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Stephania glabra (Menispermaceae)- Phytochemical Perspective.

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Abstract
Background*- Stephania glabra (Roxb) has long been used for the treatment of asthma with several other valuable uses. Over 150 alkaloids together with Flavonoids lignans, steroids, Terpenoids and coumarins have been identified in genus stephania. About 30 types of alkaloids are alone identified in S. glabra out of that Gindarudine and tetrahydropalmitine being the major one. Several other chemical constituents from the plant has been evaluated by using different chromatographic and Spectroscopical methods.* ***Method****-In the present study the ethanolic extract from the leaves of Stephania glabra was extracted by soxhlet apparatus. So obtained extract was redissolved in ethanol and evaluated for UV for 1, 0.1 and 0.01 % of after redissolving in ethanol also the FTIR spectroscopy was checked.* ***Result****-The UV Wavelength for 1%,0.1% and 0.01% dilutions was recorded between 92.15 and 92. 2 which was considered as 92. Gindarudine was its structural moiety with atropine the constituent used for the treatment of asthma. Again, the ftir data confirms the presence of Gindarudine and Tetrahydropalmitine after interpretion. Conclusion-From the whole study it is concluded that S. glabra can be used to formulate novel drug for the treatment of analgesia, inflammation and arthritis.*
Key Words*- Stephania glabra,, UV, FTIR, Gindarudine, Tetrahydropalmitine, Novel drug, Analgesia, Arthritis.*

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I. Introduction

Stephania glabra (Menispermacee) is a large climbing vine grows at an altitude of 4000-7000ft from sea level. The shrub gives greenish yellowish to reddish yellowish flowers and tubers weighing upto 30kg [1].

Fig.1: *Stephania glabra* plant image from wild source.

Various researchers has reported for its use in ancient time as well as for its different pharmacological activities. Literature provide its importance in the treatment of diabetes, fever, gastric discomfort, amoebic dysentery, as an anthalmintic, in rheumatic bodyache, blood dysentery and bloody dysentery and in leprosy[2].

Several researchers have submitted different pharmacological activities for different diseases in researches and review works. The antimicrobial[3] ani-inflammatory, analgesic and antipyretic[4-7] ,hypotensive, antihyperglycemic[8-10], antihistaminic, anthelmintic[11] activity of plant has been reported.
Reported preliminary phytochemical evaluation showed the presence of different chemical groups (Table 1)[12].The present work has been focused on phytochemical study of S. glabra.

Table .1: Showing the preliminary phytochemical evaluation of rhzome of *Stephania glabra* in three different solvents.

SrNo.	Ethanolic Extract	Petether	D.Water
1	Amino acid	Amino acid	…..
2	Alkalods	……	……
3	Flavonoids	Flavonoids	Flavonoids
4	Carbohydrates	Carbohydrates	Carbohydrates
5	Phenols	Phenols	…….
6	Saponins	……	……

The phytochemical screening had always been reported for the presence of morphine like alkaloid 'Gindarudine' from the ethanolic extract of tubers of *Stephania glabra* along with four more alkaloids viz. palmatin, Palmatine, dyhydrcorydaline and stepharanine by spectroscopical methods. Gindarudine was elucidated as 3,6-O, N-detrimethyl-10-hydroxy-thebane by means of spectroscopic data including 2DNMR studies tetrahydropalmitine has also been isolated from *Stephania glabra*[2] .Along with four constituents several constituents have also been reported (Table 2)[13]

Name			
1.	(+)-Pronuciferine	14.	stepholidine
2.	Gindarine,	15.	(36), stepharine
3.	Gindaricine,	16.	),protoberberine, palmatine
4.	gindarinine,	17.	dehydrocorydalmine
5.	hyndarine,	18.	jatrorrhizine
6.	magnoflorine,	19.	stepharanine ,
7.	N-thyloxystephanine,	20.	columbamine,
8.	N-methylhydoxystepharine, remerine,	21.	N-desmethycycleanine ,
9.	stephararine,	22.	11-hydroxypalmatine
10.	cycleanine	23.	glabradine
11.	rotundine,	24.	gindarudine
12.	capaurine		
13.	corydalmine		

Material - Leaves of *Stephania glabra* was collected from wild source of ' Gharsi' village hills, 54 Km far in north to solan district of HP India. The plant was authenticated at YS Parmar University Solan. The leaves were dried in shade.
Method- About 160 g of coarsely powdered drug was extracted by using soxhlet apparatus[12].
Experiment.
UV absorbance
Above extract was dissolved properly in sufficient amount of ethanol in clean beaker and kept intact. From the stock solution 1 ml was taken thrice to form three different dilutions as 1%, 0.1 % and 0.01% for UV absorbance. From the literature survey the wavelength for UV was found at 293 nm [14], here four different wavelengths were selected at 291,292,293 and 294 for all the three dilutions (table 3).
FTIR spectroscopy
The ethanolic dilution was checked for FTIR spectra to evaluate the presence of present chemical constituentsle (table 2)

II. Results

Table. 2:UV absorbance for different dilutions of Ethanolic extract of *Stephania glabra* leaves at different λ max
UV Absorbance

Sr,No.	λ max	1%	0.1	0.01
1	291 nm	1.179	0.603	0.075
2	292 nm	2.547	0. 606	0.075
3	293 nm	1.617	0.622	0.072
4	294 nm	1.520	0. 631	0.072

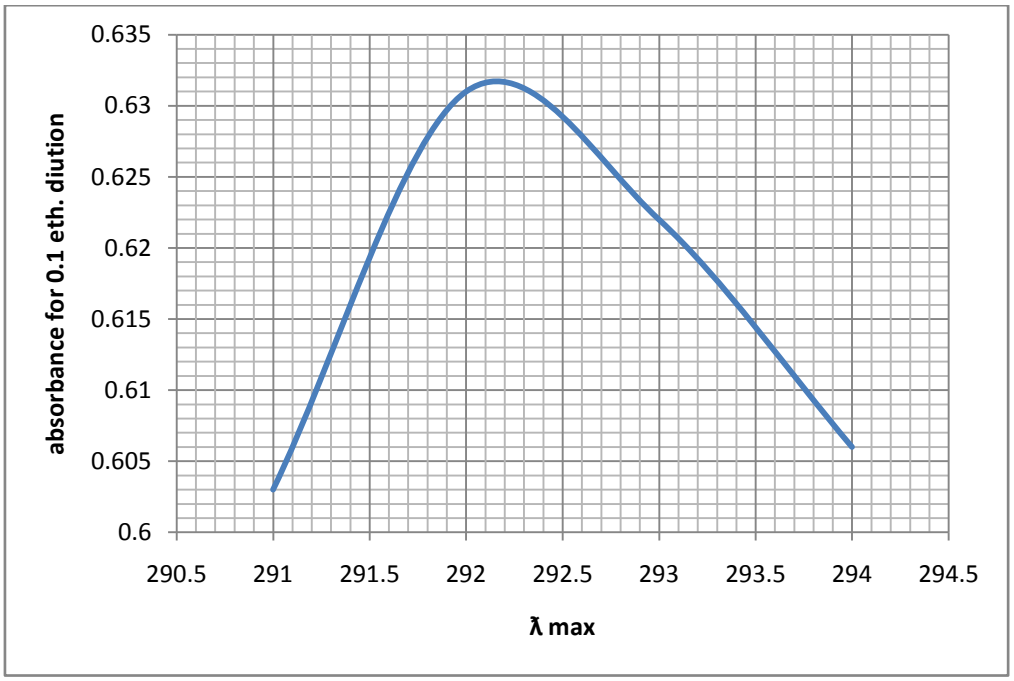


Fig.2: Showing mean λ-max at different absorbance for 0.1 % dilution.

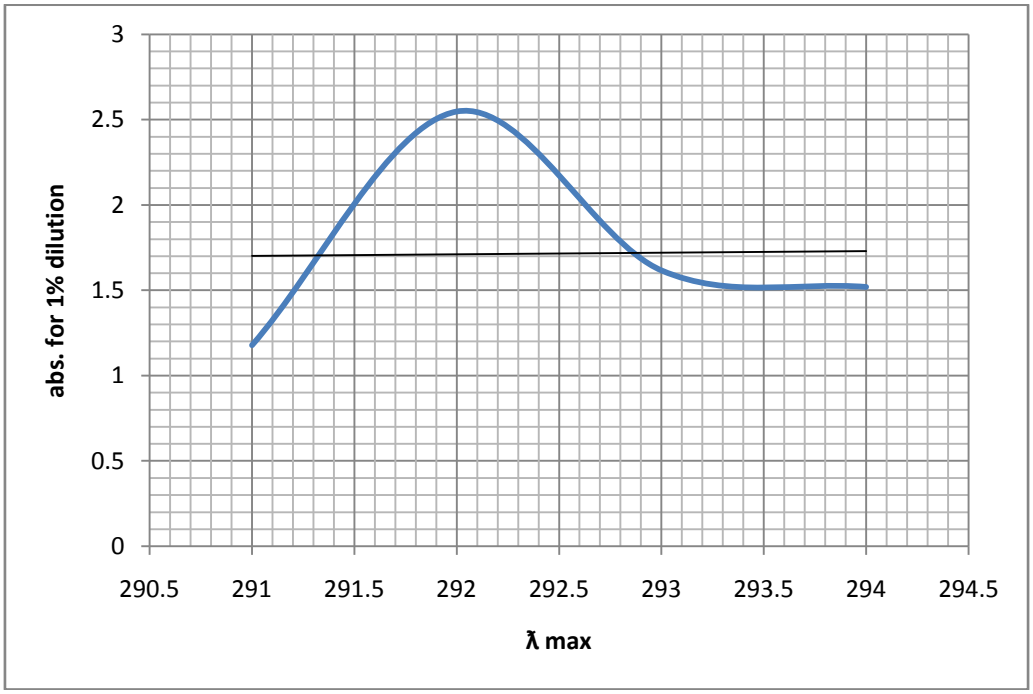


Fig.3: Showing mean λ-max at different absorbance for 1 % dilution of Ethanolic extract of *Stephania glabra*

FTIR-

FTIR- interpretation- Confirmation of presence of Gindarudine and tetrahydropalmitine

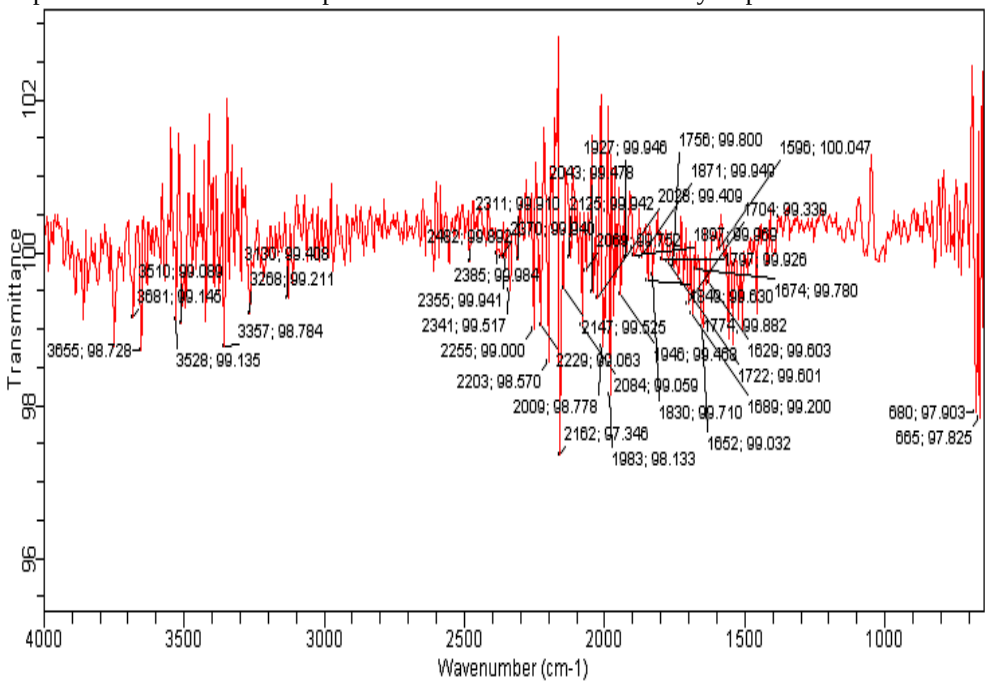


Fig.4: FTIR spectra for Ethanolic extract of *Stephania glabra* leaves.

Table:1 showing FTIR interpretation of Fig no. … for Gindarudine and tetrahydropalmitine.

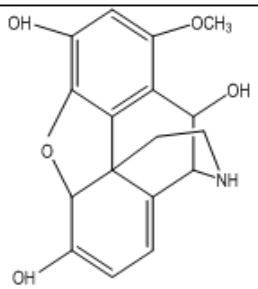
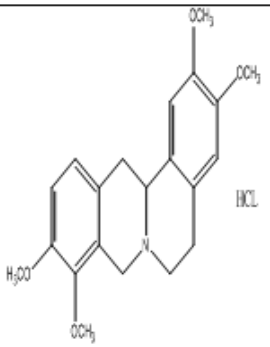
Compound	**Structure**	**Peak range (cm^{-1})**	**Peak Observed (cm^{-1})**	**Functional Group identified**
Gindarudine		1000-1200 1200-1300 1200-1400 2860-2800 3000-3100 1400-1600 600-700	1100 (Weak Band) 1210 (Weak Band) 1380 (Medium Band) 2830,2840(Weak Band) 3050 (Medium Band) 1596 (Weak Band) 680,665 (High intense band)	Tertiary amino Aromatic ether Aromatic alcohol Methoxy Compound C-H, C-N struc., Benzine — Isoquinoline Ring Band
Tetrahydropalmatine		2860-2800 1500-1550 3000-3100 1400-1600 600-700	2830,2840 (weak band) 1510,1500 (High intense peak) 3050 (medium band) 1596 (weak band) 680,665 (High Intense Band)	Methoxy group Chlorine as HCl C-H, C-N struc., Benzene — Isoquinoline Ring ring

Table 2. showing the similarity of basic moieties of Gindarudine with morphine.

Sr.No	Gindarudine	Morphene
	Structure	Structure
Description for Similarity		
Penacyclic ring with benzene ring A		
Two partially unsaturated cyclic ring B an C with ring I		
One piperidine ring D.		
One tetrahydro furan ring E.		
One phenenthrene ring structure structure.		

III. Discussion

In the present study by using spectroscopic analysis like UV and FTIR spectroscopy the absorbance is reported at 92.1 for 1% and 0.1% dilution where as n case of 0.01 % proper spectra was not observed. From the FTIR spectroscopy Gindarudine and Tetrahydro palmatine was confirmed on the basis of the presence of substitution. Both structures are having methoxy group and isoquinoline rings shows their similarity with analgesic and antipsychotic drug group. Whereas Gindarudine represent similarity with morphine on the basis of these two groups along with aromatic ether and alcohol and tertiary amino. The structure of Gindarudine was confirmed for its similarity with morphine. Moreover the basic moiety of Gindarudine resemble to that of the basic moiety of morphine (Table No. 2) .Tetrahydropalmatine is an isoquinoline alkaloid found mainly in the genus corydalis but also in other plants such as *Stephania rotunda* and other species of Stephania[15]. Several levo forms of tetrahydropalmitine has been formulated by several pharmaceutical companies which has been marketed worldwide under different brand name as an alternative to anxiolytic and sedative drugs of the benzodiazepine group and as analgesic like opiates it is also sold as dietary supplement. Also the anti inflammatory action has also been reported for its ethanolic extract[2].

IV. Conclusion

The similarity of Gindarudine with morphine and tetrahydropalmitine, the anxiolytic, analgesic, and anti-inflammatory agents with synthesized tetrahydropalmitine, is forcing to safe and new alternative formulation from S. glabra extract against pain and inflammation. The plant may provide safe and easy available raw materials for such medicines.

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