

Original Research Article**DOI - 10.26479/2015.0101.03****PHYTOCHEMICAL ANALYSIS OF BIOACTIVE COMPONENTS*****CHEILANTHES FARINOSA (FORSSK.) KAULF.*****Pradnya N. Ghorpade¹, Manisha V. Kale², S.B. Thakar^{3*}**

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ABSTRACT: The current study of phytochemical analysis in the whole plant powder extract using absolute alcohol as well as phytochemical compound screened by using GC-MS method. In this GC-MS analysis, 7 bioactive phytochemical compounds were known in the whole plant powder extract of *Cheilanthes farinosa* (Forssk.) Kaulf.. The 15 compounds mainly 3, 7, 11, 15 tetramethyl-2-hexadecane-1-ol, n- hexadecanoic acid Hexadecanoic acid, ethyl ester 9-octadecanoic acid, 1, 2 – Benzene carboxylic acid, discotyl ester, n-tetracontane, Diploptene, These diverse active phytochemicals have been set up to keep a wide range of activities, which may be ready to lend a hand in the defense against irredeemable diseases therefore *Cheilanthes farinosa* (Forssk.) Kaulf. used as medicinal and therapeutic purpose. The current study deals with extraction of vibrant biological active compounds. This study will help to design the novel drugs for many irredeemable disease.

Keywords: *Cheilanthes farinosa* (Forssk.) Kaulf.; GC-MS analysis; bioactive phytochemical components.

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1. INTRODUCTION

Pteridophytes are an integral component of world flora, representing about 225-230 genera containing some 12000 species all over the world (1). Plants are important sources of medicines. Plant derived drugs came into use in the modern medicine through the uses of plant material as indigenous cure in traditional systems of medicines. The World Health Organization estimates that 80% of world's population use plant extract or their active constituents for traditional therapies (2). The pteridophytes are second largest component of this world flora. They are one of the oldest and primitive plant groups on the earth. They grow luxuriantly in moist tropical and temperate forests. They have been used in different systems of medicines like Ayurveda; homeopathic (3) reported 160 species of useful pteridophytes in India on the basis of phytochemical, pharmacological and ethno botanical studies. *Cheilanthes farinosa* (Forssk.) Kaulf is one of the important pteridophytes belongs to family Pteridaceae. It is used in Ethnomedicinal purposes. The decoction of leaves is used orally to treat irregular menstruation (4, 5). Whole plant decoction is taken once or twice a day during chest pains. Gas Chromatography – Mass spectroscopy (GC-MS) combines two analytical techniques to a single method analyzing mixtures of chemical compounds. Gas Chromatography provides a very adequate for separation of complex samples and Mass Spectroscopy identifies the unknown compounds. Pteridophytes have many chemical compounds which are used in medicinal purposes. GC-MS determines compounds present in the plant. Therefore, we study GC-MS analysis of *Cheilanthes farinosa* (Forssk.) Kaulf

2. MATERIAL AND METHODS

Plant material

Plant material of *Cheilanthes farinosa* (Forssk.) Kaulf. Collected from Castle Rock, during the month of September. The plant specimen was identified 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 manually grinded to a fine powder. The coarsely powdered parts (5 gm) in 50 ml ethanol were exhaustively extracted using soxhlet apparatus. The extract then concentrated to 5 gm and employed in GC-MS analysis of different compounds.

GC-MS analysis was carried out on a GC Clarus 500 Perkin Elmer system.

Identification of Compound

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.

Method:

We use 10ml ethanolic of *Cheilanthes farinosa* (Forssk.) Kaulf. For GC-MS analysis. Result: Extract of *C. Farinosa* contains mainly n-hexadecanoic acid (32.12%), Diploptene (13.69%), 9 octadecanoic acid (8.85%), n-tetracontane (7.79%) and 3, 7, 11, 15 tetramethyl-2-hexdecane-1-ol (6.29%). Conclusion: These compounds having activity against some diseases. Therefore *C. farinosa* is a one of the medicinal plant.

3. RESULTS AND DISCUSSION

Studies on bioactive components in *C. farinosa* ethanolic extract by GCMS analysis clearly showed the presence of 7 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 7 peaks of the compounds detected was shown in figure 1. The most prevailing compounds are n-hexadecanoic acid, Diploptene, 9 octadecanoic acid, n-tetracontane and 3, 7, 11, 15 tetramethyl-2-hexdecane-1-ol. Hexadecanoic acid (Palmitic acid) and hexadecanoic acid, ethyl ester having antioxidants, hypochlosterolenic, nematiside, pesticide, lubricant, antiandrogenic flavor, hemolytic 5-alpha reductase inhibitor. 3,7,11,15 tetramethyl-2-hexdecane-1-ol having antimicrobial activity. (6,7). 7 bioactive phytochemical compounds were known in the whole plant powder extract of *Cheilanthes farinosa* (Forssk.) Kaulf.. The 15 compounds mainly 3, 7, 11, 15 tetramethyl-2-hexdecane-1-ol, n-hexadecanoic acid Hexadecanoic acid, ethyl ester 9-octadecanoic acid, 1, 2-Benzene carboxylic acid, discotyl ester, n-tetracontane, Diploptene. These diverse active phytochemicals have been set up to keep a wide range of activities, which may be ready to lend a hand in the defense against irredeemable diseases therefore *Cheilanthes farinosa* (Forssk.) Kaulf. Used as medicinal and

therapeutic purpose. The current study deals with extraction of vibrant biological active compounds.

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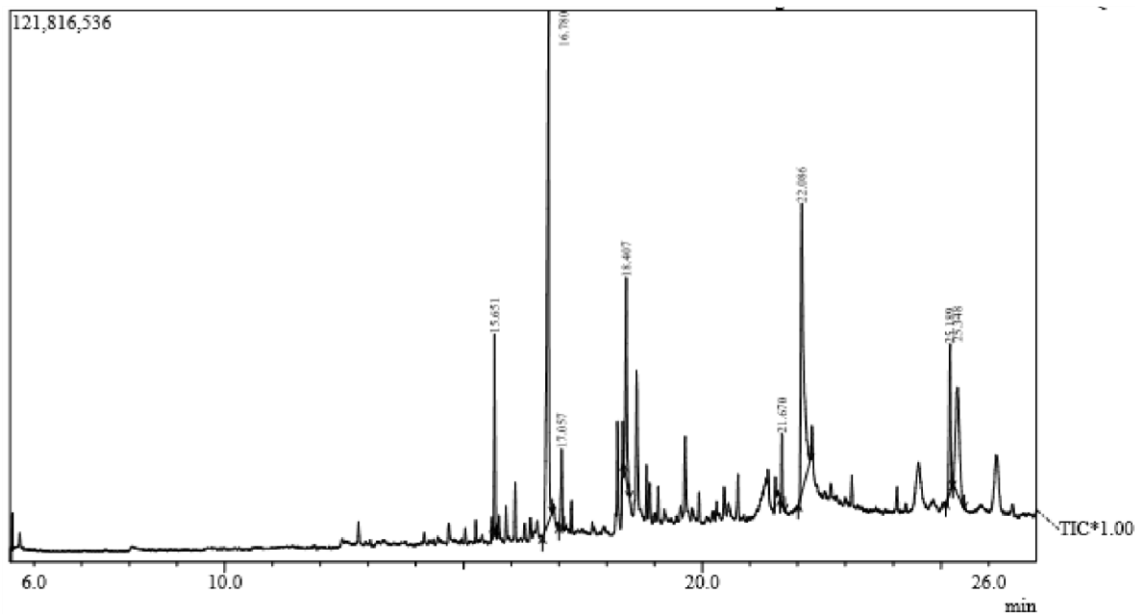


Figure1. GC-MS Chromatogram of ethanolic extract of whole plant of *C. farinosa* (Forssk.)Kaulf.

Sr. No.	R Time	Name of Compounds	Molecular Weight (gm)	Molecular Formula	% Area Peak
1	15.65	3,7,11,15 tetramethyl-2-hexdecane-1-ol	296	C ₂₀ H ₄₀ O	6.29
2	16.78	n- hexadecanoic acid	256	C ₁₆ H ₃₂ O ₂	32.12
3	17.05	Hexadecanoic acid, ethyl ester	284	C ₁₈ H ₃₆ O ₂	3.47
4	18.40	9-octadecanoic acid	282	C ₁₈ H ₃₄ O ₂	8.85
5	21.66	1,2 -Benzene dicarboxylic acid, discotyl ester	390	C ₂₄ H ₃₈ O ₄	2.40
6	25.19	n-tetracontane	562	C ₄₀ H ₈₂	7.79
7	25.30	Diploptene	410	C ₃₀ H ₅₀	13.69

Table No.1: Components identified in *Cheilanthes farinosa* (Forssk.) Kaulf.

4. CONCLUSION

In the present study 7 bioactive compounds have been identified from ethanolic extract of the *C. farinosa* by GC-MS analysis. Thus, this type of GC-MS analysis is the first Step towards understanding the nature of active principles in this medicinal plant and this type of study will be helpful for further detailed study. The presence of various bioactive compounds justifies the use of plant for various ailments by traditional practitioners.

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