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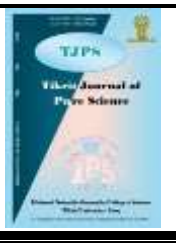

# Identification of Flavonoids and Phenolic Compound in Aloe Vera gel by HPLC

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## Abstract

Flavonoids and Phenolic Compounds are important Components For Aloe Vera gel .The HPCL analysis proved that Aloe Vera gel contains many types of phenolic compounds (188.79 mg/ml cinnamic acid ,876.44 mg aloin, 555.01 Aloe emodin, 235.096 Aloeecticacid, 252.52 Anthranol, 549.98 Simapic acid) at Retention Times (1.777, 3. 448, 5.273, 6.192, 7.378, 8.765) min and Area (54348, 231817, 188319, 71949, 88097, 153061) and many types of flavonoids (227.48 Quercetin, 236.23 Kaempherol, 247.65 Rutin)at Retention Times (1.89,3.15,7.493,8.413) and Area (75828,66531,88538,125858) .

## Introduction

Aloe vera have been used medically Since old time especially in the treatment of burns, wounds . At the present time Aloe has wide range of pharmacological properties , in cluding antibacterial, antiflammatory , antitumor, anti diabetic and inhibition of tumor cell activation**[1,2,3]** the different species have different chemical composition, it was discovered that potency of Aloe was result of aloin, abitter juice that dried to yellow powder**[4]**. Anthraquinotes derivatives in Aloe vera gel play an important role in the treatment of tumors,diabetesIt. **[5,6]** also has ahigh content of 1,8 - dihydroxyanthraquinone derivatives, tannin, steroid extracted by HPLC method **[7]**there are abroad range of research from all over the world based upon different species of Aloe For antimicrobial activity**[8,9,10]**

## Materials and methods

### Plant materials

The plant Aloe vera was collected from tikrit city, Salah Aldin.The leaves were washed with distilled water and peel was Separated from the gel.

### Methods

Extraction and isolation of phenolic compound and flavonoids was per formed to**[12]**method with some changed. While the chromatographic analyses for phenolic compound done by HPLC (Shimadzu, 10AV-LC, JAPAN) depending on the method of the**[13,14]**with some changes by using C-18 Column(50 ×2,0mm).The mobile phase containing solvent of 0.1% formic acid (solvent A).solvent B was acetonitrile acid. While for flavonoids the mobile phase consisted solvent of 0.05% trifluoro acetic acid in deionized water (A).solvent B was 0.05% trifluoro acetic acid in methanol**[15].** The UV detection wavelength and the flow rate were 280 n m and 1.1 ml/min.

Seven stander solutions (25µg/ml)were used for phenolic compound (cinnamic acid, aloin, barbiline, aloe-emodine, aloeetic acid, anthranol, sinapic acid).six stander solution (25µg/ml) for flavonoids (Quercetin, Kaempherol, apigenin, catachin, coumarin, Rutin). The concentration of identified phenolic and flavonoids was calculated to the equation:

**Conc.of sample(mg/ml)=Area of sample/Area of stand. × C × D**

**C=Conc.of standard solution**

**D=Dilution factor**

## Results and Discussion

The HPLC analysis of phenolic compound in the Aloe vera gel showed six peaks fig . (1)with different Rt (1.777,3.448,5.273,6.192,7.378,8.765) min. and area for each peak were (54348, 231817, 188319, 71949, 88097, 153061) showed in table(1).

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**Table1:Retention Times and Area under curves for Aloe phenolic compound**

| Rt.(min) | AREA | IDENTIFIED COMPOUND | CONC µ g |
|---|---|---|---|
| 1.777 | 54348 | Cinnamic acid | 188.79 |
| 3.448 | 231817 | Aloin | 876.44 |
| 5.273 | 188319 | Aloe-emodine | 555.01 |
| 6.192 | 71949 | Aloeetic acid | 235.09 |
| 7.378 | 88097 | Anthranol | 252.52 |
| 8.765 | 153061 | Sinapic acid | 549.98 |

The chromatogram of the seven standard phenolic compounds (cinnamicacid, barbiline,aloe-emodin, aloeetic acid, anthranol, sinapic acid) Fig (2). The Rt of the seven standard peaks were (1.732, 3.418, 4.3338, 5.265, 6.17, 7.36, 8.773). table(2)

**Table2:Retention time and area ander curves for standards phenolic compound**

| STANDARD | Rt.(min) | AREA |
|---|---|---|
| Cinnamic acid | 1.732 | 71958 |
| Aloin | 3.418 | 66124 |
| Barbiline | 4.338 | 63283 |
| Aloe-emodin | 5.265 | 84826 |
| Aloeetic acid | 6.17 | 76510 |
| Anthra nol | 7.36 | 87215 |
| Sinapic acid | 8.773 | 83188 |

Results shown in fig. (1) compared with chromatograms shown in fig (2) refears to that aloe vera contained (188.79cinnamic acid, 876.44aloin, 555.01 aloe - emodine, 235.09 aloeetic acid, 252.52 anthranol, 549.98 sinopic acid). HPLC analysis of flavonoids in the aloe vera gel showed 4 peaks fig.(3) with different Rt (1.89,3.15,7.493,8.413) min. and the area for each peak were (75828,66531,88538,125858) Table (3).

**Table (3) Retention times and area ander curves for Aloe Vera Flavonoids**

| Rt.(min) | Area | Identified Compounds | Conc. (µg/ml) |
|---|---|---|---|
| 1.89 | 75828 | Quercetin | 227.48 |
| 3.15 | 66531 | Kaempherol | 236.23 |
| 7.493 | 88538 | Rutin | 247.65 |
| 8.413 | 125858 | Unknown | - |

The chromatogram of the six standard flavonoids (Quercetin, Kaempherol, Apigenin, Catachin, Coumarin, Rutin) were shown in the fig(4). The Rt of the six standard peaks were (1.887, 3.207, 4.278, 5.448, 6.687, 7.578).

**Table (4) Retention Times and Area ander curves for standard Flavonoids**

| STANDARD | Rt.(min) | AREA |
|---|---|---|
| Quercetin | 1.887 | 68968 |
| Kaempherol | 3.207 | 62868 |
| Apigenin | 4.278 | 72755 |
| Catachin | 5.448 | 93049 |
| Coumarin | 6.687 | 72205 |
| Rutin | 7.578 | 99471 |

Results in fig.(3) and its Rt value in table (3) compared with chromatograms of six standard flavonoids indicate that aloe vera gel contain(227.48, 236.23, 247.65). The other unknown peaks may indicate other type of flavonoids. Results are correspond with previous studies of [8,16,17,18] which indicates the presence of many types of flavonoids and phenolic compound in aloe vera, quercetin, catechin, Aloe - emodin, sinapic acid, Aloin . No information were available in the literature about Aloe Vera gel other content .

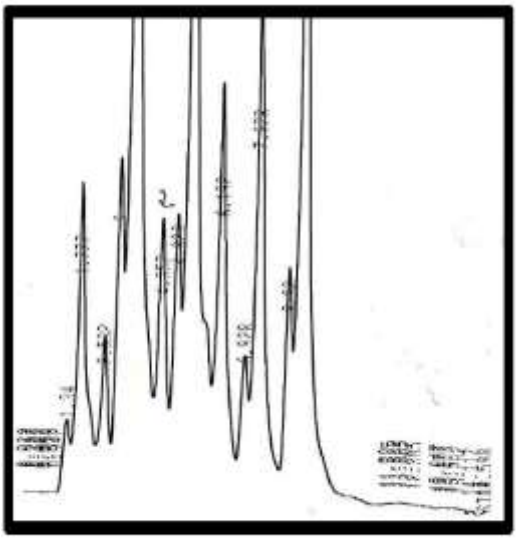

FIG1 HPLC OF Phenolic compound in Aloevera

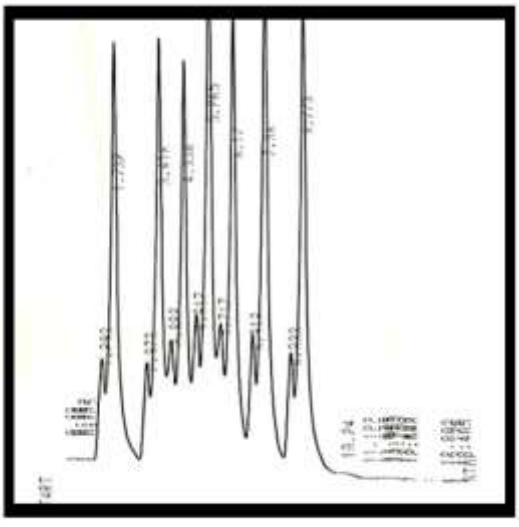

FIG2 HPLC OF7STANDARD Phenolic

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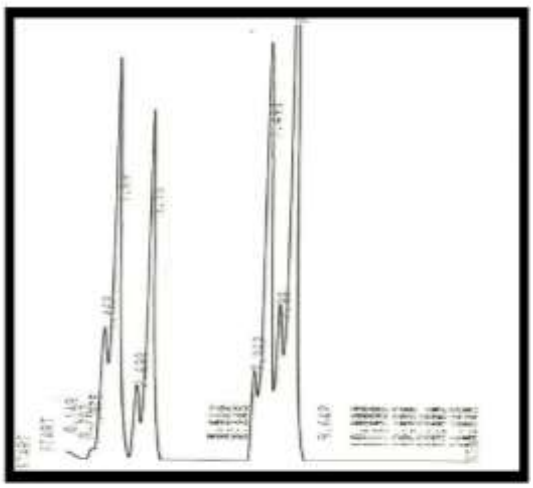

FIG 3 HPLC OF FLAVONOID IN ALOE VERA

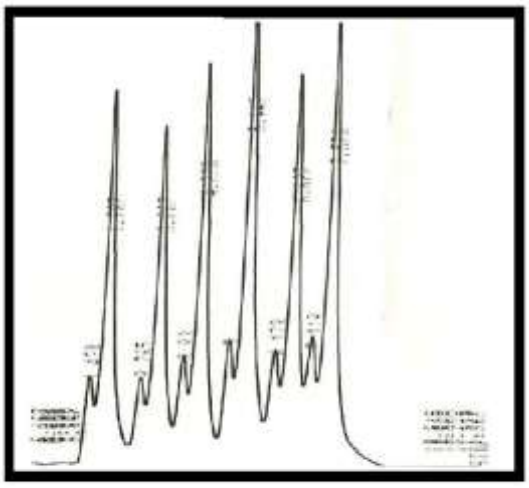

FIG.4 HPLC OF 6 STANDARD FLAVONOID

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# تشخيص الفلافونويدات والمركبات الفينولية في جل الصبار بواسطة HPLC

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**الملخص**

الفلافونويدات والمركبات الفينولية من المكونات المهمة لجل الصبار واثبتت قياسات HPLC احتواء جل الصبار على انواع عديدة من المركبات الفينولية (188.79 252.52 Aloeecticacid,235.096 Aloe emodin, 555.01 mg aloin, 876.44 mg/ml cinnamic acid ,Anthranol,549.98Simapic acid)

عند ازمان احتجاز (1.777,3.448,5.273,6.192,7.378,8.765).

والمساحة تحت المنحني (54348,231817,188319,71949,88097,153061) .

وانواع عديدة من الفلافونويدات (227.48 Quercetin,236.23Kaempherol,247.65 Rutin) .

عند ازمان احتجاز (1.89,3.15,7.493,8.413).

والمساحة تحت المنحي (75828,66531,88538,125858).