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Chemical characterization of Essential oil of *Rhynchosia beddomei*

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Abstract

Rhynchosia beddomei is an endemic medicinal plant from the Eastern Ghats of India. The plant was used in various human ailments by the tribal people of the Eastern Ghats. The plant is reported to possess significant antimicrobial activity and is a source of flavonoids. The present investigation was focused on the characterization of chemical constituents of essential oil from the leaves. The hydro distillation of shade dried leaves resulted were essential oil. The average content of essential oil was obtained as 1.32% and was analyzed using Gas Chromatography coupled with flame ionization detector. A total of 13 compounds were identified among the fourteen components, representing 99.379% of the oil, were characterized. The major components of essential oil namely phytol (47.77%), propionic acid (28.8%), pentanoic acid (6.86%) etc.

Keywords: *Rhynchosia beddomei*, Eastern Ghats, chemical composition, essential oil

INTRODUCTION

Rhynchosia beddomei Baker (Fabaceae, vernacular name - adavivuluva) is a rare and endemic medicinal plant distributed in Seshachalam hills of Eastern Ghats of Andhra Pradesh, India [1]. The leaves of *R. beddomei* were used for wounds, cuts, boils and rheumatic pains by Adivasi tribes (Sugali, Yanadi, Erukala) inhabiting the forests of Eastern Ghats of Andhra Pradesh, India [2]. The plant material was reported to contain flavonoid compounds viz., Flavones, flavonols and flavanones [3]. The leaves of the *R. beddomei* were reported to possess significant antimicrobial activity [4, 5]. The present investigation was focused on the identification of chemical constituents of essential oil obtained from the leaves which is hither to not reported by earlier workers. The results may find applications in the pharmaceutical industry for isolation of potential chemical components which were used in preparation of drugs after the toxicological investigations, besides sustainable utilization of crude drugs and conservation of endemic medicinal plants.

MATERIALS AND METHODS

Plant collection and extraction

Based on the folklore studies on ethnomedicobotanical investigations conducted in the forests of Eastern Ghats of Andhra Pradesh and the plant was selected for biological studies and chemical evaluation. The plant was collected from the forests of tirumala hills of Eastern Ghats of India, Chittoor district and the voucher specimen was deposited at Sri Krishnadevaraya University Herbarium (SKU), Anantapur. The specimen was identified with the help of flora [6] and confirmed by comparing with the authenticated specimens housed at SKU herbarium, Anantapur, MH (Madras Herbarium), Coimbatore and CAL (Central National Herbarium) Calcutta.

Isolation of the essential oil

Five hundred grams of shade dried leaves were pounded and the material was subjected to steam distillation using Clevenger apparatus for 5 h [7]. The essential oil (yield 0.45% w/v) exhibited a characteristic odor, was analyzed using Gas chromatography.

Gas chromatography analysis

TThe essential oil was dissolved in n-Hexane subjected to GC. The sample was injected at 290 °C on OV17, SS packed silica gel column (2M x 3.21mm) mesh range 80- 100, weig hing 32% at maximum temperature of 350 °C. The flow gas is nitrogen with a split ratio of 1:30 and septum sweep was held constant at 10 ml/min., on NUCON made gas chromatogram. The compounds reported in the table (1) were identified based on Kovats retention indices [8].

RESULTS and DISCUSSION

The present investigation on phytochemical components regarding the volatile oils is first report in which thirteen volatile compounds representing 99.379% of the components were identified among the fourteen compounds as depicted in table (1) retention indices of gas chromatographic studies. The majority of the components of essential oil of *R. beddomei* oxygenated monoterpenes and long chain fatty acids. The main chemical constituents of the essential oil are phytol (47.77%), propionic acid (28.87%) followed by pentanoic acid (6.86%)

nonalactone (3.22%) and α–selinene (2.45%) along with certain minor components viz., β- ocimene, cis-linalool oxide, linalool, myrtenol, myrtenol and verbanone may play significant role in medicinal properties along with flavonoids.

CONCLUSIONS

Since *R. beddomei* is an endemic plant with scanty distribution it is recommended for in vitro and in vivo conservation for sustainable utilisation and management of natural resources.

Table 1. Essential oil composition of *Rhynchosia* beddomei (leaves)

S. No.	Name of the compound	Retention index	%
1	Phytol	508	47.77
2	Propionic acid	841	28.87
3	Pentanoic acid	910	6.86
4	Unknown	958	1.81
5	β- Ocimene	1040	0.94
6	*cis*- Linalool oxide	1064	0.942
7	Linalool	1089	1.279
8	Myrtenol	1171	1.193
9	Myrtenol	1171	1.286
10	Verbanone	1186	1.5
11	Nonalactone	1316	3.22
12	α - Selinene	1495	2.5
13	Tetra decanoic acid	1757	1.22
14	Unknown	2472	0.61
	Identified compounds		**99.379**

The previous studies from our lab were supported the usage of plant for the skin diseases since it is exhibited significant antimicrobial activity [3]. The folk information on the usage of plant was evidencing the safety and is not showing the side effects has to be investigate further for its pharmacological studies which may play important role in establishment of alternate medicine where the synthetic drugs were toxic.

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