BIOINFOLET 18 (1B) : 163 - 164, 2021

GC-MS ANALYSIS OF *OCIMUM SANCTUM* SEEDS.

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ABSTRACT

An investigation was undertaken to study bioactive constituents present in ethanolic extract of the seeds of *Ocimum sanctum* by using gas chromatography-mass spectroscopy (GC-MS). The results revealed presence of alkaloids, terpenoids, flavonoids, tannins, steroids and phenols. GC-MS analysis showed presence of 12 bioactive compounds, of which alpha-Terpinyl acetate, Eucalyptol, Hexadecanoic acid, 4-Hydroxy-2-methylacetophenone were major bio-chemical compounds.

Key words: *Ocimum sanctum*, GC-MS analysis, Bioactive compounds.

Introduction

Ocimum sanctum L. (Lamiaceae; syn. *O. tenuiflorum*) commonly known as 'Tulsi' is one of the most important and oldest medicinal plant. The entire plant is considered as useful and has been widely reported to exhibit various pharmacological properties (Bhargava and Singh 1981; Yanpallewar *et al*, 2004). Present investigation was undertaken to characterize bioactive components in seed extract of *Ocimum sanctum* by Gas Chromatography Mass Spectrum (GC-MS).

Materials and Methods

The plant material was collected from Botany garden, Shivaji University, Kolhapur and identified following Yadav and Sardesai (2002) The voucher specimen (SSD01) has been deposited in the Department of Botany, Shivaji University Kolhapur.

Extraction was carried out by the soxhlet method. Dried seed powder (100 g) was extracted with 500 ml ethanol in an orbital shaker for 72hrs. The extract was evaporated under reduced pressure at 60^{0}C using rotary evaporator, placed in airtight container and stored at -8 °C until further use.

The phytochemicals such as alkaloids, tannins, saponins, steroids, terpenoids, glycosides, flavonoids, reducing sugar were qualitatively detected following the protocols suggested by Thilagavathi, *et al*., (2015)

GC-MS analysis of this extract was performed using a Shimadzu QP 2010 system and Gas Chromatograph interfaced to a Mass Spectrometer (GC-MS) as suggested by Vanitha and Manikandan (2016). The chemical compounds were identified with the help of Willey and NIST libraries by comparison.

Results and Discussion

Almost all secondary metabolites such as Flavonoids, glycosides, steroids, alkaloids, terpenoids were detected in the seed extract. During GC-MS analysis 12 peaks were observed (Fig. 1), the chemical nature of which has been elaborated in Table 1.

Among identified phytochemicals eucalyptol (1, 8-cineole), a terpenoids compound, has anti-inflammatory and antioxidative effect in various diseases (Seo and Kim, 2016). Similarly Khaleel *et al*., (2018) reported alpha terpinyl acetate which was

detected during present study; possess antioxidant, anticancer, anticonvulsant, antiulcer and antihypertensive activities. Another compound, detected in the seed extract was hexadecanoic acid, which has been reported as having anti-inflammatory property useful in controlling rheumatic symptoms (Vasudevan, *et al*., 2012). Hence, the *Ocimum sanctum* seeds possess anticancer, antioxidant and anti-inflammatory activities due to the presence of various phytocompounds. These findings support the traditional use of tulsi in treatment of various diseases. Further studies are needed to isolate active principle of the extract as well as to elucidate their exact mechanism of action.

Acknowledgements

The authors are thankful to Department of Science And Technology Promotion Of University Research And Scientific Excellence (DST-PURSE PHASE II), for providing financial assistance, and also to the Head, Department of Zoology, Shivaji University Kolhapur for providing infrastructural facilities.

Table 1: Bioactive compounds detected in ethanolic seed extract of Tulsi

Peak	Retention time	Area %	Molecular weight	Molecular Formula	Name of Possible Compounds as per NIST Library
1	5.315	1.87	98	$C_5H_6O_2$	1,2-Cyclopentanedione
2	6.349	14.87	154	$C_{10}H_{18}O$	Eucalyptol
3	9.602	5.17	150	$C_9H_{10}O_2$	4-Hydroxy-2-methylacetophenone
4	9.854	36.07	196	$C_{12}H_{20}O_2$	alpha.-Terpinyl acetate
5	10.559	2.41	204	$C_{15}H_{24}$	Bicyclo[5.2.0]nonane, 2-methylene-4,8,8-trimethyl
6	14.742	3.53	256	$C_{16}H_{32}O_2$	Methyl 9-methyltetradecanoate
7	15.986	4.49	270	$C_{17}H_{34}O_2$	Ethyl 13-methyl-tetradecanoate
8	17.319	11.75	270	$C_{17}H_{34}O_2$	Hexadecanoic acid, methyl ester
9	18.958	13.32	284	$C_{18}H_{36}O_2$	Hexadecanoic acid, ethyl ester
10	34.264	2.08	888	$C_{24}H_{72}O_{12}Si_{12}$	Tetracosamethyl-cyclododecasiloxane
11	37.261	1.78	390	$C_{24}H_{38}O_4$	Phthalic acid, di(2-propylpentyl) ester
12	38.930	2.65	888	$C_{24}H_{72}O_{12}Si_{12}$	Tetracosamethyl-cyclododecasiloxane

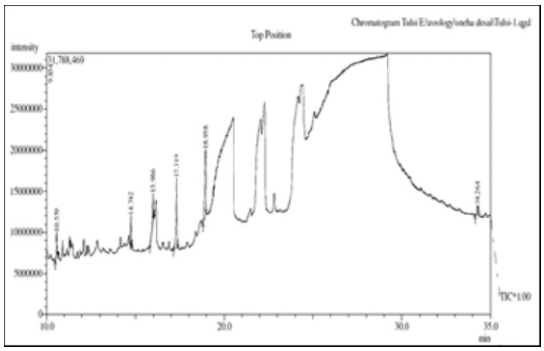

Figure 1: GC-MS of ethanolic extract of Tulsi seeds

References

Bhargava, K. P. and Singh, N. (1981) *Indian J Med Res*. **73**: 443

Yanpallewar, S.U., Raj, S., Kumar, M. and Achary, A. (2004) *Biochem Behar*. **79**:155.

Thilagavathi, T., Arvindganth, R., Vidhya, D. and Dhivya R. (2015) *Int. Res. J. Pharm* **6(4)**:246

Vanitha, V. and Manikandan, K. (2016) *Rasayan J. Chem.* **9(3)**:471

Seol, G.H. and Kim, K.Y. (2016) *Advances in Experimental Medicine and Biology* **929**:389

Khaleel, C., Nurhayat T and Gerhard B. (2018) *Open chem*.**16**:349

Vasudevan, A., Kalarickal, V.D., Pradeep, K.M., Ponnuraj, K., Chittalakkottu, S. And Madathilkovilakathu, H. (2012) *Chem Biol Drug Des*. **80**: 434

Yadav, S. R, and M. M. Sardesai (2002) " *Flora of Kolhapur District* " Shivaji University, Kolhapur.