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Essential Oil Constituents Of *Crotalaria Ramosissima* Flowers



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ABSTRACT

The essential oil of *Crotalaria ramosissima* flowers has been studied by GC-MS. The oil contains chiefly geraniol (6.42%), β -ocimene (6.17%), calamenene (6.09), etc. © 2005 Trade Science Inc. - INDIA

KEYWORDS

Crotalaria ramosissima;
 Fabaceae;
 Essential oil;
 GC-MS.

INTRODUCTION

The family Fabaceae comprising 650 genera and 18,000 species distributed abundantly in tropical and subtropical regions of the world. In India, it is represented by 440 genera and 12,000 species^[1]. The Fabaceous members with special reference to *Crotalaria* were intensively studied for phytochemical constituents and their biological activity. *Crotalaria ramosissima* a common medicinal plant used for skin diseases in human beings^[2], mouth and throat diseases of cattle by the aboriginal tribals of Eastern Ghats^[3]. The essential oils are known as naturally occurring antimicrobial agents and therapeutically potent against several human pathogens^[4-6]. The present paper deals with the chemical constituents of *Crotalaria ramosissima* flowers.

MATERIALS AND METHODS

Extraction of the essential oil

The flowers of *Crotalaria ramosissima* were collected from the vicinity of Kalasamudram forests (open lands) of Andhra Pradesh, India during February, 2002. The plants were identified with the local floras and identified voucher specimen (AJR-23802) documenting the collection has been deposited in the herbarium of Sri Krishnadevaraya University (SKU), Anantapur.

The shade dried flowers were subjected to hydro-distillation for 3h, using a Clevenger type apparatus. The oil was dried over anhydrous sodium sulphate and stored at 4°C until tested and analyzed.

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TABLE 1: Chemical constituents of the flower essential oil of *Crotalaria ramosissima*

Peak No.	RI	Name of the compound	Total %
1	793	2-Hexanone	3.15
2	943	α -Pinene	0.93
3	1049	β -Ocimene	6.17
4	1089	Terpinolene	2.21
5	1101	Linalool	0.71
6	1260	Geraniol	6.42
7	1374	1-Undecanol	0.91
8	1453	Aromadendrene	3.86
9	1513	Valencene	1.36
10	1516	Calamenene	6.09
11	1562	Geranyl butyrate	0.69
12	1568	Dodecanoic acid	3.23
13	1640	T-cadinol	0.93
14	1758	Unidentified	19.33
15	1765	Unidentified	38.34
16	1820	Nootkatone	1.94
17	1835	Unidentified	3.72
		Identified components	33.10
		Monoterpene hydrocarbons	9.31
		Oxygenated monoterpenes	7.82
		Sesquiterpene hydrocarbons	0.95
		Oxygenated sesquiterpenes	0.93
		Others	5.50
		Unidentified	61.39

TABLE 2: Mass spectra of unidentified compounds of *Crotalaria ramosissima*

Peak No.	RI	MW	m/z (Rel. int. 70 eV)
14	1758	338	121(100), 323(57), 77(28), 91(21), 187(20), 43(18), 65(11), 161(10)
15	1765	324	309(100), 203(57), 107(50), 77(49), 43(36), 187(28), 91(14), 65(12)
17	1835	354	339(100), 203(71), 43(57), 77(55), 137(43), 187(40), 354(29), 91(29), 122(27), 160(26)

GC-MS analysis

The analysis was carried out on Shimadzu 17 A GC coupled with Shimadzu QP 5050A (Quadruple) Mass-Spectrometer equipped with EI and a fused silica column DB-5 (30m x 0.25mm i.d.) of 0.25 μ m film thickness coated with polysilphenylene-siloxane. One μ l of the concentrated solvent fraction was injected and the GC oven temperature kept at 50°C

for 5 min, and programmed from 50°C - 280°C for 40 min. Helium was used as carrier gas at a flow rate of 2 ml/min with a split ratio of 1:30, and ionization voltage of mass spectral analysis was run by EI technique at 70eV. The components were identified by comparing their relative retention indices with those of standard reference compounds and available literature data^[7].

RESULTS AND DISCUSSION

Flowers of *Crotalaria ramosissima* on hydrodistillation yielded dark pungent yellowish green oil (3.2%v/w). GC-MS analysis of freshly extracted distilled oil revealed the presence of 17 different components three of which were unknown (mass spectral data - TABLE 2) accounting 61.39% of the total oil composition and the remaining fourteen components (38.60%) were identified (TABLE 1). The known composition of oil consists chiefly of sesquiterpene hydrocarbons (9.95%), monoterpene hydrocarbons (9.31%), oxygenated monoterpenes (7.82%), monoterpene ketones (5.09%) accomplished by relatively smaller amounts of oxygenated sesquiterpenes (0.93%). The monoterpenes are surprisingly present in significant amount with Geraniol as the major known constituent (6.42%) accompanied by β -ocimene (6.17%), 2-hexanone (3.15%), terpinolene (2.21%) and a much smaller amounts of α -pinene and linalool (0.93% and 0.71% respectively). The sesquiterpenes (10.9%) represented by

calamenene (6.09%) as major component and small amounts of aromadendrene and cadinol are also present (3.86% and 0.93% respectively).

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