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Prof Dr. Abdalla Omar



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OMICS International is a pioneer and leading science event organizer, which publishes around 500 open access journals and conducts over 500 Medical, Clinical, Engineering, Life Sciences, Pharma scientific conferences all over the globe annually with the support of more than 1000 scientific associations and 30,000 editorial board members and 3.5 million followers to its credit.

OMICS Group has organized 500 conferences, workshops and national symposiums across the major cities including San Francisco, Las Vegas, San Antonio, Omaha, Orlando, Raleigh, Santa Clara, Chicago, Philadelphia, Baltimore, United Kingdom, Valencia, Dubai, Beijing, Hyderabad, Bengaluru and Mumbai.

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Previous Study:

Study of Some Egyptian Plants of Potential Use in Some Cases of Hepatic Disorders



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Hepatic disorders

- **Worldwide problem.**
- **Globally, Hepatitis C Virus (HCV) infects an estimated 170 million people, and causes a 500,000 deaths per year due to complications of late-stage liver diseases.**



Situation in Egypt

- **Approximately 20% of Egyptian blood donors are anti-HCV positive.**
- **Other estimates that Egypt has the *highest prevalence* of HCV *worldwide*, ranging from 6% to more than 40% among regions and demographic groups.**

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Marketed Products

Family Asteraceae

Tribe Cynareae

Cynara scolymus

Silybum marianum



Therefore

Tribe *Cynareae*



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Screening of Some Available Members of the Tribe Cynareae for Hepatoprotective Activity

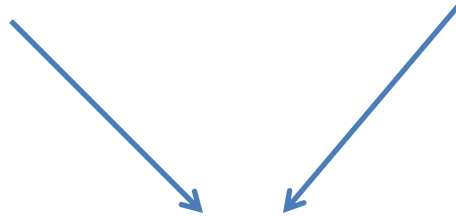
Journal of Medicinal Plants Research, 7(7); 324-328, 2013.



Hepatoprotective Assay procedures

In-vivo test models

In-vitro test models



Serum level of liver enzymes is raised.

The extent of its control by the antihepatotoxic drug under test is used as a basis for estimation.

Histopathological Examination

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Screening of Some Available Members of the Tribe Cynareae

- Members of the family **Asteraceae** especially tribe Cynarea are known for their efficacy in relieving some liver disorders.
- Plants of tribe **Cynareae** are very common in the Egyptian flora.
- This tribe is represented in Egypt by many genera such as ***Silybum***, ***Cynara***, ***Centaurea***, ***Carduus***, ***Onopordon***,etc.



Screening of Some Available Members of the Tribe Cynareae

70 % Alcoholic extract

***Cynara cornigera* aerial parts**

***Cynara cornigera* seeds**

***Onopordum alexandrinum* aerial parts**

***Onopordum alexandrinum* seeds**

***Centaurea calcitrapa* aerial parts**

***Centaurea alexandrina* aerial parts**

***Carduus getulus* aerial parts**

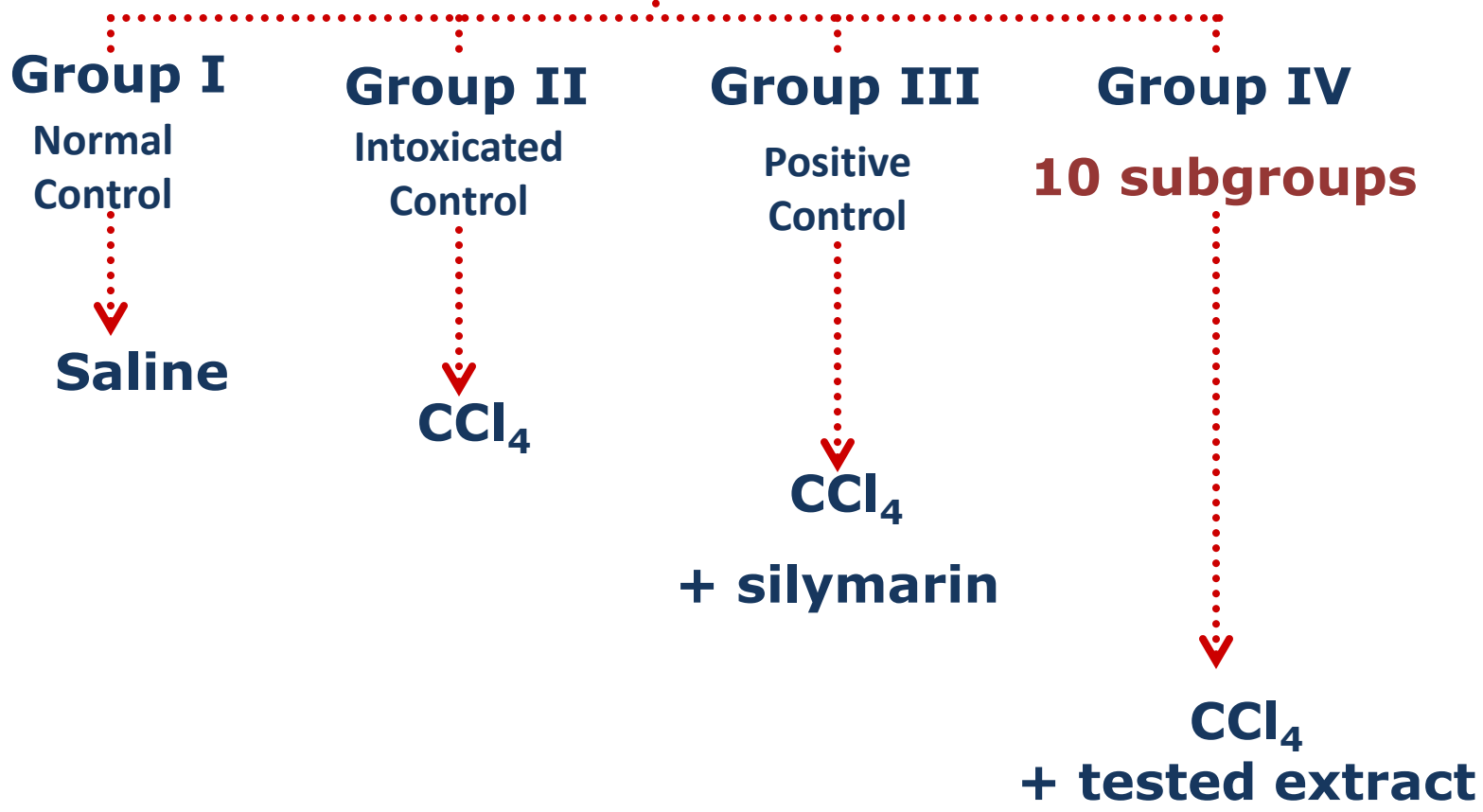
***Cynara scolymus* leaves**



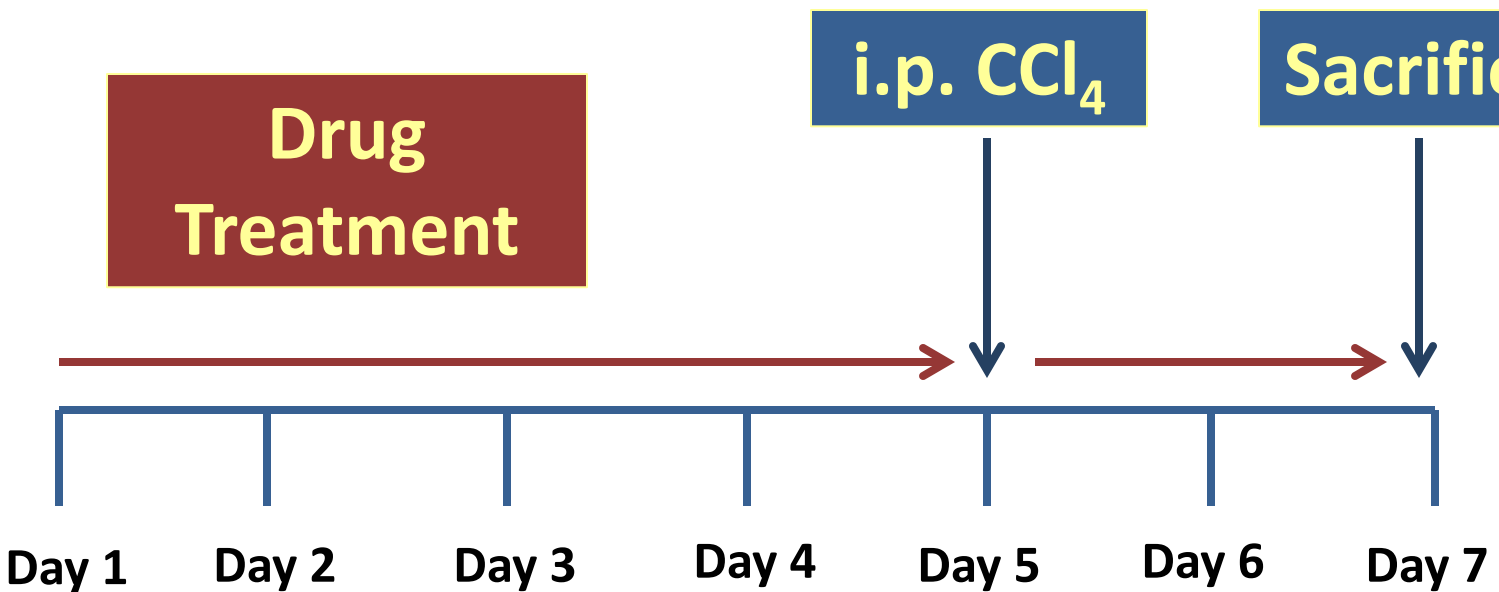
Screening of Some Available Members of the Tribe Cynareae

In-vivo assay Design

animals equally divided into 4 groups



Screening of Some Available Members of the Tribe Cynareae



Biochemical Parameters

Alanine Aminotransferase	ALT
Aspartate Aminotransferase	AST
Alkaline Phosphatase	ALP
Total Bilirubin	BIL







Screening of Some Available Members of the Tribe Cynareae

In order to compare the activity of different tested extracts, a parameter was calculated and named

“% activity compared to silymarin”

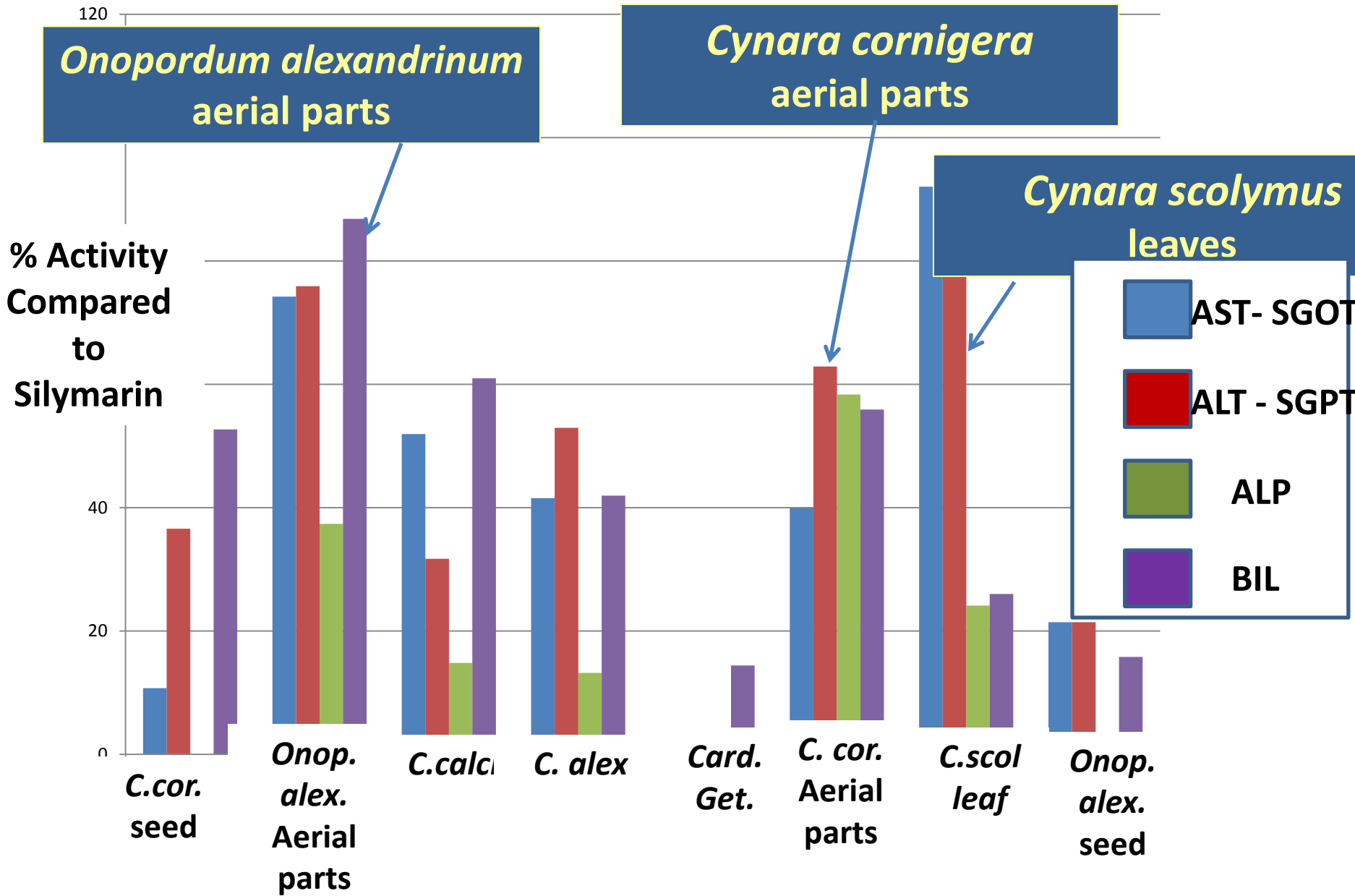
Biochemical results

	AST - SGOT
	ALT - SGPT
	ALP
	BIL

Considering Silymarin Activity as 100%



Screening of Some Available Members of the Tribe Cynareae



Screening of Some Available Members of the Tribe Cynareae

500 mg/kg

*Cynara
cornigera*



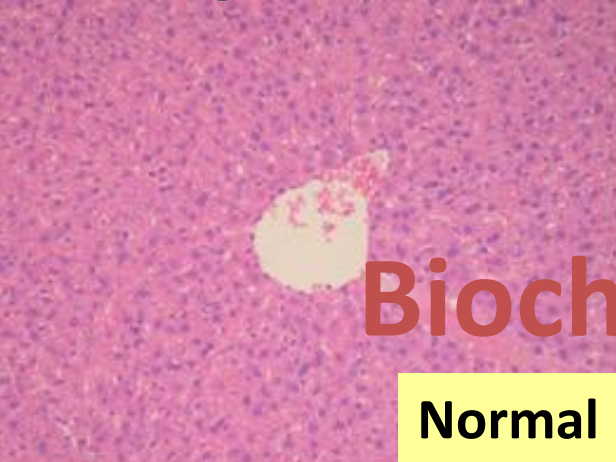
*Onopordon
alexandrinum*

250 mg/kg

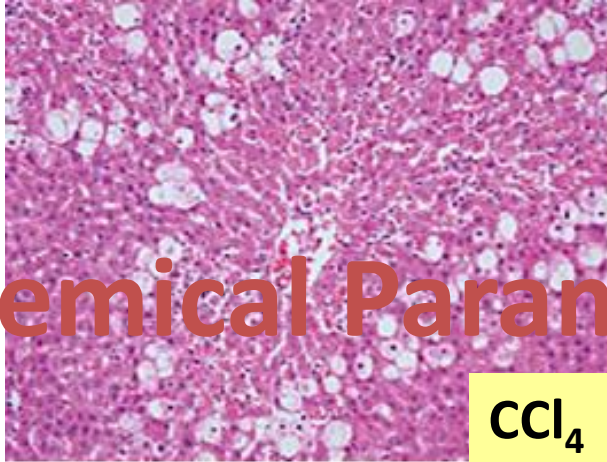


Screening of Some Available Members of the Tribe Cynareae

Biochemical Parameters



Normal

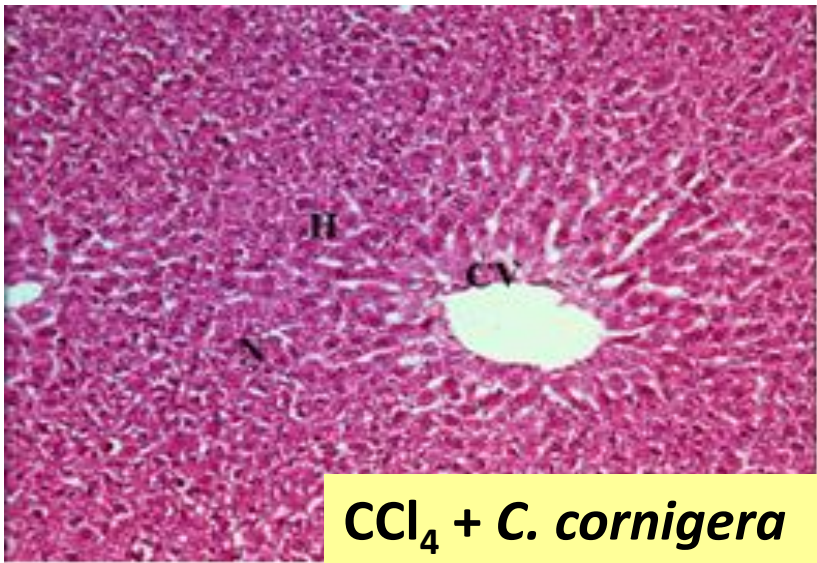


CCl₄

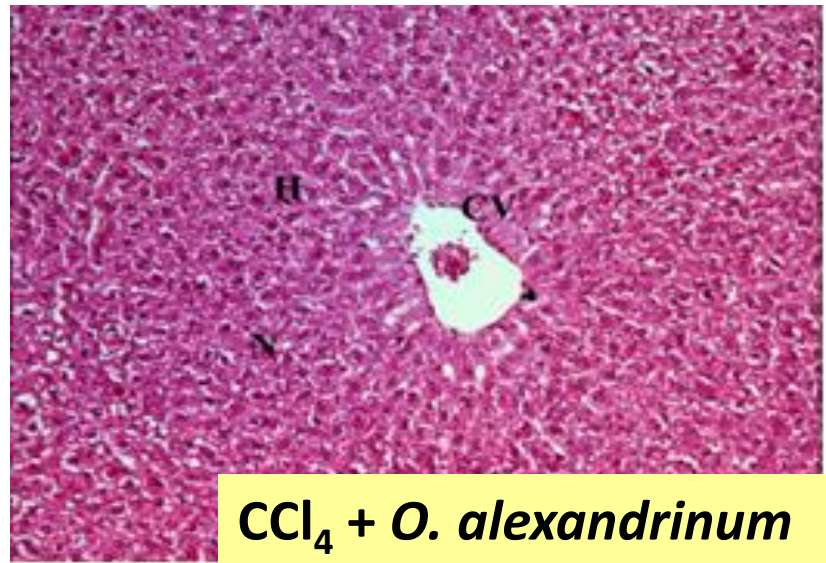


CCl₄ + Silymarin

Marked necrosis of the liver with deposition of glycogen and dilatation in centrilobular necrosis and extensive fatty changes. Congestion of central vein.



CCl₄ + *C. cornigera*



CCl₄ + *O. alexandrinum*

Publication

Evaluation of the hepatoprotective activity of some plants belonging to the tribe Cynareae growing in Egypt.

**Samah M. El Sohafy, Saleh I. Alqasoumi,
Aly M. Metwally, Abdallah A. Omar,
Masouda M. Amer , Mohammed I.
Abou Shoer, S. A. El Toumy and Maged
S. Abdel-Kader.**

Journal of Medicinal Plants Research

Vol. 7(7); 324-328, 2013.

Prof Dr. Abdalla Omar

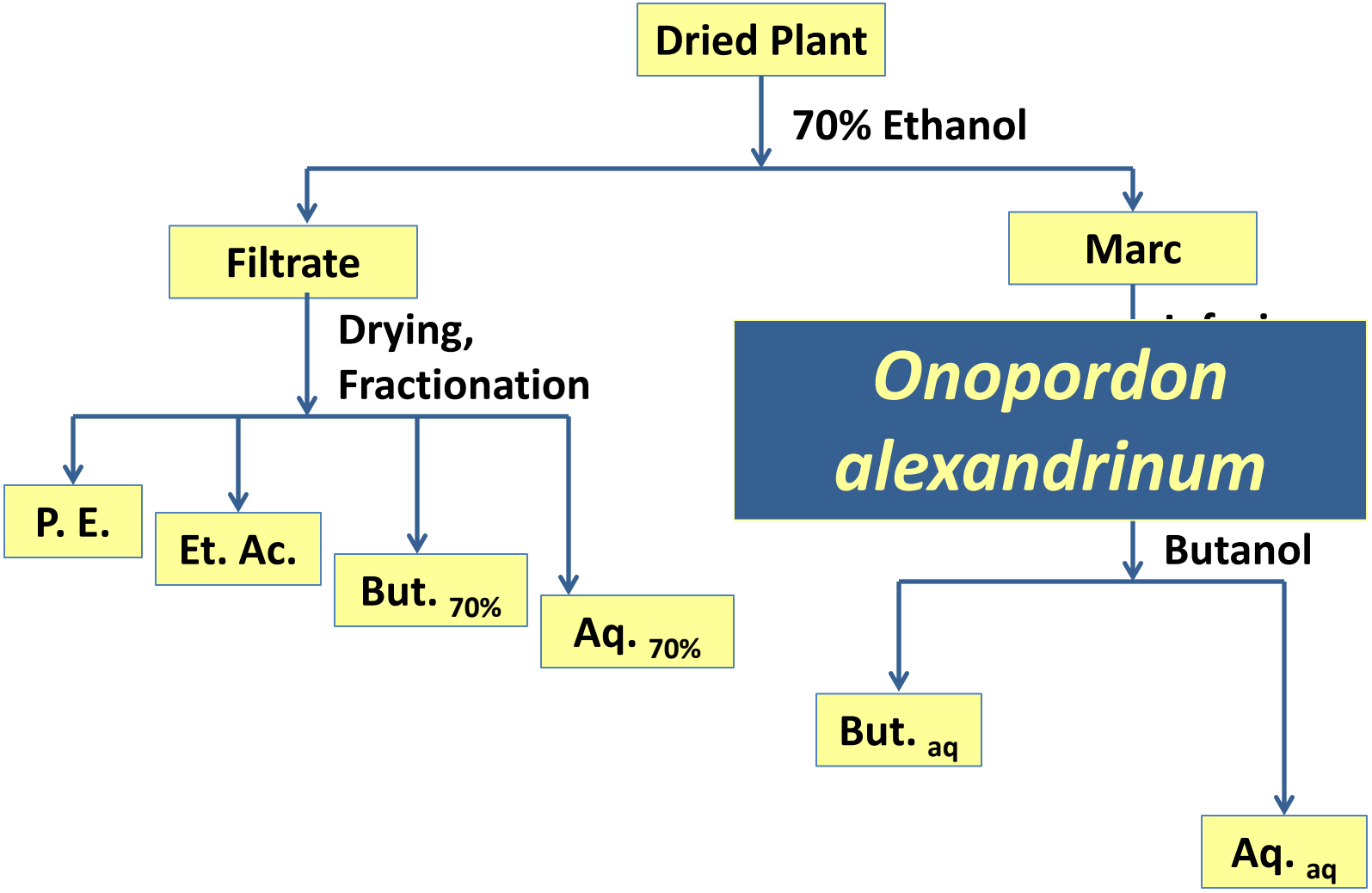


Biologically Guided Fractionation of *Onopordon alexandrinum*

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Biologically Guided Fractionation



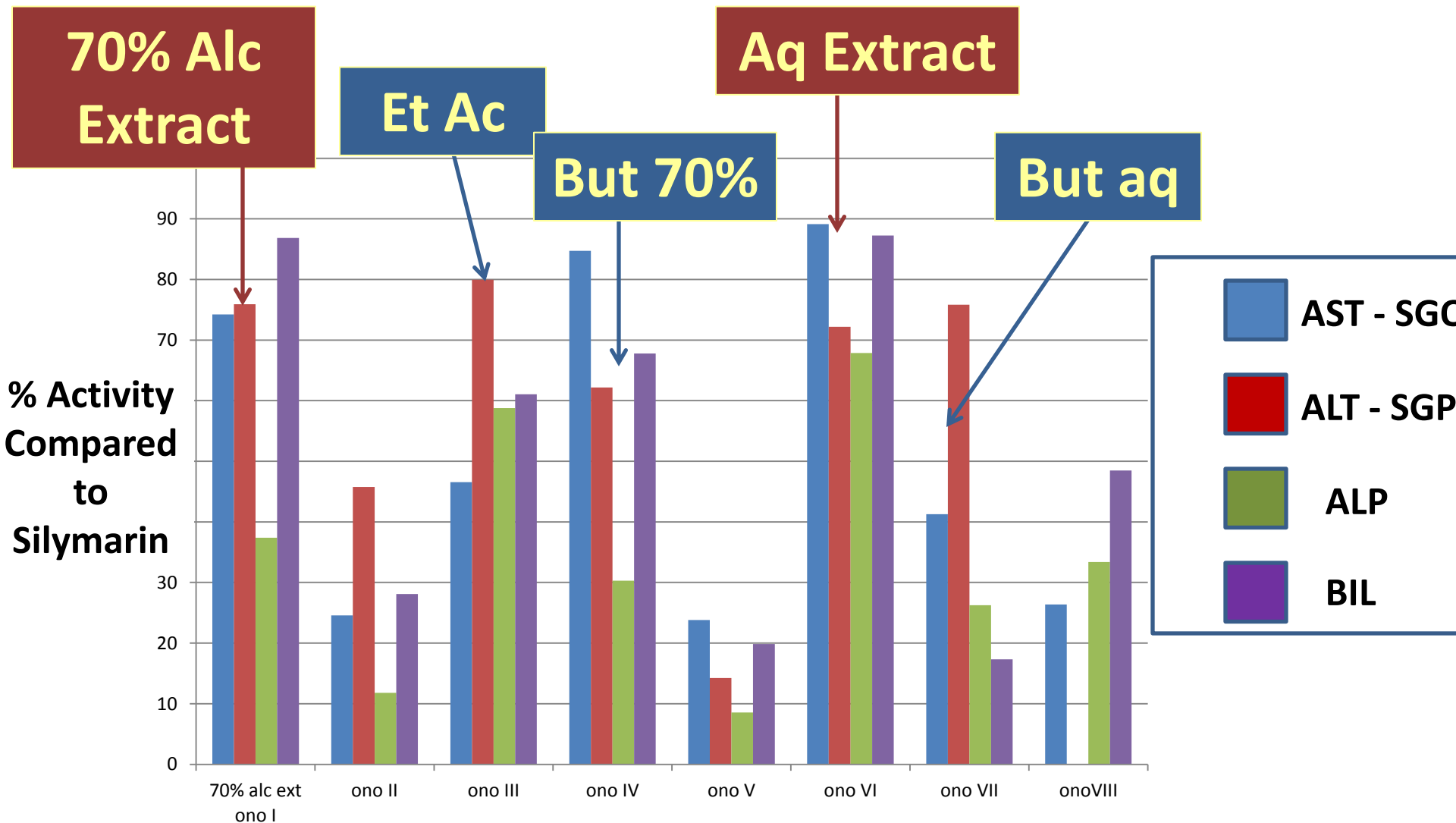
Biologically Guided Fractionation

		Activity compared to Silymarin (% activity)				
			AST -SGOT	ALT - SGPT	ALP	BIL
Ono	500	70% alc ext ono I	74.2297	75.9134	37.3886	86.833
	250	ono II	24.555	45.7602	11.8029	28.0852
	250	ono III	46.5722	79.9575	58.7808	61.045
	250	ono IV	84.7067	62.1877	30.2983	67.7826
	250	ono V	23.8134	14.2344	8.56031	19.8487
	500	ono VI	89.1397	72.1691	67.8599	87.2531
	250	ono VII	41.263	75.8207	26.2527	17.3417
	250	onoVIII	26.3902	_____	33.3696	48.4732

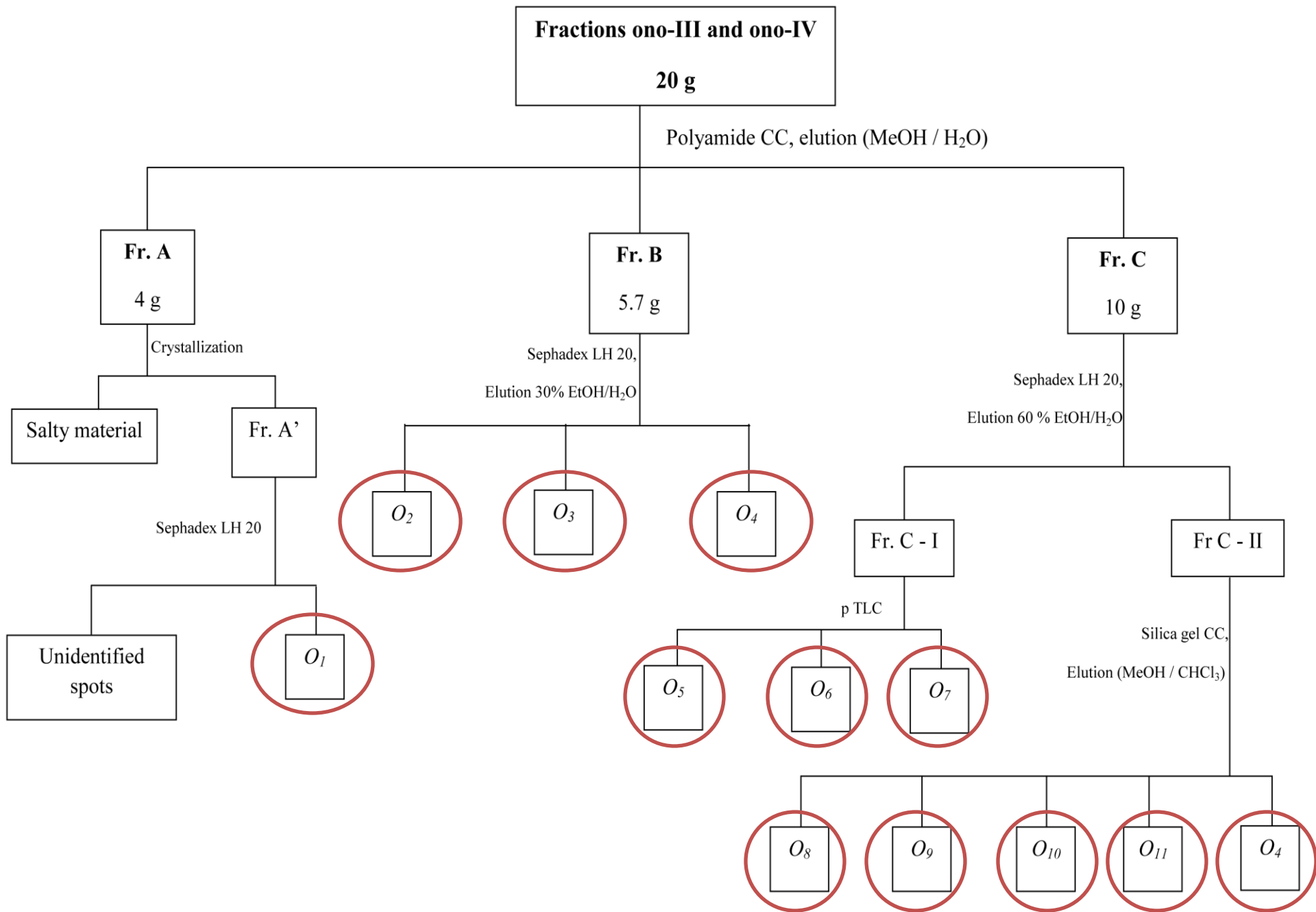
Prof Dr. Abdalla Omar

Biologically Guided Fractionation

Onopordon alexandrinum fractions



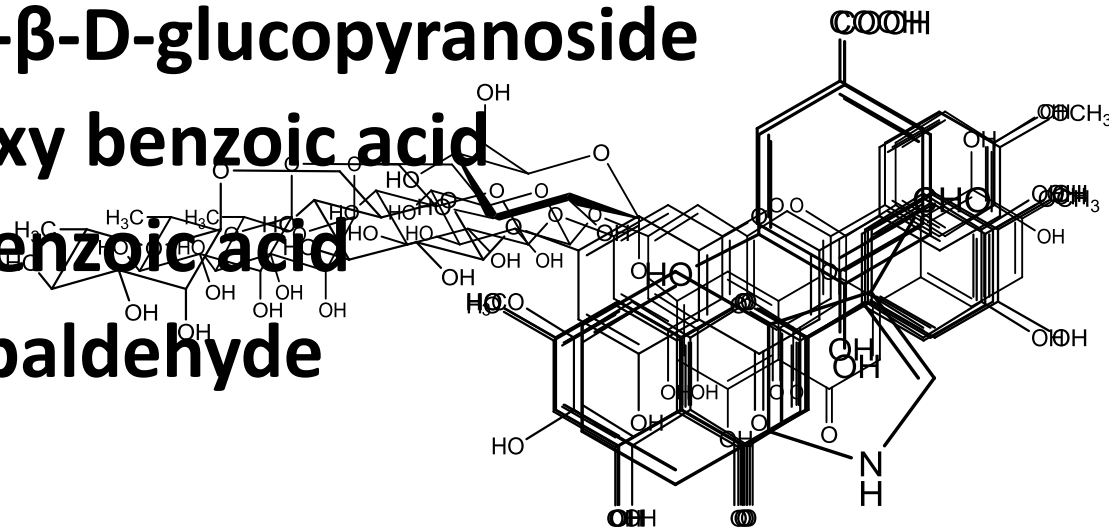
Prof Dr. Abdalla Omar



Onopordon alexandrinum Boiss.

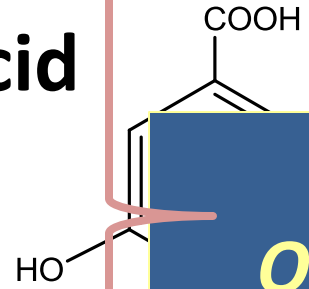
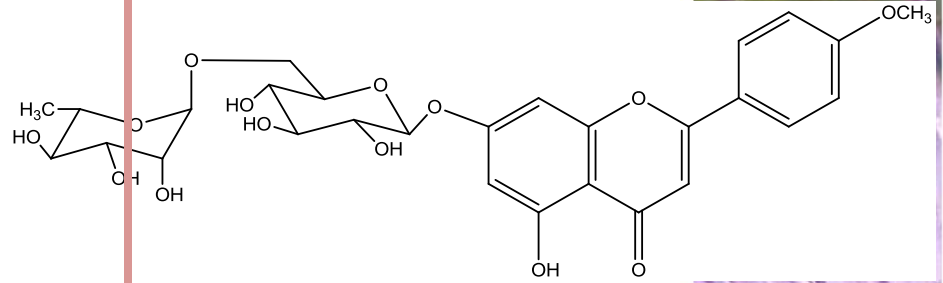
11 compounds ...

- **Luteolin-7-O-rutinoside**
- **Apigenin-7-O-rutinoside**
- **Acacetin-7-O-rutinoside**
- **Luteolin-7-O- β -D-glucopyranoside**
- **3, 4- dihydroxy benzoic acid**
- **p- hydroxy benzoic acid**
- **Indole-3-carbaldehyde**
- **Acacetin**
- **Pedalitin**
- **Apigenin**
- **Luteolin**

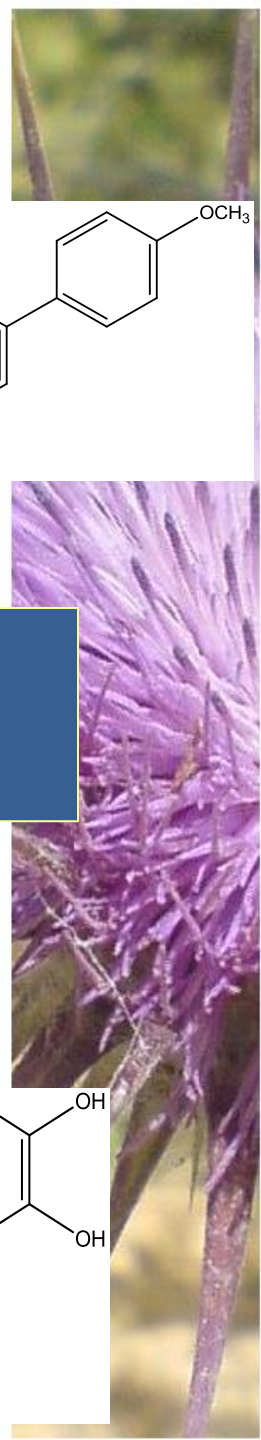
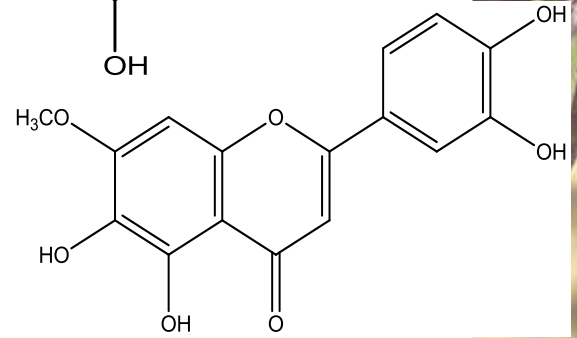
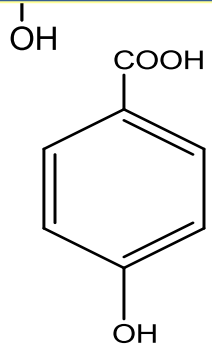


Onopordon alexandrinum Boiss.

- **Acacetin-7-O-rutinoside**
- **3, 4- dihydroxy benzoic acid**
- **p- hydroxy benzoic acid**
- **Pedalitin**

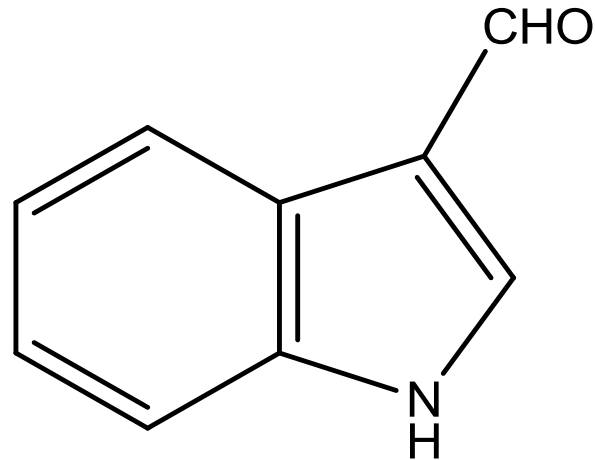


Genus
Onopordon



Onopordon alexandrinum Boiss.

Indole-3-carbaldehyde



Family Asteraceae

Prof Dr. Abdalla Omar





Thank you

Prof. Dr. Abdalla Abdel Raziq Omar
Professor of Pharmacognosy
Alexandria University

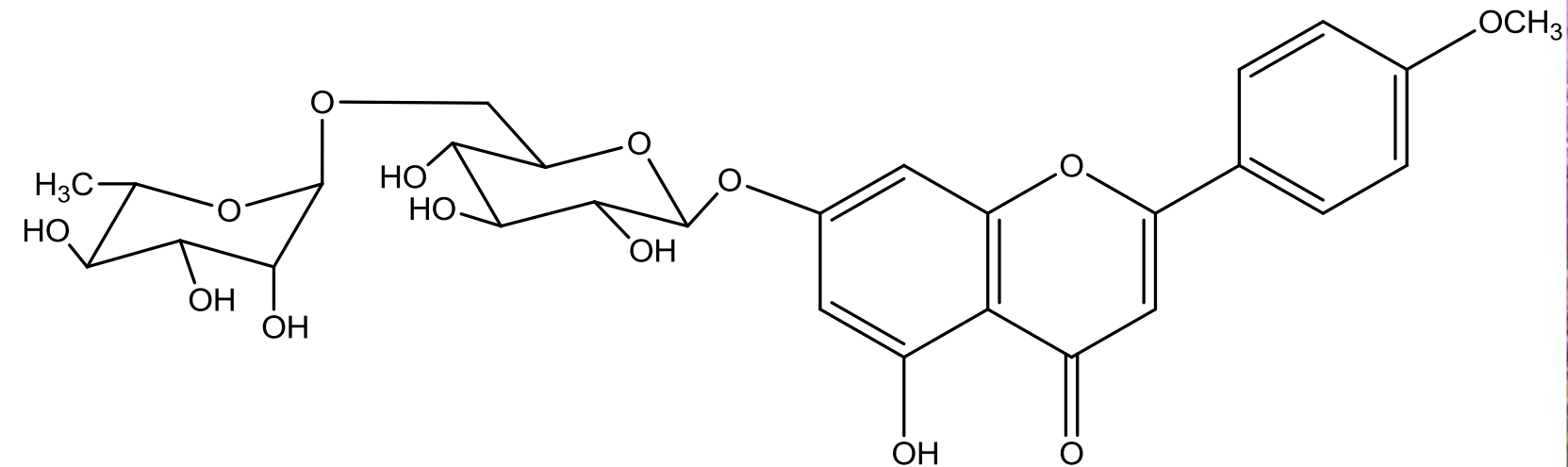
Prof Dr. Abdalla Omar



Onopordon alexandrinum Boiss. **Acacetin-7-O-rutinoside**

Compound O₃ ...

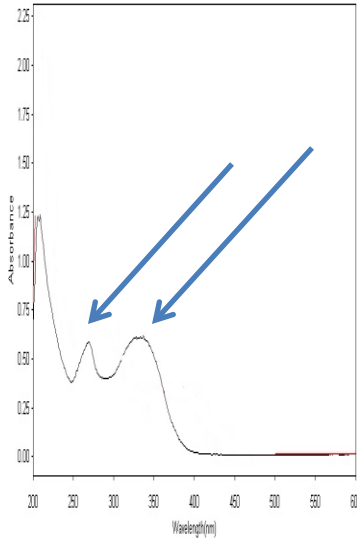
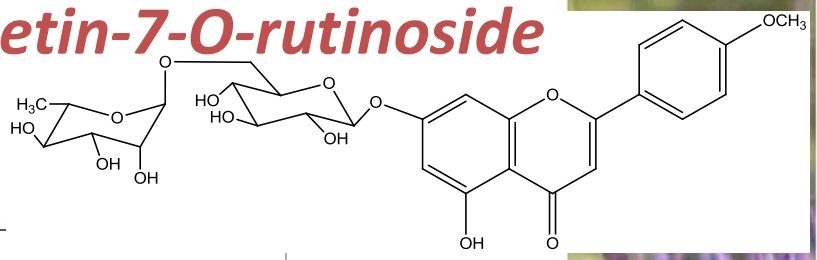
Acacetin-7-O-rutinoside



Prof Dr. Abdalla Omar

Onopordon alexandrinum Boiss. **Acacetin-7-O-rutinoside**

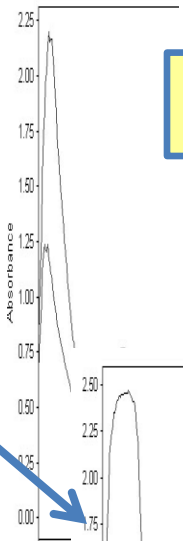
UV MeOH → 269nm → **flavone**
333 nm



NaOMe →

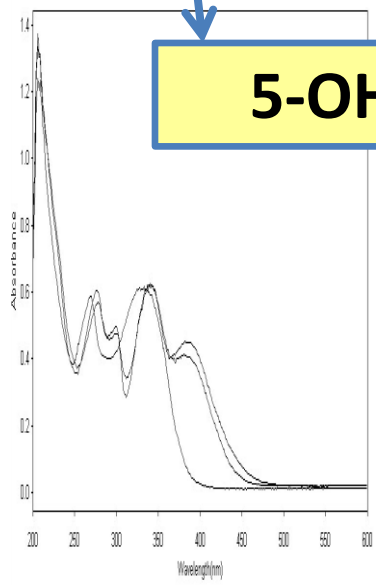
Substituted 4'-OH

NaOAc →

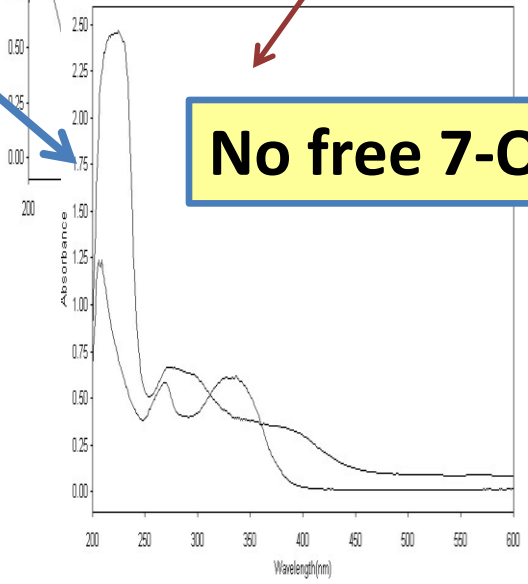


AlCl₃
AlCl₃ / HCl →

5-OH

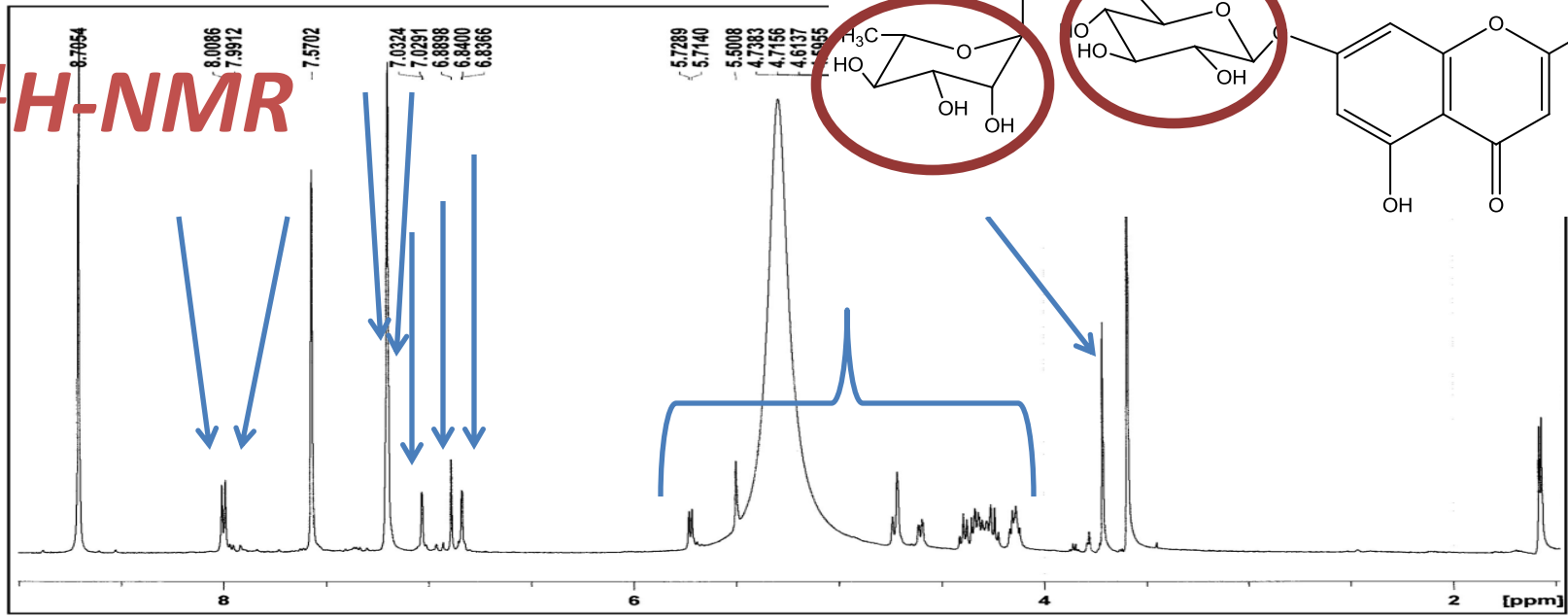


No free 7-OH

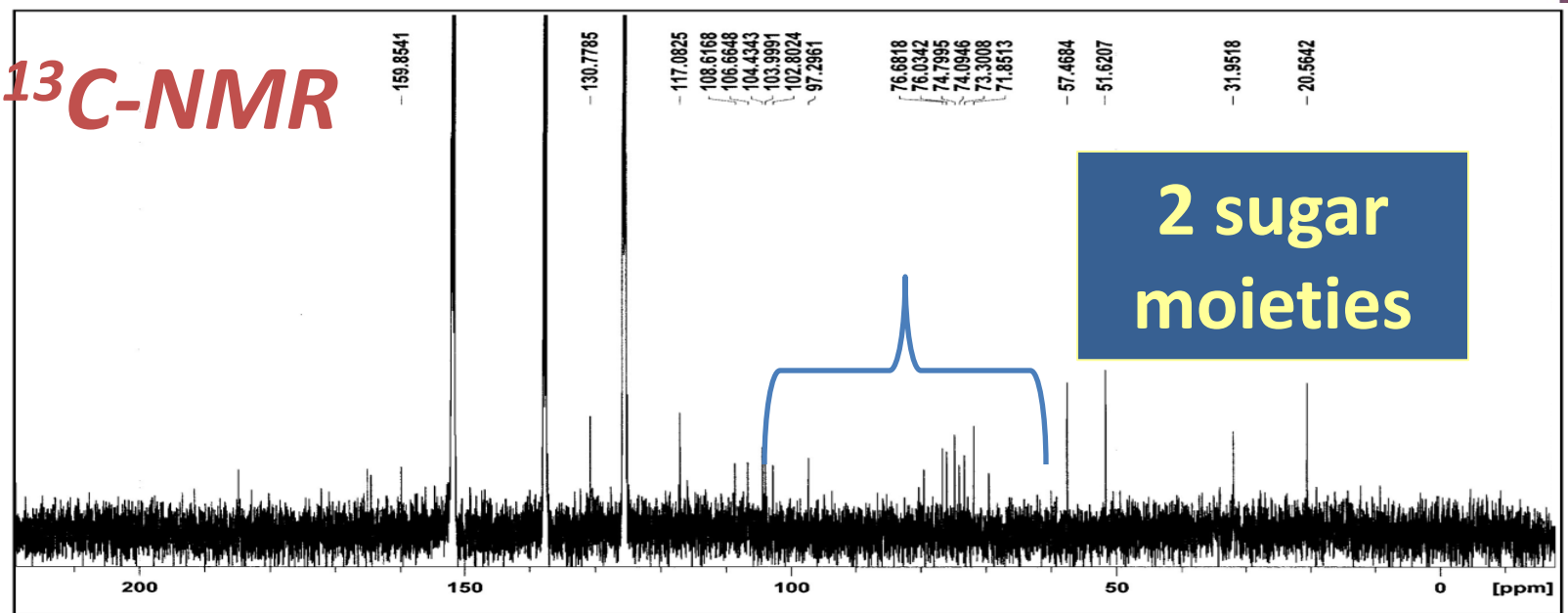


Onopordon alexandrinum Boiss. **Acacetin-7-O-rutinoside**

¹H-NMR

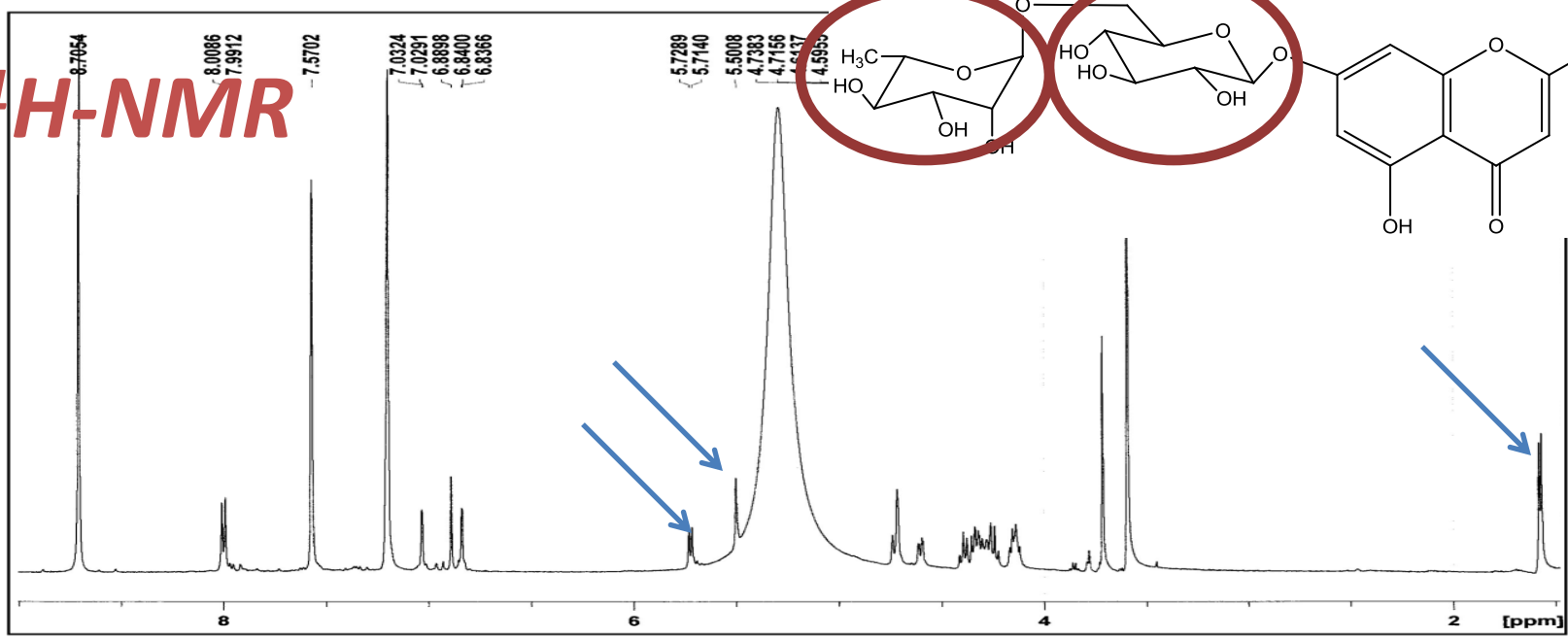


¹³C-NMR

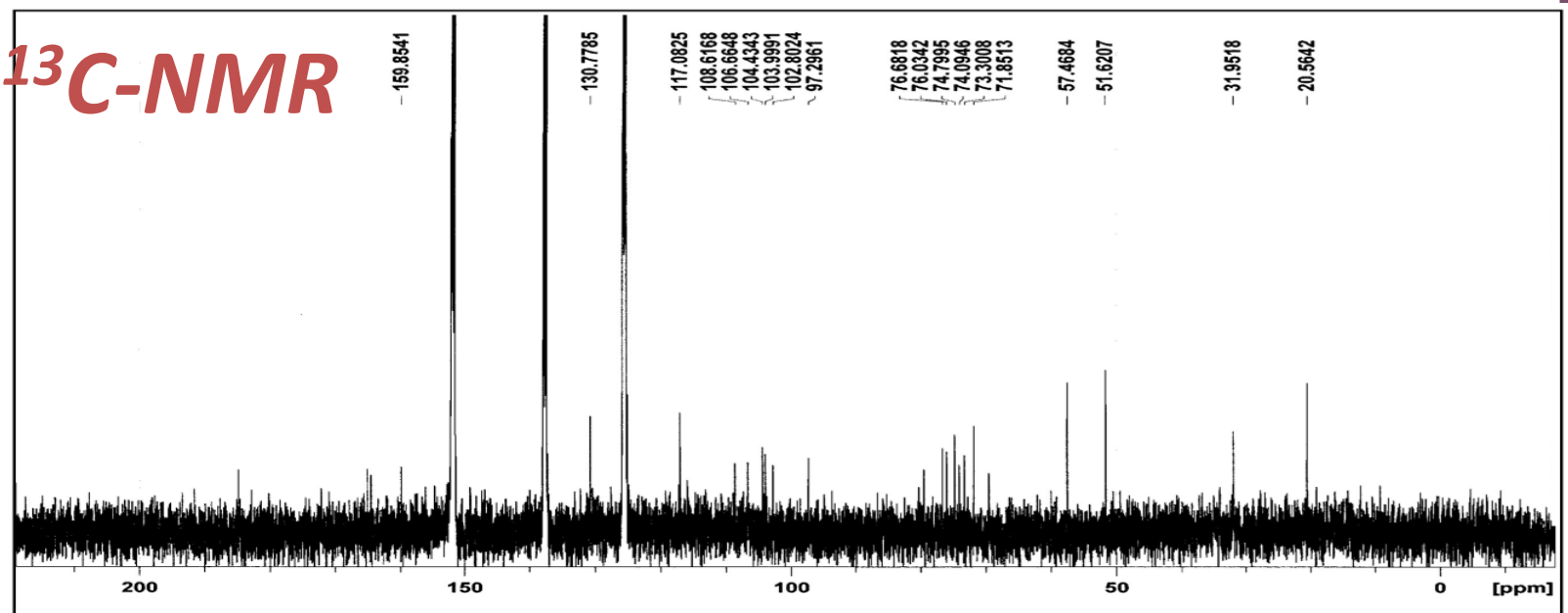


Onopordon alexandrinum Boiss. **Acacetin-7-O-rutinoside**

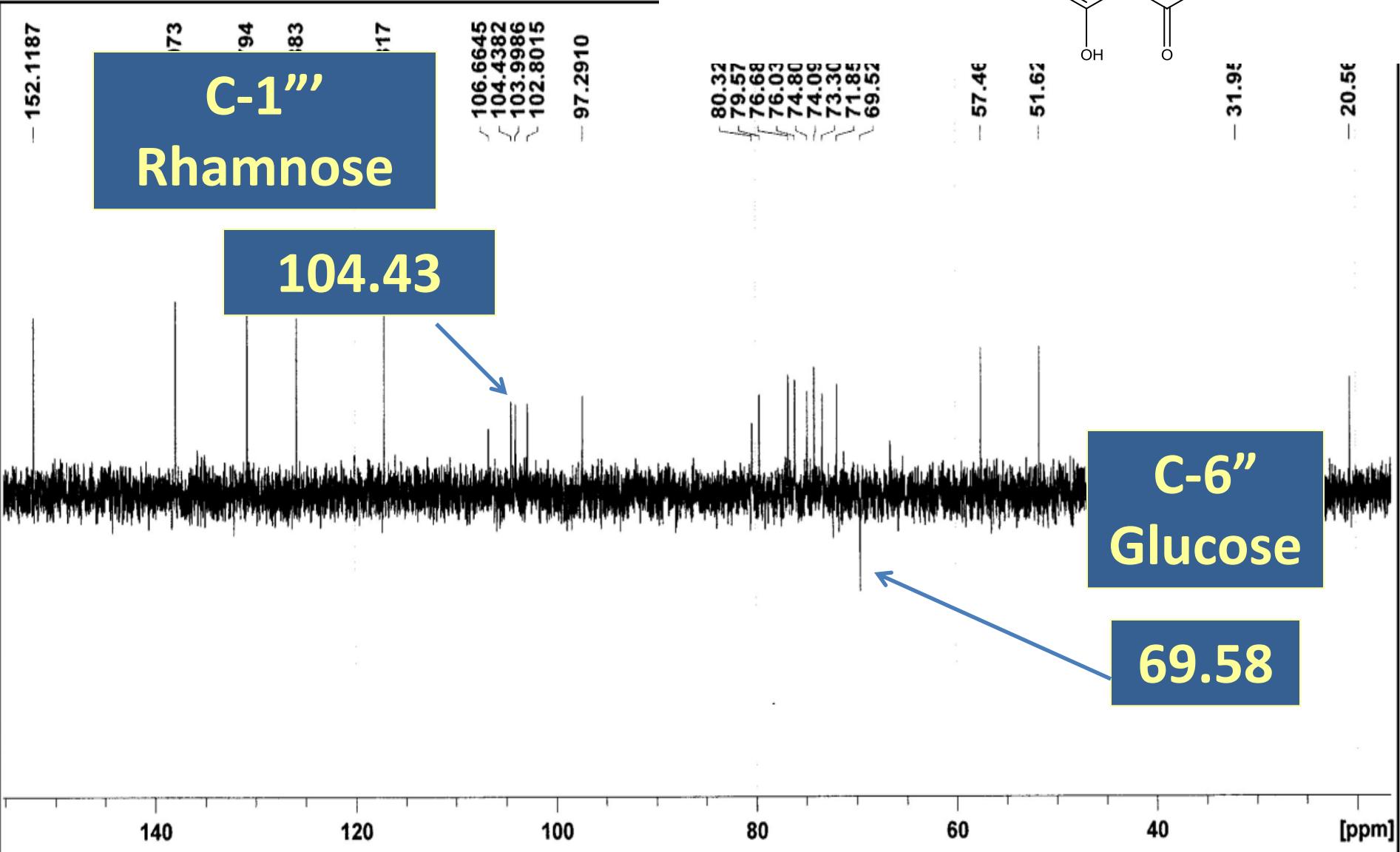
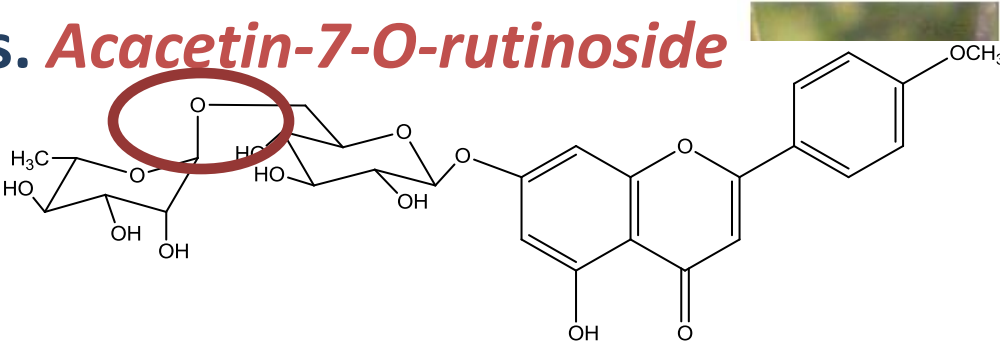
¹H-NMR



¹³C-NMR

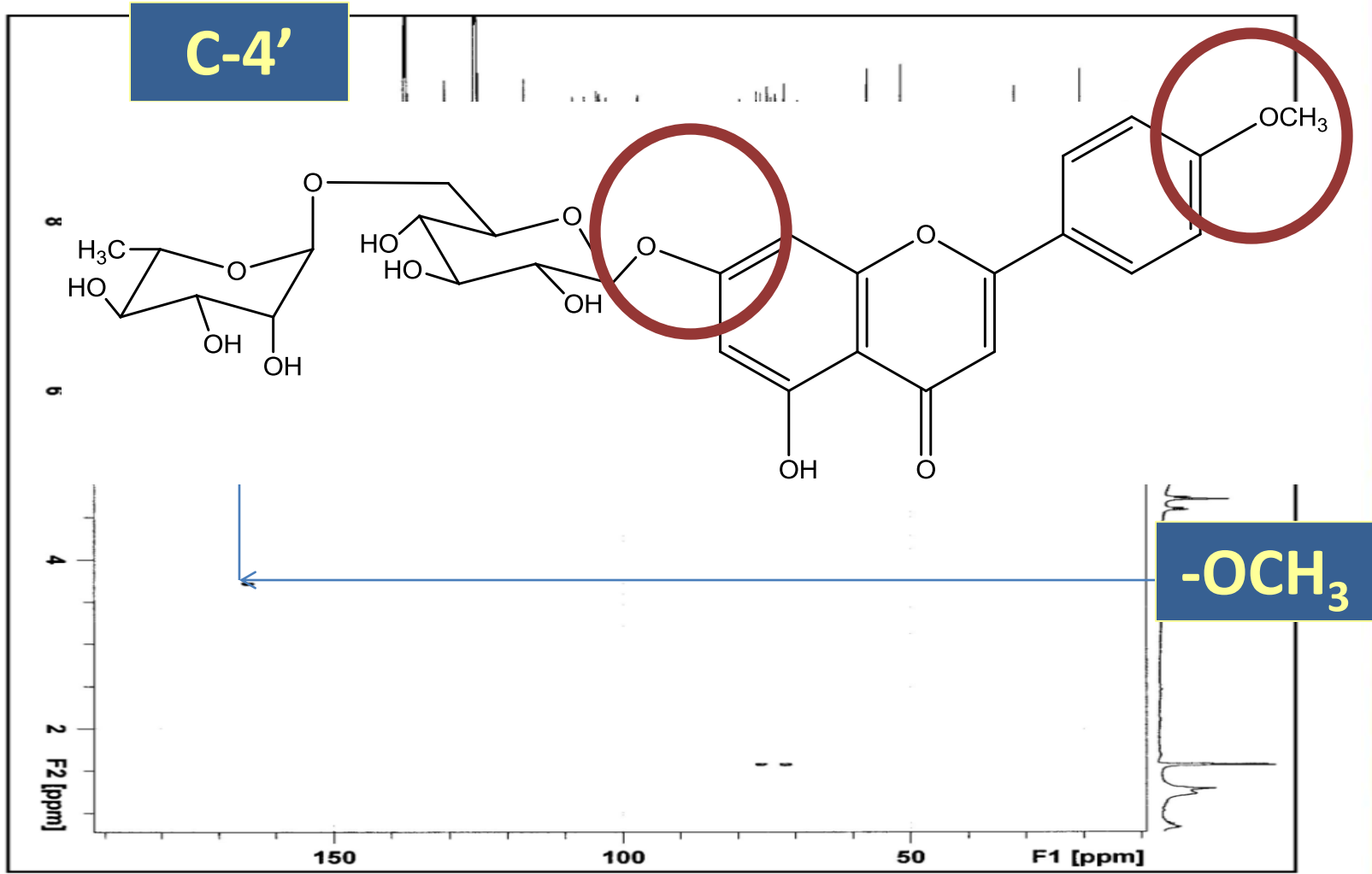
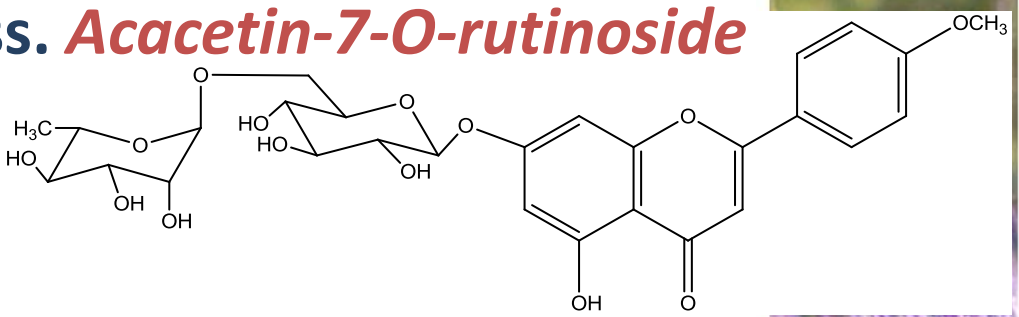


Onopordon alexandrinum Boiss. **Acacetin-7-O-rutinoside**

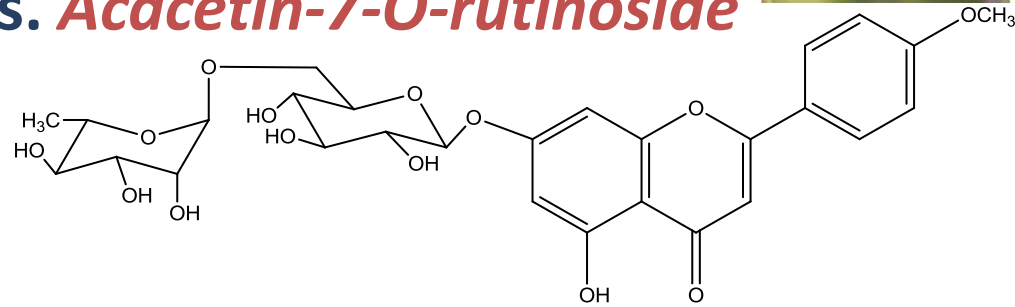


Onopordon alexandrinum Boiss. **Acacetin-7-O-rutinoside**

HMBC



Onopordon alexandrinum Boiss. **Acacetin-7-O-rutinoside**



ESIMS

peak at m/z 539

[M+H]⁺

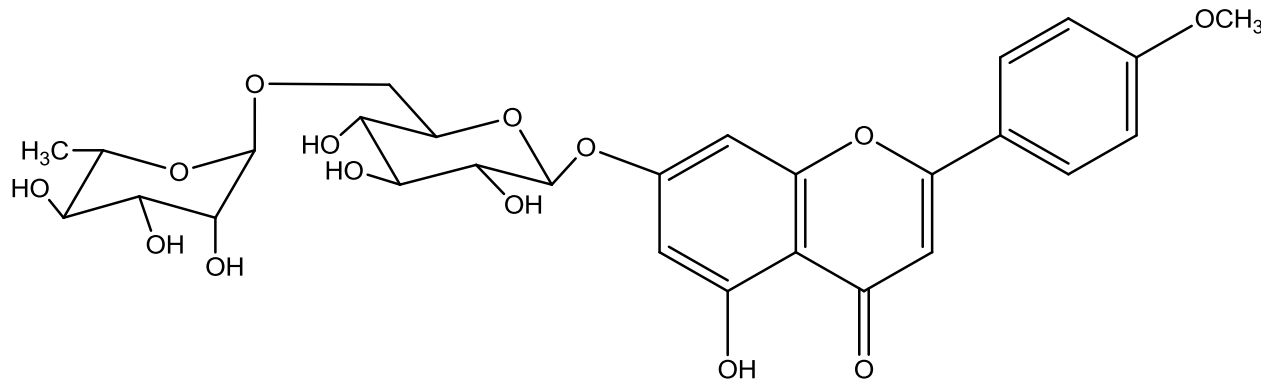
C₂₈H₃₂O₁₅



Onopordon alexandrinum Boiss. **Acacetin-7-O-rutinoside**

Compound O_3 was found to be

Acacetin-7-O-rutinoside.



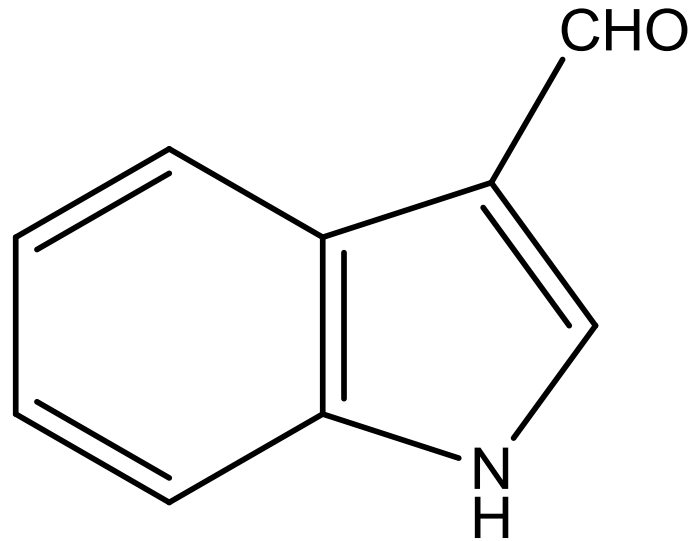
- Its structure was confirmed by comparing its spectral data with those reported in literature.
- First report for its isolation from genus *Onopordon*.



Onopordon alexandrinum Boiss. **Indole-3-Carbaldehyde**

Compound O₇ ...

Indole-3-carbaldehyde

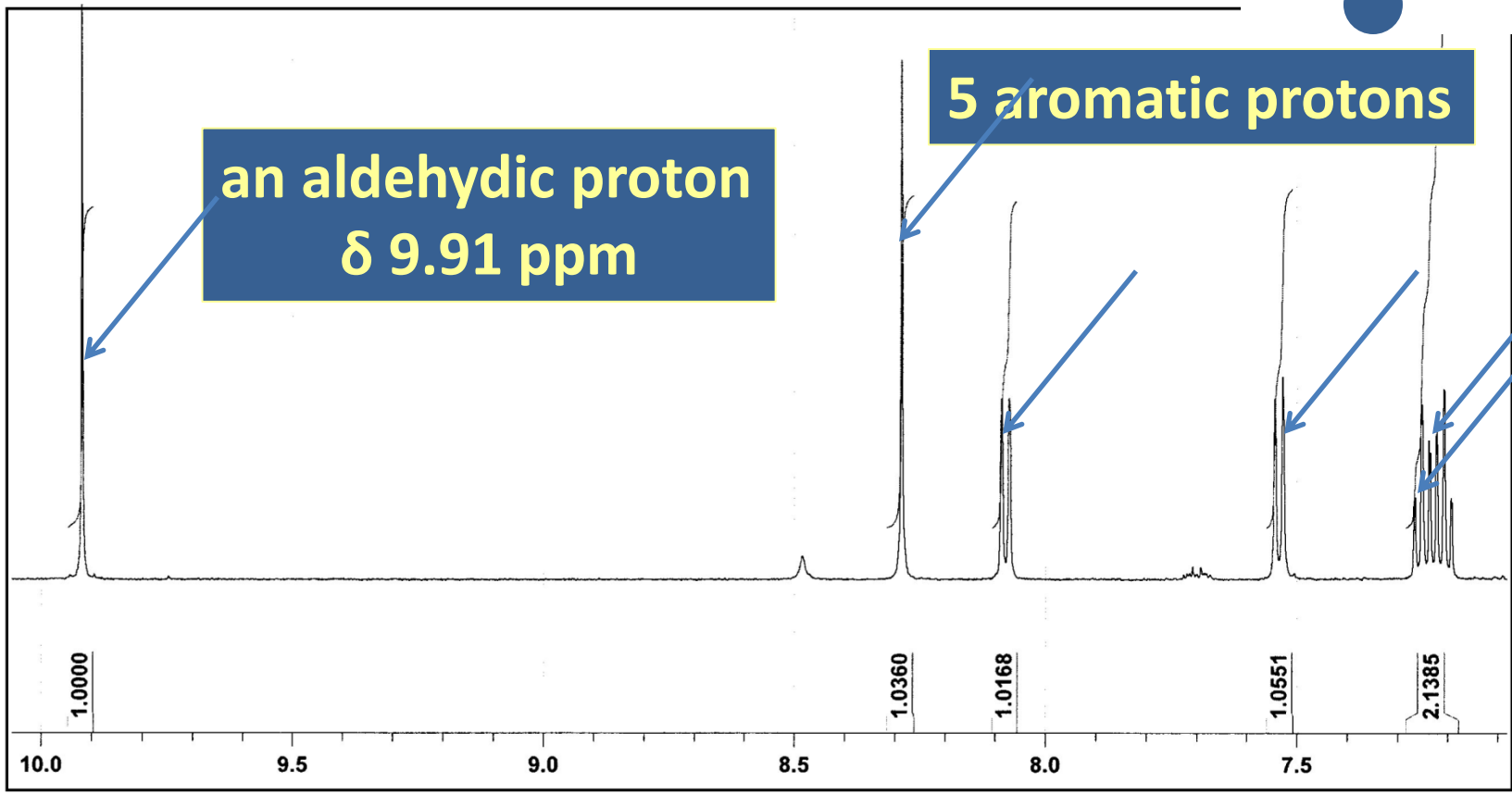
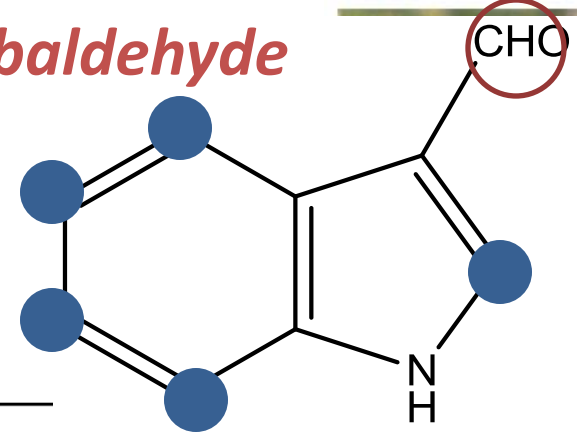


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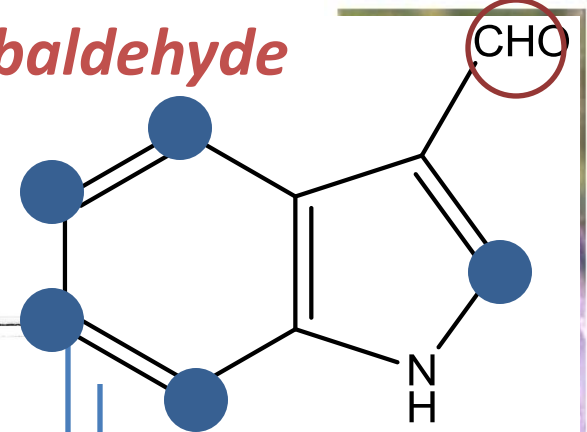
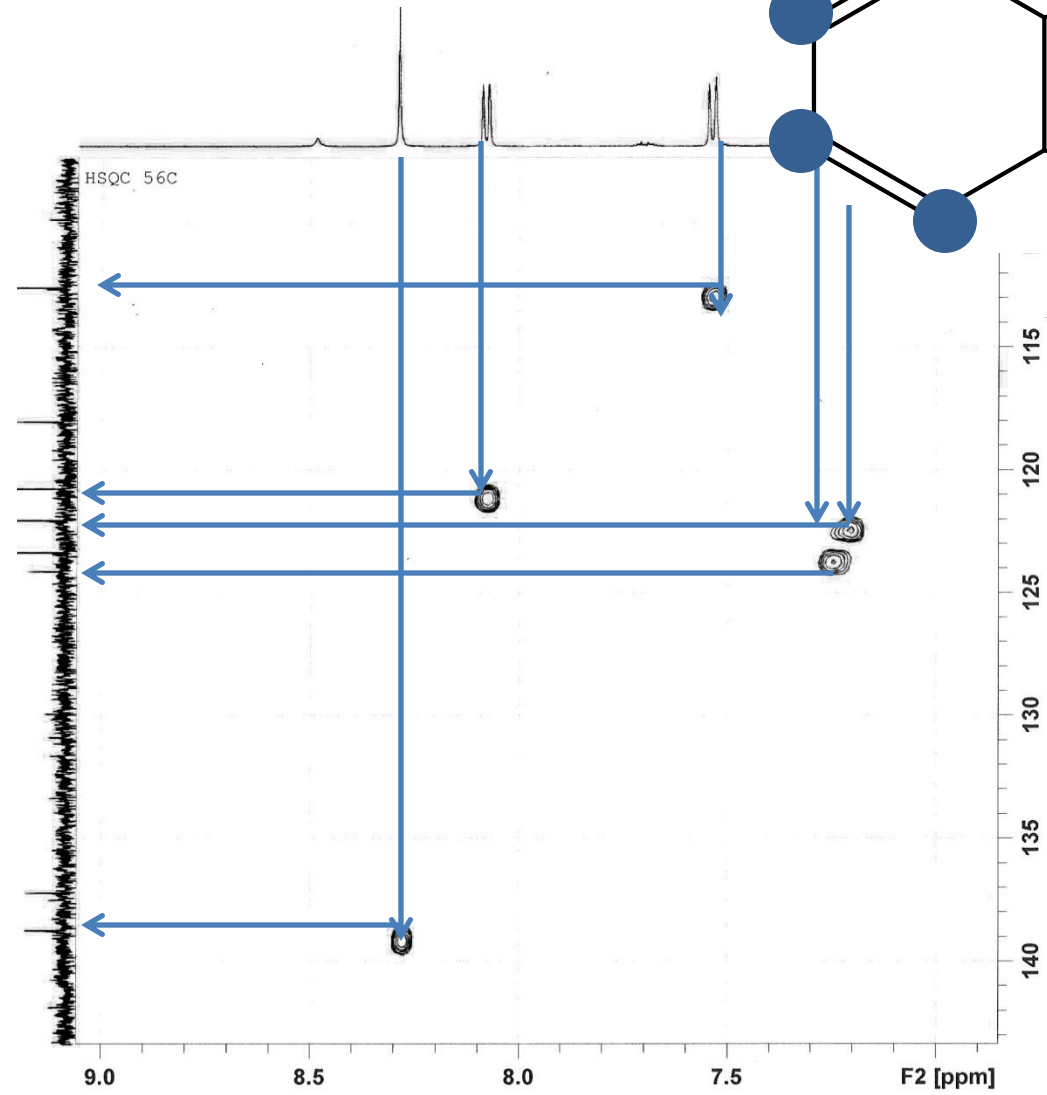
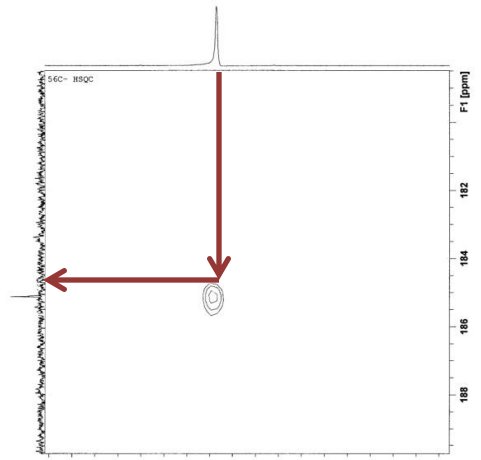
Onopordon alexandrinum Boiss. **Indole-3-Carbaldehyde**

¹H-NMR

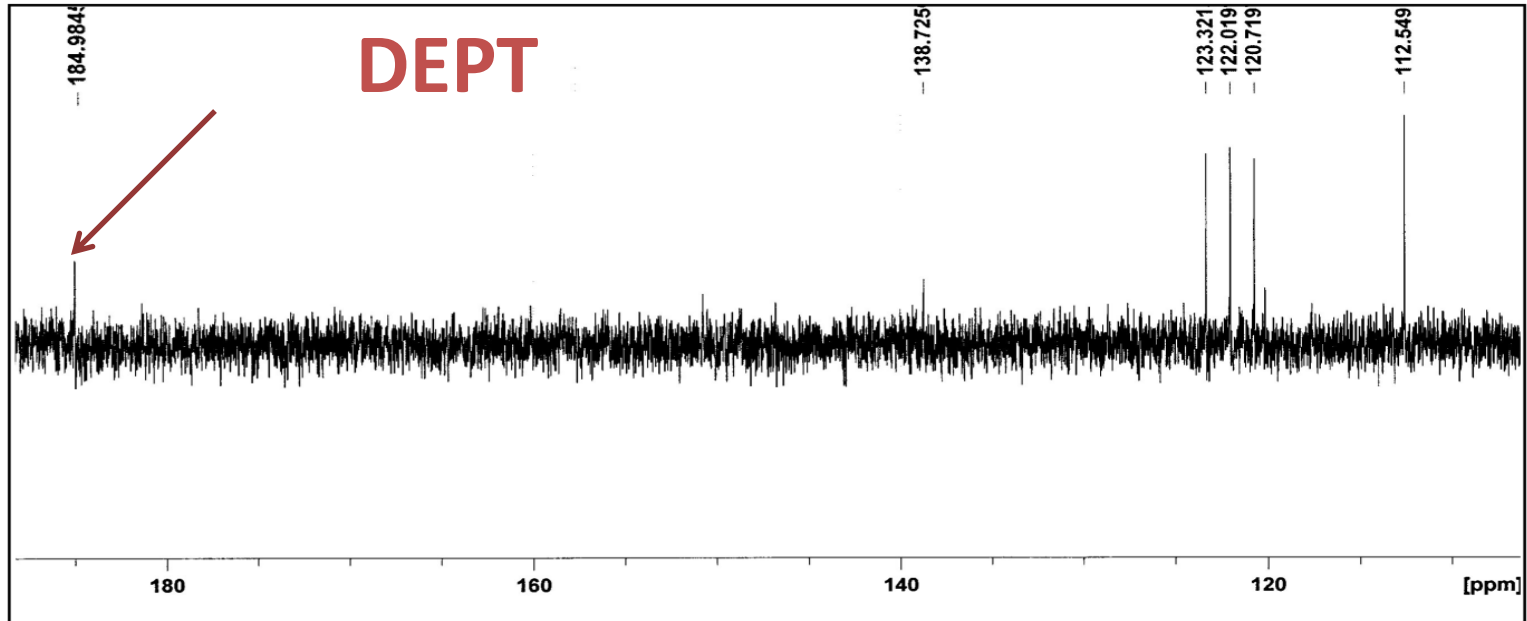
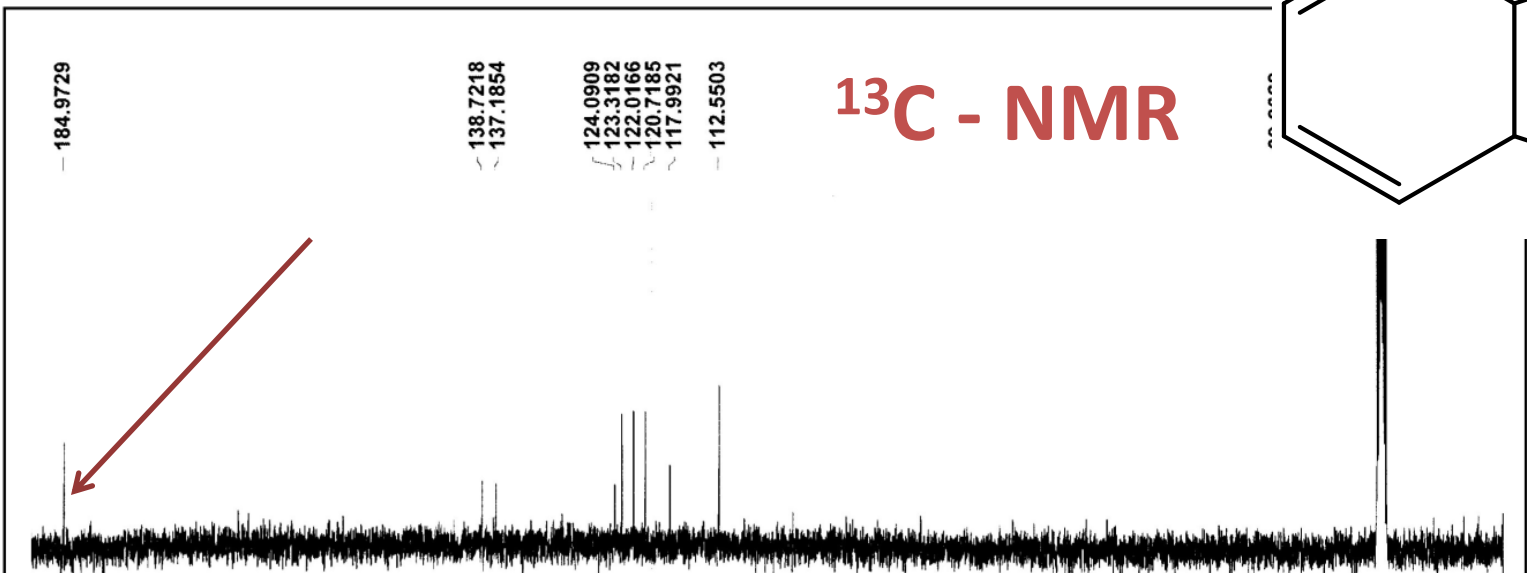
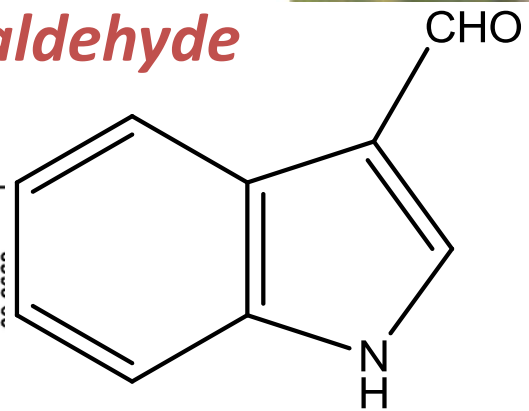


Onopordon alexandrinum Boiss. **Indole-3-Carbaldehyde**

HMQC

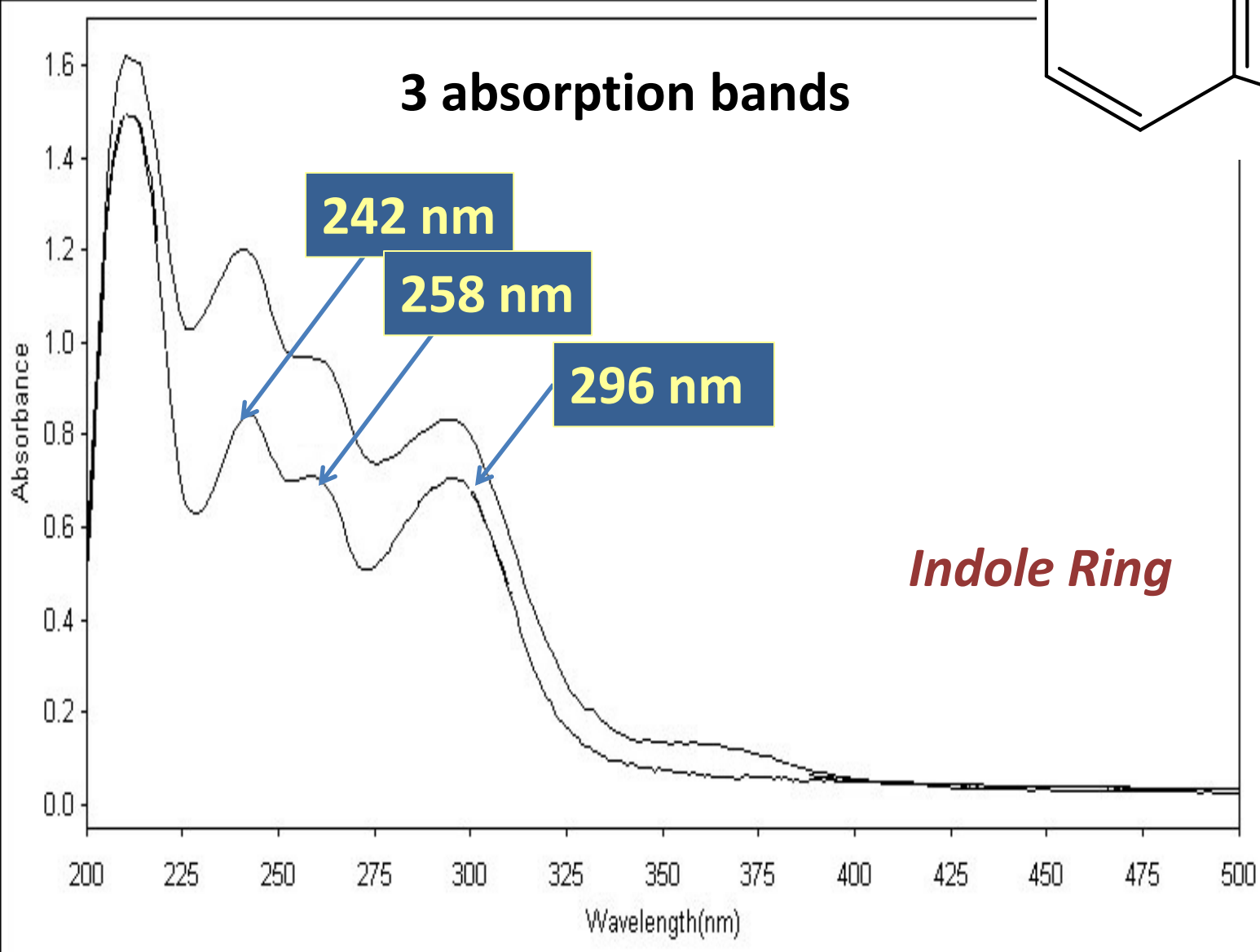
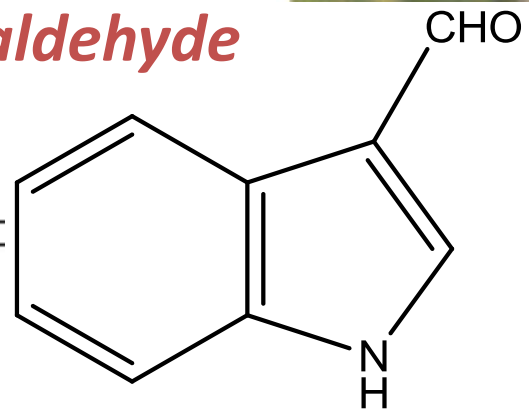


Onopordon alexandrinum Boiss. **Indole-3-Carbaldehyde**



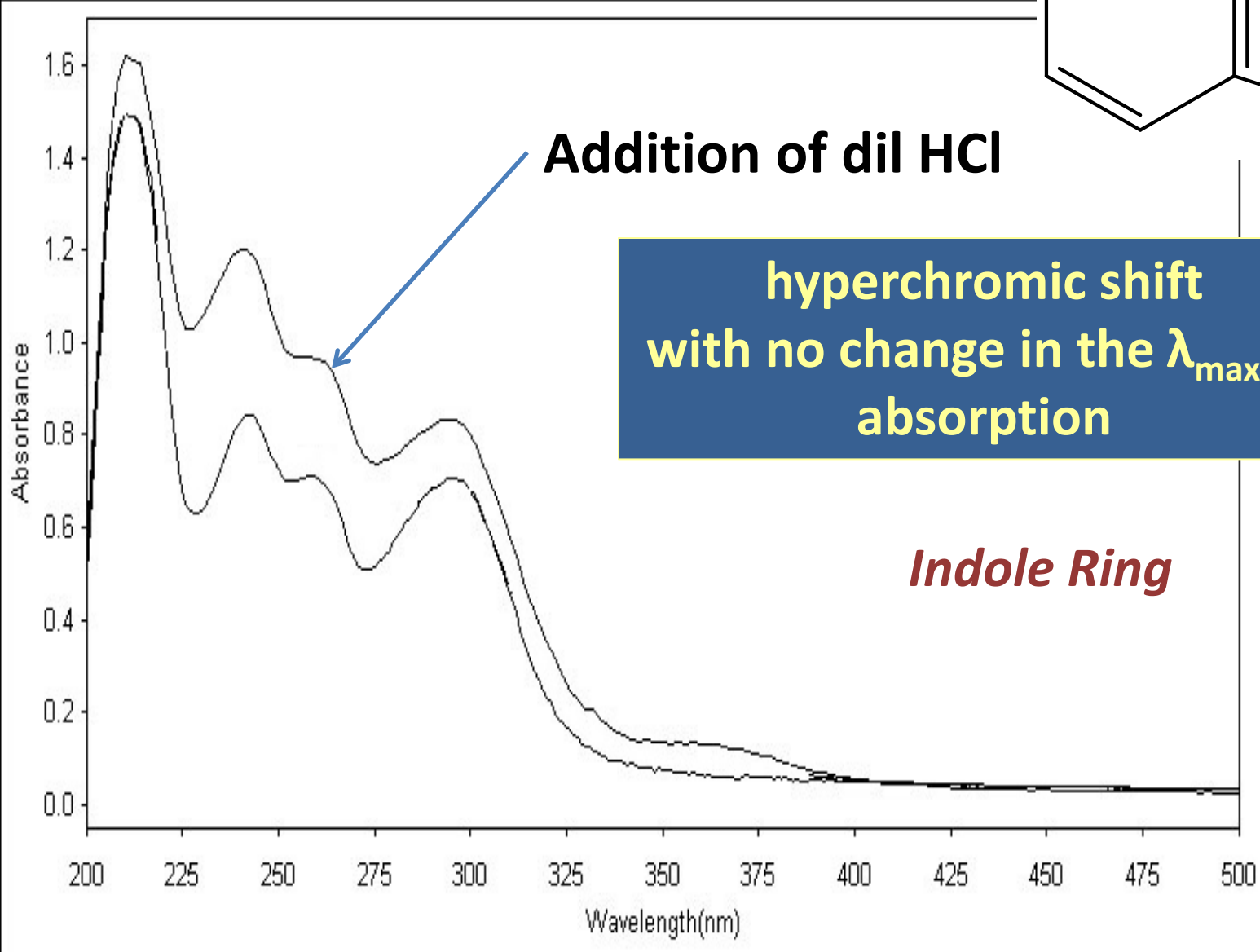
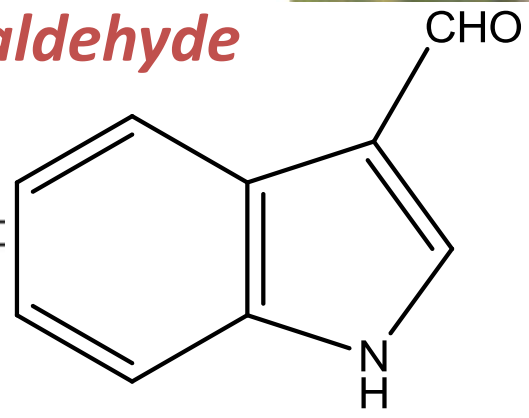
Onopordon alexandrinum Boiss. **Indole-3-Carbaldehyde**

UV compound O₇



Onopordon alexandrinum Boiss. **Indole-3-Carbaldehyde**

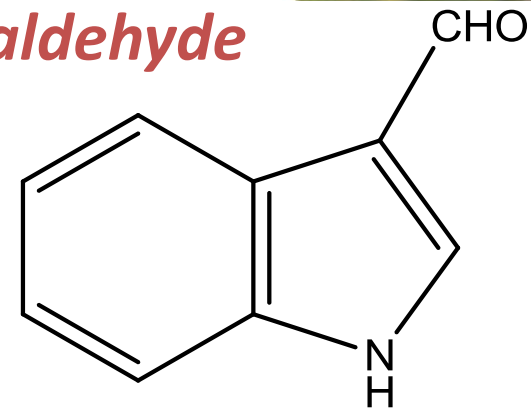
UV compound O₇



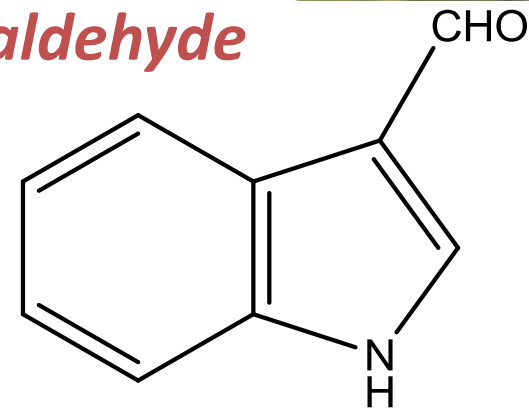
Onopordon alexandrinum Boiss. **Indole-3-Carbaldehyde**

ESIMS

- **m/z 168** $[M+Na]^+$
- **molecular formula of C_9H_7NO .**
- **The odd M^+ \longrightarrow presence of Nitrogen.**



Onopordon alexandrinum Boiss. **Indole-3-Carbaldehyde**



MS & NMR

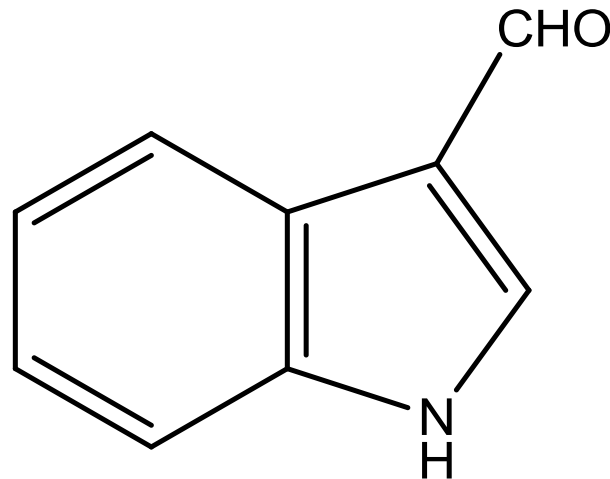
Confirmed the presence of the indole ring.



Onopordon alexandrinum Boiss. **Indole-3-Carbaldehyde**

Compound O₇

1H-indole-3-carbaldehyde



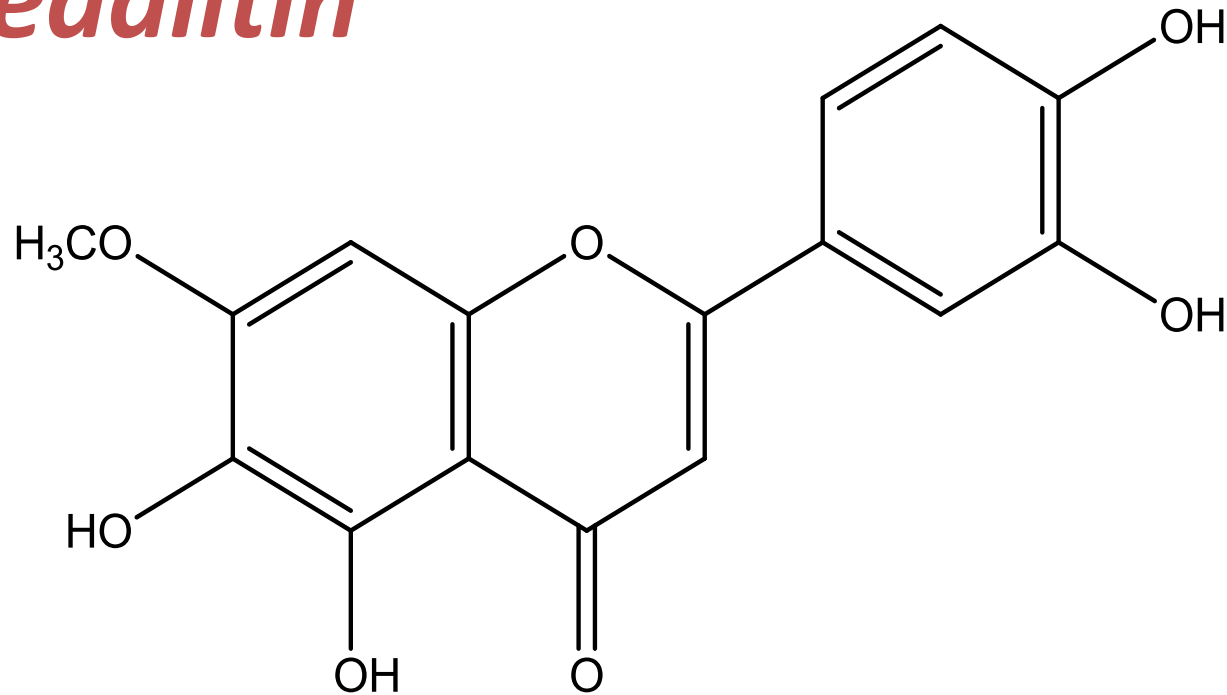
- Its structure was confirmed by comparing its spectral data with those reported in literature .
- This is the first report for the isolation of **1H-indole-3-carbaldehyde** from family **Asteraceae**.



Onopordon alexandrinum Boiss. **Pedalitin**

Compound O₉....

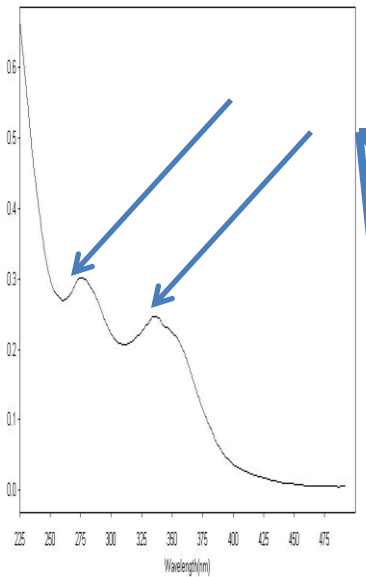
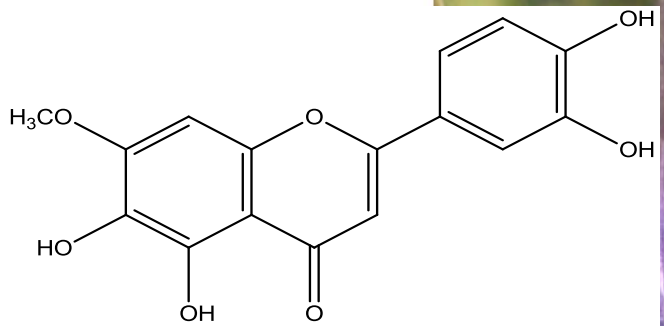
Pedalitin



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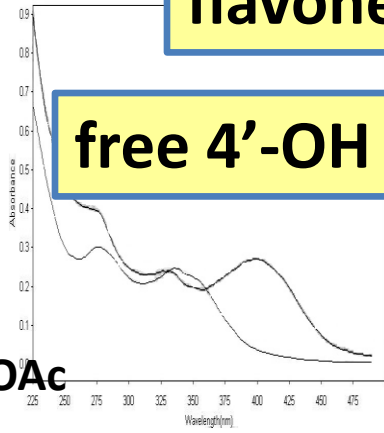
Onopordon alexandrinum Boiss. **Pedalitin**

UV MeOH → 276nm → 336 nm

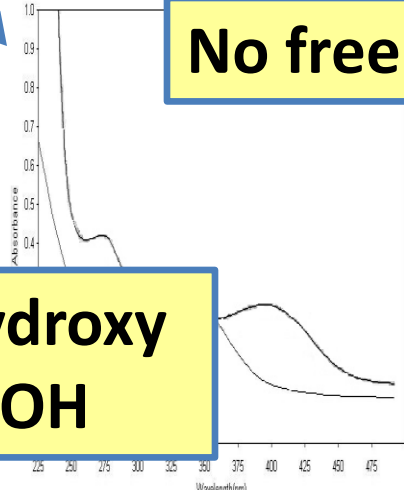


flavone

free 4'-OH

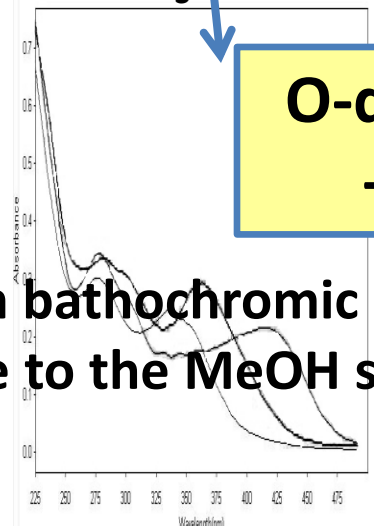


No free 7-OH



**AlCl₃
AlCl₃ / HCl**

**O-dihydroxy
+ 5-OH**



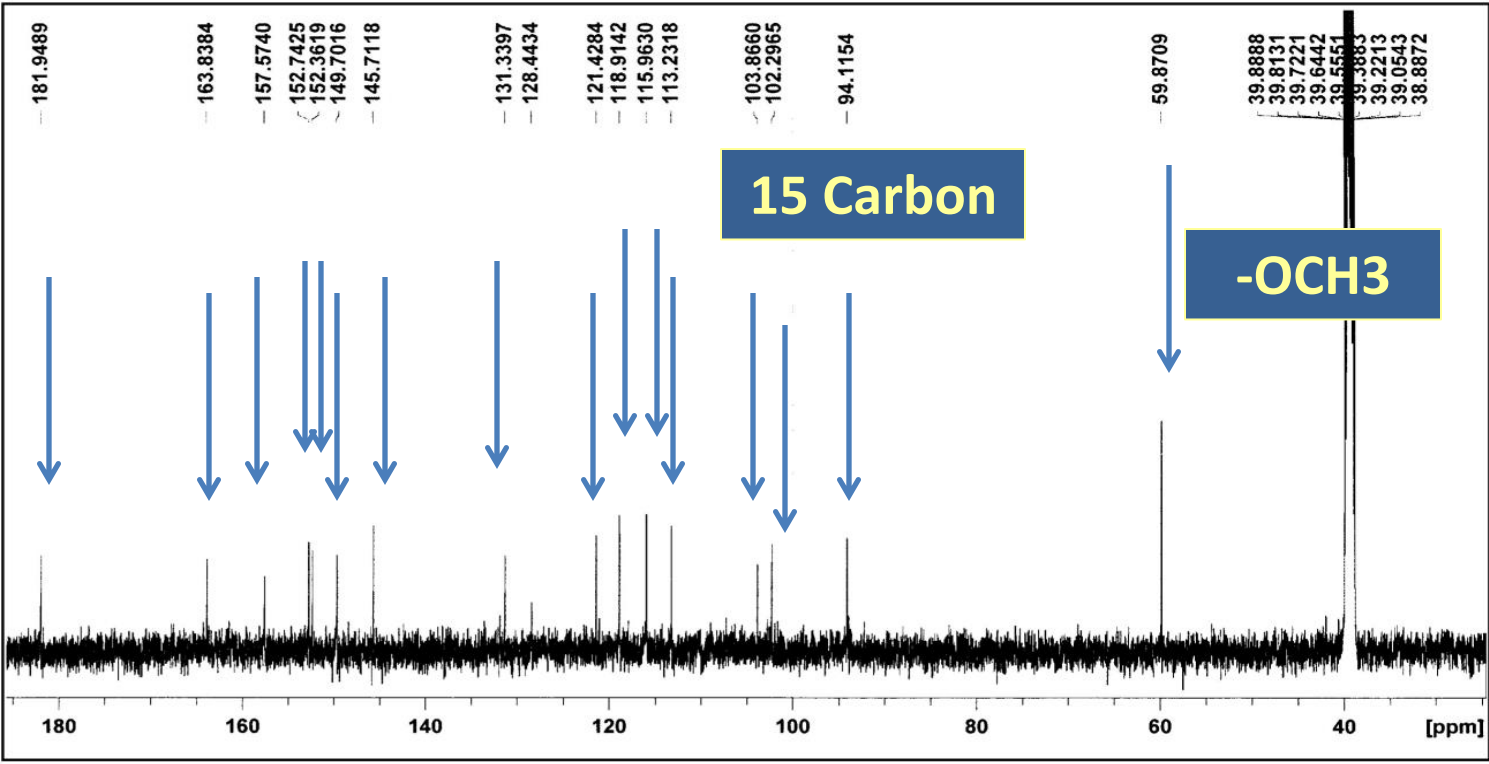
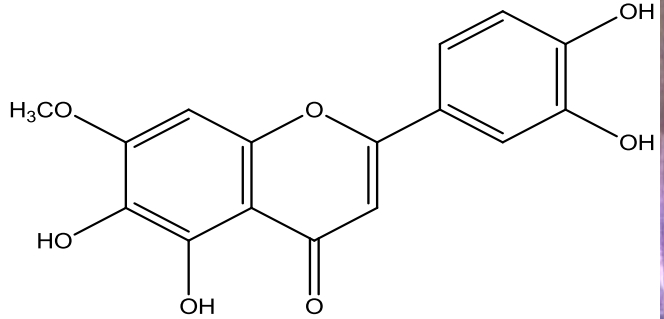
A 27 nm bathochromic shift in band I in AlCl₃ / HCl (relative to the MeOH spectrum)

Oxygenation C-6



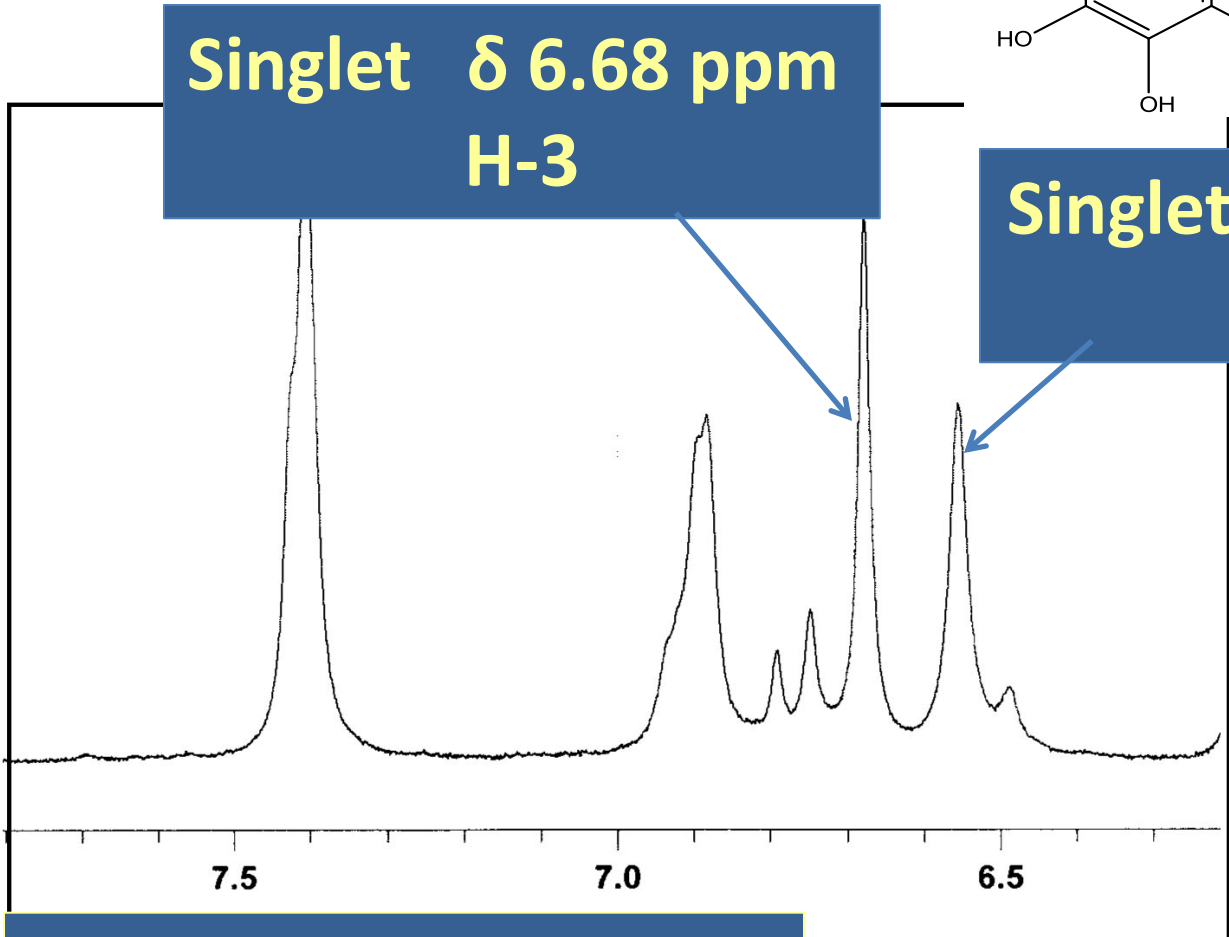
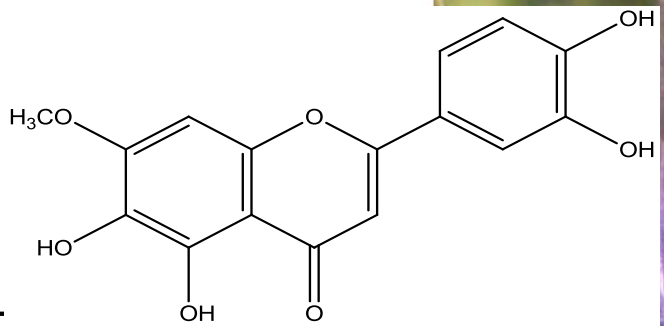
Onopordon alexandrinum Boiss. **Pedalitin**

¹³C-NMR



Onopordon alexandrinum Boiss. **Pedalitin**

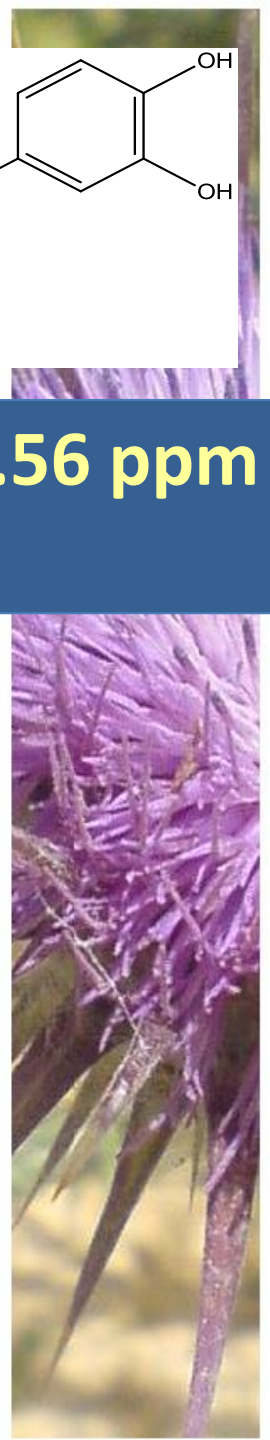
¹H-NMR



**Singlet δ 6.68 ppm
H-3**

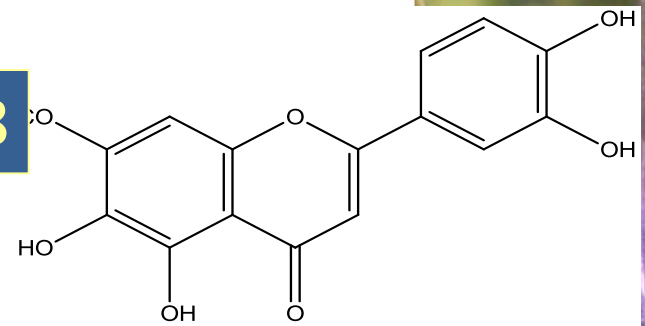
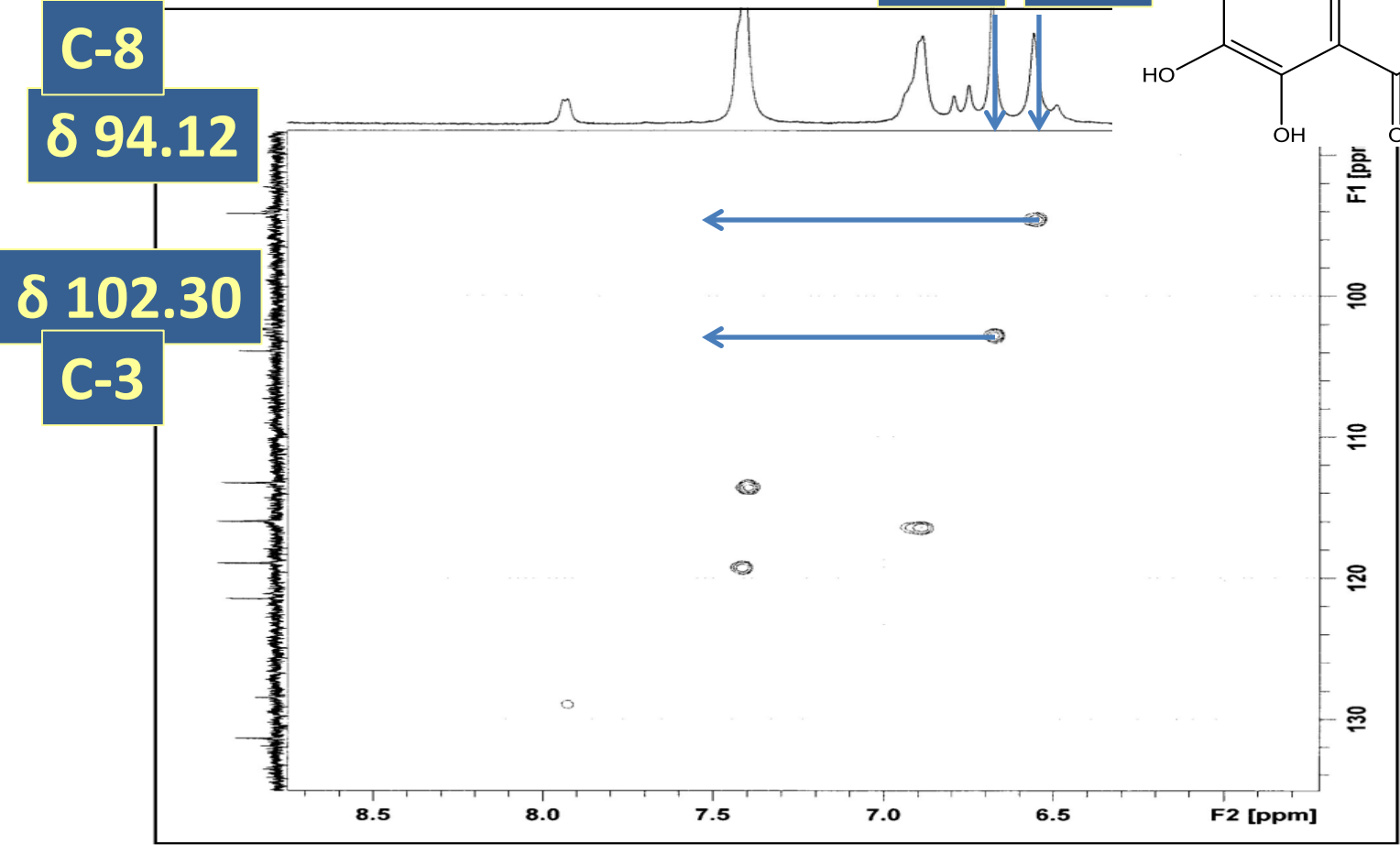
**Singlet δ 6.56 ppm
H-8**

5 aromatic protons



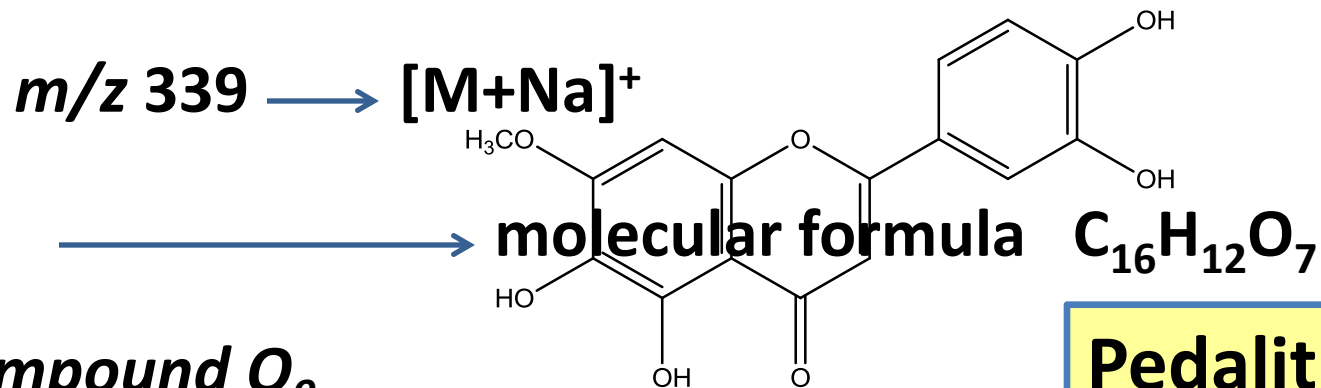
Onopordon alexandrinum Boiss. **Pedalitin**

HMQC



Onopordon alexandrinum Boiss. **Pedalitin**

ESIMS



5, 6, 3', 4'- tetrahydroxy -7- methoxy flavone

- Its structure was confirmed by comparing its spectral data with those reported in literature.
- This is the first report for the isolation of **Pedalitin** from genus *Onopordon*.



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Prof Dr. Abdalla Omar

