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## **Effect of alcoholic extracts of *Eucalyptus* spp on the growth of some species bacteria isolated from mouth and nose infections in Samarra city**

**Abeer Waleed Ameen**

Department of Life Sciences, College of Education, Samarra University, Samarra, Iraq

Email: [aberrwaleed1995@gmail.com](mailto:aberrwaleed1995@gmail.com)

**Rasheed Hameed Hasan**

Department of Life Sciences, College of Education, Samarra University, Samarra, Iraq

**Abstract**--The study aimed to know the inhibitory effect of alcoholic plant extracts (ethanol, methanol) by the method of diffusion through the pit of *Eucalyptus* spp on the bacterial species *Klebsiella pneumonia* and *Staphylococcus aureus* isolated from patients with nasal infections and the species *Escherichia coli* and *Streptococcus agalactiae* from infected patients in the isolated city Samarra. Where the samples were collected within the period from 1/12/2020 to 4/1/2021, as it was found through the results that the plant extracts used in the study showed a different inhibitory action against the bacterial species under study. *K.pneumonia* bacteria showed an increase in the diameter of inhibition at a concentration of 100 mg/ml for the alcoholic extract (methanol) and a drop of 14.67 mm for the ethanolic extract 14.0 mm, while the methanol extract showed a significant difference at most of the concentrations used in the antibiotics used in the study, while *Staph aureus* bacteria showed a significant increase in the diameter of inhibition at the highest concentration used and for the alcoholic extract For methanol 15.33 + 1.52 and alcoholic ethanolic extract 14.00 + 1.00 As for the bacterial type *E.coli* it showed a significant increase at a concentration of 100 mg/ml in the diameter of the clamping diameter for the ethanolic extract 15.33 + 1.52 and for the ethanolic extract 13.00 ± 2.00 As for *Strep.agalactiae* bacteria it showed the highest concentration used 100 mg/ml has a high stabilization effect for the ethanolic extract of 14.33 mm and for the ethanolic extract of 14.00 mm.

**Keywords**---extract, *Eucalyptus* spp, mouth.

## **Introduction**

Pathogenic bacteria are among the most common microorganisms that cause many diseases in humans and animals, due to their ability to move from one place to another and spread through cells and tissues, in addition to their ability to secrete toxins as metabolic products and invade the immune system. Recently, the need for alternative medicines or what is known as alternative medicine, especially medicinal plants, has emerged due to the increase in bacterial resistance to antibiotics after repeated use for many times. of diseases (Mahmoud, 2008).

The process of using medicinal plants has increased at the present time, the number of plants found on the surface of the earth has reached about 500.000-250.000 but a very small percentage of them are used in preparing medicinal extracts for treatment, and the roots, leaves or bark of these plants may be taken because of their chemical effectiveness or Anti-bacterial activity ( Ekwenye and Elegalam.,2005;Oneagba etal.,2004)

According to scientific reports, about 80-60% of the world's population in developing countries is still dependent on medicinal plants because they contain natural raw materials that give a better result than chemical manufactured drugs. It also reduces the amount of side effects associated with the pharmaceutical industry, thanks to the traditional complementary medicine at the origin of 25% of medical treatments Modern and its common use (Ikpefan and Ayinde, 2013),this is because it contains many vital compounds such as Phenols, Flavonoids, Saponins, Glycosides, Alkaloids, Tannins and Volatile oils (Oran,2000).

The use of antibiotics had an important role in treating bacterial infections, but several problems appeared in their use, such as the emergence of resistant strains. There are two types of resistance, namely resistance. Natural Acquired Nutural resistance and acquired resistance Gram-negative bacteria possess a natural resistance to a large number of antibiotics that exceeds the resistance of positive bacteria. The reason for this is the presence of a layer of Lipo poly sachrides, which led to a rapid increase in acquired resistance in recent years (Merck, 2002)

Eucalyptus is a large perennial tree that may reach several meters in height, grow quickly and have a fragrant smell, with narrow, spear-shaped leaves with a tapering tip 10-15 cm long ( Chakravarty,1976). It is used to treat inflammation of the respiratory tract accompanied by excessive secretions. It has an inhibitory activity against the growth of Gram-negative and Gram-positive bacteria (Newall etal.,1996).

## **Samples collection and preparation**

Samples were collected from infected persons arriving at Samarra General Hospital of both sexes. Those samples were transferred to the laboratory for the purpose of diagnosis within a period of less than two hours and planted in a culture medium used for primary isolation, which is in the middle of the

nutritious agar and kept at a temperature of 37 °C for a period of (24- 48) hours later, they were diagnosed microscopically and by biochemical tests.

## **Materials and Methods**

### **preparation of plant extracts**

In this study, the diffusion method was used in the middle of the acre by making pits to test the sensitivity of bacterial species to plant extracts with different concentrations (6.25-12.50-25-50 100-75 mg / ml) on the medium of Muller-Hinton acre. 6 ml using alkali borer, each hole contains 0.5 ml of plant extract after bacterial liquid dispersal. Then the dishes were incubated at 37 °C for 24 hours and the diameter of the inhibition zone was measured to determine the effectiveness of the plant extract (Sexena et al., 1999).

Alcoholic extracts (ethanol - methanol) were prepared by weighing 100 g of dried plant powder, adding 500 ml of methanol alcohol at a concentration of 95% and ethanol at a concentration of 80% (Sani et al., 2014 ) and leaving the powder for 24 hours soaked in high alcohol at room temperature after that. Strain with a piece of shawl to get rid of large parts. Then the filter is dried in the oven to obtain the extract in powder form, which is kept in sterile containers until use.

## **Results and Discussion**

The results shown in Table (1) showed that there were significant differences in the bacterial inhibition train. pneumoniae for the concentrations used with the concentration of 100 mg/ml for ethanolic and methanolic extracts being superior to the rest of the concentrations and their superiority as well as to antibiotics in terms of chelating efficacy. The vitality of bacteria such as their ability to form hydrogen bonds with proteins, which leads to the destruction of protein synthesis, which in turn inhibits bacterial growth (Mustafa, 1995). Also, the bacteria *Staph.aureus* isolated from the nasal infection, and the alcoholic extracts showed There was a significant difference towards it with an increase in the diameters of the clamping by increasing the doses used, noting that the concentration of 100 mg / ml exceeded the rest of the concentrations, as well as the effectiveness of antibiotics, but the concentration is 75 mg/ ml. As well as the breakdown of proteins and other structures on the bacterial cell wall that the bacteria use for adhesion (Cowan, 1999).

The results shown in Table (2) showed the inhibitory effect of eucalyptus extract against *E.coli* bacteria, and the results showed the superiority of the methanolic extract over ethanol with significant differences at some of the concentrations used and the increase in the capping diameter directly with the concentration of the extract. This can be explained by the increase in the concentration of the inhibitory substance. (Hernandez et al., 1994). As for the bacteria *Strep.agalactiae*, the results showed that there were significant differences between the concentrations used at the probability level of <0.05 and the increase in the diameter of the capillarity with the increase in the concentrations, and the concentration of 100 mg ml recorded a remarkable superiority compared to other concentrations as well as compared to most of the antibiotics used, that eucalyptus leaves contain Flavones as well as phenolic compounds, which have

an important role in inhibiting bacterial growth by inhibiting the growth of enzymes responsible for basic metabolic reactions by their unspecialized interference with proteins and this leads to protein denaturation (Chakravarty.1976; Mason and wasserma,1987).

Table (1) : Inhibitory effect of alcoholic (ethanol / methanol) of *Eucalyptus spp* .extract in *k.pneumoniae* and *staph.aureus* isolated from nose inhibition zone (mm)

Type of treatment	Concentration Mg/ml	Mean ± SD <i>k.pneumoniae</i>	Mean ± SD <i>staph.aureus</i>
Ethanolic Extract of <i>Eucalyptus spp.</i>	6.25	0.00±0.00 n.s	0.00±0.00 *
	12.50	0.00±0.00 n.s	4.67±1.15 *
	25	4.67±0.57 *	6.67±1.52 *
	50	7.00±2.00 *	8.67±1.15 *
	75	10.33±1.52 *	11.33±1.52 *
	100	14.0±1.00 *	14.00±1.00 *
Methanolic Extract of <i>Eucalyptus spp.</i>	6.25	0.00±0.00 *	0.00±0.00 *
	12.50	4.33±0.57 n.s	5.67±1.15 n.s
	25	6.00±1.00 n.s	8.33±1.52 n.s
	50	8.67±0.57 *	10.33±1.52 n.s
	75	11.33±1.52 *	12.33±1.52 n.s
	100	14.67±1.52 *	15.33±1.52 n.s
Amikacin		6.33±5.50	0.00±0.00
Gentamicin		9.66±2.51	12.33±1.52
Ampicillin		7.66±1.52	4.66±0.52
Amoxicillin		10.33±1.52	9.66±1.52
Erythromycin		11±3.60	11.66±1.52
Cefixime		0.00±0.00	0.00±0.00
Imipenem		25.33±2.51	19.66±1.52
Van comycin		7.33±1.15	12±2
Penicillin		0.00±0.00	0.00±0.00
Azithromycin		11.33±1.52	12±2

n.s : no significant differences at  $p \leq 0.05$  .

\* There is significant differences at  $p \leq 0.05$

Table(2) : Inhibitory effect of alcoholic (ethanol / methanol) of *Eucalyptus spp* .extract in *E.coli* and *strep.agalactiae* isolated from Mouth inhibition zone (mm)

Type of treatment	Concentration Mg/ml	Mean ± SD <i>E.coli</i>	Mean ± SD <i>strep.agalactiae</i>
Ethanolic Extract of <i>Eucalyptus spp.</i>	6.25	0.00±0.00 n.s	0.00±0.00 n.s
	12.50	0.00±0.00 n.s	1.67±1.52 n.s
	25	0.00±0.00 n.s	6.00±1.00 *
	50	8.00±1.00 *	8.00±1.73 *
	75	10.00±2.00 n.s	11.33±1.52 *
	100	13.0±2.00 n.s	14.00±4.58 *

Methanolic Extract of <i>Eucalyptus spp.</i>	6.25	0.00±0.00 *	0.00±0.00 n.s
	12.50	6.00±2.00 n.s	2.67±1.15 n.s
	25	8.00±2.00 n.s	8.67±1.52 *
	50	10.67±1.15 n.s	10.33±2.08 *
	75	12.33±1.15 n.s	12.67±3.60 *
	100	15.33±1.52 *	14.33±5.50 *
Amikacin		9.33±3.05	9.33±2.08
Gentamicin		9.33±1.15	9±1
Ampicillin		0.00±0.00	0.00±0.00
Amoxicillin		4.66±1.52	0.00±0.00
Erythromycin		0.66±1.15	3.33±1.52
Cefixime		0.00±0.00	8.66±1.52
Imipenem		10.33±2.51	18.66±1.52
Vancomycin		5.33±1.15	12±2
Penicillin		0.00±0.00	0.00±0.00
Azithromycin		8.33±2.08	13±2

n.s : no significant differences at  $p \leq 0.05$  .

\*There is a significant differences at  $p \leq 0.05$

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