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COMPARISON OF CHEMICAL COMPOSITION OF THE ESSENTIAL OIL OF *HYPTIS SUAVEOLENS* (L.) POIT LEAVES FROM DIFFERENT REGIONS OF TAMIL NADU

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ABSTRACT

The chemical composition of the essential oil of *Hyptis suaveolens* (L.) leaves from three different regions of Tamil Nadu was analysed by GC – MS method and the constituents of three different localities were compared. In all 12 compounds were identified and they were α -caryophyllene, α -pinene, α -thujene, camphene, D-limonene, sabinene, β -myrcene, 1, 8-cineole, γ -terpinene, α -terpinolene, α -terpineol, phenentherene. It was found that the constituents of the essential oil differed in quantities in the three different populations of *Hyptis suaveolens* (L.) which may due to local geographical differences.

INTRODUCTION: The plant *Hyptis suaveolens* (L.) Poit commonly known as Wilayati tusi belongs to the family Lamiaceae and is an ethnobotanically important medicinal plant. The plant has been considered as an obnoxious weed, distributed throughout the tropics and subtropics. Almost all parts of this plant are being used in traditional medicine to treat various diseases. The leaves have been utilized as a stimulant, carminative, sudorific, galatogogue and as a cure for parasitic cutaneous diseases¹.

Crude leaf extract is also used as a relief to colic and stomachache. Leaves and twigs of *Hyptis suaveolens* (L.) Poit are considered to be antispasmodic and used in antirheumatic and antispurific baths² further leaves of *Hyptis suaveolens* (L.) Poit are considered to be anti inflammatory and also applied as an antiseptic in burns, wounds and various skin complaints³. The essential oil of *Hyptis suaveolens* (L.) Poit showed a strong antifungal activity against *Mucor* Sp and *Fusarium moniliforme*⁴.

Hyptis is known to be used in traditional medicine for the treatment of various illness and has been found to possess significant pharmacological⁵ anticancerous properties⁶ and tumorigenic⁷ properties. In addition to above it also has insecticidal properties and said to be mosquito repellent⁶. The aim of the current study is to determine and compare the chemical composition of essential oil of *Hyptis suaveolens* (L.) Poit collected from three naturally growing sites of Tamil Nadu.

MATERIAL AND METHODS:

Plant material: *Hyptis suaveolens* (L.) Poit leaves were harvested in March 2008 respectively from Madurai, Dindigul and Kanyakumari.

Extraction of Essential Oil: Fresh leaves of *Hyptis suaveolens* (L.) Poit were homogenized with distilled water into slurry, which was hydro distilled by Clevenger-type glass apparatus for 4 h for isolation of oils. The oil samples were stored at 0°C in air-tight containers after drying them over anhydrous sodium sulfate and filtered before GC-MS analysis.

GC-MS Analysis: The essential oils from leaves of *Hyptis suaveolens* (L.) Poit were analyzed by Shimadzu GC-RIA(FID) gas chromatograph, fitted with a 30m × 2.5 mm fused silica capillary column coated with DB-5 (J and W); GC-MS analysis was performed with a Perkin Elmer 0-700 equipped with a SE-30 capillary column oven temperature programmed from 60°C (3 min) to 240°C (5 min). Injector and detector temperatures are 250°C, carries gas is helium at a flow rate of 0.9 ml/min, source 70 ev.

Identification of the compounds: Oil components were identified by matching the peaks with computer Wiley MS libraries and confirmed by comparing mass spectra of the peaks and those from literature^{8,9,10,11}.

RESULTS AND DISCUSSION: The chemical composition of the essential oil isolated from the leaves of *Hyptis suaveolens* (L.) Poit collected from Madurai, Dindigul and Kanyakumari which experienced different climatic and geographic circumstances were determined by GC and MS analysis. While collecting the experimental sample, we took care to pick up the leaves at the same developmental stage. The qualitative and quantitative compositions of the essential oil of the leaves of *Hyptis suaveolens* (L.) Poit are presented in **Table 1** and **Figures 1, 2 & 3**.

As seen in the table, 12 different compounds were determined from the essential oil obtained from the leaves of *Hyptis suaveolens* (L.) Poit which were collected in Madurai, Dindigul and Kanyakumari. Regarding the distribution of α -caryophyllene in three different populations of *Hyptis suaveolens* (L.) Poit the Dindigul population showed the highest percentage of

α -caryophyllene while the Kanyakumari population had the lowest percentage of α -caryophyllene.

TABLE 1: THE ESSENTIAL OIL COMPOSITION OF LEAVES OF *HYPTIS SUAVEOLENS* (L.) POIT COLLECTED FROM MADURAI, DINDIGUL AND KANYAKUMARI (T = TRACE AMOUNT)

Chemical compound (in %)	Madurai	Dindigul	Kanyakumari
α -caryophyllene	68.30	85.45	53.92
α -pinene	8.98	1.19	17.35
α -thujene	0.38	1.25	5.21
camphene	0.08	1.43	5.85
D-limonene	1.30	1.54	t
sabinene	12.38	2.73	0.57
β -myrcene	t	t	5.35
1,8-cineole	2.87	1.63	2.98
γ -terpinene	1.35	0.63	3.75
α -terpinolene	2.74	1.26	3.5
α -terpineol	1.57	1.78	1.41
phenentherene	t	0.61	t

In Kanyakumari population α -pinene was found to be abundant next to α -caryophyllene. But in Madurai and Dindigul population Sabinene was found to be abundant next to α -caryophyllene. The β -myrcene found in Kanyakumari population was found in trace amount in other populations. The similar trend was observed in the distribution of Phenentherene in Dindigul population. The compound α -terpineol was found to be almost equal in all the three populations. The essential oils were found to be present in different quantities among three different populations of *Hyptis suaveolens* (L.) Poit.

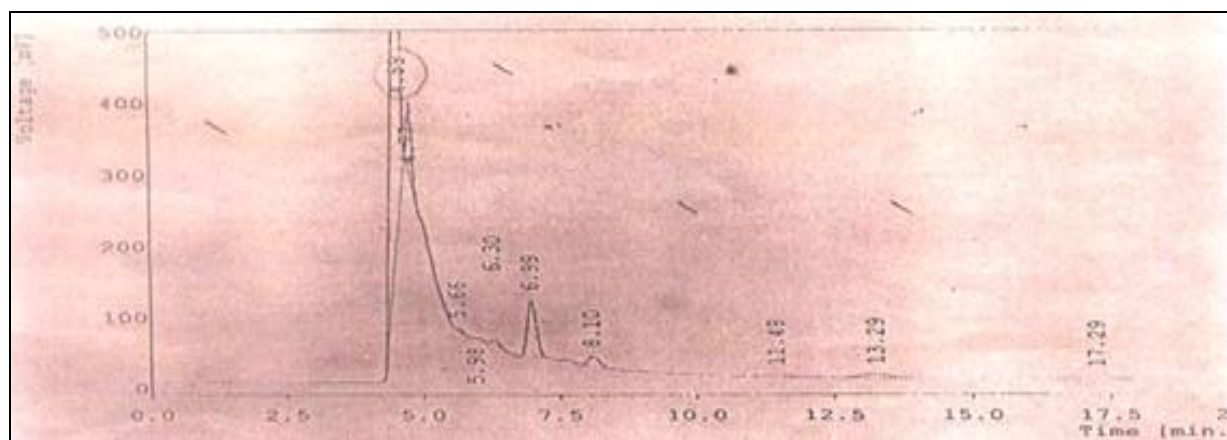


FIG. 1: GCMS CHROMATOGRAM OF *HYPTIS SUAVEOLENS* (L.) POIT COLLECTED FROM MADURAI IN TAMIL NADU

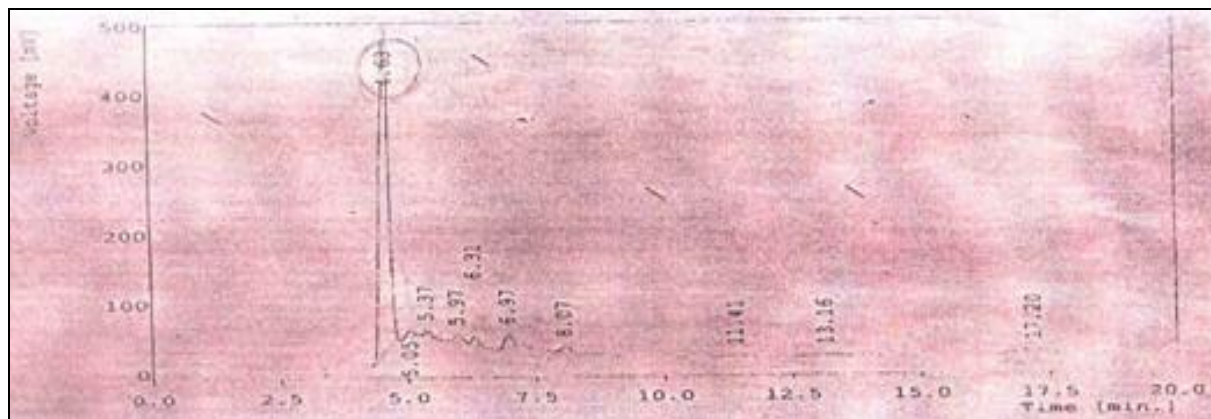


FIG. 2: GCMS CHROMATOGRAM OF *HYPTIS SUAVEOLENS* (L.) POIT COLLECTED FROM DINDIGUL IN TAMIL NADU

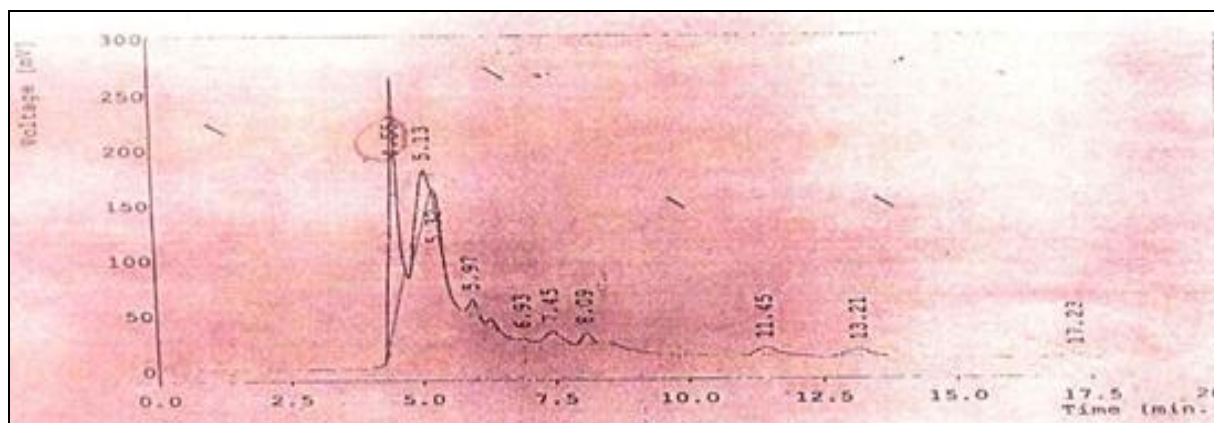


FIG. 3: GCMS CHROMATOGRAM OF *HYPTIS SUAVEOLENS* (L.) POIT COLLECTED FROM KANYAKUMARI IN TAMIL NADU

This may be ascribed and parallel to the investigations of Sharma *et al.*,¹² who observed the different quantities of 1, 8-cineole in the populations of Bangalore, Hyderabad and Lucknow. This is probably due to the local geographical differences. It has been already reported by various workers^{11, 12, 13}.

In conclusion, our study has shown that the qualitative and quantitative properties of essential oils of three different population of *Hyptis suaveolens* (L.) Poit are mainly due to local geographical differences.

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