GC-MS ANALYSIS OF ETHANOL EXTRACT OF *ENTADA PURSAETHA* DC SEED

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ABSTRACT

The investigation was carried out to determine the possible bioactive components of seed of *Entada pursaetha* using GC-MS. *Entada pursaetha* known to the Kanikkars as "Parandaikodi" is an important medicinal plant. The Kanikkar tribe, inhabitants of Agasthiarmalai Biosphere Reserve, Western Ghats, Tamil Nadu use this plant to relief from rheumatic pain. The chemical compositions of the ethanol extract of seed of *Entada pursaetha* were investigated using Perkin-Elmer Gas Chromatography-Mass Spectrometry, while the Mass spectra of the compounds found in the extract was matched with the National Institute of Standard and Technology (NIST) library. Fourteen compounds were identified; 1,2, Benzenedicarboxylic acid, diisooctyl ester (69.52%) was found to be major component followed by Benzeneacetic acid, 2,5-dihydroxy- (syn: Homogentisic acid) (8.12%), n-Hexadecanoic acid (4.48%) Oleic acid (4.39%) Azulene, 1,4-dimethyl 1-7- (1-methylethyl)- (3.86%) and undecanoic acid (2.46%).

Key words: Ethnomedicine, *Entada pursaetha*, GC-MS, Rheumatism.

INTRODUCTION

Entada pursaetha DC belongs to "Mimosaceae" is commonly known as "Parandaikodi" in Kanikkar tribals of Agasthiarmalai Biosphere Reserve, Western Ghats, Tamil Nadu. Paste prepared from the seeds of *Entada pursaetha* is applied over the affected and the inflamed swellings by the Kanikkars to reduce pain due to rheumatism (Shanmugasundaram *et al.,* 2011). The Kanikkar women consume the seeds paste of *Entada pursaetha* to improve lactation (Viswanathan, 2006). The Valmiki, Bakatha and Nakkalolu tribal communities living in the Eastern ghats of Tamil Nadu and Andhra Pradesh use seeds of *Entada pursaetha* to treat various ailments. The seed of *Entada pursaetha* is used as antihelmenthic and febrifuge. The powdered seed kernal is given to the women for post delivery recuperation. Seed kernal is also used to cure cough and stomachache. The kernal paste is used as contraseptive (Priya and Rao, 2008). Persual of literature reveals that information on the GC-MS analysis of *Entada pursaetha* is totally lacking. Hence, the objective of the present study is to identify the phytochemical constituents with the aid of GC-MS technique.

MATERIALS AND METHODS

The seeds of *Entada pursaetha* DC were collected from the Agasthiarmalai Biosphere Reserve, Western Ghats, Tamil Nadu. The seeds were shaded dried and pulverized to powder in a mechanical grinder. Required quantity of powder was weighed and transferred to stoppered flask, and treated with ethanol until the powder is fully immersed. The flask was shaken every hour for the first 6 hours and then it was kept aside and again shaken after 24 hours. This process was repeated for 3 days and then the extract was filtered. The extract was collected and evaporated to dryness by using a vacuum distillation unit. The final residue thus obtained was then subjected to GC-MS analysis.

GC-MS Analysis

GC-MS analysis of these extracts were performed using a Perkin-Elmer GC Clarus 500 system and Gas chromatograph interfaced to a Mass spectrometer (GC-MS) equipped with a Elite-I, fused silica capillary column (30mmX0.25mm 1D X 1 µMdf, composed of 100% Dimethyl poly siloxane). For GC-MS detection, an electron ionization system with ionizing energy of 70 eV was used. Helium gas (99.999%) was used as the carrier gas at constant flow rate 1ml/min and an injection volume of 2µl was employed (split ratio of 10:1); Injector temperature 250°C; Ion-source temperature 280°C. The oven temperature was programmed from 110°C (isothermal for 2 min.), with an increase of 10°C/min, to 200°C, then 5°C/min to 280°C, ending with a 9min isothermal at 280°C. Mass spectra were taken at 70 eV; a scan interval of 0.5seconds and fragments from 45 to 450 Da.

Total GC running time was 36 minutes. The relative % amount of each component was calculated by comparing its average peak area to the total areas, software adopted to handle mass spectra and chromatograms was a Turbomass.

Interpretation on mass spectrum GC-MS was conducted using the database of national Institute Standard and technology (NIST) having more than 62,000 patterns. The spectrum of the unknown component was compared with the spectrum of the 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 results pertaining to the GC-MS analysis are given in figure 1 and Table 1. Fourteen compounds were detected in ethanol extract of *Entada pursaetha* seed. The results revealed that 1, 2, Benzenedicarboxylic acid, diisooctyl ester (69.52%) was found to be major component followed by Benzeneacetic acid, 2, 5-dihydroxy- (syn: Homogentisic acid) (8.12%), n-Hexadecanoic acid (4.48%) Oleic acid (4.39%) Azulene, 1, 4-dimethyl 1-7- (1-methylethyl)- (3.86%) and undecanoic acid (2.46%). Figure 2, 3 and 4 shows the mass spectrum and structure of Tetradecanoic acid, 9, 12- octadienoic acid (z, z) and 1, 6- Anhydro- β-d-talopyranose respectively.

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Table 1: Components detected in *Entada pursaetha* seed extract

No	RT	Name of the compound	Molecular Formula	MW	Peak Area %
1	10.47	1-Octanol, 2-butyl-	$C_{12}H_{26}O$	186	0.24
2	15.05	1,6-Anhydro-β-d-talopyranose	$C_6H_{10}O_5$	162	2.46
3	16.26	Undecanoic acid	$C_{11}H_{22}O_2$	186	0.89
4	18.22	Benzeneacetic acid, 2,5-dihydroxy- [synonyms: Homogentisic acid]	$C_8H_8O_4$	168	8.21
5	19.73	Azulene, 1,4-dimethyl-7-(1-methylethyl)-	$C_{15}H_{18}$	198	3.86
6	20.46	Tetradecanoic acid	$C_{14}H_{28}O_2$	228	1.31
7	23.47	Hexadecanoic acid, methyl ester	$C_{17}H_{34}O_2$	270	0.47
8	24.36	n-Hexadecanoic acid	$C_{16}H_{32}O_2$	256	4.48
9	24.73	Hexadecanoic acid, ethyl ester	$C_{18}H_{36}O_2$	284	0.90
10	26.46	Vitamin E	$C_{29}H_{50}O_2$	430	1.19
11	26.60	9,12-Octadecenoic acid (Z,Z)-,	$C_{18}H_{32}O_2$	280	0.83
12	26.71	9-Octadecenoic acid (Z)-, methyl ester	$C_{19}H_{36}O_2$	296	1.25
13	27.57	Oleic acid	$C_{18}H_{34}O_2$	282	4.39
14	33.96	1,2-Benzenedicarboxylic acid, diisooctyl ester	$C_{24}H_{38}O_4$	390	69.52

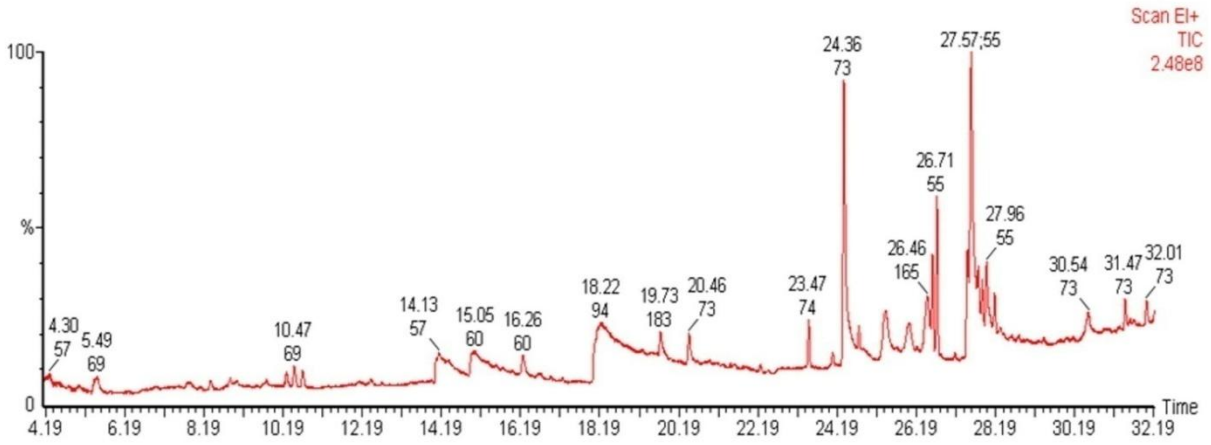

Fig 1: GC-MS Chromatogram of the ethanol extracts of *Entada pursaetha* seed

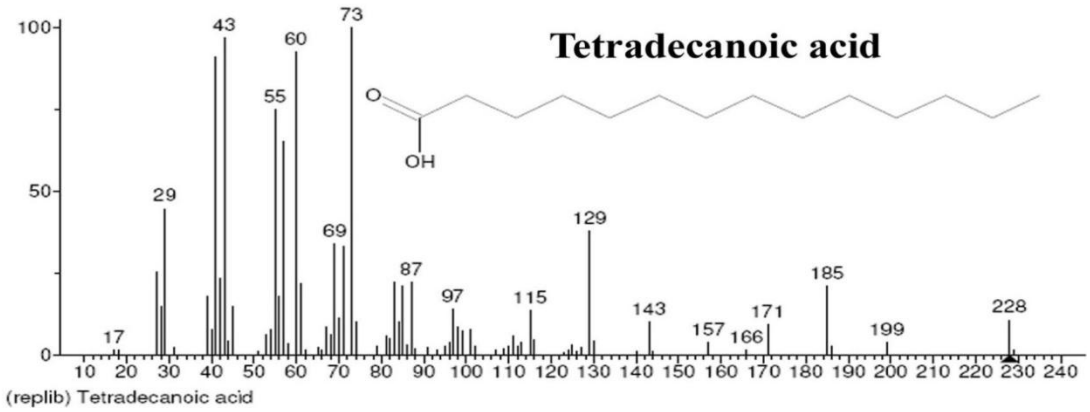

Fig 2 : Mass Spectrum of Tetradecanoic acid.

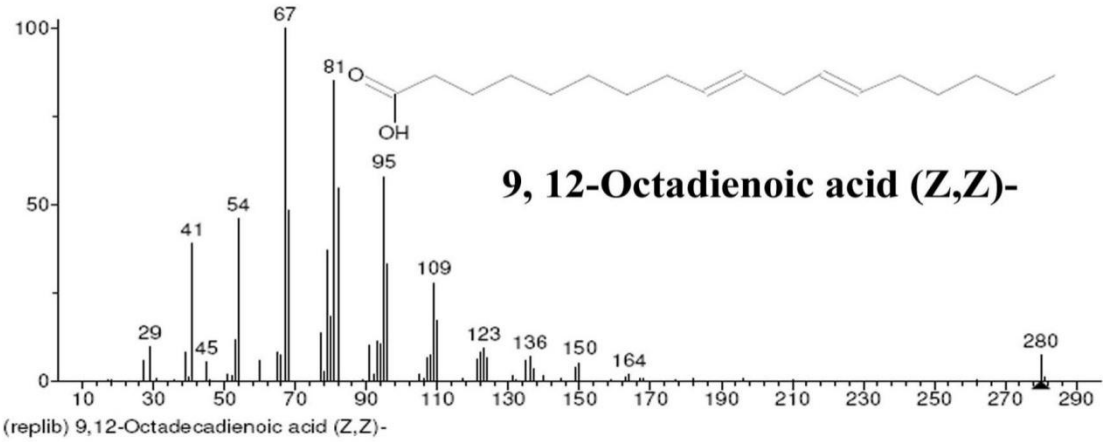

Fig 3 : Mass Spectrum of 9, 12-Octadienoic acid (z,z).

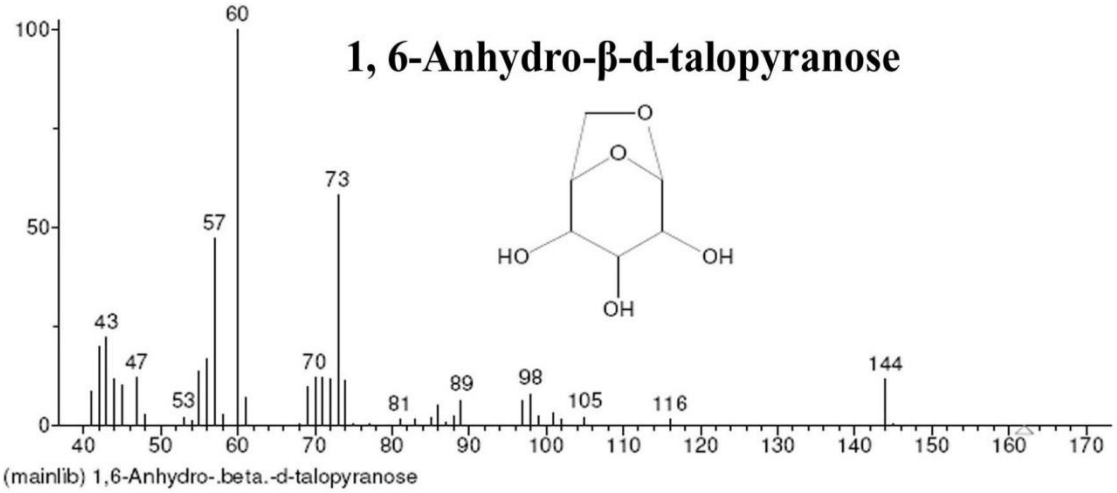

Fig 4 : Mass Spectrum of 1, 6-Anhydro-β-d-talopyranose.

Among the identified phytochemicals, Tetradecanoic acid, n-Hexadecanoic acid and Vitamin E may have the role in antioxidant and antiiflammatory effects.Thus, this type of GC-MS analysis is the first step towards understanding the nature of active principles in this medicinal plants and this type of study will be helpful for further detailed study.

ACKNOWLEDGEMENT

We would like to thank Mr. S. Kumaravel, senior scientist, India Institute of Crop Processing Technology (Ministry of Food Processing Industries, Government of India), Tanjavore, Tamil Nadu for providing all the facilities and support used to carry out the work.

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