



GC-MS Analysis of Essential Oil of Turmeric Rhizome and its Activity Against *Sporothrix schenckii* Fungus

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ABSTRACT

The volatile oil of turmeric (*Curcuma longa*) was isolated from its rhizomes through steam distillation. Oil thus obtained was analysed by GS-MS technique. The oil showed 20 constituents of which, 6 components contributing 70% of the total composition. The most abundant components were aromatic turmerone, β -tumeron, curcumene, caryophyllene etc. The oil was tested against *sporothrix Schenckii* fungus, which causes skin infection sporotrichosis.

Key words: GS-MS technique, turmerone, caryophyllene, *sporothrix Schenkii* fungus.

INTRODUCTION

Turmeric belongs to Zingiberaceae family which is widely distributed in southeast Asia. There are 200 species of this family belonging to 20 genera. Turmeric has been used not only as a spice but as a natural colourant, to flavour the food stuff and also as a herbal antiseptic medicine. The fresh rhizomes and the dried powder of turmeric are popular remedies of blood disorders, cold, cough and various skin diseases. Research indicates that the turmeric and its active components have unique antioxidant, anti carcinogenic, anti inflammatory, anti microbial and antifungal properties as reviewed earlier. It is a very popular Asian medicine for the treatment of hepatic disorders and rheumatism. The present study is focused on GC-MS analysis and the antifungal activity of turmeric oil.

MATERIAL AND METHOD

The fresh rhizomes of *Curcuma longa* were collected from the local market of Kannauj and Kanpur. The rhizomes were then cut into smaller pieces and then subject to steam distillation. A known weight of rhizomes were taken in reaction vessel and attached to steam generator. A water cool condenser was also attached with the reaction vessel. Steam generator produced steam which passed through the sample, condensed and collected with essential oil. The oil was then dried over anhydrous sodium sulphate and stored at 4°C till GC-MS analysis was carried out.

GC-MS Analysis

GC MS of Varian, Saturn Model 2000, equipped with ion trap detector (ITD), was used for

the identification of different components of essential oil of *Curcuma longa*. The sample was injected on DB-5 MS (30 m x 0.25 mm ID, 0.25 μ film thickness) column. Helium was used as a carrier gas with flow rate of 7.0-9.5 psi and split ratio 1:5. The column temperature was maintained at 75°C for 5 minutes, with 2.5°C rise/min at 250°C.

Various components were identified by their retention time and peak enhancement with standard samples in gas chromatographic mode and MS library research from derived mass fragmentation pattern of various components of the essential oil.

RESULTS AND DISCUSSION

The essential oil from the sample extracted yielded 0.673%- 0.744% v/w. The oil was pale in colour y/w - GC MS analysis revealed the presence of more than 20 component some major component are tabulated in table 1.

Many more components were found in traces. Aromatic turmerones are mosquito repellents and may be an effective drug for the treatment of respiratory diseases.

Activity against *Sporothrix schenckii* fungus

The antifungal activity of turmeric oil was tested against *sporothrix schenckii* fungus using disc

diffusion method. The oil showed activity against the fungus. The zone of growth inhibition was 9 mm by the sample oil after 8 days and 11 mm after 10 days (Table-2).

Table 1: Components of Turmeric oil by GC-MS analysis

S.No.	R.T.	Name of components	Area
1.	21.014	Ar-turmerone	22.99
2.	20.428	dehydro Ar-turmerone	15.62
3..	29.145	ar. Curcumene	8.40
4.	20.935	Curcumem	8.90
5.	18.423	Zingiborene	3.38
6.	16.432	Bisabalene	2.08
7.	10.728	α -Phellandrene	1.52
8.	10.342	Cineole	1.46
9.	9.842	Caryophyllene	1.12
10.	12.432	α -Tumerone	2.06

Table 2 : Antifungal activity of turmeric oil using disc diffusion method

Test organism	Name of oil	Zone of inhibition in mm.	
Sporothrix Schencku	Turmeric oil	8 day 09 \pm 1.8 mm	10 days 11.00 \pm 1.8 mm

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