Summary

Disease of the conjunctiva, minor as well as major, form a very large proportion of the ophthalmologic maladies, ranging from an average proportion of about 3% to as much as 90% in those countries where conjunctivitis constitutes a national problem.

Acute bacterial conjunctivitis is a common condition responsible for more than 5 million patient visit emergency departments in hospitals each year.

1- Total of 214 patients of untreated clinically diagnosed as acute conjunctivitis as well as fifty normal control conjunctiva were examined and sampled over four seasons throughout two years, the clinical diagnosis of 214 cases of conjunctivitis within a period of two years means that the disease is not rare in Egypt.

The epidemiological studies were focused on the incidence of the disease in relation to sex and age of patients. Following the seasonal changes in the number of patients complaining of conjunctivitis beside notice the difference between age groups and sex. The microbiological studies were carried out to identify the microorganisms (bacteria and fungi) associated with conjunctivitis.

2- Females have over numbering males recorded in 122 cases constituting (57.1%) out of the total cases and males recorded 92 times constituting (42.9%).

Microbial conjunctivitis cases showed some relation to the age of patients. Distributions of bacterial conjunctivitis among different age groups according to the total number of diseased patients revealed that patients in all age groups were suffering from conjunctivitis but with different percentages, the highest incidence of the disease was estimated in patients with age range of 31-50 years (28.5%), followed by patients

with age range of (13-20) years (15 %). The lowest incidence of conjunctivitis was recorded in patients with age range of 71-81 years (2.8 %).

Fungal conjunctivitis was diagnosed in 48 patients out of 214 patients matching 22.4 %.The highest incidence of fungal disease was observed in males and females lies mainly in age range of 31-50 years, where the number of infected females was about two times that of males. The percentage of conjunctivitis was more prevalent in adult cases than in children.

There were 23 patients constituting 10.7% found to be infected with mixed microorganisms. Most of the mixed cultures were isolated from females, the highest incidence of mixed cultures was observed in adult patients with age range of 31-50 years (34.8 %), followed by patients with age range of 21-30 years (26.1 %) and the lowest incidence of mixed cultures was observed in patients with age range of 7-12 and 13-20 years (4.3 %).

Isolated microorganisms from all positive specimens of conjunctivitis were identified; bacteria and yeasts were identified according to their morphological and biochemical characteristics, while fungi were identified according to their growth characteristics and microscopic examination using the image analysis system.

From different groups of patients studied fourteen species of bacteria were isolated and identified, the most predominant bacterial species were found to belong to the genus *Staphylococcus.*

The highest percentage of bacterial isolates was *Staphylococcus albus* (16 %), followed by *Staphylococcus aureus* (13.3 %), *Corynebacterium xerosis* (9.8 %), *Haemophilus influenzae* and *Neisseria catarrhalis* and *Moraxella lacunata* (9.1 %), *Streptococcus pneumoniae* (7.7 %), *Streptococcus pyogenes* (6.9 %), *Pseudomonas aeruginosa* (6.3 %), *Escherichia coli* (5.6 %), *Haemophilus aegyptius* (4.2 %), *Streptococcus oralis* (3.5%) and *Klebsiella pneumoniae* & *Proteus vulgaris* (2.1 %).

The development of clinically useful drugs continues to rely heavily on isolation from natural sources.

The great medicinal and commercial potential of bioactive substances derived from natural sources have huge pharmaceutical impact. Hence, natural products have been the main source of antibacterial drugs.

The present work aims at investigating the effect of propolis and Bee venom (BV) on the viability of isolated microorganisms causing conjunctivitis.

Regarding susceptibility of the tested bacteria to the propolis, it seems that they were susceptible to propolis. The results of agar well diffusion test revealed that propolis ethanolic extract showed antibacterial activity against Gram positive and Gram negative bacteria. The largest inhibition zones were noticed against *Staphylococcus albus* (26mm) and against *Staphylococcus aureus* (23mm), followed by *Streptococcus oralis* (22mm), *Streptococcus pyogenes* (20 mm), *Streptococcus pneumoniae* (19 mm) and *Corynebacterium xerosis*(13 mm).

On the other hand, *Proteus vulgaris* was the most susceptible tested Gram-negative bacteria to propolis with inhibition zone diameter (20

mm), followed by *Haemophilus aegyptius* (18 mm), *Haemophilus influenzae*(16 mm), *Neisseria catarrhalis* (13 mm), *Escherichia coli* and *Moraxella catarrhalis* (8 mm), *Klebsiella pneumoniae* (7 mm), *Pseudomonas aeruginosa* (3 mm). The control (absolute ehtanol, v/v) showed no inhibitory zone against any tested bacteria.

Propolis had the lowest MIC against *Staphylococcus albus* (0.175 mg/ml), and *Staphylococcus aureus* (0.35 mg/ml), followed by *Streptococcus oralis* (0.7 mg/ml). Propolis had the same MIC against *Streptococcus pyogenes* and *Streptococcus pneumoniae* (1.4 mg/ml) and *Corynebacterium xerosis* (5.6 mg/ml).

On the other hand propolis had the same MIC against *Proteus vulgaris* and *Neisseria catarrhalis* (5.6 mg/ml), *Haemophilus aegyptius* (1.4 mg/ml), *Haemophilus influenzae*(2.8 mg/ml), *Klebsiella pneumoniae* (22.4 mg/ml), *Escherichia coli* and *Moraxella catarrhalis* (11.2 mg/ml), then *Pseudomonas aeruginosa*(89.6 mg/ml).

Generally in our study the higher activity of propolis sample against Gram-positive bacteria was greater than Gram-negative bacteria.

Bee venom seemed to have higher antibacterial activity than propolis. *Staphylococcus albus* seemed to be the most sensitive tested bacteria (34mm) followed by *Staphylococcus aureus* (33mm),then *Streptococcus oralis* (32mm), then *Streptococcus pyogenes* (30 mm) and then *Streptococcus pneumoniae* (29 mm) and *Corynebacterium xerosis* (25mm).

On the other hand, *Proteus vulgaris* was the most susceptible tested Gram-negative bacteria with inhibition zone diameter (24 mm), followed by *Haemophilus aegyptius* (22 mm), *Haemophilus influenzae*(20 mm), *Neisseria catarrhalis* (18mm), *Klebsiella pneumoniae* (18mm), *Escherichia coli* and *Moraxella catarrhalis* (15 mm), then

Pseudomonas aeruginosa seemed to be the least sensitive bacteria (5 mm). Based on these results, it is clear that bee venom exhibited differences in its (MIC) against tested bacteria. Bee venom had the same MIC against *Staphylococcus albus* and *Streptococcus oralis* (0.043 mg/ml), and also the same MIC against *Staphylococcus aureus* and *Streptococcus pyogenes* (0.087 mg/ml), followed by *Streptococcus pneumoniae* (0.175 mg/ml) and *Corynebacterium xerosis* (1.4 mg/ml).

On the other hand Bee venom had MIC against *Proteus vulgaris* (0.35 mg/ml), *Neisseria catarrhalis* (2.8 mg/ml), *Haemophilus aegyptius* (0.7 mg/ml), *Haemophilus influenzae* (0.35 mg/ml), *Klebsiella pneumoniae*, *Escherichia coli* and *Moraxella catarrhalis* (5.6 mg/ml), then *Pseudomonas aeruginosa*(22.4 mg/ml).

Gram negative bacteria seemed to be the least sensitive bacteria *i.e.* Gram positive bacteria were more affected by tested venom compared to Gram negative bacteria.

The collected data emphasized that propolis and Bee venom (BV) have significant antibacterial activities where they inhibit the growth of fifteen different species of the most infected human pathogenic bacteria causing conjunctivitis.

Hence, our study points to the importance of exploring these raw products and opens new horizons in the field of development of pharmacological tools in bacterial therapy.