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Detection of the active compounds in the leaves of the Common mallow plant *Malva parviflora* L. using GC-MS and HPLC technology.

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Abstract

The plant leaves of Common mallow plant were collected from the gardens of college of Agriculture ,University of Kufa to detect the active compounds of this plant. The plant was dried in the shade at room temperature and grinding a log of plant leaves and used to detect the active compounds in the laboratories of the Ministry of Science and Technology using GC-MS and HPLC. The results ofanalysis showed that commonmallow leaves contained many of active compounds such as kaempherol, Rutin, QurcetineandLuteolin when analyzed by a HPLC. Either When analyzeedby GC-MS the result showed that it contained9,12 -Octadecadioenaic acid(z,z),methyl ester and 10,13-Octadecadioenaic acid, methyl ester at a percentage of 70.58% and Hexadeanoic acid, methyl esterat a percentage 8.42%.

Keywords**:** Common mallow plant *Malva parviflora* L., Active compounds, HPLC, GC-MS.

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Introduction

The plant of Common mallow is a herbal plant annuals growing in a normal height ranges between 10-30cm (1,3). A wide spread all over the world from the date of its flowers June to September(16). The common mallow has many of the active compounds as indicated in chemical detection qualitative results of his leaves which contain of glycosides, saponine, alkaloid, phenols, flavonoid, tannins, volatile oil and also contains sugars such as glucose and xeolose، ramanose and galactose (7,5).showed this plant pharmacological potential in treating various diseases due to have many active compounds such as used to treat and clean burns and wounds and also used to treat cough and bronchitis (4,2). It is also used to remove the crust of hair (13). The common mallow plant also an important role in the elimination of positive and negative bacteria of gram stains (16). Alcohol and aquatic extract of common mallow plant can be used to inhibit the growth of bacteria *S. aureus* , *B. subtilis* and *E. coli* (10,11and14). It also has antifungal activity (6) and has the property of antioxidation (7). It has an effective activity protecting the liver from the harmful effects of paracetamol (9).and its extracts have an active activity in regulating the level of sugar in the blood(8). Due to the characteristics of medical and therapeutic properties owned by the common mallow plant the purpose of this study was analysis the active compounds of leaves of common mallow using the GC-MS and HPLC device to detect the active compounds in them.

Materials and methods

1- Plant leaves collection.

Plant leaves were collected from the gardens of college of Agriculture, University of Kufa and washed to remove dirty dust and left to dry in the shade.

2- Detection of active compounds using GC-MS(Gas Chromatography-Mass Spectrometer).

The analysis was conducted out in the laboratories of the Ministry of Science and Technology. The sample was extracted using methanol alcohol after that 2µI was injected to a GC-MS following according to the conditions : capillary column(30m ×250µm × 0.25µm) helium gas was used as a carrier gas with a flow rate of 1ml /s the oven temperature was set at 50-150℃ at 3℃ / min for 10 minutes, after that the temperature was raised to 300℃ for 10 minutes.

3- Detection of active compounds using HPLC(High -Performance Liquid Chromatographic).

The extraction was done according to the method used(15) as it has been mixing 1g of plant common mallow leaves powder with 5ml of alcohol chloroform then filtering by PVDF membrane 0.45micron Table (1)showed the conditions and specifications of separation the following flavonoids of alcohol extract Kaempherol, Luteolin ,Qurcetin and Rutin the retention time of these compounds was compared with the standard compounds and the concentration of the active compounds contained in the leaves of the common mallow plant was calculated by the following equation :

$$\text{Concentration of sample}=\frac{area\ of\ sample}{area\ of\ standard}\times\text{conc. of standard}\times\text{dilution factor}$$

Results and Discussion

The results showed that the common mallow plant leaves analyzed using a GC-MS have several effective compounds as shown in Table(2)which showed presence of9,12-Octadecadioenaic acid(z,z),methyl ester and10,13 Octadecadioenaic acid, methyl esterwith the area percentage of 70.58% and Hexadecanoic acid,

methyl ester 8.42% and 1,2-Benzisothiazole,3-(hexahydro-1H-azepin-1-y1) -,1,1-dioxide 3.32% andHexasiloxane,1,1,3,3,5,5,7,7,9, 9,11,11dodecamethyl 2.29% and Methyl 10-trans, 12-cis-octadecadienoate(1.59%) and Trans-13-octadecenoic acid, methyl ester (1.55%) This is consistent with (1)analysis GL Ctechnology.

Table(1)Describe the conditions and specifications of separation using HPLC

Conditions of separation HPLC	Specification of separation conditions
Column	C18- ODS (250m×4.6mm × 5μm)
Mobile phase	A:(methanol : d.w :acetic acid) (85:13:2) B: (methanol: d.w : acetic acid) (25:70:5)
Flow rate	0.8ml/ min
Detector	UV-360nm

The HPLC result showed that the leaves of the common mallow contained Kaempherol, Luteolin, Qurcetin and Rutin as show in the Table (3) and Figure(1) . These substances play important a role in the therapeutic and the inhibitory effect of common mallow. This is consistent with(12).

Table(2) Active compounds in the Common mallow leaves using GC-MS

perk	Name of compounds	R.time	Area%
1	Hexadecanoic acid, methyl ester	33.234	8.42
2	Pentadecanoic acid, 14-methyl ester	34.819	0.52
3	Allantion	35.051	0.21
4	10,13-octadecadienoic acid,methyl ester 9,12-octadecadioenoic acid(z,z) methyl ester	36.308	70.58
5	Trans-13-octadecenoic acid, methyl ester	38.174	1.55
6	Methyl 10-trans, 12-cis-octadecadienoate	38.445	1.59
7	octadecadienoic acid, methyl ester 6,9-	38.609	1.29
8	Hexasiloxane,1,1,3,3,5,5,7,7 9,9,11,11،dodecamethyl	39.054	2.29
9	1,2-Benzisothiazole,3-(hexahydro-1H-azepin-1-y1) -,1,1-dioxide	40.408	3.32
	6-octadecenoic acid,(z-)		
10	1-Docosanethiol	41.123	0.94
	9-octadecenoic acid,(E)		
11	9-Hexadecenoic acid,methyl ester,(z)	41.451	0.32

Table(3) Active substance separated by HPLC.

Active substance concentration ml/g	area	Time detention	name	ت
1675.82	21216	3.90	Kaempherol	1
387.23	24628	5.27	Luteolin	2
405.24	10928	6.78	Qurcetine	3
3006.20	28822	7.55	Rutin	4

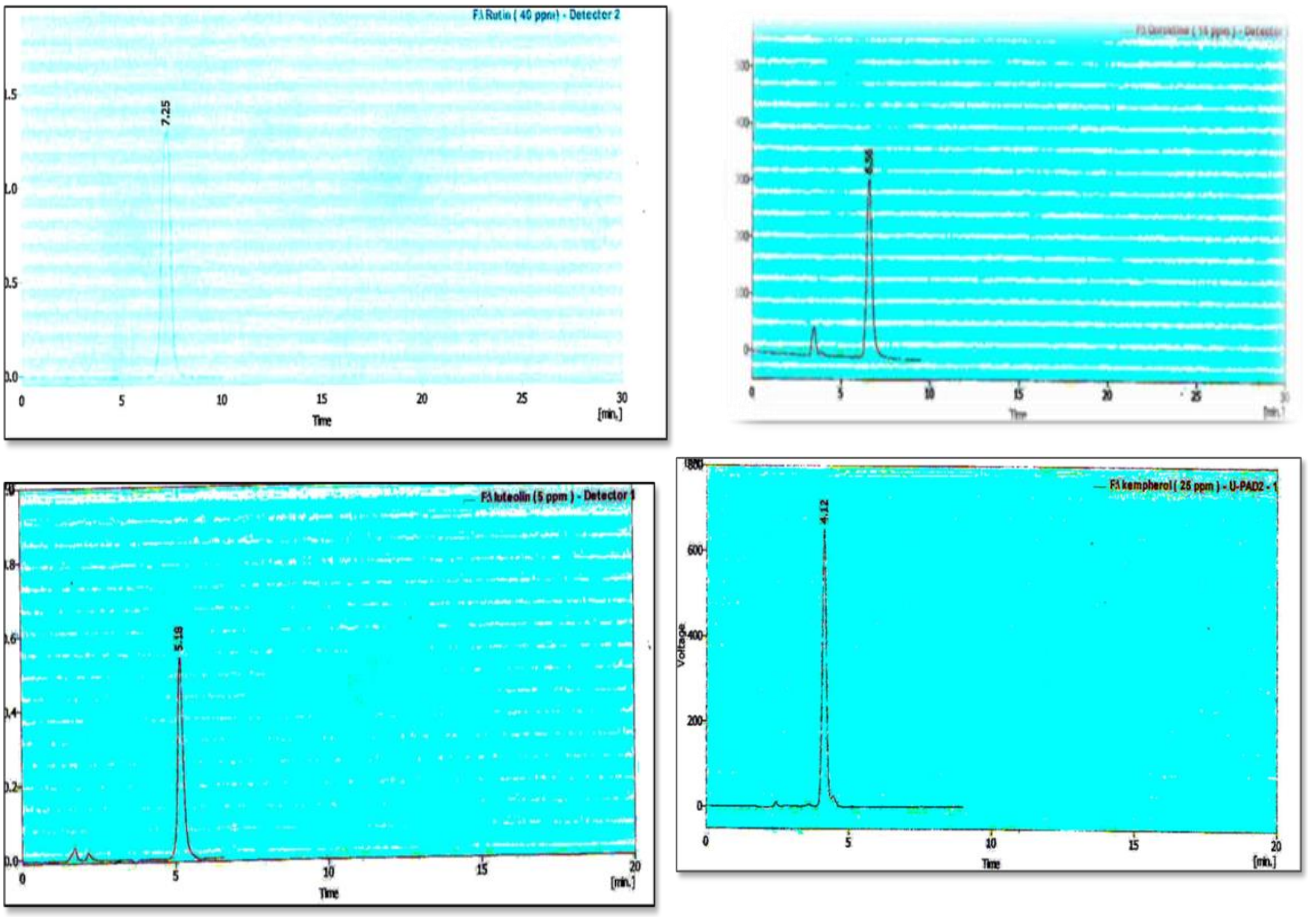

Figure (1) Standard curves of compounds

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