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PHYTOCHEMICAL ANALYSIS OF WHOLE PLANT EXTRACTS OF *ANGIOPTERIS HELIFERIANA*

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ABSTRACT: In this Present study of phytochemical analysis of whole plant extract of *Angiopteris heliferiana* plant powder extract using absolute alcohol along with phytochemical compound separated by using Gas Chromatography Mass Spectrometry (GC-MS) is a technique for the analysis. In this GC-MS analysis, 8 phytochemical composites were well-known in the whole plant powder extract of *Angiopteris heliferiana.* The 14 compounds mainly2-Tridecenal, (E)- $$, 2-Decenal, (E)- $$ trans-2-Decenal $$, Nonane, 1,1-diethoxy- $$ Nonanal diethyl acetal $$, 2-Pentadecanone, 6,10,14-trimethyl- $$ Hexahydrofarnesyl acetone $$ n-Hexadecanoic acid , Octadecanoic acid , Heptadecanoic acid, 15-methyl-, ethyl ester $$,Octadecanoic acid, 9,10-epoxy-, isopropyl ester $$,Nonanoic acid, 9-oxo-, ethyl ester $$,11-Dodecen-1-ol monofluoroacetate ,Hexadecanoic acid, 2-hydroxy-1-(hydroxymethyl)ethyl ester $$, Tetracosane Hexacontane ,Pentadecane, 2,6,10,13-tetramethyl- $$,Hexacontane $$. These an assortment of active phytochemicals have been set up to domain a comprehensive variety of activities, which may be set to contribute a indicator in the resistance against eternal infections, accordingly *Angiopteris heliferiana*. Used as medicinal and therapeutic purpose. The current study compacts with extraction of vibrant biological active compounds. This study will aid to plan the innovative drugs for many incurable diseases.

KEYWORDS: *Angiopteris heliferiana,* phytochemical analysis, GC-MS technique, Ethyl palmitate

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1.INTRODUCTION

Angiopteris heliferiana commonly called as the Giant Fern, is a infrequent plant occurring in eastern and northern Australia. As well as originate growing in nearby islands such as New Guinea and several places in Polynesia and Melanesia.[1] Recorded as endangered in New South Wales, everywhere it has been documented growing in sub-tropical rainforest, in the valley of the Tweed River[2]. It is an offensive species in Hawaii and Jamaica. *Angiopteris evecta* is the type species of the genus *Angiopteris*. It was initially described as *Polypodium evectum* by Georg Forster in 1786,[3]. Previously being reclassified and specified its current binomial name in 1796 by Georg Franz Hoffmann.[4] The species name is the Latin adjective *evectus* "swollen" or "inflated"[5].Common names consist of giant fern, king fern, oriental vessel fern, and mule's foot fern. The enormous mature fronds measure up to 8 metres (25 ft) elongated. They initiate from a large thick rootstock, up to 150 cm (60 in) high. *Angiopteris heliferiana* can be full-fledged in well-drained moist sites in the garden with several shades. It is impotent to be propagated by spores but the lobes from the frond base can be uninvolved and will form a new plant in everywhere a year in a medium of sand and peat [5]. The fern might have allelopathic effects, preventing the growth of other plants[6].This plant is used medicinally to treat intestinal worms in Indochina, skin ulcers and wounds in New Guinea, and fever in Malaysia. As well as .*In vitro* examples of the fern kill bacteria. [7-14].

2. MATERIALS AND METHODS

Angiopteris heliferiana Plant material of collected from South Western Ghats a Biodiversity Hot Spot. The plant specimen was recognized with help of Pteridophytes flora of Western Ghats, South India (5).Preparation of Extract Whole plant material was washed with distilled water and shade dried. The dried sample was by hand grinded to a fine powder. The tastelessly powdered parts (5 gm) in 50 ml ethanol were carefully extracted using soxhlet apparatus. The extract then concentrated to 5 gm and employed in GC-MS analysis of diverse compounds.

GCMS Analysis

Angiopteris heliferiana of the GC-MS Analysis of whole plant powder extract with in absolute alcohol, was implemented with a Clarus 500 Perkin Elmer gas chromatography equipped with an Elite-5 capillary column (5% phenyl 95% dimethyl polysiloxane) (30nm X 0.25mm IDX0.25µmdf) at the same time mass detector turbo mass gold of the company which was activated in EI mode. Helium was the carrier's gas at a flow rate of 1ml/min. and instantaneously the injector was operated at 290ºC and the oven temperature was programmed as follows; 50ºC at 8ºC/min to 200ºC (5min) at 7ºC/min to 290ºC(10min).

3. RESULTS AND DISCUSSION

Phytochemicals components analysis on in *Angiopteris heliferiana ethanolic* extract by GCMS analysis evidently presented the presence of 8 compounds (Table no.1). The active principles with their retention time (RT), molecular weight (gm), molecular formula and concentration (Peak area %) are presented in table no.1. The GCMS chromatogram of 14 peaks of the compounds identified was revealed in figure 1. The most prevailing compounds are The 8 compounds mainly 14 phytochemical composites were well-known in the whole plant powder extract of *Angiopteris heliferiana.* The 14 compounds mainly mainly2-Tridecenal, (E)- $$, 2-Decenal, (E)- $$ trans-2-Decenal $$, Nonane, 1,1-diethoxy- $$ Nonanal diethyl acetal $$, 2-Pentadecanone, 6,10,14-trimethyl- $$ Hexahydrofarnesyl acetone $$ n-Hexadecanoic acid , Octadecanoic acid , Heptadecanoic acid, 15-methyl-, ethyl ester $$,Octadecanoic acid, 9,10-epoxy-, isopropyl ester $$,Nonanoic acid, 9-oxo-, ethyl ester $$,11-Dodecen-1-ol monofluoroacetate ,Hexadecanoic acid, 2-hydroxy-1-(hydroxymethyl)ethyl ester $$, Tetracosane Hexacontane ,Pentadecane, 2,6,10,13-tetramethyl- $$,Hexacontane $$. 14 bioactive phytochemical compounds were identified in the whole plant powder extract of *Dicranopteris linearis*. These dissimilar active phytochemicals have been set up to preserve a widespread range of activities, which may be all set to deal a hand in the resistance against unalterable diseases from this time *Angiopteris heliferiana* used as curative and therapeutic purpose.

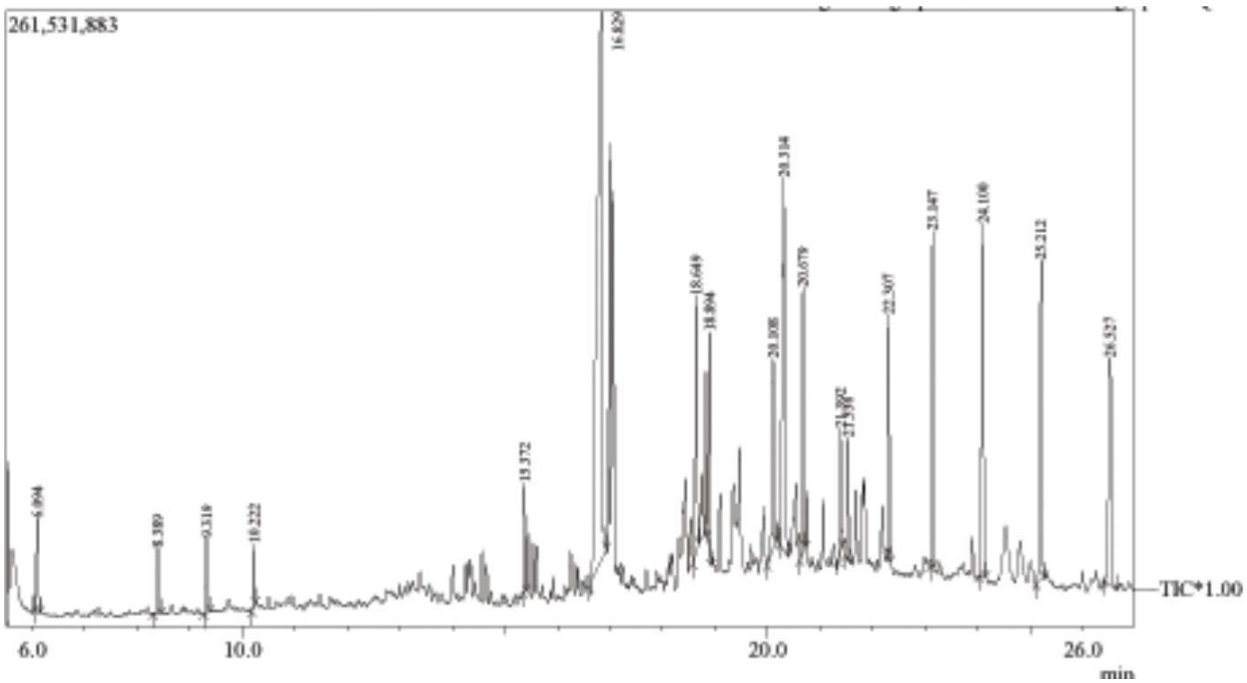

Fig. 1 GC-MS Chromatogram of ethanolic extract of whole plant extract of *Angiopteris heliferiana*

Name of Plant	Bioactive Compounds	Molecular Weight	Molecular Formula	CAS Value	Retention time
Angiopteris heliferiana whole plant powder	2-Tridecenal, (E)- $$	196 gms	$C_{13}H_{24}O$	7069-41-2	6.04-6.15
	2-Decenal, (E)- $$ trans-2-Decenal $$	154 gms	$C_{10}H_{18}O$	3913-81-3	8.30-8.46
	Nonane, 1,1-diethoxy- $$ Nonanal diethyl acetal $$	216 gms	$C_{13}H_{28}O_2$	54815-13-3	9.26-9.39
	2-Pentadecanone, 6,10,14-trimethyl- $$ Hexahydrofarnesyl acetone $$	268 gms	$C_{18}H_{36}O$	502-69-2	15.34-15.40
	n-Hexadecanoic acid	256 gms	$C_{16}H_{32}O_2$	57-10-3	16.60-16.94
	Octadecanoic acid	284 gms	$C_{18}H_{36}O_2$	57-11-4	18.58-18.70
	Heptadecanoic acid, 15-methyl-, ethyl ester $$	312 gms	$C_{20}H_{40}O_2$	57274-46-1	18.85-18.93
	Octadecanoic acid, 9,10-epoxy-, isopropyl ester $$	340 gms	$C_{21}H_{40}O_3$	95007-80-0	20.00- 20.16
	Nonanoic acid, 9-oxo-, ethyl ester $$	200 gms	$C_{11}H_{20}O_3$	3433-16-7	20.23-20.39
	11-Dodecen-1-ol monofluoroacetate	244 gms	$C_{14}H_{25}FO_2$	-----	20.61-20.72
	Hexadecanoic acid, 2-hydroxy-1-(hydroxymethyl)ethyl ester $$	330 gms	$C_{19}H_{38}O_4$	23470-00-0	21.34-21.43
	Tetracosane	338 gms	$C_{24}H_{50}$	646-31-1	21.50- 21.57
	Hexacontane	842 gms	$C_{60}H_{122}$	-----	22.27- 22.34
	Pentadecane, 2,6,10,13-tetramethyl- $$	268 gms	$C_{19}H_{40}$	17081-50-4	23.10- 23.18
	Hexacontane $$	842	$C_{60}H_{122}$	-----	26.40- 26.64

4. CONFLICT OF INTEREST

The authors confirm that this article content has no conflicts of interest

5.ACKNOWLEDGEMENT

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REFERENCES

1. *Angiopteris evecta"*. *Global* Invasive Species.
2. *"Angiopteris evecta"*. *PlantNET* - NSW Flora Online. *2010-07-12*.
3. *"Polypodium evectum G.Forst."*. *Australian Plant Name Index* (APNI), IBIS database. Centre for Plant Biodiversity Research, Australian Government.
4. *"Angiopteris evecta (G.Forst.) Hoffm."*. *Australian Plant Name Index* (APNI), IBIS database. Centre for Plant Biodiversity Research, Australian Government.
5. Elliot, Rodger W.; Jones, David L.; Blake, Trevor (1985). Encyclopaedia of Australian Plants Suitable for Cultivation: Vol. 2. Port Melbourne: Lothian Press. p. 195. *ISBN* 0-*85091-143-5*.

6. Ismail, B. S. and C. Tut-Vun. (2007). Effects of the extract of *Dicranopteris linearis* on seed germination and seedling growth of selected common weeds in Malaysia. *Allelopathy Journal*20:2.
7. Toji, T., et al. (2007).Antibacterial activity of *Dicranopteris linearis* under *in vitro* conditions .*STARS Int. Journal (Sciences).* 1:2 191-95.
8. Sambhaji B. Thakar, Kailas D. Sonawane (2013) Mangrove Infoline Database: A Database of Mangrove Plants with Protein Sequence Information Current Bioinformatics. 8.524- 529
9. Ghorpade et al, 2015 Phytochemical Analysis of Four Cheilanthes Species from Northern Western Ghats of India July-August RJLBPCS 2(1) Page No.121-99
10. Manisha V Kale 2015.QUALITATIVE AND QUANTITATIVE ANALYSIS OF THREE BOLBITIS SPECIES July-August RJLBPCS 2(1) Page No.122-125.
11. Ghorpade et al, 2015 phytochemical analysis of bioactive components CHEILANTHES FARINOSA (FORSSK.) KAULF. 2015 May-June RJLBPCS 1(1) Page No.121-37
12. Manickam, V. S., Irudayraj, V. (1992) Pteridophyte flora of Western Ghats, South India, BI Publications, New Delhi.
13. Sermakkani M & Thangapandian V (2012). GCMS analysis of Cassia italica leaf methanol extract. Asian journal of pharmaceutical and clinical research .vol 5.
14. Gopalakrishnan, S. (2012) GCMS analysis of some bioactive constituents of Musseanda frondosa Linn. International J. of pharma