

Chemical Composition of the Essential Oil of *Hyptis Suaveolens*

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Abstract: The chemical composition of *Hyptis suaveolens* was investigated and twenty three compounds were abundant enough to be identified by GC-MS.

Keywords: *Hyptis suaveolens*, Lamiaceae, chemical composition, cineole, caryophyllene.

Introduction

The *Hyptis genus* (Lamiaceae) is composed of 400 species that mainly occur in tropical America [1-3]. Most of these plants are highly aromatic and also found in the other parts of the world; particularly as a weed in the wet tropic region of the Northern Territory, Australia [4-6]. The genus *Hyptis* is known to be used for traditional medicine for the treatment of various illness and has been found to possess significant pharmacological activity [7-12], including tumorigenic [13-16], antifertility [17,18] mycotoxic and phytotoxic activities [19]. *H. suaveolens* has recently been shown to possess insecticidal properties [20] as well as grain protectant from *Cowpea* weevil during storage [21]. The terpenes content of distilled volatile oils have been known to differ enormously due to different geographical locations and between different species of the same plant (22, 23). This genus possesses a

diverse range of biological activities that led us to investigate the chemical composition of essential oil obtained by hydrodistillation from the leaves of *Hyptis suaveolens* Poit. The chemical constituents of this species was also compared with two other species, *H. mutabilis* [22] and *H. emoryi* [24].

Results and Discussion

The essential oil obtained after hydrodistillation of the leaves of *H. suaveolens* gave an average yield of 0.1 %. The main constituents were 1, 8-cineole (32%) and -caryophyllene (29%) Fig. 1. Enormous difference in the concentration levels of these two major components were found in the three species, *H. suaveolens*, *H. mutabilis* [22] and *H. emoryi* [24], as shown in the Table 1. This significant variation of the major components permit an easy differentiation between these three species.

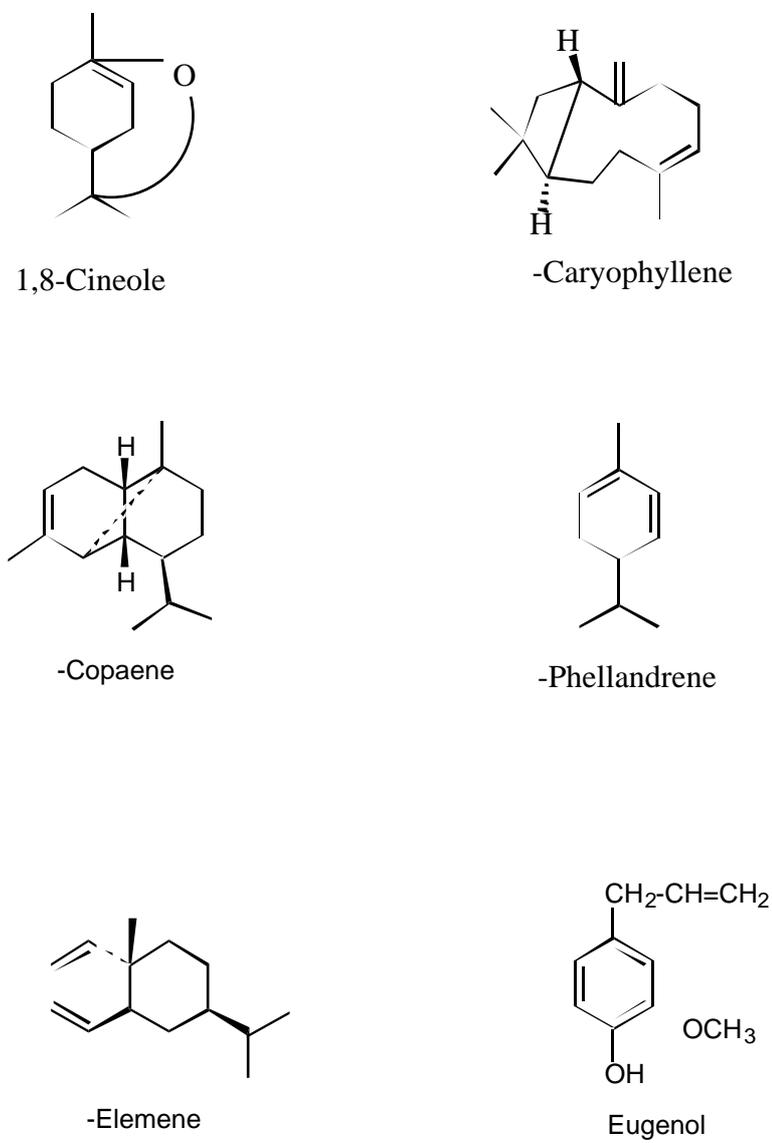


Fig. 1. Major components, 1,8- cineole and -caryophyllene and others only found in *Hyptis suaveolens*

Table 1. A comparison of chemical composition of the essential oils from *Hyptis* sp.
A = *H. suaveolens*; B = *H. emoryi* [24]; C = *H. mutabilis* [22].

Component	A	B	C
-Thujene	0.3	7.0	1.80
-Pinene	2.5	6.6	0.30
Camphene	0.02	1.1	-
Sabinene	3.9	T	0.33
-Pinene	4.2	5.0	0.51
Myrcene	0.6	1.8	1.85
-Phellandrene	2.0	T	-
-Terpinene	-	-	0.74
p-Cymene	-	-	15.14
Limonene	-	5.6	-
-Phellandrene	-	0.8	-
1, 8-Cineole	32	6.9	5.67
cis- -Ocimene	-	-	0.74
-Terpinene	0.7	0.1	1.93
-Terpinolene	0.3	T	-
Cimenenol	-	-	0.33
Linalool	0.06	1.3	1.77
Fenchol	0.3	-	-
Camphor	-	1.3	-
4-Borneol	-	11.9	-
4-Terpinenol	2.3	1.9	0.34
-Terpineol	0.2	-	0.43
Carvone	-	0.7	-
Neral	-	2.0	-
Bornyl acetate	-	0.6	-
Thymol	-	-	7.85
Carvacrol	-	-	0.35
-Elemene	-	-	1.44
Eugenol	1.2	-	-
-Copaene	1.8	-	-
-Elemene	1.0	-	-
-Caryophyllene	29	2.5	12.35
-Humulene	1.6	T	2.95
-Bergamotene	2.0	-	-
Aromadendrene	0.5	-	0.59
-cadinene	0.1	6.7	-
-cadinene	0.5	1.4	-

T = Trace

Materials and Methods

Plant Material

Plant material was collected around Darwin and a voucher specimen has been deposited at the Northern Territory University Herbarium.

Distillation of the Essential Oils

Fresh leaves were hydrodistilled for three hours to give pale yellow essential oil in 0.1 % yield (w/w) [25]. The oil was dried over anhydrous sodium sulphate and analysed with GC-MS for identification of its components.

GC-MS Analysis

The component of the oils were identified by GC-MS analysis using a Varian Saturn GC-MS instrument. Capillary GLC was carried out by using at 25.0m OV101 glass capillary column. The column was programmed at 90 °C for 10 min to 180 °C at a rate of 2 °C/min, then kept at 180 °C for 30 min. Helium was used as a carrier gas. Mass spectra were taken at 70 eV. The gc/ms data system contains the National Bureau of Standards (NBS) mass spectral library and *Registry of Mass Spectral Data* [26] were used to help verify the identity of individual components by mass spectral comparison. Identification of the separated components were also carried out by using authentic specimens and private library of essential oil constituents.

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Sample Availability: Available from the authors.