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GC – MS Analysis and Phytochemical Studies of *Evolvulus alsinoides L*

A. Zahir Hussain and S. Kumaresan

[1] PG and Research Department of Chemistry, Jamal Mohamed College (Autonomous), Tiruchirapalli, Tamil Nadu, India. E-mail: azahirhussainchem@yahoo.co.in and skumaresanskc@gmail.com.

ABSTRACT

The present study deals with the phytochemical investigation of *Evolvulus alsinoides L*. It is an important medicinal plant worldwide trend towards the utilization of natural plant remedies has created an enormous need for the use of medicinal plants. The plant was extracted using methanol as solvent. This study carried out the preliminary phytochemical screening, separation and identification of compounds present in the methanolic extract of *Evolvulus alsinoides L*. The methanolic extract of plant was subjected to GC – MS studies were confirmed by spectral analysis. The preliminary phytochemical screening such as alkaloids, flavonoids, phenolic compound, saponins, Glycosides, tannins, carbohydrate and terpenoids. These different active phytochemicals have been found to possess a wide range of activities, which may help in the protection against permanent diseases.

INTRODUCTION

Modern medicines are traced back to Greeks and after enrichment by Chinese and Indian medicines, if went to modern Europe, the earliest references of medicinal use of plants was the Rig-Veda [4500 – 1600 B.C]. In order to discover the physiologically active plant constituents, the pharmacological studies are being carried out in a systematic way the efforts in this direction are greatly facilitated by modern techniques particularly the phytochemical studies on medicinal plant have led to dual outcome. On the one side they are providing a good ground for the starting materials

drugs by bringing new chemotherapeutic agents on the other they are promoting studies in the correlation of functional groups variations in the natural products the knowledge of herbal medicines has been further enriched recently by learned scientists from international and national level scholars [1]. Plants are the richest resource of drugs of traditional systems of medicine, modern medicines nutraceuticals food supplements folk medicine pharmaceutical intermediates and chemical entities for synthetic drugs medicinal plants are a source of great economic value all over the world nature has bestowed on us a very rich botanical wealth and a large number of diverse type of plants of the country [2]. India is rich in all the 3 levels of biodiversity namely species diversity, genetic diversity, and habitat diversity. In India thousand of species are known to have medicinal value and the use of different parts of several medicinal plants to cure specific ailments has been in vogue since ancient times. Herbal medicine is still the mainstay of about 75 -80% of the whole population and the major part of traditional therapy involves the use of plant extract and their active constituents [3]. *Evolvulus alsinoides L.* is a perennial herb belonging to the family of Convolvulaceae with a small wood and branched root stock [4]. This plant is used in traditional medicine in India, East Asia, Africa and Philippines to cure fever, cough, cold, venereal diseases, azoospermia, adenitis dementia, nootropic anti-inflammatory activity asthma and amnesia [5-7]. Hence the present investigation is carried out to determine the possible chemical constituents of *Evolvulus alsinoides L* by Phytochemical studies and GC – MS analysis.

MATERIALS AND METHODS

Collection of plant materials

Fresh parts of plant *Evolvulus alsinoides L* whole plants were collected at kolli hills Namakkal district . The plant materials were identified by botanically. The plant materials were shaded and dried until all the water molecules evaporated and plants became well dried for grinding. After drying, the plant materials were grinded well using mechanical blender into fine powder and transferred into air tight container with proper labeling [8]. The plant extracts was extracted using soxhlet apparatus by standard procedures [9].

Preliminary Phytochemical Screening

Qualitative phytochemical tests for the identification of alkaloids, flavonoids, steroids, terpenoids, tannin, carbohydrate, saponins, glycosides and phenolic compounds were carried out for all the solvent extracts of the selected study plants using standard method (9).

GC-MS analysis

The eluted component was detected in the mass detector. The spectrum of the unknown component is compared with the spectrum of the known components stored of the National Institute of Standard and Technology (NIST) library having more than 62,000 patterns. The name, molecular weight and structure of the components of the test materials were ascertained [12].

RESULTS AND DISCUSSION

Preliminary phytochemical analysis

Flavonoids and phenolic compounds are found in all the extracts, where as coumarin and saponins are absent in all the extracts of the selected study plant. Alkaloids, carbohydrates, tannin, flavonoids, terpenoids and phenolic compounds are identified in methanol and chloroform extracts of selected study plant. Acetone extracts showed the presence of alkaloids, carbohydrates, flavonoids, terpenoids and phenolic compounds in the study plant. Flavonoids and phenolic compound are identified in the hexane extracts of the study plant. Alkaloids, carbohydrates, flavonoids, terpenoids and phenolic compounds are detected in the petroleum ether and water extracts of the study plant (Table 1). A similar observation was made by [13].

Identification of phytochemical compounds by GC – MS analysis of *Evolvulus alsinoides* L.

The spectrum profile of GC – MS confirms the presence of twenty six components. The identified compounds of the *E. alsinoides*, their retention indices, percentage composition, chemical structure, molecular formula, molecular weight and chromatogram and activities are given (Table 2 and 3). The compound prediction is based on Dr. Duke's Phytochemical and Ethnobotanical Databases.

The results showed the presence of Lupeol (10.79%), Betulin (9.28%), Viridiflorol (8.83%), Glycerol (8.49%), Anthocyanidin (8.24%), 1,2,4-Butanetriol (8.24 %), n-Hexadecanoic acid (8.24 %), Quinic Acid (7.83%), 1-[2-(2-Methoxy-1-methylethoxy)-1-methylethoxy]-2-propanol (6.84%), Squalene (6.72%), Phytol (6.70%), Octadecanic acid (5.68%), 9-octadecenoate (4.51%), Copaene (3.86%), terpinolene (3.02%), Conhydrin, (2.79%), Bis(2-ethylhexyl) phthalate (2.30%), Diethyl Phthalate (2.06%), 3,5-Dihydroxy-6-methyl-2,3-dihydro-4H-pyran-4-one (2.06%), Ethyl icosanoate (1.84%), Pyrogallol (1.77%), Triethyl (5-benzoyl-1H-pyrrol-2-yl) methanetricarboxylate (1.76%), Cycloheptatriene (1.72%), 1-(2-Piperidiny)-1-propanol (1.65%), 3-Methylcyclopentan-1,2-diol (1.09%), 4-(3,6-Dimethyl-3-heptanyl)phenol (1.53 %), Cinnamaldehyde (1.44%), Ethyl 3,7,12-

trihydroxycholan-24-oate (0.53%). In terms of percentage amounts, lupeol and betulin are terpenoids compounds, which are predominant in the extracts of *E. alsinoides* plant. These two compounds have been isolated and characterized using spectral data.

CONCLUSION

The preliminary phytochemical tests indicated the presence of alkaloids, carbohydrates, glycosides, steroids, tannins, flavonoids, terpenoids and phenolic compounds in the different solvent fractions. Several such compounds are known to possess potent antioxidant activity and antiasthma activity. Hence, the observed antioxidant activity may be due to the presence of Lupeol and Betulin. Similarly the observed antiasthma activity may be due to the presence of Lupeol and Betulin in the *E. alsionoides* plant.

Table 1 : Qualitative Phytochemical screening of *E. alsinoides*

S. No.	Phytochemical Constituents	Name of the Test	<i>E. alsinoides</i>					
			M	C	A	H	P	W
1	Alkaloids	Mayer's Test	+	-	+	-	-	+
		Dragendroff's Test	+	+	+	-	+	+
		Wagner Test	-	-	-	-	-	-
2	Carbohydrates	Molisch's Test	+	+	+	-	+	-
		Fehling's Test	+	+	+	+	-	+
		Benedict's Test	-	+	-	-	+	+
3	Glycosides	Keller killani Test	+	-	-	-	+	-
		Borntrager's Test	+	-	-	-	+	-
4	Steroids	Salkowaski Test	-	-	+	-	-	-
5	Saponins	Foam Test	-	-	-	-	-	-
6	Tannin	Lead sub acetate Test	+	+	+	-	+	+
		FeCl ₃ Test	+	+	+	-	+	+
7	Flavonoids	Lead Acetate Test	+	+	+	-	+	+
		Shinoda Test	+	+	+	-	+	+
8	Coumarin	NaOH Test	-	-	-	-	-	-
9	Terpenoids	Liebermann's -	+	+	+	-	+	-
		Bucherl's Test	+	+	+	-	+	-
		Chloroform Test	+	+	+	-	+	-
10	Phenolic compounds	FeCl ₃ Test	+	+	+	+	+	+

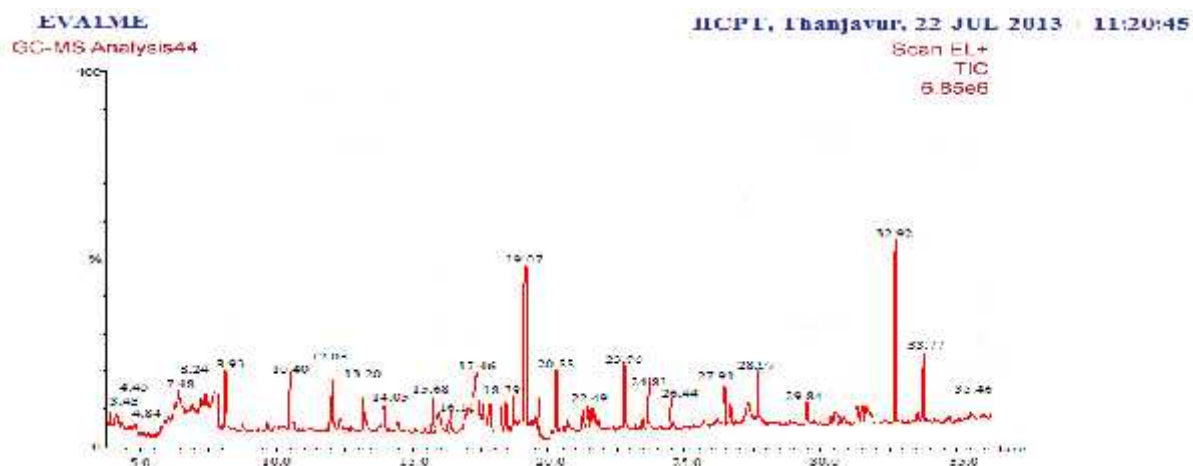


Fig. 1: GC-MS Chromatogram of the methanolic extract of *E. alsinoides*

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