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Research Article

STUDIES ON BIOACTIVE COMPOUNDS OF TECTARIA COADUNATA(WALL. EX HOOK. & GREV.) C. CHR.

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ABSTRACT

Pteridophytes are the sources of important therapeutic aids for alleviating human ailments. Tectaria coadunata (Wall. ex Hook. & Grev.) C. Chr. (Common Name - Jathamasi) belonging to family Dryopteridaceae is one of the medicinally important pteridophyte used on insect bites or getting relief in centipede bite. The extraction of dried rhizome is also used as anthelmintic activity, stomach pains, gastrointestinal disorders, eradications of worms in children.

Thus the present investigation to understand the bioactive compounds in the rhizome of T. coadunata . It reveals that 16 bioactive compounds were identified from the methanolic extract of rhizome of T. coadunata. These different active compounds have been found to possess a wide range of activities, which may help in the protection against incurable diseases.

Keywords: Tectaria coadunata, GC-MS analysis, Medicinal value.

INTRODUCTION

In the plant kingdom, there are thousands of plants that yield medicines or drugs use to man. The world population relies mainly on plants and plant extract for health care. Plants are natural resources for a variety on biochemical products and are used medicinally in different countries; they are the source of many potent and powerful drugs. These plants, which are the chemical goldmines existing in the ecosystems to get the disease of men and animals cured in natural way. Plants are the traditional sources for many chemicals used as pharmaceuticals, biochemicals, fragrances, food colors and flavor. Many plants emits substantial amounts of phytogenic volatiles organic compounds which includes alkanes, alkenes, alcohols, aldehydes, ethers, esters and carboxylic acids [Ciganek *et.al* 2007: Battino *et.al.*2007]

Pteridophyte *Tectaria coadunata* (J.Smith) C.Chr. is one of the medicinally important plant. The rhizome of *T. coadunata* is used against anthelmintic activity, stomach pains, gastrointestinal disorders, eradication of worms in Childrens. Fresh rhizome and frond is used in insect bites or getting relief in centipede bites and extraction of dried rhizome, stem and stipe is used in respiratory disorders like cold cough, asthma and bronchitis (J. Malviya *et.al.* 2012). Decoction of *T. coadunata* is also useful in colitis (Upreti *et.al*.2009).

Gas Chromatography–Mass Spectroscopy (GC-MS) is normally used for direct analysis of components existing in traditional medicines and medicinal plants. In recent years GC-MS studies have been increasingly applied for the analysis of medicinal plants. This technique has proved to be a valuable method for the analysis of non polar components and volatile essential oils, fatty acids, lipids (Jie et.al.1988) and alkaloids (Betz *et.al*.1997).

MATERIAL AND METHODS

Plant material

Tectaria coadunata was collected from Patan (Maharashtra) in the month of October 2012.

Preparation of extract

The rhizome of *Tectaria coadunata* were dried and pulverized to powder in a mechanical grinder. Required quantity (5 gm) plant material was weighed and subjected to Soxhlet extraction with 50ml Methanol. The extract then concentrated to 5ml and employed in GC-MS analysis for different compounds.

GC-MS Analysis

For quantification of compounds Mass Spectra were recorded in the Selective Iron Monitoring (SIM) mode use NIST library.

RESULTS AND DISCUSSION

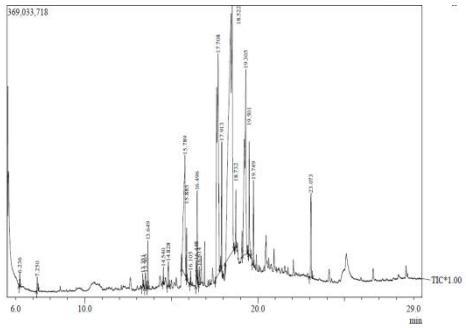

Figure 1:GC-MS Chromatogram of methanolic extract of rhizome of *Tectaria coadunata* (wall.ex.Hook & Grev.) C.Chr.

The components present in the methanolic extract of rhizome of *T. coadunata* were identified by GC-MS analysis. The active principles with their retention time (RT), molecular formula, molecular weight (MW) and concentration (% peak area) are presented in table no.1. The GC-MS chromatogram of 21 peak of compounds detected were shown in fig.1. The most prevailing compounds are octadec-9-enoic acid (oleic acid), n-hexadecanoic acid (palmitic acid), octadecanoic acid (stearic acid), Di-n-octyl phthalate, hexadecanoic acid methyl ester, hexadecanoic acid ethyl ester.

The compound octadec-9-enolic acid is unsaturated fatty acid present in several plants. It lowers the blood level of cholesterol and lowers the risk of heart problem. It also responsible for hypotensive, antherosclerosis and aids in cancer prevention (Modupe Ogunlesi *et.al.* 2010).

N-hexadecanoic acid (palmitic acid) having antioxidants, hypochloresterolenic, nematiside, pestiside, lubricant, antiandrogenic flavor, hemolytic properties .3, 7, 11, 15 tetramethyl-2-hexadecan-1-ol having a antimicrobial property (Sermakkani M *et.al.* 2012).

Oleic acid, hexadecanoic acid, octadecanoic acid known to have potential antibacterial and antifungal activity (McGraw *et.al.* 2012, Seidel V. Taylor 2004).

Table 1:Analysed Bioactive Compound From T. coadunata (wall.ex.Hook & Grev.)C.Chr. shown in

Sr.no.	Retention Time(RT)	Name of compound	Molecular weight (in grams)	Molecular formula	% Area of Peak
1.	6.233	1,1,3 triethoxy propane	176.25	$C_9H_{20}O_3$	0.25
2.	7.250	4H-Pyran-4-one, 2,3-dihydro-3,5-dihydroxy-6-methyl	144.12	$C_6H_8O_4$	0.32
3.	13.350	Lauric unhydride	382.62	$C_{24}H_{46}O_3$	0.29
4.	13.508	Cyclonanosiloxane	666	$C_{18}H_{54}O_9Si_9$	0.57
5.	13.650	Pentadecanoic acid, ethyl ester	270.45	$C_{17}H_{34}O_2$	0.83
6.	14.542	3-(4-Oxocyclohexyl)-propionic acid, ethyl ester	198.25	$C_{11}H_{18}0_3$	0.25
7.	14.828	N-Hexadecanoic acid, methyl ester	270	$C_{17}H_{34}O_2$	0.75
8.	15.789	n-Hexadecanoic acid	256.42	$C_{16}H_{32}O_2$	9.15
9.	15.885	Pentadecanoic acid, ethyl ester	270.45	$C_{17}H_{34}O2$	0.90
10.	16.105	Octadecane	254.49	$CH_3(CH_2)_{16}CH_3$	0.22
11.	16.448	1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	278.34	$C_{16}H_{22}O_4$	0.34
12.	16.496	3,7,11,15-Tetramethyl-2-hexadecen-1-ol	296.53	$C_{20}H_{40}O$	1.57
13.	16.614	Pentadecanoic acid	242.4	$C_{15}H_{30}O_2$	0.44
14.	17.708	n-Hexadecanoic acid	256.42	$C_{16}H_{32}O_2$	17.99
15.	17.913	Hexadecanoic acid ,ethyl ester	284.47	$C_{18}H_{36}O_2$	2.31
16.	18.522	Octadec-9-enoic acid	282.46	$C_{18}H_{34}O_2$	42.38
17.	18.732	Octadecanoic acid	284.47	$C_{18}H_{36}O_2$	1.05
18.	19.305	Octadec-9-enoic acid	282.46	$C_{18}H_{34}O_2$	13.24
19.	19.501	Octadecanoic acid	284.47	$C_{18}H_{36}O_2$	2.68
20.	19.749	Heptadecanoic acid,15-methyl-ethyl ester	312.53	$C_{20}H_{40}O_2$	1.62
21.	23.073	Di-n-Octyl *phthalate*	390.56	$C_{24}H_{38}O_4$	2.79

CONCLUSION

In the present study sixteen chemical constituents have been identified from the rhizome of *T. coadunata.* The presence of various bioactive compounds justifies the use of *T. coadunata* rhizome in various ailments by traditional practitioners.

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