients' clinics, Urology Department. These samples have been isolated from different ages of males and females ranged 35-75 years of males and 20-60 years of females. These samples were immediately tested for bacterial count on CLED agar, on the basis of samples which gave bacterial growth less than 10^5 CFU per ml in urine culture considered negative and were excluded but samples which gave bacterial growth $\geq 10^5$ CFU per ml in urine culture considered positive, also these samples were cultured on CLED agar, nutrient agar, MacConkey agar and blood agar. The isolates were characterized via microscopic examination, and classified and identified to the species level according to laboratory manuals and determinative keys of bacteriology.

In the present study, the results demonstrated that Gram-negative bacteria were the most common cause of UTIs which present in 87.0% of patients while Gram-positive bacteria were percent in 13.0% of patients.

The most frequent isolated species from UTIs patients were: 40.0% *E. coli*, 22.0% *Proteus mirabilis*, 15.0% *Klebsiella pneumoniae*, 13.0% *Staphylococcus* saprophyticus and 10.0% *Pseudomonas aeruginosa*.

Regarding the resistance and susceptibility of the uropathogenic organisms to the antimicrobial agents, the results showed that the antibiotic ofloxacin is more effective against isolated pathogenic bacterial organisms, where the percentage of sensitive organisms to ofloxacin is 58.0% followed by amikacin 54.0%, chloramphenicol 52.0%, norfloxacin 51.0%, azithromycin 48.0%, ampicillin 11.0%, cefotaxim sodium 2.0% and penicillin-G 0.0%.

In the present study, the results demonstrated that rosemary, lemon grass, peppermint, hibiscus, clove, marjoram, thyme, cinnamon, castor plant and chamomile were most effective plants extracts against selected pathogens (*Escherchia coli*, *Klebsiella pneumoniae*, *Proteus mirabilis*, *Pseudomonase aeruginosa* and *Staphyloccocus saprophyticus*). However in three cases (cold water, boiled water and alcohol extract), ginger was the lowest effective plant extracts.

Orange peel and fennel were most effective only in case of alcohol extract, low effective in case of boiled water extract, and not effective in case of cold water extract. More over garlic was the most effective in case of cold water and alcohol extract, and not effective in case of boiled water extract.

Spearmint and tilia haven't any effect against bacteria. However in three cases (cold water, boiled water and alcohol extract).

Combination between clove extract (extraction by boiled water) and antibiotics like ofloxacin and amikacin increase the antimicrobial agent effectivity of antibiotics against isolated bacteria.

Protein analysis for bacterial isolates showed that there is difference in protein bands (there are many protein bands induced and other disappeared) between treated bacteria with effective materials (boiled water clove extract and MIC of ofloxacin antibiotic) and none treated bacteria (control).

The results obtained from spectrum analysis (NMR and IR) for identification the antibacterial substance, illustrated that the effective compound in clove extract which represent as antimicrobial agent is eugenol.