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Quantification of Some Active Ingredients in Antimicrobial of *Menthaarvensis* in Iraq

WafaaTaliRadef[1]*,Ali AbdSharad[2] ,AshwaqTalibHameed[3],Enas Mohammed Ali [4]

[1].university of Anbar , Headquarter, Al-Anbar , Iraq.
Waftal1982@gmail.com

. Biologydep. ,College of Education for pure Science ,University Of Anbar[2]
Iraq
aliabd197359@uoanbar.edu.iq
[3.] Biology dep. ,College of Education for women, University of AnbarAshwaq.talib@uoanbar.edu.iq

[4.]Chemical dep. College of Education for women, University of Anbar
Enas.ali@uoanbar.edu.iq

Abstract

The research contained a number of active ingredients such as, saponins, alkaloids, tannins, flavonoids, and phenols, which are all naturally occurring herbs in major Regions of Iraq and have been used in medicinal prescriptions since ancient times., These substances are excellent antioxidants, also lt's contained phenols appeared in the form of several curves and wave lengths (200-600) nm UV apparatus .This is evidence of the presence of several types of phenols in *Menthaarvensis*, which gives it a distinct therapeutic, Two extracts from the aerial part of the plant, chloroform and ethanol, were prepared by Soxhlet extractor. Three concentrations (30,60,90) mg / ml were tested to inhibit the growth of some bacterial species brought from Ramadi-General Hospital. Chloroform extract at(90 mg) concentration showed the best inhibition of E. *coli*, followed by (90 mg) ethanol extract towards*Pseudomonas*,*Klebsiella*,*Corynobacterium andaeruginosa*species.

Key wards: chemical , biological , diabetes, *Menthaarvensis*, Iraq .

Introduction

Wild medicinal plants are of medicinal and therapeutic importance because they contain many physiological and therapeutic chemicals in living organisms. Therefore, interest in the description and study of wild plants in chemical and biological experiments has increased in recent years. Menthaarvensis is a plant that grows in the wild. Wide belongs to the

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Lamiceae family and is one of Iraq's most commonly used wild herbs. It has a heavy scent about it. "Grows in clusters of 10 to 60 cm, and leaves develop in opposite pairs along the stem, with serrated edges and lengths of 2-6.5 cm (AL-Moussawi, 1978)." She attracted attention to herself because she was a natural plant., she focused her attention on its active chemical content because it contains volatile oils and compounds such as glycosides, flavonoids and caffeine (Olli *et al.*, 2011), and it is rich in volatile oils that have effectiveness against pathogenic bacteria (Evans, 2010).

A study (Depa*et al*., 2012) showed that the vegetative part of *Menthaarvensis* contains many phenolic compounds such as phenolic acid, turbine and flavonoids, which are antioxidant and anti-proliferation roots of harmful free radicals from metabolism. The study (AL-fahdawy, 2018) emphasis on the containment of the plant *Menthaarvensis* which growing in Iraq to many chemicals material such as alkaloids, tannins and in addition to a good proportion of oils that encouraged the growth of normal lymphocytes of humans outside the body" . Many studies showed the high content to the active materials which worked as inhibiting the growth of bacterial and fungal pathogens causing cough and pulmonary infections due to their content of flavonoids (Mikaili*et al*., 2013).

Coutinho*et al*., 2012 also showed that the plant *Menthaarvensis* has anti-growth activity of opportunistic pathogenic bacteria, and has active for inhibiting the growth of Chlamydia bacteria that infect the respiratory system and attributed to the content of the plant *Menthaarvensis* extract on phenols and other effective compounds that act as a brake on the growth of bacteria (AL-rajab, 2015) Our study aimed at quantitative detection of general phenols with plant leaves, extraction of ethanolic and chloroform for leaves and testing their ability to inhibit some species of bacterial pathogens.

Materials and methods

1:Collect plant samples

Menthaarvensis naturally grown leaves were collected in a field in Habbaniyah in the fourth month of 2017, It was diagnosed according to previous studies(Al rawi,1964; Al mousawi,1978). It was dried, grinded and kept in bottles until use .

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1- Phytochemical analysis

" The presence of some chemical compounds in the pulverized samples of plant were determined using standard methods such as (tanins, flavonoids, saponin , alkaloids and phenolic compounds **(**Evans**,** 2010).

2: Extraction and measurement of total phenols:

In a 1-liter glass beaker, 50 g of plant leaf powder was weighed and 500 ml of 75 percent ethanol alcohol was applied before being left in the dark for a week. It was then filtered with filter paper, dried in a rotary evaporator at 45 ° C, and stored in dark containers until the analysis was completed (Sarkis et al.,1980). We used a UV apparatus to compare from (200-600) nm lengths to find the peak. W''' "

3:Preparation of ethanol and chloroform extract "

The ethanol and chloroforme extract of the plant was prepared with a weight of 50 g of powdered *Menthaarvensis* leaves and placed in 250 ml of boiling water at 70 ° C for 24 hours, then filtered with filter paper and concentrated with a rotary evaporator until the extract was dried and then weighed the concentrations (30, 60, 90) mg / ml alcohol for alcohol extract and chloroform for chloroform extract."

4: Biological study

The biological activity of *Menthaarvensis* extract against the growth of four pathogenic bacteria was measured using the diffusion process (Escherichia Coli, Klebsiella, Corynobacterium and Pseudomonas aeruginosa). The grew on Nutrient agar medium at 37 ° C and was then placed in three Petri dishes. In comparison to the control group (ethanol and chloroform) at a concentration of 70% (ethanol and chloroform), the extracts were put in 4 mm thick pits and incubated at 37 ° C for two days.Hammed et al.,2007).

5: Statistical Analysis

The complete random design was adopted in the biological experiment at a probability level of 0.05 and at the least significant difference.

Results and discussion

:Quantification of some active ingredients in *Mentha arvensis*1

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Effective Material	Alkaloids	Saponins	Tannins	Phenols	Flavonoids
%	0.77	2.9	12.7	1.96	0.43

The current results showed that *Menthaarvensis* contains a good amount of active ingredients such as tannins, Saponins and phenols, These substances are excellent antioxidants against the effectiveness of many pathogenic bacteria (Olli *et al*.,2011). It is effective against fungal poisoning (Rachel and meera,2011). In addition to its therapeutic importance as a painkiller and tranquilizer (mikaili*et al*.,2013).

2: Spectroscopy of phenols

The total phenols found in *Menthaarvensis*, which were dark yellow, were estimated using a spectrophotometer at a wavelength of 765 nm, as shown in Figure (1). The results of the determination of phenols in the UV apparatus showed the presence of curves at (252, 322 and 412). This is confirmed (Mikaili*et al*.,2013) by the multiplicity of phenols of *Menthaarvensis*, which gives it physiological and protective activity. He urged the researchers to study and experiment against all parasitic and bacterial organisms and experimental mice (souza*et al*.,2014).

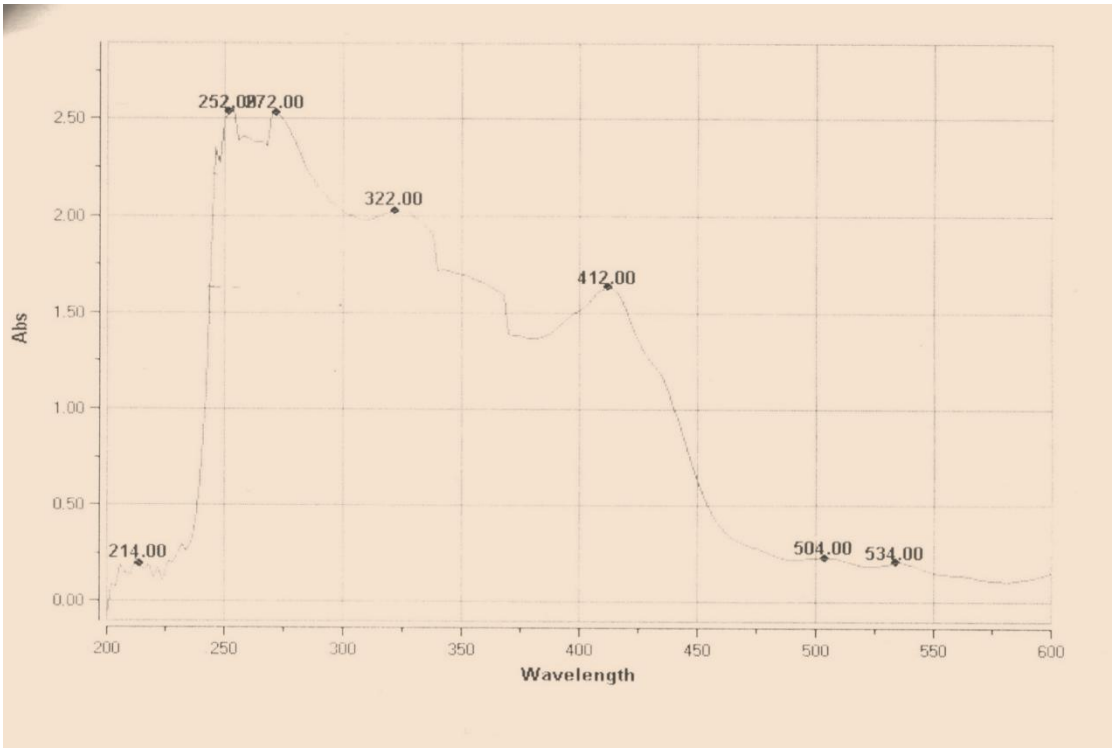

Figure 1: Ultraviolet spectra of total phenolic from *Menthaarvensis* leaf

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While the results of the study in Table (1) showed the effect of ethanolic extract and chloroform on a selected group of pathogenic bacteria, the results showed significant differences between the extracts and the control. The concentration of 90 mg/ml of chloroform extract gave the highest inhibition diameter of the bacteria (*Escherichia Coli*) We may attribute the reason that alcohol chloroform is a polar solvent with the ability to extract phenolic compounds at high concentrations to give effect on the viability of pathogenic bacteria(**Mkaddem*et al*.,2009**). The ethanol extract showed significant differences at concentrations (60mg/ml and 90mg/ml) as it is a good widespread solvents that reduce the activity of the negative and positive bacteria of Gram stain(**Rachel and Meera,2011**). The effect of the extracts is due to the increase of some active substances such as phenols, tannins, glycosides and other substances that have a role in the alternative treatment and the elimination of pathogenic bacteria(**Akram*et al*.,2001**).

Table 1 : inhibition zone of chloroform and ethanol extract at three concentration on four type of bacteria.(LSD 5% =1.439)

Tested bacteria	Inhibition Diameter Rate (mm)						Control (70 %)	
	Concentration of ethanol extract			Concentration of chloroform extract				
Concentrations	30	60	90	30	60	90	**chloroform**	**ethanol**
Klebsiella	15	19	21	17	19	23	7.5	6.2
Escherichia Coli	12	16	19	16	20	24	7.3	5.9
Corynobacterium	10	12	19	12	17	21	8	11.5
Pseudomonas aeruginosa	7	13	20	11	15	22	8.8	9.3

is found (**mawlood,2011**), in the study of the Jordanian Badia (desert) herbs adjacent to western Iraq, it contains a high percentage of vitamins and elements, in addition to the presence of proteins and carbohydrates. As a result of this plant contains chemical components and nutrients make it an important

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medicinal plants that support the body's immunity, prevent abnormal cell division which causes many diseases and many mutations are inhibited by removing free radicals that interfere with genetic material(**atta*et al*.,2011**). The plant prevents the growth of some bacterial pathogens because of its chemical content, which also works to support the work of some important organs in the body such as liver and bile(**zang*etal*.,2015 ; akroum*et al*.,2009**).

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