Available on line www.eijppr.com

International Journal of Pharmaceutical and Phytopharmacological Research

ISSN (Online) 2249 – 6084

ISSN (Print) 2250 – 1029

Int.J.Pharm.Phytopharmacol.Res. 2011, 1(3): 112-116

(Research Article)

Phytochemical Screening and GC-MS Studies on the Ethanolic Extract of *Cayratia pedata*

A.Leo Stanley[*], V. Alex Ramani[1] , A. Ramachandran[2]

[*]*Department of Chemistry, St.Joseph's College (Autonomous), Tiruchirapalli,* India.

[1] *Dean, St.Joseph's College (Autonomous), Tiruchirapalli, India*.

[2] *Director, Centre for Climate Change and Adaptation Research, Anna University, Chennai, India*

Received on: *16/12/2011* ***Accepted on:*** *24/12/2011*

ABSTRACT

Cayratia pedata is an indigenous herb belonging to the family Vitaceae. The leaves of Cayratia pedata are used as astringent and refringent. The phytoconstituents present in this medicinal plant have been studied to possesses diuretic activities. The present research was designed to investigate the ethanolic extract of the medicinal plant Cayratia pedata, which contains alkaloids, steroids, carbohydrates, terpenoids, tannin, phenolic compounds and flavonoids and all of them were confirmed through phytochemical screening and GC-MS analyses.

Key Words: GC-MS, Phytochemical screening, Diuretic activity, *Cayratia pedata,* Vitaceae

INTRODUCTION

Cayratia pedata[1], **(**Tamil: Pannikkodi, Kattupirandai, Sanskrit: Suvaha, Gobhapadi, Malayalam: Velutta sori valli, Tripadi) is an indigenous herb belonging to the family *Vitaceae*. It is a woody climber with cylindrical stem and grown mostly in semi evergreen to evergreen forest. Traditionally, the leaves of this plant were used in the treatment of ulcers and diarrhea. The decoction of the leaves was used to check uterine and other fluxes[2]. The plant has also found to possesses anti-inflammatory[3] and antinociceptive activities[4] .The aim of the present study was to identify the phytocomponents of the plant through to GC-MS analysis of the ethanolic extract of the plant leaves.

MATERIALS AND METHODS

Collection of plant materials

The leaves of the plant *Cayratia pedata* were collected from Kollimalaihills. They were identified and authenticated by, The Rapinet Herbarium, St. Joseph's college (Autonomous), Tiruchirappalli, Tamilnadu, India[5].

Sample Preparation

The leaves of *Cayratia pedata* were shade dried and pulverized well. About 20g of the powdered leaves were soaked in 100 mL of ethanol. It was left for 24 hours so that alkaloids, terpenoids, and other constituents if present will get dissolved. The ethanolic extract was filtered using Whatmann (number 1) filter paper and the residue was removed.

Phytochemical Screening

Phytochemical screening of the plant leaf extract was carried out as per the methods and tests given by Harbone[6] to decipher the presence or absence of various phytoconstituents.

Gas Chromatography—Mass Spetroscopy[7]

The ethonolic extract was subjected to GC-MS analysis on the instrument GC-MS SHIMADZU QP2010 with Elite – DB-5M column and the GC-MS solution version 2.53 software. Initially oven temperature was maintained at 70 °C for 2.0 minutes, and the temperature was gradually increased upto 300 °C at 10.0/35.0 min and 4.0 µL of sample was injected for analysis .Helium gas 99.995% of purity was used as a carrier gas as well as a eluent. The flow rate of helium gas was set to 1.5 mL/min. The sample injector temperature was maintained at 260º C and the split ratio is 20 throughout the experiment periods. The ionization mass spectroscopic analysis was done with 70 eV. The mass spectra was recorded for the mass range 40-1000 *m/z* for about 35 minutes. Identification of components was based on comparison of their mass spectra. As the compounds separated, on elustion through the column,were detected in electronic signals.

As individual compounds eluted from the Gas chromatographic column, they entered the electron ionization detector where they were bombarded with a stream of electrons causing them to break apart into fragments. The fragments were actually charged ions with a certain mass. The m/z ratio obtained was calibrated from the graph obtained which was called as the mass spectrum graph which is the fingerprint of the molecule. The identification of compounds was based on the comparisons of their mass spectra with NIST Library 2008 WILEY8, FAME.

RESULTS AND DISCUSSION

Phytochemical screening of the plant Cayratia pedata by GC-MS method

The phytochemical active compounds *of Cayratia pedata* were qualitatively analysed and the results are presented in Table.1 which indicates that the ethanolic extract of *Cayratia pedata* leaves showed the presence of phytochemical active compounds such as alkaloids, carbohydrates, steroids, tannin, phenolic compounds, flavonoids and terpenoids.

GC-MS Analysis

GC-MS analysis was carried out on the ethanolic extract of *Cayratia pedata* and 33 compounds were identified. The GC-MS analysis was done using the instrument GC-MS SHIMADZU QP2010 with GC-MS solution version 2.53 software. The sample volume was 4.0 µL. The sample of ethanolic extract was run for 35 minutes. The Chromatogram (Figure.10) shows 7 prominent peaks in the retention time range 8.208 - 29.068. The peak at 18.080 retention time is having the peak area 49.82. This largest peak is due to the presence of Phytol (Mmass, 296). The Second less prominent peak at 29.068 retention time has the peak area 13.66 is due to the presence of Lupeol (Mmass, 426). The third less significant peak at 27.910 retention time with the peak area 7.21 is characteristic of Gamma-stigmasterol (Mmass, 414). The Fourth less prominent peak at 23.703 retention time with the peak area 6.32 denotes All-trans-Squalene (Mmass, 410). The other less prominent peaks at other retention times are given in Table 2. The total ion chromatograph (TIC) showing the peak identities of the compounds identified have been given in Figure 1.

CONCLUSION

The result of the present investigation reveals that the successive extracts of *Cayratia pedata* possessed significant diuretic activity which was analyzed by phytochemical screening and GC-MS analysis. The plant extract reveals the presence of alkaloids, carbohydrates, steroids, tannin, phenolic compounds, flavonoids and terpenoids. The GC-MS analysis of the ethanolic extract of *Cayratia pedata* reveals the presence of phytoconstituents belonging to the type-acids, esters, alcohols, ethers, *etc.*Thus, the medicinal plant *Cayratia pedata* is found to possess significant phytoconstituents. The presence of such a variety of phytochemicals may be attributed to the medicinal characteristics of this plant *Cayratia pedata***.**

Table 1: Phytochemical screening of the leaves of *Cayratia pedata*

S.No.	Tests	*Results*
1.	**Alkaloids**	(+)`
2.	**Amines**	(-)
3.	**Carbohydrates**	(+)
4.	**Cardiac Glycosides**	(-)
5.	**Steroids**	(+)
6.	**Saponins**	(-)
7.	**Fixed oils and Fats**	(-)
8a.	**Tannin**	(+)
8b.	**Phenolic compounds**	(+)
9.	**Proteins and Free amino acids**	(-)
10.	**Flavonoids**	(+)
11.	**Terpenoids**	(+)

(+) Present (-) Absent

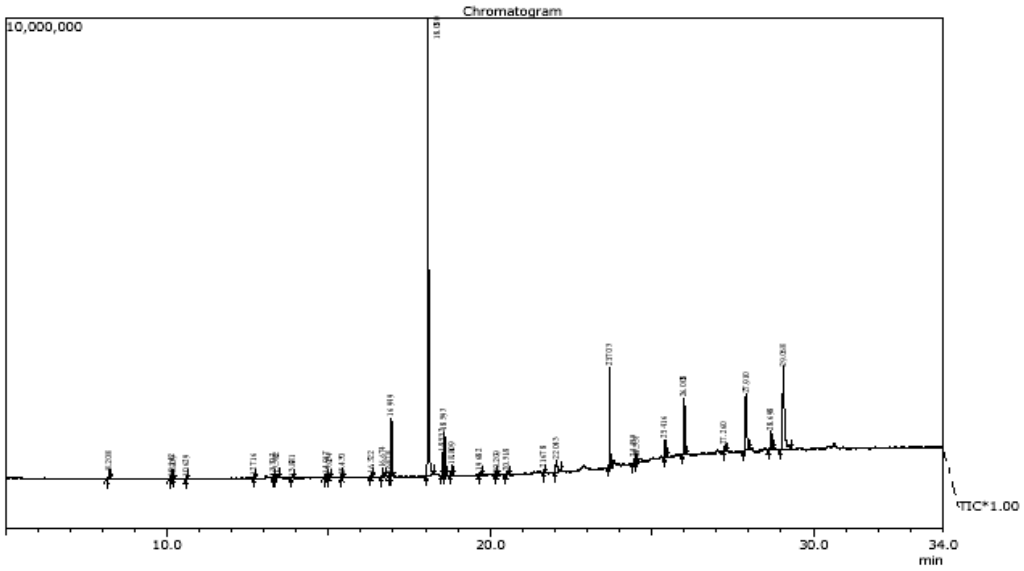

Fig.1. GC-MS Chromatogram of ethanolic extract of *Cayratia pedata.*

Table-2: The Compounds present in the ethanolic extract of *Cayratia pedata*

S.No	RT (min)	Name of the compound	Peak Area (%)
1.	8.208	L-Glutamic acid	0.57
2.	10.142	Biphenyl	0.16
3.	10.209	2-Methyl-4-heptanone	0.03
4.	10.629	2,6,10,10-Tetramethylbicyclo(7.2.0) undeca-1,6-diene	0.07
5.	12.716	Di-Isodectyl Phthalate	0.07
6.	13.302	1,2,4,5-Tetroxane,3,3,6.6-Tetraphenyl-	0.06
7.	13.382	3-Oxo-Alapha,-Ionol	0.37
8.	13.881	3-Buten-2-ol,4-(2,6,6-Trimethyl-1-cyclohexen-1-yl)	0.08
9.	14.917	Methyl 7-hydroxy-2-methyl-3,5-octadienoate	0.33
10.	15.034	4-Hydroxy-3,5,5-Trimethyl-4-(1E)-3-oxo-1-butenyl)-2-cyclohexene-one	0.18
11.	15.430	Hexahydropseudoionone	0.08
12.	16.322	4-(2-Hydroxy-2,6,6-Trimethylcyclohexyl)-3-buten-2-one	0.25
13.	16.674	n-Hexadecanoic acid	0.76
14.	16.878	E-11- Hexadecanoic acid,Ethylester	0.13
15.	16.949	EthylHexadecanoate	3.18
16.	18.080	Phytol	49.82
17.	18.532	Ethyl(9Z,12Z)-9,12- Octadecanoate	1.21
18.	18.593	Ethyl Linolenate	2.74
19.	18.809	Ethyl Octadecanoate	0.69
20	19.682	1-Hexadecanol	0.32
21.	20.209	3,7-dimethyl-1-octyl methylphosphonofluoridate	0.09
22.	20.518	Ethyl icosanoate	0.30
23.	21.678	DEPH;1,2-Benzenedicarboxylicacid,bis(2-hylhexyl)ester	0.18
24.	22.043	2-Phenoxyl-2-phenylpropanic acid	1.65
25.	23.703	All-trans-squalene	6.32
26.	24.455	Methyl Linolenate	0.33
27.	24.537	Methyl cis-11,14,17-Icosatrienoate	0.38
28.	25.416	Gamma-Tocopherol	1.48
29.	26.008	Di-Alpha,- Tocopherol	4.58
30.	27.260	Stigmasterol	0.68
31.	27.910	Gamma-stigmasterol	7.21
32.	28.698	Lupenone	2.18
33.	29.068	Lupeol	13.66

REFERENCES

1. Khare C.P., Indian medicinal plants. Springerscience, New Delhi, 2007.
2. Patil, S. G. Honrao, B. K. Journal of Economic and Taxonomic Botany, 2000, 24(3): 688-694
3. Veeradass Rajendran, Rathinambal V and Gopal V, A preliminary study on antiinflammatory activity of *Cayratia pedata* leaves on Wister albino rats, Scholars research library. Der Pharmacia Lettre, 2011,3 (2) : 433-437.
4. Veeradass Rajendran, Indumathy S and Gopal V, Anti-nociceptive activity of *Cayratia pedata* in experimental animal models, Journal of Pharmacy Research, 2011,4(3):852-853.
5. Sarita das, S.K. Dhas and S.N. Padhy, Ethno-medicinal Informations from Orissa State, India, Girach, J. Hum. Ecol., 1996,14(3): 181.

6. Sriranmsridharan, GC-MS Study and Phytochemical profiling of *Mimosa pudica* linn. Journal of Pharmacy Research,2011, 4(3):741-742.
7. Ganesh S. and Jannet Vennila J., Phytochemical Analysis of *Acanthus ilicifolius* and *Avicennia officinalis* by GC-MS, Research Journal of Phytochemistry, 2011,5(1):60-65.
8. De jussiew A.L., American Philosophical Society,volume, 1935-June,24, Part.2,255.

Corresponding Author: *A.Leo Stanley,*
Department of Chemistry,
St.Joseph's College (Autonomous),
Tiruchirapalli – 620002, India.
Email: leostandly@ymail.com