

## ANALYSIS OF OIL COMPOSITION OF THE METHANOL EXTRACT OF *CORIANDRUM SATIVUM* LINN FRUIT BY SOXHULATION TECHNIQUE

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### ABSTRACT

*Coriandrum sativum* Linn [Family Apiaceae] is a medicinal herb used in the treatment of various disease and disorders. The present investigation was carried out to determine the constituents present in the oil composition of the methanol extract of *C. sativum* fruits by Soxhlation using GC-MS technique. The analysis revealed that by Soxhlation method, a total of 21 compounds were obtained with major constituents as Adenosine [25.08 %]. The other constituents were found to be heptanal [16.63 %], nonane [7.90 %], hexadecanoic acid [3.48 %], pyranone [3.46 %], Heptanoic acid [3.29 %], dodecyl ether [2.99 %] and Pentanone [2.51 %].

**Keywords:** *Coriandrum sativum*, GC-MS analysis, Soxhlation, Methanol extract.

### 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 bleeding<sup>1</sup>. It is aphrodisiac to enhance sexual function and reproductive capacity. It is used for treating leucorrhoea; spermatorrhea. Coriander fruit possess stimulant and carminative properties<sup>2</sup>. Its oil is bactericidal and larvacidal<sup>3</sup>. It is hypoglycemic and anti-inflammatory<sup>4</sup>. The fruits are used as astringent, anthelmintic, emollient, stomachic, antibilious, digestive, appetizer, constipating, diuretic, antipyretic, refrigerant, tonic, expectorant, anodyne, antidiabetic and dyspepsia<sup>5</sup>. It is reported that coriander oil contains linalool and 20% hydrocarbons which differ from the seed oil<sup>6</sup>. The oil composition of fruit of *C. sativum* by soxhlation technique and maceration by petroleum ether and benzene extract were determined[7,8]. Therefore present aim is to determine the constituents present in the oil composition of the methanol extract of *C. sativum* fruits by Soxhlation using GC-MS technique.

### MATERIALS 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 fruits were packed in the soxhlet apparatus and extracted with petroleum ether followed by benzene, chloroform and methanol for 18 hours. The petroleum ether, benzene, chloroform and methanol extracts were concentrated by rotaevaporator and dried. The percentage yield of

petroleum ether, benzene, chloroform and methanol extracts were found to be 10.35, 2.36, 1.10 and 7.68 % 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 Zebtron ZB 5 ms capillary column [Length: 30 m, diameter: 0.25 mm, film thickness: 0.25  $\mu$ m]. 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  $\mu$ l was employed [split ratio: 10]. The oven temperature was programmed from 40<sup>o</sup> C [isothermal for 2 min], with an increase at the rate of 10<sup>o</sup> C/min to 300<sup>o</sup> 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.

#### RESULTS AND DISCUSSION

The Fig no 1 gives the GC-MS spectrum of oil obtained from methanol extract of *Coriandrum sativum* by soxhlation. It can be seen from Table No: 1 that total of 21 compounds was obtained with major constituents as Adenosine [25.08 %]. The other constituents were found to be heptanal [16.63 %], nonane [7.90 %], hexadecanoic acid [3.48 %], pyranone [3.46 %], Heptanoic acid [3.29 %], dodecyl ether [2.99 %] and Pentanone [2.51 %].

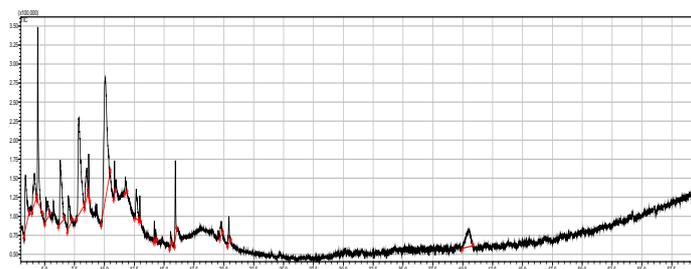


Fig. 1: GC-MS of oil obtained from methanol extract of *Coriandrum sativum* by soxhlation

Table 1: Chemical composition of oil obtained from methanol extract of *Coriandrum sativum* by soxhlation

Peak#	Compound	R. Time	I. Time	F. Time	Area	Area%
1	n. i	3.392	3.250	3.690	743012	6.32
2	n. i	4.145	3.930	4.335	496132	4.22
3	n. i	4.417	4.350	4.855	1156273	9.83
4	Pentanone	5.120	5.015	5.435	295301	2.51
5	Nonane	6.303	6.160	6.615	928557	7.90
6	Pyranone	6.985	6.900	7.275	407442	3.46
7	Heptanal	7.868	7.655	8.300	1956176	16.63
8	Heptanoic acid	8.520	8.335	8.615	386456	3.29
9	Limonene	8.684	8.640	8.775	187177	1.59
10	Adenosine	10.085	9.725	10.480	2949424	25.08
11	n. i	10.854	10.790	10.905	114013	0.97
12	Dodecane	11.763	11.695	11.890	112482	0.96
13	Dodecyl ether	12.658	12.545	12.915	351894	2.99
14	Dodecanoic acid	12.970	12.905	13.040	90165	0.77
15	Phthalic acid	14.183	14.135	14.235	76526	0.65
16	Nonane	14.297	14.235	14.380	49750	0.42
17	2-decenol	15.553	15.465	15.680	111297	0.95
18	Hexadecanoic acid	15.940	15.870	16.050	408698	3.48
19	2-decenol	19.790	19.640	19.895	134252	1.14
20	Decanoic acid	20.416	20.300	20.575	184313	1.57
21	n. i	40.482	39.970	40.830	620396	5.28
					11759736	100.00

## CONCLUSION

The result of this work suggests that the methanol extract of *Coriandrum sativum* has number of components which can act as a drug for various diseases. The analysis revealed that by Soxhlation method, a total of 21 compounds were obtained with major constituents as Adenosine [25.08 %]. The other constituents were found to be heptanal [16.63 %], nonane [7.90 %], hexadecanoic acid [3.48 %], pyranone [3.46 %], Heptanoic acid [3.29 %], dodecyl ether [2.99 %] and Pentanone [2.51 %]. Further in future, these components can be isolated and pharmacological activity may be studied to ascertain the traditional use.

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## CONFLICT OF INTEREST

None to be declared

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