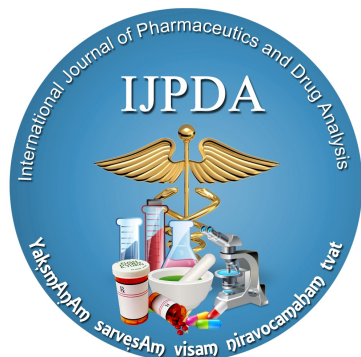


Analysis of oil composition of the chloroform extract of *Coriandrum sativum* Linn fruit by soxhlation and maceration technique.

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Abstract:

Coriandrum sativum Linn [Family Apiceae] is a medicinal herb used in the treatment of various disease and disorders. The present investigation was carried out to determine the change in the oil composition of the chloroform extract of *C. sativum* fruits by two different method of extraction Viz., Soxhlation and maceration using GC-MS technique. The analysis revealed that by Soxhlation method, a total of 29 compounds were obtained with major constituents as E-2-decenol [15.25 %], dodecanoic acid [10.28 %], tetradecenol [9.96 %], E-2- dodecanol [9.74 %], undecane[7.23 %] and undecane [4.36 %] whereas maceration method yielded 18 compounds with major constituents as tetradecanal[23.44 %], n-octadecanol[19.66 %], tetradecenol [4.66 %], dodecanoic acid [3.08 %], -2-tridecenal [3.70 %] and undecanal [3.18 %]. The analysis concludes that soxhlation method is better than maceration technique.

Keywords: *Coriandrum sativum*; GC-MS analysis, Soxhlation, maceration.

Introduction

Coriander [*Coriandrum sativum* Linn.] an annual of the Apiaceae family is one of valuable medicinal and seasoning plant. This species comes from the Mediterranean region and it is grown all over the world. The coriander fruit and essential oil isolated from it are used for medicinal purpose. It is used to treat menstrual disorder, secondary infertility, ovaritis and cervicitis. It is used to treat female diseases such as menoxenia, ovulation type dysfunctional uterine bleeding¹. It is aphrodisiac to enhance sexual function and reproductive capacity. It is used for treating leucorrhea; spermatorrhea. Coriander fruit possess stimulant and carminative properties². Its oil is

bactericidal and larvicidal³. It is hypoglycemic and anti-inflammatory⁴.

The fruits are used as astringent, anthelmintic, emollient, stomachic, antibilious, digestive, appetizer, constipating, diuretic, antipyretic, refrigerant, tonic, expectorant, anodyne, antidiabetic and dyspepsia⁵. It is reported that coriander oil contains linalool and 20% hydrocarbons which differ from the seed oil⁶. Therefore present aim is to determine the change in the oil composition of the chloroform extract of *C. sativum* fruits by two different method of extraction Viz., Soxhlation and maceration using GC-MS technique.

Material and methods

Plant material and extraction procedure

Coriandrum sativum fruits were collected from local market in Bangalore, Karnataka, India and it was identified and authenticated by Botanist, Natural Remedies Pvt Ltd., Bangalore. The fruits were dried in shade and powdered coarsely. 350 g of powdered fruits were macerated with petroleum ether followed by benzene and chloroform for 24 hrs and filtered and concentrated in Rota evaporator and dried. Similarly 350 g of fruits were packed in the soxhlet apparatus and extracted with petroleum ether followed by benzene and chloroform for 18 hours. The petroleum ether, benzene and chloroform extracts were concentrated by rotaevaporator and dried. The percentage yield of petroleum ether, benzene and chloroform extracts were found to be 4.35, 3.97, 3.58 and 10.35, 2.36, 1.10 % w/w respectively with respect to air dried plant material.

Gas Chromatography-mass Spectrum Analysis [GC-MS]

GC-MS technique was used in this study to identify the components present in the extract which was carried out at Indian Institute of Science, Bangalore. GC-MS analysis was performed using GC Thermo scientific, Trace GC ultra and gas chromatograph interfaced to a Mass spectrometer DSQII equipped with Zebron ZB 5 ms capillary column [Length : 30 m, diameter:0.25 mm, film thickness:0.25 µm. For GC-MS detection, an electron ionization energy system with ionization energy of 70eV and Quadrapole as analyzer was used. Helium gas [99.99%] was used as the carrier gas at a constant flow rate of 1 ml/min and an injection volume of 1 µl was employed [split ratio: 10]. The oven temperature was programmed from 40 °C [isothermal for 2 min], with an increase at the rate of 10 °C/min to 300 °C for 5 min. Mass spectra were taken at 70eV; a scan interval of 5 min with scan range of 30-600 m/z. Total GC running time was 60 min. The relative percentage amount of each component was calculated by comparing its average peak area to the total areas. The spectrum of unknown component was compared with spectrum of the known compound stored in the software library [Xcaliber and AMDIS]. The name, retention time and % area of the component of the test material was ascertained with the data given in the AMDIS library.

Result and Discussion

The Fig no 1 and 2 gives the GC-MS spectrum of oil obtained from chloroform extract of *Coriandrum sativum* by soxhletion and maceration respectively. It can be seen from Table No: 1 that total of 29 compounds were obtained with major constituents as E-2-decenol [15.25 %], dodecanoic acid [10.28 %], tetradecenol [9.96 %], E-2- dodecanol [9.74 %], undecane [7.23 %] and undecane [4.36 %] whereas maceration method [Table No:2] yielded 18 compounds with major constituents as

tetradecanal [23.44 %], n-octadecanol [19.66 %], tetradecenol [4.66 %], dodecanoic acid [3.08 %], -2-tridecenal [3.70 %] and undecanal [3.18 %].

Conclusion

The result of this work suggests that the chloroform extract of *Coriandrum sativum* has number of components which can act as a drug for various diseases. The analysis revealed that by Soxhletion method, a total of 29 compounds were obtained with major constituents as E-2-decenol [15.25 %], dodecanoic acid [10.28 %], tetradecenol [9.96 %], E-2- dodecanol [9.74 %], undecane [7.23 %] and undecane [4.36 %] whereas maceration method yielded 18 compounds with major constituents as tetradecanal [23.44 %], n-octadecanol [19.66 %], tetradecenol [4.66 %], dodecanoic acid [3.08 %], -2-tridecenal [3.70 %] and undecanal [3.18 %]. The analysis concludes that soxhletion method is better than maceration technique. Further in future, these components can be isolated and pharmacological activity may be studied to ascertain the traditional use.

Acknowledgement

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Ethical Issues

There is none to be applied

Conflict of Interest

None to be declared

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Fig No.1: GC-MS of oil obtained from chloroform extract of *Coriandrum sativum* by soxhlation

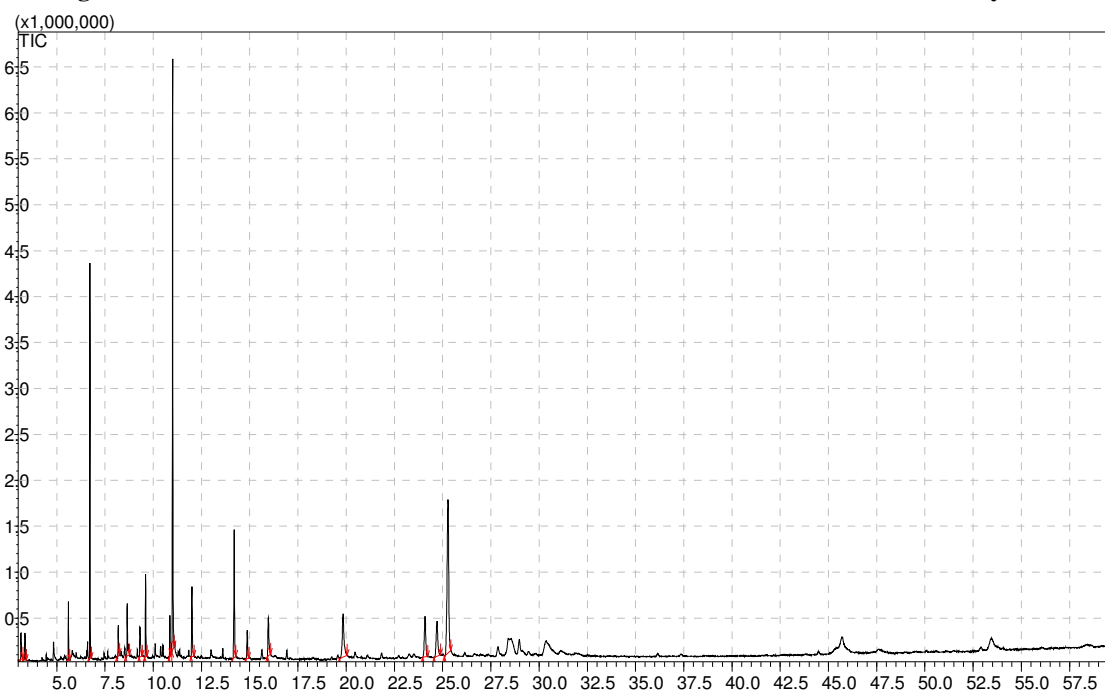


Fig No.2: GC-MS of oil obtained from chloroform extract of *Coriandrum sativum* by maceration

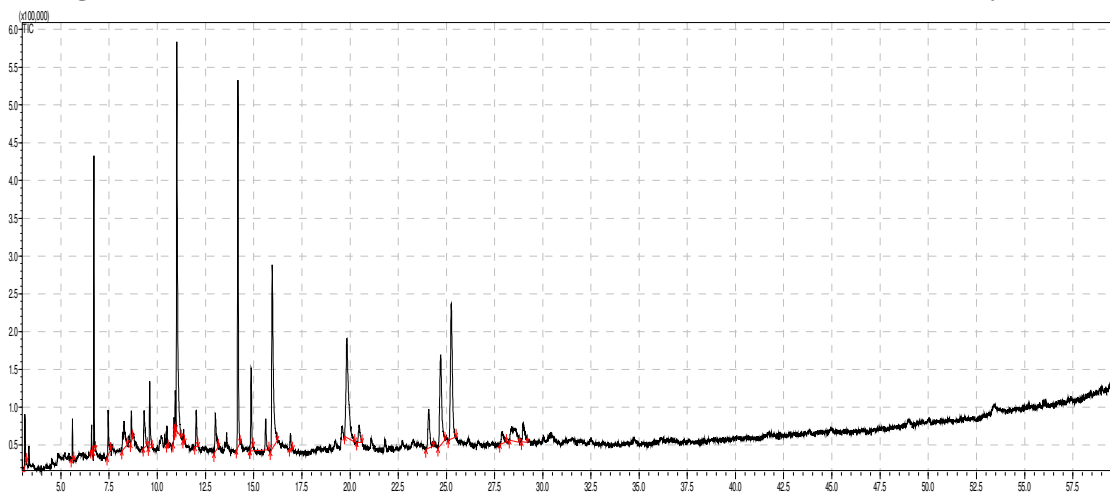


Table no.1: Chemical composition of oil obtained from chloroform extract of *Coriandrum sativum* by soxhlation

Peak#	Compound	R.Time	I.Time	F.Time	Area	Area%
1	Heptanal	3.129	3.080	3.215	141146	1.13
2	Decane	5.594	5.535	5.660	80595	0.65
3	1-decanol	6.589	6.540	6.645	55768	0.45
4	Undecane	6.709	6.665	6.790	544382	4.36
5	n.i	7.450	7.385	7.575	161641	1.30
6	Undecanal	8.271	8.150	8.435	252249	2.02
7	Dodecanal	8.655	8.610	8.720	92089	0.74
8	Nonanal	9.312	9.265	9.485	232153	1.86
9	Undecanol	9.606	9.535	9.730	265180	2.12
10	n.i	10.498	10.470	10.555	53940	0.43
11	E-2 decenal	10.870	10.820	10.895	44149	0.35
12	Decane	10.932	10.895	10.960	89532	0.72
13	E-2-decenol	11.013	10.970	11.240	1903123	15.25
14	Decanal	11.357	11.320	11.410	35961	0.29
15	n.i	12.018	11.945	12.115	173063	1.39
16	n.i	13.012	12.935	13.170	262050	2.10
17	n.i	14.181	14.100	14.290	1368078	10.96
18	n.i	14.865	14.790	14.965	349737	2.80
19	n.i	14.865	14.790	15.790	483007	3.87
20	Dodecanoic acid	15.964	15.865	16.220	1282990	10.28
21	Heptadecane	16.905	16.860	17.025	69053	0.55
22	E-2-Dodecanol	19.833	19.715	20.245	1214856	9.74
23	n.i	20.470	20.340	20.625	136687	1.10
24	Tetradecenal	24.091	23.935	24.335	338309	2.71
25	Undecane	24.698	24.560	24.930	902413	7.23
26	Tetradecenol	25.249	25.090	25.500	1242453	9.96
27	1-Decanol	27.914	27.770	28.110	134628	1.08
28	n.i	28.386	28.265	28.790	356617	2.86
29	n-Octanal	28.985	28.900	29.205	213377	1.71
					12479226	100.00

Table no.2: Chemical composition of oil obtained from chloroform extract of *Coriandrum sativum* by Maceration

Peak#	Compound	R.Time	I.Time	F.Time	Area	Area%
1	n-Octanal	3.138	3.070	3.245	607483	1.23
2	Decane	3.347	3.245	3.420	382438	0.77
3	Undecane	5.601	5.535	5.665	859029	1.74
4	n.i	6.716	6.640	6.800	5710293	11.57
5	E-2- Decenal	8.182	8.105	8.250	603244	1.22
6	Pentadecanol	8.649	8.565	8.770	1201861	2.44
7	1-Dodecenol	9.307	9.265	9.435	1012505	2.05
8	Undecanal	9.602	9.555	9.685	1567958	3.18
9	Undecanol	10.863	10.820	10.895	750862	1.52
10	Tetradecanal	11.005	10.960	11.085	11568969	23.44
11	E-2- Tridecenal	12.006	11.960	12.120	1826246	3.70
12	n.i	14.193	14.090	14.280	3598850	7.29
13	n.i	14.871	14.785	14.960	885955	1.80
14	Dodecanoic acid	15.966	15.915	16.075	1517947	3.08
15	n.i	19.842	19.645	20.050	2928805	5.93
16	n.i	24.085	23.965	24.225	2328108	4.72
17	Tetradecenol	24.710	24.555	24.890	2299608	4.66
18	n- Octadecanol	25.276	25.095	25.425	9705616	19.66
					49355777	100.00