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GC-MS Determination of Bioactive Compounds of *Indigofera aspalathoides*

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ABSTRACT

In this study,the bioactive compounds of I.aspalathoides have been evaluated using GC-MS. The chemical compositions of the whole plant methanol extract of I.aspalathoides were investigated using Perkin-Elmer Gas Chromatography- Mass Specroscopy. GC-MS analysis of I.aspalathoides whole plant methanol extract revealed the existence of the major compound Tetradecanoic acid (39.70), 2 Methoxy -4α-methylandrost-2-en-17--1-one 5β(24.38).

Keywords : GC-MS analysis Bioactive compounds, *I.aspalathoides*, Methanol extract.

INTRODCTION

Indigofera is a large genus of about 700 species of flowering plants belonging to Fabaceae. Medicinal plant are used by 80% of the world population for health needs. The relationship between man, plants and drugs derived from plants described the history of mankind. Plants are importance source of natural drugs. Traditional system of medicine has become a burning issue of global importance

India is the birth place of renewed system of Indigenous medicine such as siddha, Ayurvedha and Unani. Traditional systems of medicines are prepared from a single plant or combinations of more than one plant. these efficacy depends on the current taxonomic identify of plant species, use of proper plant part and its biological potency which in turn depends upon the presence of required quantity and nature of secondary metabolite in a raw drug. Traditional system of medicine continued to be widely practiced Global estimate indicates that 80% of about 5 billion population cannot afford the products of the western pharmaceutical industry but they offered the

uses of traditional medicines which are mainly derived from plant materials. In this modern world, nowadays plant based drags are widely used and many countries contributes 40-50% of their total, health budget in the population of novel drugs (Karthishwaran *et al.,* 2010.,Sati *et al*., 2010).

Root is chewed as a remedy for toothache and aphthae (Mail *etal* 2006) Leanes of *Indigofera aspalathodes* are used to obtain blue black dye and the plant shows positive effect on colonization with arbuscular microflora fungi (Sundar., 2008)

The entire plant is traditinolly used for various ailments including liver disorders and tumors (Nadkarni, 1996, Kirtikar and Basu, 1993).

Indigofera articulate is used for toothache and *Indigofera oblogifolia* was used as an anti-inflammatory for insect stings, snakebites and swellings. *Indigofera aspalathodies* have also been used as anti-inflammatories (Raj kapoor *et al*., 2005).

MATERIALS AND METHODS

Plant material

Indigofera aspalathoides was collected from Tamil university, Campus ,Thanjavur District,Tamil Nadu in India and Identified by Prof.Dr.A.Rajendran ,Research Gaide,Dept of Botany, Bharathiar University, Coimbutore.

Preparation of extract

The Sample were dried and Pulverized to powder in a mechanical grinder.Required quantity of the whole plant powder of *Indigofera aspalathodies* was weighted ,transferred to flaske, treated with the Methanol until the powder was fully immersed,incubated over night and filtered through a Whatmann No.41 filterpaper along with Sodium sulphate was wetted with absolute alcohol.The filtrate is then concentrated to 1ml by bubbling nitrogen gas in to the solution. The extract contains both polar and non-polar components of the material and 2ul sample of the solution was employed in GC-MS for analysis of different compounds.

GC-MS analysis

The GC – MS analysis was carried out using a Clarus 500 Perkin – elmer (Auto system XL) Gas Chromatograph equipped and coupled to a mass detector Turbo mass gold – Perkin Elmer Turbomass 5.1 spectrometer with an Elite – 1 (100% Dimethyl poly siloxane), 30m x 0.25 mm ID x 1µm of capillary column. The instrument was set to an initial temperature of 110^{o}C, and maintained at this temperature for 2 min. At the end of this period the oven temperature was rose up to 280^{o}C, at the rate of an increase of 5^{o}C/min, and maintained for 9 min. Injection port temperature was ensured as 250^{o}C and Helium flow rate as one ml/min. The ionization voltage was 70eV. The samples were injected in split mode as 10:1. Mass spectral scan range was set at 45-450 (m/z).

Using computer searches on a NIST Ver.2.1 MS data library and comparing the spectrum obtained through GC – MS compounds present in the plants sample were identified.

Identification of phytocompounds

Interpretation on mass-spectrum GC-MS was conducted using the dadabase of National institute Standard and Tecnology (NIST)having more 62,000 patterns. The spectrum of the unknown components was compared with the The spectrum of known components stored in the NIST library. The name, molecular weight and structure of the components of the test materials were ascertained.

RESULTS AND DISCUSSION

The studies on the active principles in the *Indigofera aspalathoides* whole plant Methanolic extrct by GC-MS analysis clearly showed the presence of ten compounds (Tab-1).The active principles with ther retention time (RT).molecular formula, molecular weight (MW),and concentration (peak area%)are presented in Table-1.The GC-MS chromatogram of the seven peak of the compounds detected was shown in Figure-1.Chromatogram GC-MS analysis of the methanol extract of *I. aspelathoides* Showed the presence of 10 majer peaks and the components corresponding to the peaks were determined as follows. The First set up peaks were determined to be Dode canoicacid acid tR=10.99 min and covered with 1.61% of spectral area. The second peakes indicated to be tetradecanoic acid (tR=13.47min) with 39.70% of peak area. Following this an area up 11.14% cowered in the mass spectrum by n-Hexadecanoic acid at(tR-16.34 min). The next peaks considered to be 5.45% of 9,12 – octadecadienoic acid (tR=18.96min). The fifth peak indicated to be oleic acid (tR=19.03 min) with 6.46% of peale area. The sixth peak (tR=19.87) were determined to be octadecanoic acid while the seventh peak (tR=20.95 min) were attributed as kour 16-ene. Pregnonetrial (tR=21.26) 5-(1-Isopropenyl 1-4,5 – dimethyl bicycle (4.3.0) nonan -5-Y1)-3- methyl-2-pentenil acetate (t2=22.35 min), 2 Methoxy -4α-methylandrost-2-en-17--1-one 5β (tR=30.02) with 4.83% 3.15% and 24.38%.

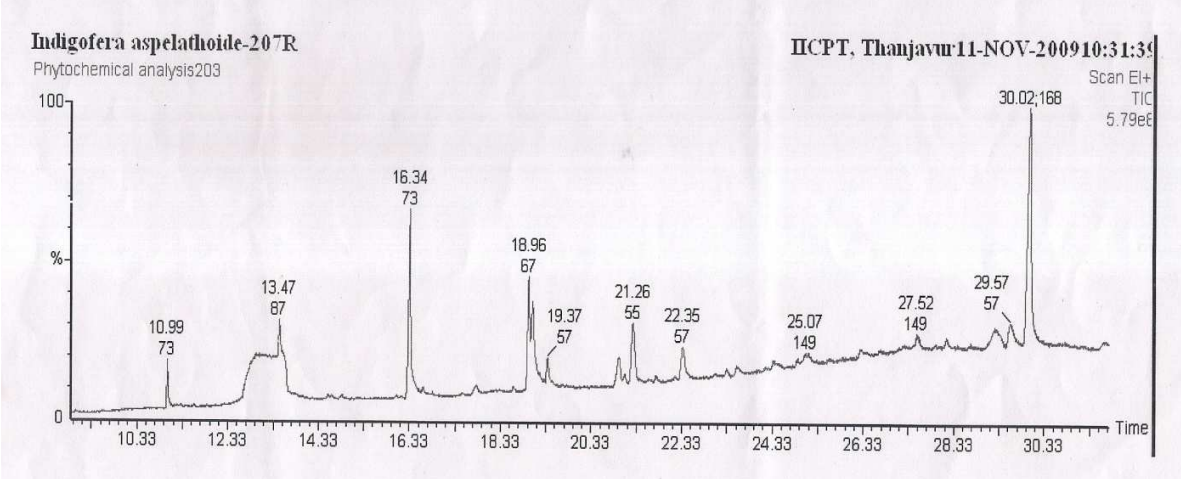
Among the identified phyto compounds Dode canoicacid acid, tetradecanoic acid and n-Hexadecanoic acid have the property of anti oxidant and antimicrobial activities (Bodoprost and Rosemeyer 2007).

Table1. GC – MS analysis of *Indigofera aspalathoides*

S. No	RT	Name of the compound	Molecular Formula	MW	Peak Area%
1	10.99	Dodecanoic acid	$C_{12}H_{24}O_2$	200	1.61
2	13.47	Tetradecanoic acid	$C_{14}H_{28}O_2$	228	39.70
3	16.34	n-Hexadecadienoic acid	$C_{16}H_{32}O_2$	256	11.14
4	18.96	9,12-Octadecadienoic acid (Z,Z)	$C_{18}H_{32}O_2$	280	5.45
5	19.37	Oleic Acid	$C_{18}H_{34}O_2$	282	6.46
6	19.03	Octadecanoic acid	$C_{18}H_{36}O_2$	284	1.31
7	20.95	Kaur-16-ene3	$C_{20}H_{32}O_2$	272	1.98
8	21.26	Pregnanetrial	$C_{21}H_{36}O_3$	336	4.83
9	22.35	5-(1-Lsopropenyl-4,5dimethylbicyclo(4.3.0) nonan-5-yl)-3-methyl-2-pentenol acetate	$C_{22}H_{36}O_2$	332	3.15
10	30.02	2-Methoxy-4α-methylandrost-2-en-17ol-l-one 5β	$C_{21}H_{32}O_3$	332	24.38

Litsea polyantha Juss. (Lauraceae) has a long history of medicinal use among the traditional healers of Oraon and Munda community of Jharkhand. Powdered bark and roots are used for pains, bruises and contusions and for fractures in animals. The present study is carried out to identify the phytoconstituentspresent in *L. polyantha* Juss. bark extracts using GC-MS. We are reporting for the first time the presence of chalcone and its derivatives from *L. polyantha* Juss. The studies also eugenol support the use of *L. polyantha*as an analgesic in the folklore medicine, since eugenol possesses analgesic properties.(Manik Ghosh and B.N. Sinha2010).
(Table1&fig1)

Fig 1. GC – MS analysis of *Indigofera aspalathoides*



CONCLUSION

In the present study twenty chemical constituents have been identified from Methanolic extract of the whole plant of *Indigofera aspalathodies* by Gas Chromatogram Mass spectrometry (GC-MS) analysis.The presence of various bioactive compounds justifies the use of whole plant various ailments by traditional practitioners.

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