

EFFECT OF WATER AND ALCOHOL EXTRACTS OF LAVANDULA MULTIFIDA AND MATRICARIA CHAMOMILLA PLANTS ON PATHOGENIC BACTERIA

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Abstract:-

The inhibitory effect of the extracts of lavender and chamomile was studied, followed by the Disk Diffusion Method (Bauer et al., 1966) on bacterial species *E.coli*, *Klebsiella sp.*, and *Staphylococcus epidermidis*. The plants provided a source of compounds in medicines, great towards human health. However. The results of antimicrobial activity from all plants are shown in this experiment. Different concentrations of water extract, were used: 10-15-20 gm it was found in this study that plant extracts obtained by ethanol showed an activity where *E. coli* gave a response to the chamomile extract of chamomile rather than the water of both plants where the mean inhibition diameter respectively (1.9-2-2.4) The water extract of the lavender plant has an effective effect against *Klebsiella* inhibition (1.85-1.96-2.03) cm, whereas *Staphylococcus epidermidis*. Was the effect of the water extract of the lavender greater than the effect of the water extract of chamomile? The diameters of the three concentrations are (1.23_1.76_2) cm.

Keywords:-Inhibitory activity - plant extracts - disk diffusion method - lavender and chamomile.

1-INTRODUCTION

The interest in the subject of medicinal and aromatic plants is due to being the first major sources of access to medicines since the beginning of creation, where humans used plants in food and to alleviate the pain and treatment of various diseases, using one of the parts of the plant or the whole plant after soaking or boiling, but depending on the experience only and the progress of science and technology scientists have been able to separate the active substances from the plants contained and prepared in a manner suitable for use. (Muthuswami *et al.*, 2008)

The medicinal and aromatic plants have long been known to humans and have not been given much knowledge and information about these plants in ancient civilizations such as the ancient civilization of the ancient Egyptians, India, China, , and Yemen. These plants are still sold at the spice dealer. Our ancestors had historical interest in medicinal plants where they cultivated and processed diseases as they care about aromatic plants and plants that secrete gum and gum resins, (Sana&Ghori,2012,Syarifah.,*et al.*2014).

As the science developed, it was able to grind the medicinal plant into powder. In the eighteenth century, medicinal plants emerged in the form of extracts or tinctures that became more concentrated, effective and easier to prepare and eat. With the advancement of applied science, especially chemistry and knowledge of scientists to methods of chemical analysis, scientists have been able to separate the active substances in the plants and manufacture in pure form in the form of tablets or paint or injection and jealousy. In addition, increased interest in medicinal and aromatic plants and the medical secrets it has established companies, institutions and scientific centers in different countries in order to obtain more plant treatments for some of the most intractable diseases. (Mohd., *et al.*2014,Mohadeseh ., *et al.*2013)

The herbal medicine among the team calls for a return to herbal treatment and away from the chemicals manufactured in factories and factories harmful side effects, and a team calling to keep pace with the technology of modern treatment and irreversibility of the past, especially after modern medicine achieved great success. Humanity today does not want to go back and let the technology of the times but in return do not want medicine to treat a disease and create other diseases of bad excitement and complications. What benefits the liver damages the spleen as stated in the Arab proverb. (Muhammad.,*et al.*2013)

Medicinal and aromatic plants are non-traditional crops, used by humans throughout the ages for various purposes, such as spice when cooking food, and medicine. In the middle Ages and modern, it became clear the importance of medicinal and aromatic plants in the treatment of many human diseases as well as many of the food industry as preservatives, flavor and appetizers, in addition to the new ones are consumed in the form of beverages. (Aneja *et al.*, 2009, Dadgar, 2008) .

2-The aim of work

The objective of this applied study is to detect the inhibitory effect of the aquatic and alcoholic extracts of *Lavandula multifida* and *Matricaria chamomilla* on *E. coli*, *Klebsiella sp*, *Staphylococcus epidermidis*., and their use as alternatives to the updated antimicrobials, which show high resistance to pathogenic bacteria.

Where many studies have shown on a global scale that chamomile has an effect on most pathogenic bacteria, the world of Owlia and others in 2007 conducted an experiment to test the effectiveness of chamomile on types of Streptococcus bacteria had an effective effect and noted that there is a discouragement of growth.

Faazila fathima and others in 2015 tested an experiment to confirm the inhibitory effect of lavender oil on some pathogenic bacteria such as *Staphylococcus aureus*. *E.coli* had an effect on the bacteria used. Sienkiewicz and others proved that the lavender oil has an effect on acne-causing bacteria.

3-Material & Methods

3.1-Materials Required:

Sterile loops, petri plates, incubator, Vibratory Incubator, Autoclave, Filter papers, Sensitive Balance, Oven, zonal scale for measuring the zone of Inhibition, bottles for storage.

3.2- Medias:

Mueller Hinton Agar

3.3-Plants used:

The sensitivity of the bacterial species was tested for two plant extracts: lavender and chamomile. These plants were obtained from the local markets of the city of Al-Marj. The plants were grinded by an electric grinder to keep the powder in clean plastic bags and at room temperature until use.

3.3.1- *Lavandula multifida*:

The lavender herb is a small shrub that grows up to a height of 60 cm. It has dense branches of green and grayish color. Its native habitat is the Mediterranean, Arabian Peninsula, Russia and Africa. In Europe and in the United States of America and Australia, it belongs to the Lamiaceae family, known as the oral species. The lavender herb contains effective substances of 1% to 3% essential oil containing 20% to 50% Linalool, 30% to 40% Linalyl acetate, and hydroxyl coumarins, tannins, and acid (Cqffeic acid) and its products. It stimulates the heart, liver, spleen and kidneys, prevents body odor and sweat, sterilizes wounds and treats the throat.

3.3.2- *Matricaria chamomilla*:

It is 5-15 cm long and has a thin, branched stem. Is one of the important medicinal herb native to southern and eastern Europe? It is also grown in Germany, Hungary, France, Russia, Yugoslavia, and Brazil, Chamomile is used mainly as an anti-inflammatory and antiseptic antispasmodic and mildly sudorific. Medically used parts: flowers and oils. The chamomile flowers contain 1.5% of the dry flowers. The active ingredient among these oils is Kamacolin, which is the one that gives the chamomile its beneficial effect. Its benefits: Calming the nerves, anti-stress, helps to sleep and relax., Useful in stomach cramps and gastrointestinal tract, useful in cases of pneumonia and bronchitis strengthens the liver, helps in the dissolution of kidney stones, is one of the best painkillers, contributes to the treatment of diarrhea, some of which are used in soap; It is widely used in cosmetics as it is a powerful help in the smoothness of the skin. Chamomile flowers contain essential oil with the azuleas. Azulins have an anti-inflammatory effect, reduced rashes, and are resistant to regeneration or build. Chamomile flowers also contain epigenin, For effective spasm. As well as other incendiary materials.

3.4-Bacteria used:

Staphylococcus epidermidis- *Escherichia coli* –*Klebsiella*

3.5- Preparation of Extracts:

3.5.1-Hot water extraction:

Add 10, 15, 20g of dried powdered air was added to 100 ml of distilled water and boiled over a slow heat for 2 hours. Was filtered through the gauze and placed on the incubator Vibrator for 15 minutes. The extract was dried to obtain the final powder, a stock solution was obtained from the plant extract by dissolving every 1 g in 5 ml sterile distilled water (200 mg / ml), and the solution was administered using Whatman No.1 paper. The tablets of the filter paper were saturated with the water extract of the different plants. (Sienkiewicz., *et al.* 2013) .

3.5.2-Alcohol extraction:

Add 10, 15, 20g of powdered air powder to 100 ml of 96% ethanol alcohol in a 1000 ml conical flask and leave for 24 hours at room temperature. Then mix the mixture with the Vibrator incubator for 15 minutes and filter with Whatman No. The powder was extracted from the extract by dissolving every 1 g in 5 ml alcohol (200 mg / ml) and the solution was administered using Whatman No.1 paper. The tablets of the filter paper were saturated with the alcohol extract of the different plants.

3.6-Sensitivity Test:

Followed a microbial suspension of each pathogenic microorganism, by taking a bacterial wipe from a 24-hour Mueller Hinton Agar dish placed in a physiological solution to give a stir, and transfer 0.5 ml of microbial suspension and brushes over the center of Mueller Hinton agar with a cotton cloth and after 15 minutes The tablets impregnated with extracts were distributed over the surface of the agricultural medium with sterile forceps, placed in the refrigerator for two hours to spread the active substance within the agricultural medium and then incubated at 37 ° C for 24 hours. The appearance of inhibition zones in the food medium around the tablets is clear evidence of Inhibition of microbial growth, and inhibition diameters were recorded after end of the incubation by the ruler of the millimeter, the experiment was completed by three replicates. (Nanasombat and Lohasupthawee 2005; Salvagnini *et al.*, 2008).

4-Results &Discussion

Plants have provided a source of compounds in medicines and plants have made significant contributions to human health. Extracts from plant materials depend largely on the type of solvent used in the extraction procedure. Traditional healers use water primarily as a solvent. In this experiment, different concentrations of the water and alcohol extract of the chamomile and chamomile were used: 10-15-20. Table 1 and Figure 1 showed that the effect was increased directly.

The microorganisms were all sensitive to water and alcohol extracts. Following the water extract of the reservoir at a weight of 20 g at *E. coli*, the diameter of the inhibition ring was 1.56 cm (Fig. 2).

While the effect of the alcoholic extract on the same plant on the previously mentioned bacteria was found to be inhibited by 1.86 cm (Fig. 1). The alcohol extract had a greater effect than the water extract (Table 2). The water extract of chamomile on *E.coli* did not produce any effect at 10 g Alcoholic effect was 2.08 cm at a concentration of 20 g. In the case of *Staphylococcus epidermidis.*, the effect of the aquatic extract was greater than the effect of the water extract of chamomile. The diameters of the three concentrations are (1.23_1.76_2 cm) Fig. 7.3). The effect of the chamomile extract of chamomile for the three concentrations (1.58-1.88-1.91) cm as shown in Table 2 shows that the *E.coli* bacteria gave a response to the chamomile extract of the chamomile,

The average inhibition diameter was respectively (1.9-2-2.4) and this is consistent with the world (Owlia 2007). Figure 6 shows that the water extract of the lavender plant has an effective effect against the *Klebsiella* bacteria with an inhibition of 1.85-1.96-2.03 cm.

Table (1): Effect of water extract of plants used

Water extract of <i>Matricaria chamomilla</i>			Water extract of <i>Lavandula multifida</i>			Bacterial isolates
20	15	10gm	20	15	10gm	
1.68	1.08	0	1.56	1.41	1.26	<i>E.coli</i>
1.56	1.03	0	2.03	1.96	1.85	<i>Klebsiella</i>
1.46	1.35	0	2	1.76	1.23	<i>Staph. epidermidis</i>

Table (2): Effect of alcohol extract of plants used

alcohol extract of <i>Matricaria chamomilla</i>			alcohol extract of <i>Lavandula multifida</i>			Bacterial isolates
20	15	10	20	15	10	
2.4	2	1.9	1.86	1.41	1.26	<i>E.coli</i>
1.55	1.16	0	1.6	1.18	1.08	<i>Klebsiella</i>
1.91	1.88	1.58	1.55	1.28	1.16	<i>Staph. epidermidis</i>

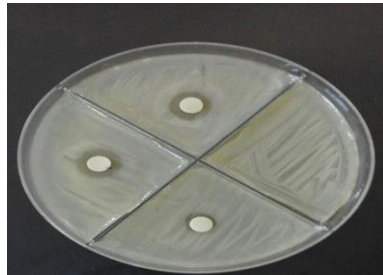


Figure (1): Effect of alcohol extract of *Lavandula multifida* 20 g on *E.coli*

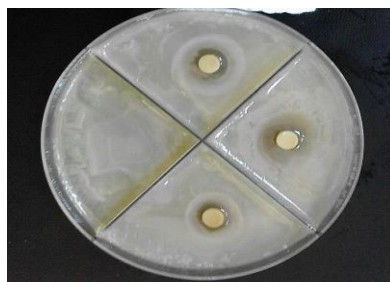


Figure (2): Effect of alcohol extract of *Lavandula multifida* 15 g on *E.coli*



Figure (3): Effect of alcohol extract of *Lavandula multifida* 15 g on *Staphylococcus epidermidis*.

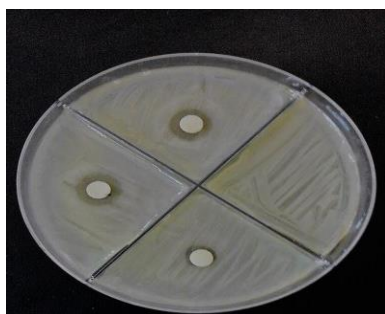


Figure (4): Effect of alcohol extract of *Matricaria chamomilla* 20 g on *E.coli*

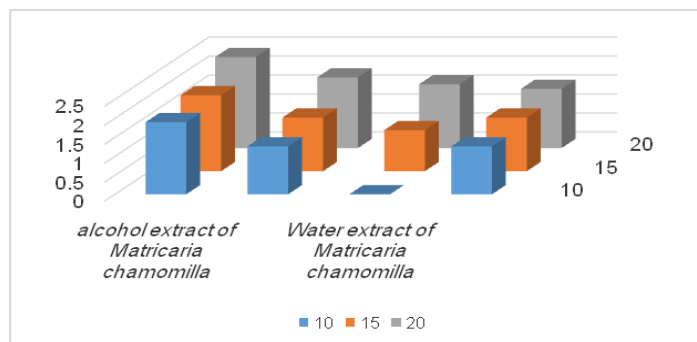


Figure (5): Effect of water and alcohol extract of plants on *E.coli* bacteria

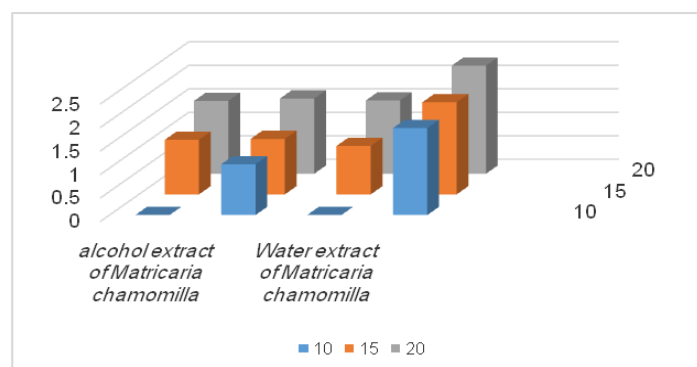


Figure (6): Effect of water and alcohol extract of plants on *Klebsiella* bacteria

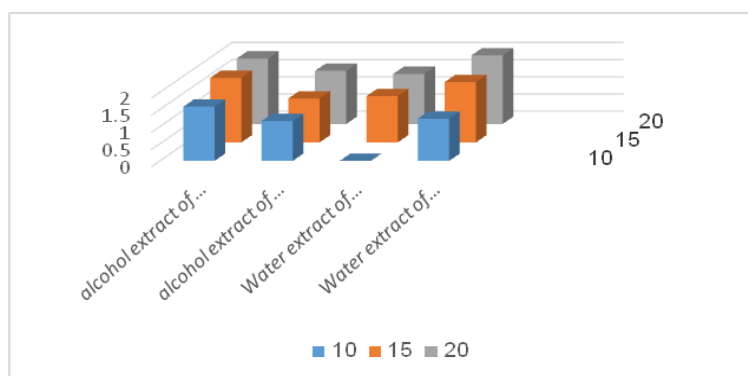


Figure (7): Effect of water and alcohol extract of plants on *Staphylococcus epidermis epidermidis*.

Conclusions

We conclude from this study the following points:

- 1- Both water and alcoholic plant extracts have an effect on the bacteria used in the study.
- 2- It is possible to use lavender and chamomile to reduce some diseases that may be caused by pathogenic bacteria.
- 3- From these results, a broader study of the extracts should be undertaken, and the nature, quantities and separation of chemical compounds should be determined.
- 4- To study the effect of each of the active compounds of each plant alone on pathogenic microorganisms to determine the active substance and to study toxicity tests in the organism to be used in the treatment of inflammatory infections resulting from the infection of some pathogenic microorganisms in the future.
- 5- Other studies on different extracts of lavender and chamomile plants such as cold water or other alcoholic extracts such as chloroform and others.

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