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## Research

**Isolation and Characterization of Volatile Contents from *Ocimum basilicum***Varun Jain<sup>1\*</sup>, Sohan Kumar<sup>2</sup>, Ruchi Upadhyay<sup>1</sup><sup>1</sup>School of Sciences, SAM Global University, Raisen-464 551, Madhya Pradesh, India<sup>2</sup>Govt. PM Rise PG College, Vidisha-464001, Madhya Pradesh, India\*Corresponding Email: [jainvarun27@gmail.com](mailto:jainvarun27@gmail.com)

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**Abstract:** The essential oils of *O. basilicum* were obtained from a Clevenger apparatus distilled for 3 hr. Essential oils of *O. basilicum* were analyzed by GC and GC-MS. Theyield of the essential oil obtained from *O. basilicum* (0.98% w/w). Methyl eugenol and eugenol were found to be major constituents of fresh leaves of *O. basilicum*.

**Keywords:** Essential oils, *Lamiaceae*, *Ocimum* species

**Introduction**

To expand the spectrum of antibacterial agents from natural resources, *Coleus aromaticus* belonging to the *Lamiaceae* family (Mint family) has been selected. The leaves of the green type of country borage are often eaten raw with bread and butter. The chopped leaves are also used as a substitute for sage (*Salvia officinalis* L.) in stuffing. *Coleus aromaticus* is used for seasoning meat dishes and in food products, while a decoction of its leaves is administered in cases of chronic cough and asthma. It is considered to be an antispasmodic, stimulant, and stomachic and is used for the treatment of headache, fever, epilepsy, and dyspepsia. It is used to treat conditions such as indigestion, diarrhea, nervous tension, insect bites, toothache, earache, rheumatism, whooping cough, and bronchitis. It is also known to be a very powerful pain killer, that stimulates the flow of bile aiding digestion. Mast cell stability properties of *C. aromaticus* leaves were checked in rat peritoneal mast cells. The essential oils from *Ocimum* contain many terpenes (linalool, citral, 1,8-cineole) and

phenyl propanoids (e.g. methyl chavicol, eugenol) produced in specialized glandular trichomes (Warrier et al. 1995, CSIR 1992, Charles and Simon 1990, Gang et al. 2001). It is also a source of aroma compounds and essential oils containing biologically active constituents that possess insecticidal and nematocidal properties (Deshpande and Tipnis 1997). To the best of our knowledge, an investigation of the essential oil of *O. sanctum* and *O. basilicum* leaves of South India has not been reported to date. In the present study, the essential oils were isolated from fresh leaves and the volatile oil was analyzed by GC/MS method.

**Materials and Methods:**

**Plant Materials** The fresh leaves of *Ocimum basilicum* were collected from various areas of Vidisha (M.P). Specimens of *Ocimum basilicum* were deposited at the Pest control and ayurvedic Research Lab of SSSL Jain P.G College Vidisha (M.P). Isolation of the Volatile Oils is done by chopping the fresh leaves of *O. basilicum* and hydro distilled for 3h using a Clevenger-type apparatus. The essential oils were collected separately and stored in well-capped bottles prior to analysis. GC-MS Analysis GC-MS was carried out in SAIF CDRI Lucknow. The identification of the compounds was performed by comparing their retention indices and mass spectra with those reported and supplemented by Wiley and Quadlib 1607 GC-MS libraries.

## Results and Discussion

The percentage of essential oil obtained was *O. basilicum* (0.98% w/w). The gas chromatograms of these three essential oils are given in Fig. 1. The essential oils of *O. basilicum* obtained from the Clevenger apparatus were found to be rich in methyl eugenol and eugenol. As shown in Table 1, essential oils constituents in both plant samples from Vidisha (M.P) were identified by the GC-MS method. The essential oil of *Ocimum basilicum* (L) was identified as three major constituents such as methyl eugenol (37.5%), eugenol (31.3%), and unknown (31.1%) (Table 1, Fig.1, Fig.2).

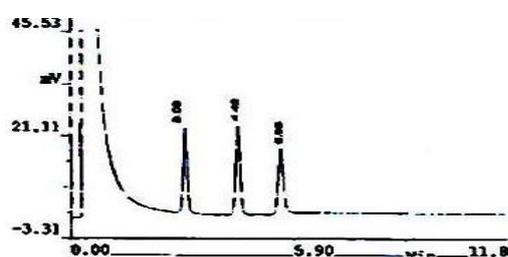


Fig.1. Gas chromatograms of three essential oils.

Table 1. Chemical composition of essential oil from the fresh leaf of *Ocimum basilicum*.

S. No.	RT	% Area	Constituents	Methods
1	3.03	31.1	Unknown	GC-MS
2	4.42	37.5	Methyl Eugenol	GC-MS
3	5.55	31.3	Eugenol	GC-MS
<b>Total</b>		<b>99.9</b>		

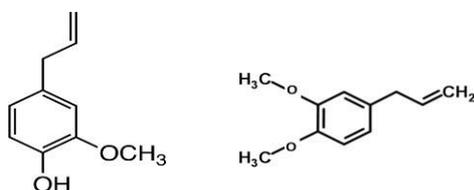


Fig. 2. Chemical structures of Methyl Eugenol and Eugenol.

### Methyl Eugenol Eugenol

Methyl eugenol has been previously reported as the main constituent of the essential oils from *Ocimum selloi* and *Ocimum basilicum* (Ozcani

and Chalchat, 2007, de Paula et al. 2007). In contrast, a trace amount of methyl eugenol has been reported from the essential oil of *Juniperus angosturana* (Adams et al. 2007, 2017), and a low content in the essential oil from *Pimenta dioica* berries (Park et al. 2007). There is currently concern as to the carcinogenic potential of methyl eugenol.

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### References

- Adams, R.P., Beauchamp, P.S., Dev, V., & Dutz, S. M. (2007). New natural products isolated from one-seeded *Juniperus* of the Southwestern United States: isolation and occurrence of 2-ethenyl-3-methyl phenol and its derivatives. *Journal of Essential Oil Research*, 19(2), 146-152.
- Adams, R.P. (2017). Identification of essential oil components by gas chromatography/mass spectrometry. 5 online ed. Gruver, TX USA: Texens is Publishing. 46-52.
- Charles, D.J., Simon, J.E. (1990). Comparison of extraction methods for the rapid determination of essential oil content and composition of basil. *Journal of the American Society for Horticultural Science*, 115(3), 458-462.
- Chatterjee, A., Sukul, N.C., Laskar, S., Ghosh Majumdar, S. (1982). Nematicidal principles from two species of *Lamiaceae*. *Journal of Nematology*, 14 (1), 118.
- CSIR (1992). The useful plants of India. Council of Scientific and Industrial Research, New Delhi.
- De Paula, J.P., Farago, P.V., Ribas, J.L.C., Spinardi, G.M.S., Doll, P.M., Artoni, R.F., Zawadzki, S.F. (2007). *In vivo* evaluation of the mutagenic potential of estragole and eugenol chemotypes of *Ocimum selloi* Benth. *Essential Oil Lat. Am. J. Pharm.*, 26(6), 846-851.
- Deshpande, R.S., Tipnis, H.P. (1997). Insecticidal activity of *Ocimum basilicum* L. *Pesticides*, 11, 1-12.
- Gang, D.R., Wang, J., Dudareva, N., Nam, K.H., Simon, J.E., Lewinsohn, E., Pichersky, E. (2001). An investigation of the storage and biosynthesis of phenylpropenes in sweet basil. *Plant Physiology*, 125(2), 539-555.
- Park I.K., Kim J., Lee S.G., Shin, S.C. (2007). Nematicidal activity of plant essential oils and components from Ajowan (*Trachyspermum ammi*), Allspice (*Pimenta dioica*), and Litsea (*Litsea cubeba*) essential oils against pine wood nematode (*Bursaphelenchus xylophilus*). *J Nematol.*, 39(3), 275-279. PMID: 19259498
- Kumar, A., Elango, K., Markanday, S., Undhad, C.V., Kotadiya, A.V., Savaliya, B.M., et al. (2007). Mast cell stabilization property of *Coleus aromaticus* leaf extra ctinratperitoneal mast cells. *Indian Journal of Pharmacology*, 39(2), 119-120.

11. Kumaran, A. (2006). Antioxidant and free radical scavenging activity of an aqueous extract of *Coleus aromaticus*. Food Chemistry, 97(1), 109-114.
12. Ozcani, M. Chalchat, J.C. (2002). Essential oil composition of *Ocimum basilicum* L. and *Ocimum minimum* L. in Turkey. Czech J. Food Sci., 20(6), 223-228.
13. Warriar, P.K., Nambiar, V.P., Ramankutty (1995). Indian medicinal plants, 1st ed, Orient Logman limited: Madras, pp. 315.