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# Phytochemical Study of *Cynara caduncullus L.* Growing in Libya

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**ABSTRACT**

The paper deals with the isolation and identification of some active constituents of *Cynara cardunculus L* .( Family Asteracae growing in Libya.

**Key word:** *Cynara cardunculus L.*, Asteraceae, Triterpenes and sterols, flavanoids, cynaratriol.

## INTRODUCTION

*Cynara cardunculus L*.is a wild plant widely growing in Libya .,it is a popular medicinal plants used in phytotherapy for its strong choleretic activity, it also used as hepatoprotective[1] and antioxidant[2] and hypoglycemic[3], The obvious biological activities of this plant was a good motive to investigate it which is a wild Libyan plant.

## RESULT AND DISCSSION

The careful separation of the aerial part extract afforded in addition the β sitosterol, stigmasterols, β amyrin , β amyrin acetate, further 5 compounds, apigein1,Luteolin 2, cynaratriol3, B-sitosterol o-glycosides 4 and Luteolin 7-0-glucosides 5.

The structures of these compounds could be easily deduced from UV., IR., $^1$HNMR., MS. spectral data.

Compound 1 the UV Spectral data showed that this compound is a flavenoid and by comparing the UV. Data with published data, we found out that this compounds

Is apigenin . The $^1$HNMR. and IR. data confirmed this result.

For compound 2 the UV, $^1$HNMR and IR data prove that this compound is luteolin.

The IR.data of compound 3 showed aband at 1780 $cm^{-1}$which indicate that this compound has a lactone ring.

The $^1$Hmmr data showed signals at δ-2.86(m, H-1) 1.85(dd, br, H-5) , 4.6 (dd-H-6) and 2.06( m-H7). Indicate that this compound has a gauaianolide structure.

The broad doublets at δ -3.95 (H-3) due to the proton under hydroxyl group the two broad singlets at δ -3.17 (H-14). Andat δ- 4.99(H-14') indicate the presence isolated $=CH_2$ group.

The $C^{13}$nmr confirm this assumption. compound 5 ,the $^1$Hnmr signals are similar tocompound 2 except the signals of sugar part which is glucose. The UV. data confirm this assumption.

**Compound 1. IR Spectrum :- 3300 $cm^{-1}$, 2890$cm^{-1}$,2924$cm^{-1}$,1652$cm^{-1}$,1607$cm^{-1}$**

**UV.Spectrum data**

| Shift reagent | $\lambda_{max}$ | |
|---|---|---|
| | **Band I** | **Band II** |
| MeOH | 265 $cm^{-1}$ | 338 $cm^{-1}$ |
| MeOH+ NaoMe | 276 $cm^{-1}$ | 325,399 $cm^{-1}$ |
| MeOH+$ALcL_3$ | 276 $cm^{-1}$ | 240,345 $cm^{-1}$ |
| MeOH+$ALcL_{3+}$HcL | 277$cm^{-1}$ | 240,376$cm^{-1}$ |

MS. spectrum data m/z:-
270 ($M^+$) (C15 $H_{10}O_5$), 253 (5), 242 (20), 154 (28), 122 (16), 47 (10).

**Compound 2. IR spectrum:- 3350 $cm^{-1}$, 2980-2890 $cm^{-1}$, 1670 $cm^{-1}$, 1620 $cm^{-1}$**

**UV. Spectrum**

| Shift reagent | $\lambda_{max}$ | |
|---|---|---|
| | **Band I** | **Band II** |
| MeOH | 254 $cm^{-1}$ | 342 $cm^{-1}$ |
| MeOH+ NaoMe | 275 $cm^{-1}$ | 402 $cm^{-1}$ |
| MeOH+$ALcL_3$ | 274 $cm^{-1}$ | 338, 425 $cm^{-1}$ |
| MeOH+$ALcL_{3+}$HcL | 266$cm^{-1}$ | 296,354 $cm^{-1}$ |

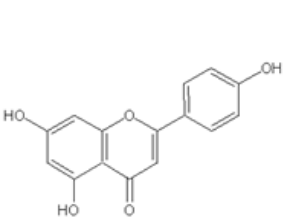
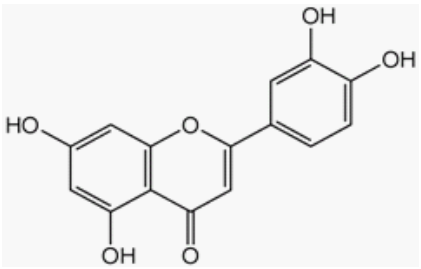
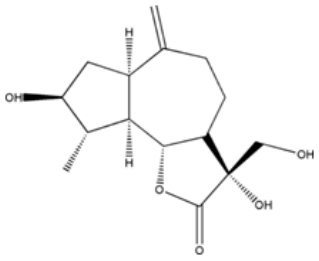
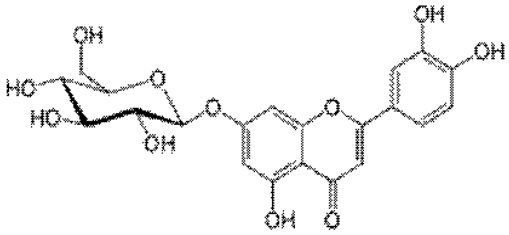
MS spectrum: - 286(M+) ,( C15 H10 06) ,279 (10), 168(29), 153(20), 149(100) ,137(52)

**Compound 3. IR spectrum :- 3520 $cm^{-1}$ 2990 -2890 $cm^{-1}$, 1780 $cm^{-1}$, 1570 $cm^{-1}$**

**UV. Spectrum**

| Shift reagent | $\lambda_{max}$ | |
|---|---|---|
| | **Band I** | **Band II** |
| MeOH | 256 $cm^{-1}$ | 345 $cm^{-1}$ |
| MeOH+ NaoMe | 266 $cm^{-1}$ | 305 $cm^{-1}$ |
| MeOH+$ALcL_3$ | 278 $cm^{-1}$ | 338, 420 $cm^{-1}$ |
| MeOH+$ALcL_{3+}$HcL | 258$cm^{-1}$ | 356, 388 $cm^{-1}$ |

MS spectrum
286 (M+- glucose), 256 (10), 156(20),60(80), 44(100)

## EXEPERIMENTAL

### Material and Methods

Plant material was collected from Musrata-libya. In March 2007, $^{1}$Hnmr spectra were recorded in ($DCl_3$ with Bruken wm400.

Mass spectra were carried out in Shimadzu QP5050A, 70 e.v.

UV spectra were recorded by UV-1601 UV/VIS Spectrophotometer

IR spectra were recorded by IR Spectrophotometer FT-IR Spectrometer

### Extraction and isolation

The air dried material (1kg) was extracted with methanol- ether-pot.ether(1:1:1) affording after deffaling with methanol 14 g. extract.

Column chromatography. ($SiO_2$) of the obtained extract furnished 7 fractions .known compounds were usually identified by comparing their data with those authentic data .

The pet.- ether fraction gave by TLC ($SiO_2$,PF245,pet.ether:ETAC 9:1) B-amyrin acetate, B-amy rine, fraction 4( $ET_2O$- pet.toether 1:1)gave â-sitosterol and stigmasterols.

Fraction 5 ($ET_2O$) gave by TLC ( $SiO_2$, $CHCL_3$-MeoH (9:1) 20 mg apigein and 39 mg of Luteolin and 10 mg of cynaratriol.

Fraction 6( $ET_2O$:MeOH 1:1) give a12 mg of lutealin-7-0-glucoside.) after using PTLC ( $Sio_2$, $CHCL_3$ MeOH- 1:2).

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