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GC-MS ANALYSIS ON METHANOLIC BARK EXTRACT OF FILICIUM DECIPIENS. (WIGHT & ARN)THWAITES

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ABSTRACT

The present study was carried out to determine the chemical components of Methanolic bark extract of Filicium *decipiens* (Family: Sapindaceae) by GC-MS method. In GC-MS analysis 34 compounds were identified. Ethyl heptone, Nananoic acid, Herbecide, Propyl hexanoate, Dodecane, Azulene, Oxadrotone, Bornesitol, Ononital, Pinitol, Quebrachitol, Chavibetol, Eugenol, Isoeugenol, Thujaplicin, Hinkitiol, Thymoquinone, Abietic acid, Heptadecanoic acid, Methylundecanal, Ascaidole, Chrysanthemic acid, Iridomyrmecin, Lineain, Palmeticacid, Pentylhexanoate, Myristic acid, Arecadidine, Ethosuxinmide, Diacetonealcohol, Prophylpropanoate, Azelaic acid, Hexanal, Amyl Acetate.

KEYWORDS: Gas chromatography-Mass Spectrometry, Phytochemical, *Filicium decipiens*.

INTRODUCTION

Gas chromatography–mass spectrometry is an analytical method that combines the features of gas-liquid chromatography and mass spectrometry to identify different substances within a test sample. Applications of GC-MS include drug detection, fire investigation, environmental analysis, explosives investigation, and identification of unknown samples. GC-MS has been widely heralded as a "gold standard" for forensic substance identification because it is used to perform a *specific test*. A specific test positively identifies the actual presence of a particular substance in a given sample.[1] A *non-specific test* merely indicates that a substance falls into a category of substances. Although a non-specific test could statistically suggest the identity of the substance, this could lead to false positive identification.

Filicium decipiens belongs to the family Sapindaceae it is commonly known as fern tree, in Tamil sanni maram. *F. decipiens* large tree up to 20m tall found in Chittery hills in India. Bark is brownish; Leaves are pinnate, Leaflets 6-8 pair. Smooth, shining, opposite or some alternate, stalk less, linear oblong, 4-6 inch long with prominent midrib, leaf spine has a leafy wing on either side between the leaflets. Flowers are small, numerous, unisexual in erect narrow panicles, 6-8 inches long. In leaf axis, sepals are narrow, smooth, persistent, petals in male flowers as sepals. In female small. Disk is very hairy; drupe is ovoid, 0.5 inch in diameter, purple shining.[1]

The aim of the present study was to identify the phytochemical constituents of methanolic bark extract of F. *decipiens* by GC-MS analysis.

MATERIALS AND METHODS

Collection of plant material

The barks of *F. decipiens* were collected from the Chittery hills, Dharmapuri district, Tamil Nadu, India. They were identified with help of by Gamble (1935) and "The flora of the Tamil Nadu, Carnatic India" K .M .Mathew, (1983).

Preparation of plant powder for extraction

Healthy plant barks were collected from Chittery Hills region of Tamil Nadu, India. The collected plant materials were dried in shade for 15 days and chopped in to small pieces then the plant materials were pulverized in to coarse powder. About 200 gm of coarse powder was filled in the column of Soxhlet apparatus and extracted with 80% methanol for sixteen hours. The methanol extracts of the bark was used for GC/MS analysis.[10]

GC-MS ANALYSIS

Preparation of Extract

The plant powder were dissolved in methanol separately, sonicated and purged with nitrogen gas for 15 minutes. Then 0.5µl of the extract was injected into the preheated column with the help of an injector.

INSTRUMENTS AND CHROMATOGRAPHIC CONDITIONS

The Gas chromatography - Mass spectroscopy (GC-MS) is an effective technique used for the separation of volatile materials. GC-MS analysis was carried out on a GC clarus 500 Perkin Elmer system comprising a AOC-20i auto sampler and gas chromatograph interfaced

to a mass spectrometer (GC-MS) instrument employing the following conditions: column Elite-1 fused silica capillary column (30 × 0.25 mm ID ×1EM df, composed of 100% Dimethyl poly siloxane), operating in electron impact mode at 70 eV; helium (99.999%) was used as carrier gas at a constant flow of 1ml/min and an injection volume of 0.5 EI 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/min, then 5°C/min to 280°C/min, ending with a 9min. isothermal at 280°C. Mass spectra were taken at 70 eV; A scan interval of 0.5 s and fragments from 40 to 550 Da (Mariajancy rani *et al*., 2011).

IDENTIFICATION OF COMPONENTS

Interpretation on mass spectrum of GC-MS was done using the database of National Institute Standard and Technology (NIST) having more than 62,000 patterns. The mass spectrum of the Unknown component was compared with the spectrum of the known components stored in the NIST and WILEY library. The name, molecular weight and structure of the components of the test materials were ascertained.[1]

RESULTS AND DISCUSSION

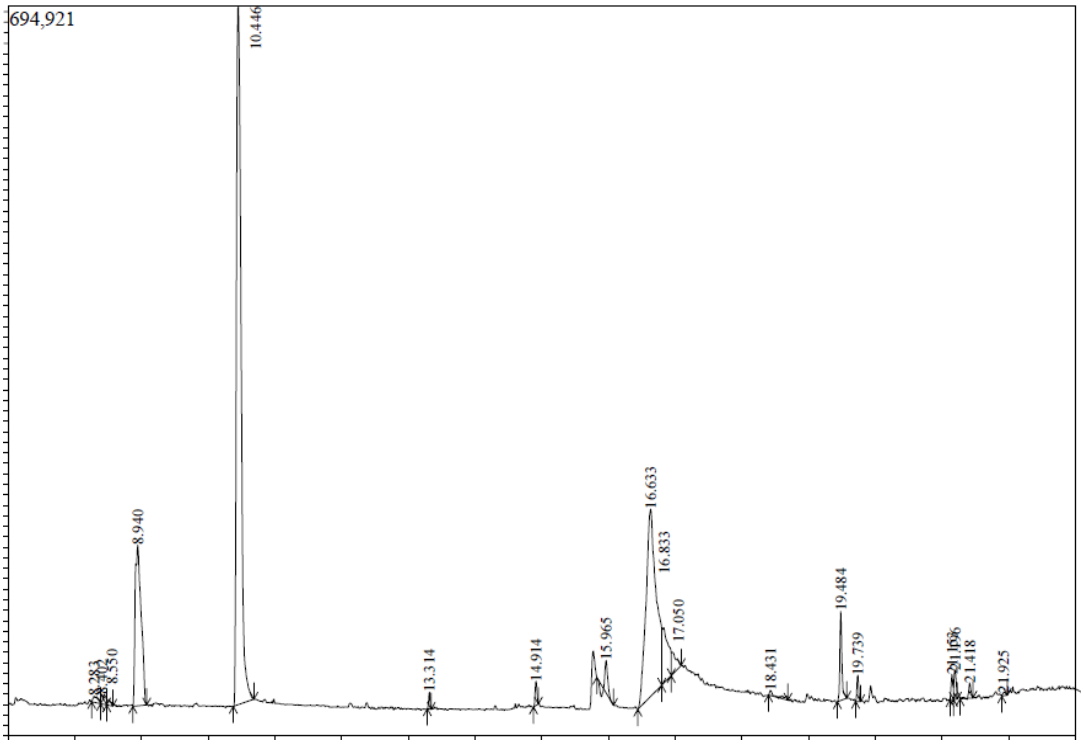
The Gas chromatography–mass spectrographic (GC–MS) analysis affords the advantage of identifying the chemical entities present, which constitutes the chemical picture of a plant (herbal) extract and by which the complex mixtures can be resolved into individual components. It has been applied to identify the different phytoconstituents present in *F. decipiens.*

The GC-MS analysis revealed the presences of 34 chemical compounds from the GC-MS analysis of the methanolic bark extract of *Filicium decipiens.* The identified 34 chemical components like (C9 H18 O2) Ethyl heptone, (C9 H18 O2) Nananoic acid, (C9 H18 O2) Herbecide, (C9 H18 O2) Propyl hexanoate, (C12 H26) Dodecane, (C10 H8) Azulene, (C19 H30 O3) Oxadrotone, (C7 H14 O6) Bornesitol, (C7 H14 O6) Ononital, (C7 H14 O6) Pinitol, (C7 H14 O6) Quebrachitol, (C10 H12 O2) Chavibetol, (C10 H12 O2) Eugenol, (C10 H12 O2) Isoeugenol, (C10 H12 O2) Thujaplicin, (C10 H12 O2) Hinkitiol, (C10 H12 O2) Thymoquinone, (C20 H30 O2) Abietic acid, (C17 H34 O2) Heptadecanoic acid, (C12 H24 O) 2-Methylundecanal, (C10 H16 O2) Ascaidole, (C10 H16 O2) Chrysanthemic acid, (C10 H16 O2)Iridomyrmecin, (C10 H16 O2) Lineain, (C16 H32 O2) Palmetic acid, (C11 H22 O2) Pentyl hexanoate, (C14 H28 O2) Myristic acid, (C7 H11 NO2) Arecadidine, (C7 H11 NO2)

Ethosuxinmide,(C6 H12 O2) Diacetone alcohol, (C6 H12 O2) Prophyl propanoate, (C9 H16 O4) Azelaic acid, (C6 H12 O) Hexanal, (C7 H14 O2) Amyl Acetate. The active principles with their retention time (RT), Chemical formula, Molecular weight (MW) and Chemical Name shown in the table (1).

Table: 1 GC-MS analysis of the methanolic bark extract of *Filicium decipiens* (wight & arn) thwaites.

S. No.	R. Time	Chemical formula	Molecular Wight	Chemical compound
1.	8.400	C9 H18 O2	158	Ethyl heptone
2.	8.400	C9 H18 O2	158	Nananoic acid
3.	8.400	C9 H18 O2	158	Herbecide
4.	8.400	C9 H18 O2	158	Propyl hexanoate
5.	8.942	C12 H26	170	Dodecane
6.	10.450	C10 H8	128	Azulene
7.	14.917	C19 H30 O3	306	Oxadrotone
8.	16.633	C7 H14 O6	194	Bornesitol
9.	16.633	C7 H14 O6	194	Ononital
10.	16.633	C7 H14 O6	194	Pinitol
11.	16.633	C7 H14 O6	194	Quebrachitol
12.	16.833	C10 H12 O2	164	Chavibetol
13.	16.833	C10 H12 O2	164	Eugenol
14.	16.833	C10 H12 O2	164	Isoeugenol
15.	16.833	C10 H12 O2	164	Thujaplicin
16.	16.833	C10 H12 O2	164	Hinkitiol
17.	16.833	C10 H12 O2	164	Thymoquinone
18.	16.833	C20 H30 O2	302	Abietic acid
19.	19.483	C17 H34 O2	270	Heptadecanoic acid
20.	21.150	C12 H24 O	184	2-Methylundecanal
21.	21.150	C10 H16 O2	168	Ascaidole
22.	21.150	C10 H16 O2	168	Chrysanthemic acid
23.	21.150	C10 H16 O2	168	Iridomyrmecin
24.	21.150	C10 H16 O2	168	Lineain
25.	21.417	C16 H32 O2	250	Palmetic acid
26.	21.417	C11 H22 O2	186	Pentylhexanoate
27.	21.417	C14 H28 O2	228	Myristic acid
28.	21.925	C7 H11 NO2	141	Arecadidine
29.	21.925	C7 H11 NO2	141	Ethosuxinmide
30.	21.925	C6 H12 O2	116	Diacetone alcohol
31.	21.925	C6 H12 O2	116	Prophylpropanoate
32.	7.108	C9 H16 O4	188	Azelaic acid
33.	7.108	C6 H12 O	100	Hexanal
34.	7.108	C7 H14 O2	130	Amyl Acetate



GC-MS analysis of the methanolic bark extract of *Filicium decipiens* (wight & arn) thwaites.

CONCLUSION

The Gas chromatography-mass spectroscopy (GC-MS) analysis in the methanolic extract of *F. decipiens* showed 34 peaks indicating the presences of 34 compounds.

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