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Research Article

Chemical profiling of nonpolar compounds of *Onopardum acanthium* using GCMASS

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ABSTRACT

The purpose of this study is to identify the oily and non-polar compounds of *Onopardum acanthium* emerged in south of IRAQ and to prepare them for further biological and chemical study once their identity was affirmed. The extraction done using cold maceration with petroleum ether solvent. After that, the extracts send for chromatographic analysis to characterize the chemical present in the extract.

Key words: *Onopardum acanthium*, GC-MASS investigation, Petroleum ether extract, Aerial parts.

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BACKGROUND

The use of medicinal plants increase in escalating fashion due to the medical importance and the activity of secondary metabolite the plants contain. Also the high adverse effect profile of the synthetic molecule and the difficulty and cost of synthesis, all of that make the focus and research on the discovery of natural product and compounds of natural origin.[1,2] One of these plants are the *onopardum acanthium*. This plant has tremendous effect on ecological system and other plant distribution.[3] *Onopardum acanthium* grow in harsh environment, compete with other plants in growth with production of bulky amounts of seeds, and can tolerate challenges in growth and even affecting other plants growth.[4] In addition, because of that *onopardum acanthium* can produce differ and even new compounds in the new averments that's growing in.[5] There is specific phenomena called alleopathey when other organism like plant, bacteria or fungi can introduce compound, which in turn affect in the ecologic system and the growth of other organism.[6,7]

Onopardum acanthium distributed mainly in southern Europe and south Asia, but it's considered as invasive plant which grow and distributed in other area other than its original home, and even considered as risk and threatening to other plant and ecological system.[8,9] *Onopardum acanthium* considered biennial, but it can turn into annual or a short-lived perennial, reproducing almost entirely by cypselae (fruits) that it can produce up to 50,000.[10]

Onopardum acanthium cypselae can remain in the soil for long period and regrow again when the conditions improved.[11,12] Different uses of the onopardum flower extracts have been uses like their activity on the cardiovascular system, its effectiveness on the urinary system and stimulate secretion form the stomach.[13] Extracts from stem and leaves exhibit cytotoxic effect.[14] From the leaves of *onopardum acanthium* onopordopicrin has been isolated which Is a sesquaterpine compound and has approved tested activity against plasmodium falciparum and trypanosome brucie.[14] Further chemicals also identified in *onopardum acanthium* using different analytical technique in chromatography.

The aim of the present study is to identify the secondary constituents present in *onopardum acanthium*. In addition, focusing on the medically importance of each compounds so it can be analyzed and studied in further research in biology and pharmaceutical chemistry. Using petroleum ether maceration technique, the aerial parts of *onopardum acanthium*. Then using gas chromatography with mass fragmentation and library we could identify different non-polar compound and affirm their identity and searching for their current medical applications and uses.

TAXONOMY

Kingdom: Plantae

Order: asterales

Family: asteraceae

Genus: onopardum

Species: acanthium

BOTANICAL DESCRIPTION

O. *acanthium* is a robust, upright biennial to 3m tall, with oblong, spiny, cobwebby grey leaves to 30cm long, and rounded, thistle-like purple flower heads 5cm across in summer. (Figure 1)

MATERIAL AND METHODS

All the chemicals and reagents used for the research were of analytical grade.

Regarding the GC-MSMS was Agilent Gas chromatography GC.

Plant collection and identifications

Plant material were collected in MISAN/south of IRAQ in 2021 during summer season. The plant was identified and authenticated by Mr. mohanad Salim Pharmacognosy Department, of Almanara collage of medical sciences.

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Figure 1: *Onopardum acanthium* .

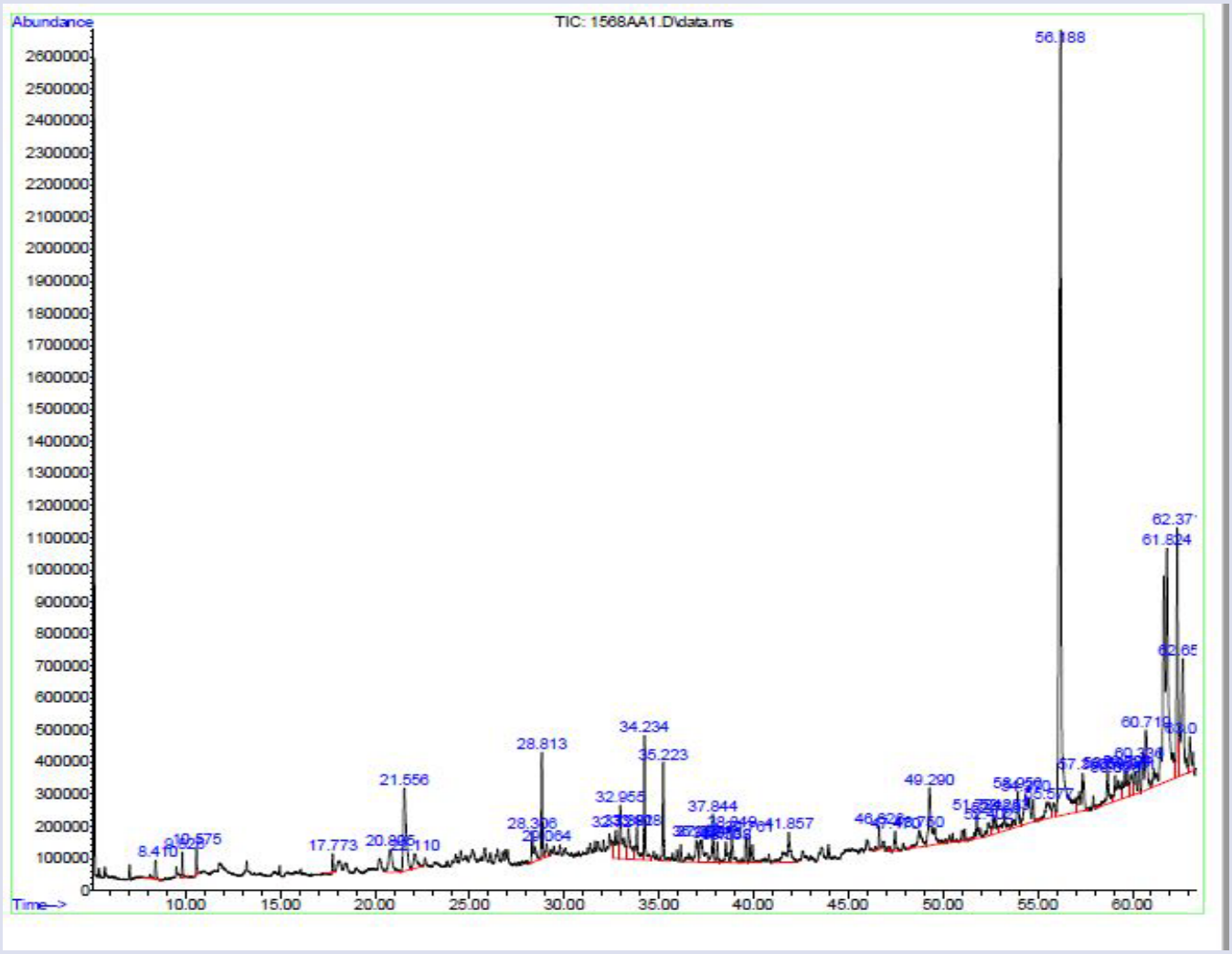

Figure 2: Shown the GC MASS retention time for each compounds.

Table 1: The identified compounds in *onopardum acanthium* using GC MASS analysis.

Peak	RT	Name	Quality
1	8.408	Cyclotrisiloxane, hexamethyl-	91
2	9.826	2-Methyl-5-methylene-2-azaspiroundecane-1,7-dione	78
3	10.574	4-(3'-Thienyl)-1,5-dihydro-2H-pyrrol-5-one	53
4	17.776	Cyclotrisiloxane, hexamethyl-	59
5	20.805	3-CYCLOHEXENE-1-METHANOL, .ALPHA	50
6	21.553	Bicyclo[3.1.1]hept-3-en-2-one, 4,6,6-trimethyl-, (1S)-	98
7	22.108	1H-Isoindole-1,3(2H)-dithione	49
8	28.303	1-Tridecene	98
9	29.063	Cyclohexasiloxane, dodecamethyl	62
10	32.721	Nonadecane	56
11	32.955	Hexadecane, 2,6,10,14-tetramethyl	55
12	33.390	BETA. BOURBONENE	43
13	33.830	3-Tetradecene, (E)-	97
14	34.236	Tetradecane	97
15	35.224	Caryophyllene	99
16	36.990	.gamma. 1-cadinene	95
17	37.225	Octasiloxane, 1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15-hexadecamethyl-	74
18	37.842	.gamma.-Muurolene	99
19	38.076	Benzene, 1-(1,5-dimethyl-4-hexenyl)-4-methyl-	99
20	38.539	Naphthalene, 1,2,3,4,4a,5,6,8a-octahydro-4a,8-dimethyl-2-(1-methylethenyl)-, [2R-(2.alpha.,4a.alpha.,8a.beta.)]-	98
21	38.848	pentadecane	95
22	39.762	.delta.-Cadinene	99
23	41.860	Dodecanoic acid	97
24	46.626	Ethyl tridecanoate	91
25	47.472	2-ISOPROPYL-1,3-DIMETHYLCYCLOPENTAEN	50
26	48.752	Oleic Acid	25
27	49.290	Tetradecanoic acid	99
28	51.782	Neophytadiene	90
29	52.399	1-Hexadecene	41
30	52.765	Heptadecanolide	84
31	53.250	Oleic Acid	91
32	53.953	Tetradecane	74
33	54.371	Eicosane	95
34	55.577	n-Hexadecanoic acid	91
35	56.188	n-Hexadecanoic acid	99
36	57.388	Thiophene, 2-propyl-	52
37	58.697	9-Octadecenoic acid (Z)-	55
38	59.097	EICOSAMETHYLCYCLODECASILOXANE	45
39	59.703	Nonadecane	93
40	59.960	Cyclohexadecane	87
41	60.337	6-Octadecenoic acid, (Z)-	90
42	60.720	etracosamethyl-cyclododecasiloxan	58
43	61.823	Oleic Acid	99
44	62.372	1-Heptadecanecarboxylic acid	99
45	62.658	Eicosane	95
46	63.041	Decyl oleate	45

Preparation of plant material

Plant parts were air-dried at room temperature and milled into powder for extraction. The powder (150 g) was extracted in 100%petrolium ether using cold maceration and repeated three times each one for 72 hours. The resultant extract was concentrated using a rotary evaporator to get rid of petroleum ether an oily viscous final extract.

Gas chromatography-mass spectrometry (GC-MS) analysis

GC-MS analysis were carried out as shown below

Agilent 190915-433UI

Hp-5ms Ultra Inert

In Front SSZ Inlet He

Out MSD

Initial 60 c

Pressure 7.037 psi

Flow 0.9ml/min

Average Velocity 34772 cm/sec

Holdup time 1.4379 min

RESULT AND DISCUSSION

The following compounds were identified in oily petroleum ether extracts using GC MASS supplied with library as shown in the table and diagram. (Table 1 and Figure 2)

CONCLUSION

The preliminary analysis and the GC-MSMS reveled the existence of many chemicals that is potentially of medicinal values as shown in the previous tables.

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