

Study of the antibacterial activity of Malva Neglecta

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Abstract

Different extract of Malva neglecta were investigated for their antibacterial against *Streptococcus pneumonia*, *Staphylococcus aureus*, *Haemophilus Influenza*, *Moraxella, catarrhalis*. Almost all extract produced significant antibacterial activity against all microorganism the in comparison with Gentamicin sulphate. Petroleum ether was more effective than the other extract. The flavonoids was separated on silica gel thin layer chromatography and responsible for this activity the study determined that antibacterial action is related to flavonoid.

دراسة الفعالية المضادة للبكتيريا لخلاصة نبات الخباز

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المستخلص

تمثل هذه الدراسة محاولة لتحديد بعض الخصائص المضادة للبكتيريا لنبات الخباز درست الفعالية البكتيرية لخلاصات مختلفة من نبات الخباز درست فعاليتها البكتيرية ضد البكتيريا *Streptococcus pneumonia*- *Staphylococcus aureus*-*Haemophilus influenzae*-*Moraxella catarrhalis* أظهرت كل الخلاصات تأثيراً "بكتيريا" واضح ضد البكتيريا المذكورة اعلا و هذا التأثير تم مقارنته مع المضاد الحيوي جنتاميسين سلفيت. وجد ان خلاصة البتروليم ايثر هي اكثر فعالية من بقية الخلاصات. تم فصل مادة الفلافونيدات المسؤولة عن هذه الفعالية على الطبقة الرقيقة من السليكا جيل كروماتوگرافي. أظهرت فاعلية الفلافونيدات ضد البكتيريا المذكورة اعلا.

Introduction

Plants – derived medicine have been part of the traditional healthcare in most part of the world for thousands of years (1). With the alarming incidence of antibiotic resistance in bacteria of medical importance (2). There is increasing interest in plants as sources of agents for the treatment of microbial disease. Plants contain numerous biologically active compounds and many of these have been shown in a variety of plants to exhibit antimicrobial properties (3). In Iraq a variety of plants are widely used in folk medicine (4,5) Some of these plants have been systematically studied for their clinical and biological properties (6,7). Many reports published in this respect indicate that these plants as antimicrobial (8,9). The aim of the present study was to evaluate the antibacterial activity of *Malva neglecta*

Materials and Methods

The *Malva neglecta* species are identified and authenticated by the Iraqi National Herbarium Baghdad.

Extraction procedure .

The leaves parts were cleaned and dried at room temperature and ground to powder for extraction. *Malva neglecta* powder was dissolved in distilled water and separated on Silica gel TLC plates developed in (Butanol: Acetic acid: water). 40:10:2.5). Location of the spot was determined by spraying the plate with methanolic LOH. The alcoholic extract (5ml, corresponding to 1g of plant material) was treated with a few drops of concentrated HCL and magnesium turning (0.5g). The presence of flavonoids was indicative of pink or magenta-red colour developed within 3min (10). The sample was extracted with petroleum ether, chloroform, ethanol, water by percolation for 24 hours according to Baronet, et al 1994 (11).

Antibacterial assay

Two Gram positive and two Gram negative clinical isolates were identified as in Baronet et al (11). Stock solution of 150 mg / ml and their serial double dilutions were performed according to Tyler 1996 (12) in (12). Agar diffusion technique was used for screening antibacterial activity. Agar dilution technique was conducted using Mueller Hinton agar plate (13), to determine minimum inhibitory concentration (MIC). Gentamicin sulphate (25 Microgram/ ml) was used as positive control and propylene glycol (the vehicle used for dissolving different residues) was used as negative control.

Results

The major chemical compounds of the plants under study were flavonoids. The petroleum ether gave inhibition zone ranges from 15 to 19 mm, chloroform extracts showed inhibition zone ranges of 13 to 14 mm, water no effect, and ethanol extracts present inhibition zone ranges of 15 -18 mm (Table 1). The minimum inhibitory concentration MIC ranges were 3.125-25 for petroleum ether 50-200 for chloroform, 25-100 water, and 6.25-50 mg / ml for ethanol (Table 2). *S. aureus*, *M. catarrhalis* sensitive to all test extracts. *M. catarrhalis* sensitive to ethanol alone. *H. influenzae* *Strep. Pneumonia* resistant to all test extracts except petroleum ether was the most effective among the others

Discussion

This study has evaluated the antibacterial activity of *Malva neglecta* commonly in Iraq. Petroleum ether was proved to be a good solvent in extracting inhibitory substances from tested plants (14). It has not been previously reported in the literature for its flavonoid content. Different studies about the antibacterial activity of herbal extracts but this is the first study about the antimicrobial effect of *Malva neglecta* on the pathogenic microorganism the

Malva neglecta may play role in the antimicrobial activity. These results have encouraged use to undertake further studies regarding the isolation and characterization of the active principles present in the active extracts(9). Different studies about the antibacterial of herbal extract but this is the first study about the antibacterial effect of Malva neglect Wang et al (15)

showed the presence of three potent antimicrobial protein named (cw-3), (cw-4),(cw -5) showed different antimicrobial spectrum (16). These result showed the importance of plant extracts is achemotherapeutic agents (17) . Further studies of the antibacterial properties of these extracts and elucidation of the compounds responsible for the activities is warranted.

Table (1) : Diameter of inhibition zones for different extracts of Malva neglecta against bacterial species

Solvent extraction	<i>S. aureus</i>	<i>Strep pneumonia</i>	<i>H. influenzae</i>	<i>M. catarralis</i>
Petroleum ether	19	-	17	15
Chloroform	13	-	-	14
Water	-	-	-	-
Ethanol	18	-	-	15
Gentamicin S				
	20		21	22
			22	20

no inhibition zone

Table (2):Minimum inhibitory concentration (MIC) mg/ml for different extract of Malva neglecta

Bacteria	Petroleum ether	Chloroform	Water	Ethanol
<i>S. aureus</i>	6.25	50	25	6.25
<i>Strep pneumonia</i>	12.5	200	100	50
<i>H. influenzae</i>	25	100	50	25
<i>M. catarralis</i>	3.125	50	25	12.5

References

- 1-Chariandy CM, Seaforth CE, Phelps RH, et al . Screening of medicinal plants from Trinidad and Tobago for antimicrobial and incitecidal properties. J Ethnopharmacol. 1999 64: 265-270.
- 2- Monroes, Polk R. Antimicrobial use and bacterial resistance Curr opin Microbial 2000. 3. 501-.564.
- 3- Cowan MM. plant product as antimicrobial agents. Clin Microbial Rev . 1999. 12: 564- 582.
- 4- Al – Zubaid, Z.N, Baban , H. A, Kadim, F., Manual of treatment by

Iraqo Medicinal Herbs, Ab. Publishing Company Baghdad.

- 5- Al Rawi. A. medicinal plants of Iraqi technical Bulletin ,1990 . 15.
- 6- The biological Abstract Database (1988- 2000). Courtesy of Silverplatter information company .(2001)
- 7- Kapoor, L. D Hand book of Ayurbic medicinal plants CRC press , Florida , 61. (1999)
- 8- Ali, S. M and Abu, G. S. I; antifungal activity of plant extract against dermatiphytes, mycosis Dec 1999. 42 (11-12: 665-672.

- 9- Salish, S Raveesh, K. A antimicrobial activity of plant extracts against Dermatophytes, Mycosis . Des. 1999. 42 (11-12). 665-672.
- 10- Mojab Farazokamaline jed Mohamad, Ghadari, Nayansanceh, Vaibidipour Hamid Reza . photochemical screening of some specieses of Iranian plants. Iranian journal of pharmaceutical reseaech, 2003, 77-82.
- 11- Baronet, E.J; petrson, L.R. and Finegold, S.M. Diagnostic Micro biology, th ed Mosby. Stlouis 1994 .
- 12- Tyler, V.E.J. pharm. Assoc., 1996, 36, 1,29 .
- 13- Harborne, J. B. Phytochemical methods: A guide to modern technique of plant analysis , 2nd Chapan, Hall, London.
- 14- Mukherijee. PK; Gunas- R Subburaju- t; Dhanbal- SP; Duraiswamy-B, Vijauan-P; Suresh-B. Studes on the antibacterial grandiflora R. B (Asclepiadaceae) extract. Phytother- Res. 1999 Feb; 13(1): 70-72.
- 15- Wang x Bunkrs, -G.J, Watters, M.R. The purification and characterization of the antifungal proteins weed (Malva neglcta. Biophys Res. Gommman 2001. 20; 282(5): 1224-1228.
- 16- Alsaimary Ihsan Baker Sundss, Jaftar Thuray. Effect of some plant extracts and antibiotics on Pseudomonas Saudi Med J. 2002, 23(7): 802-805.
- 17- Wanger , H. Blat. S. plant . Drug analysis, Springer – Relag. Berlin; Heidelberg 2nd. 1996. 273.