



## PHYTOCHEMICAL ANALYSIS OF TINOSPORA CORDIFOLIA PLANT EXTRACT BY USING GC-MS METHOD

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### ABSTRACT:

The purpose of the current study is to monitor the phytochemical constituents in *Tinospora cordifolia* plant extract. Phytochemical screening of the plant extracts were used for analysis which showed the presence of bioactive compounds like alkaloids, flavonoids, phenols, tannins, saponins, terpenoids and carbohydrates. *Tinospora cordifolia*, a well-known medicinal shrub, belonging to the family Menispermaceae is widely utilized for the treatment of various diseases. According to ancient ayurvedic literature, *Tinospora cordifolia* is found to show anti-ageing effects. In the current study, detailed phytochemical analysis of stem and leaf of *Tinospora cordifolia* was performed using GCMS techniques to ascertain the presence of compounds responsible for its highly beneficial medicinal value.

### KEYWORDS:

PHYTOCHEMICAL, TINOSPORA CORDIFOLIA, EXTRACT, USING GCMS TECHNIQUES, MEDICINAL SHRUB.

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### INTRODUCTION:

Plants are necessary for man's survival. Ever since civilization first emerged, there has been medicine. The enormous natural flora that has been given upon India conceals its wealth. There are several medicinal plants in India. Pharmaceutical, non-pharmacopeial and synthetic medication creation can utilize the abundant components found in medicinal plants. [1]

Essentially, "the interdisciplinary logical assessment of the organically dynamic medications that are generally utilized" is the definition of ethnopharmacology. [2] As a result, the ethnopharmacological approach is built on a body of work that includes contributions from pharmacology, chemistry and botany. For a long time, the efficacy of conventional treatments has piqued the curiosity of many scientists. The discovery of novel medications from natural sources has tremendously aided the development of contemporary treatment systems, and this is all thanks to the field of ethnopharmacology. Interest in the pharmacognostical, phytochemical, and pharmacological studies of traditional medicinal plants has increased dramatically in recent years. The biological activity potential of natural medicines has also been studied extensively in both laboratory and human settings, with results indicating the wide-ranging biological effects of various plant-derived compounds across many classes of substances. Moreover, many studies, both preclinical and clinical, have investigated the biological activity potential of natural medicines, revealing a vast range of plant-derived compounds in diverse classes of chemical groups with a wide range of biological

consequences. [3] There are so many chemicals are found in plants like phytochemicals, minerals, vitamins etc. and they have antibacterial, antimicrobial and many other activities. [4]

### 2. COLLECTION AND IDENTIFICATION OF PLANT MATERIAL:

The first step in performing the plant is preparing to sample to preserve the phytochemical of plant part (cell) before the extraction. The whole plant part is collected and kept in a dried polybag. *Tinospora cordifolia* plant part were collected from tahsil Pansemal, district Barwani M.P. India.

*Tinospora cordifolia* plant part were separately cleaned and separately washed with distilled water. After completion of the cleaning and washing activity, the *Tinospora cordifolia* plant part were collected in a separately beaker. *Tinospora cordifolia* plant parts were dried in Laboratory Room. Then *Tinospora cordifolia* plant part are converted into powder form with the help of a homogenized instrument and stored in the separately air-glass bottle till future use.

### SEPARATION OF EXTRACT:

Soxhlet Extractor Method:

1. First, we turn on the heat and heat up the metal plate.
2. The RBF that contains our solvent begins to boil.
3. The vapor from the RBF passes through the distillation tube from the RBF to the condenser.

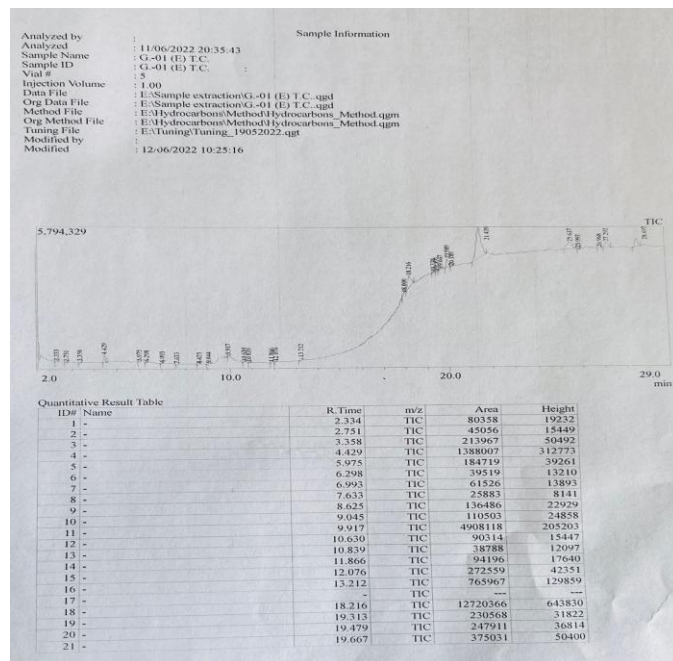
- 4 .The condenser condenses the solvent vapor, which falls to the thimble.
5. We placed our powder sample into the thimble. To avoid powder falling directly into the thimble, the powder must be covered from the bottom with a cotton ball. Also, from the top, cover the powder.
6. As a result, when the condensed vapors fall into the thimble, the powder becomes wet with the solvent, and the solvent-soluble components join it.
7. As we saw, the siphon connects the thimble to RBF.

Soxhlet Extractor Method was used and ethanol extract preparation. The concentrate was sifted with Whatman paper. The fluid was gathered and stored in a glass bottle.

### 3. GAS CHROMATOGRAPHY - MASS SPECTROSCOPIC ANALYSIS:

The analysis of unidentified constituents of GC-MS plays major role in plant origin. The crude methanol (5 µl) extract containing different compounds of *Tinospora cordifolia* was subjected for (GC-MS) analysis. Instruments and chromatographic circumstances GC-MS examination was carried out on a GC clarus 500 Perkin Elmer system containing a AOC-20i auto analyst and gas chromatograph interfaced to a mass spectrometer (GCMS) instrument retaining the subsequent conditions; column Elite-1 attached silica capillary column (30 ×0.25 mm × ID x 1µm of capillary column, composed of (100% Dimethyl poly siloxane), operational in electron impact mode at 70 eV; helium (99.99%) was used as transporter gas at a persistent flow of 1ml/minute and an injection capacity of 0.5 EI was employed (split ratio of 10:1) inject or temperature 250°C; ion-source temperature 280°C. The oven temperature was programmed from 110°C (isothermal for 2min), with an increase of 10°C/minutes, to 200°C/minutes, then 5°C/minutes to 280°C/min, finish

with a 9 minutes isothermal at 280°C. Mass spectra were occupied at 70 eV; a scan intermission of 0.5 seconds and fragments from 45 to 450Da. The eluted constituent is identified in the mass detector. The spectrum of the unidentified constituent is matched with the spectrum of the recognized constituents stored in NIST library and concludes the name and molecular weight.[3]



ID#	Name	R. Time	m/z	Area	Height
22	-	19.989	TIC	2589161	384590
23	-	20.189	TIC	243196	45595
24	-	21.439	TIC	20735829	1288717
25	-	25.617	TIC	5368975	308778
26	-	25.997	TIC	175054	45892
27	-	26.968	TIC	220546	33610
28	-	27.292	TIC	2262358	249827
29	-	28.697	TIC	3330154	361446

TABLE: TINOSPORA CORDIFOLIA SAMPLE INFORMATION

TINOSPORA CORDIFOLIA			
S.No	Mol. Formula / Mol. Weight [g / mol]	Purified extracts	RT (Min.)
1	Formula:C4H6O4 CAS:629-15-2 MolWeight:118	1,2-Ethanediol, diformate	2.334
2	Formula:C6H10O3 CAS:6628-79-1 MolWeight:130	Pentanoic acid, 3-methyl-4-oxo	2.751
3	Formula:C4H10O CAS:71-36-3 MolWeight:74	1-Butanol	3.358
4	Formula:C6H14O2 CAS:105-57-7 MolWeight:118	Ethane, 1,1-diethoxy	4.429
5	Formula:C7H16O CAS:595-41-5 MolWeight:116	3-Pentanol, 2,3-dimethyl	5.975
6	Formula:C6H10O2 CAS:6776-19-8 MolWeight:114	2-Butenoic acid, ethyl ester, (Z)-	6.298
7	Formula:C8H10 CAS:95- MolWeight:106	o-Xylene	6.993
8	Formula:C5H10O4 CAS:533-67-5 MolWeight:134	D-erythro-Pentose, 2-deoxy	8.625
9	Formula:C6H16O4Si CAS:0-00-0 MolWeight:180	Triethoxysilanol	9.045
10	Formula:C5H9NO CAS:872-50-4 MolWeight:99	2-Pyrrolidinone, 1-methyl	9.917

11	Formula:C15H20N2O2 CAS:330221-02-8 MolWeight:260	3-[[Cyclohexyl-methyl-amino)-methyl]-3H-benzooxazol-2-one	10.630
12	Formula:C8H18 CAS:563-16-6 MolWeight:114	Hexane, 3,3-dimethyl	10.839
13	Formula:C10H19NO4 CAS:0-00-0 MolWeight:217	5-Diethoxymethyl-3-ethoxy-4,5dihydro-isoxazole	11.866
14	Formula:C6H8O4 CAS:28564-83-2 MolWeight:144	4H-Pyran-4-one, 2,3-dihydro-3,5dihydroxy-6-methyl	12.076
15	Formula:C10H8 CAS:91-20-3 MolWeight:128	Naphthalene	13.212
16	Formula:C25H42O4 CAS:0-00-0 MolWeight:406	Fumaric acid, 2-ethylhexyl tridec-2yn-1-yl est	17.979
17	Formula:C19H32O2 CAS:301-00-8 MolWeight:292	9,12,15-Octadecatrienoic acid, methyl ester, (Z,Z,Z)-	18.216
18	Formula:C20H42O2S CAS:111530-37-1 MolWeight:346	Di-n-decylsulfone	19.313
19	Formula:C17H32N2O2Si2 CAS:0-00-0 MolWeight:352	Tert-Butyl (2-aminophenyl)carbamate, 2TMS derivative	19.479
20	Formula:C16H32O2 CAS:62691-05-8 MolWeight:256	Tetradecanoic acid, 12-methyl-, methyl ester, (S)-	19.667
21	Formula:C13H10O CAS:119-61-9 MolWeight:182	Benzophenone	19.989
22	Formula:C14H22O4Si CAS:55590-92-6 MolWeight:282	Ethyl homovanillate, TMS derivative	20.189
23	Formula:C15H16O2 CAS:80-05-7 MolWeight:228	Phenol, 4,4'-(1-methylethylidene)bis	21.439
24	Formula:C15H13Cl2NO2 CAS:15307-78-5 MolWeight:309	Diclofenac, methyl ester	25.617
25	Formula:C17H32N2O2Si2 CAS:0-00-0 MolWeight:352	Tert-Butyl (2-aminophenyl)carbamate, 2TMS derivative	25.997
26	Formula:C10H28O4Si3 CAS:3555-45-1 MolWeight:296	Silicic acid, diethyl bis(trimethylsilyl) ester	26.968
27	Formula:C16H32O2 CAS:57-10-3 MolWeight:256	n-Hexadecanoic acid	27.292
28	Formula:C18H36O2 CAS:628-97-7 MolWeight:284	Hexadecanoic acid, ethyl ester	28.697

## CONCLUSION:

GC-MS is a very commercial method to distinguish the integrant of issue, long chain, limited chain, and so on. The GC-MS strategies for *T. cordifolia* test separates have happened in numerous phytochemical compounds. In light of the pinnacle region, maintenance time, and sub-atomic equation, it was laid out that the phytochemical substances were what they professed to be. It was accounted for that the dynamic standards have maintenance times (RT), atomic recipes, sub-atomic loads (MW), rates, and portrayal.

Knowledge of chemical constituents of plants is important and desirable because such information will be important for synthesis of chemical substances. It could be well qualified for application in pharmaceutical industry. The GC-MS analysis of methanolic extract of experimental plant showed the presence of pharmacologically active compounds such as antioxidant and antihyperlipidemic. This plant can be saved through biotechnological approaches and its quality can be improved through secondary metabolites production and thus it can be used as a source for developing new drugs and commercialization. Further investigations on preclinical and clinical trials of these extracts could become a part of

standard drug designing and treatment protocols for hyperlipidemic and hence a promising and powerful weapon for hyperlipidemic treatment.

## REFERENCES

1. Y. Nabachandra, Manjula and Bisht, "Medicinal plants and welfare of the mankind," Journal of Nature Conservation, Vol. 4, Issue 6, Page 149-152, 1992.
2. IpekSuntar, "Phytonutrients in Food: From Traditional to Rational Usage," Elsevier Science &Technology, 2019.
3. D. Rathi and Dr. PL. Balasubramanian "Phytochemical Compound Analysis of *Tinospora Cordifolia* by GC-MS Method" International Journal of Science and Research (IJSR),2018.
4. R.Papitha, R.Lokesh et al"Phytochemical Screening, FT-IR and Gas Chromatography Mass Spectrometry Analysis of *Tinospora cordifolia* (Thunb.) Miers"International Journal of Pharmacognosy and Phytochemical Research, 2016.