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REVIEW ARTICLE

PHARMACOGNOSY

PHYTOCHEMICAL STUDIES ON *POLYGONUM GLABRUM* (WILLD.)

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ABSTRACT

The plant *Polygonum glabrum (willd.)* belonging to the family Polygonaceae. The plant mostly found in river banks, stream sides and marshy areas. It is found as dense clumps and the plants are sub shrubs and growing up to 2.5 cm. The root stocks are reported to be used in piles, jaundice, debility and consumption. The herb possess anti bacterial activity against micrococcus pyrogens and diplococcus pyrogens. Some naturally occurring flavonoids like kaemphferol-3-methyl ester, quercetrin, quercetin shows anti fungal activity. Four new diesters isolated from 2, 3 dihydroxy hydramine were isolated from the herb having anthelmentic activity in traditional medicine. The anatomical and macroscopical work was done and used for the identification of the plant. The phytochemical screenings of chloroform extract shows the presence of chemical compounds like alkaloids, glycosides, carbohydrates and flavonoids. The spectral studies like U.V and FTIR are the preliminary work for the detection of some alkaloidal contents in the plant. The chromatographic studies shows various spots (Paper/Hptlc) with chloroform extract may confirm the presence of alkaloidal contents in the plant.

KEY WORDS

Polygonum glabrum (willd.), Chloroform extract.

INTRODUCTION

Nature always stands as a golden mark to exemplify the outstanding phenomenon of symbiosis. The biotic and abiotic elements are all interdependent. The plants are indispensable to men for his life. A medicinal plant were used in India for centuries as an important therapeutic source for treating wide variety of ailments and has been found to be of immense global importance. The family Polygonaceae consists of several important medicinal plants with wide range of biological activities and interesting phyto chemical constituents. The selection of plant *Polygonum glabrum (Willd.)* was based on its availability, therapeutic value and the degree of research work, which is not done mostly in earlier. Keeping in mind about the adverse effects of synthetic drugs available in the market, *Polygonum glabrum (Willd.)* extracts were used for the screening of different pharmacological activities and active constituents present in the extract.

Aim and Plan of work:

Aim:

The aim of the present work is to study the Phytochemical screening of *polygonum glabrum (willd.)*

Plan of work:

The plan of work on the Plant of ***POLYGONUM GLABRUM (Willd.)*** (Persicaria glabra (Willd.) was as follows.

Phytochemical studies:

a. Preparation of extract
b. Qualitative Phytochemical analysis
c. Chromatographic studies
    i) Paper Chromatography
    ii) HPTLC
d. Spectroscopic studies
    i) U.v Spectroscopy
    ii) IR Spectroscopy

MATERIALS AND METHODS

Preparation of extract

Preparation of the extract of ***POLYGONUM GLABRUM (Willd.)*** by using following solvent:

Chloroform extract

The shade dried course powder of the plant ***POLYGONUM GLABRUM (Willd.)*** (250 gm) were packed well in sox let apparatus and was subjected for continuous hot extraction with chloroform until the completion of the extraction. The extract was filtered while hot and the resultant extract was distilled in vacuum under reduced pressure in order to remove the solvent completely. Dried and kept in a desiccator till experimentation. Obtained extract was weighed and percentage yield was

calculated in terms of air-dried powdered crude material.

The yield and % yield of chloroform extract of powdered *POLYGONUM GLABRUM (Willd.)* were reported below.

EXTRACTION VALUES OF CHLOROFORM EXTRACT

Sl No	Extracts	Yield (grams)	% yield W/W
1	Chloroform	9.50	3.8

Phytochemical Studies

QUALITATIVE PHYTOCHEMICAL ANALYSIS OF *POLYGONUM* GLABRUM CHLOROFORM EXTRACT

Plant Constituents	Chloroform extract of *Polygonum glabrum (Willd.)*
Alkaloids	+
Carbohydrates	+
Flavonoids	+

(+) = Present

Paper chromatography Rf values of Chloroform extract (Paper chromatography)

Sl No	Extracts	Solvent system	Number of spots		Rf value
1	Chloroform	n- butanol : acetic acid : water 5 : 4 : 1	2	1	0.89
				2	0.87
2	Chloroform	n-butanol : acetic acid: water 4 : 3 : 3	2	1	0.91
				2	0.89

High performance liquid chromatography (HPTLC)

TLC/ HPTLC are important analytical tool in the separation, identification and estimation of different components. When we spot a mixture of components on TLC plates, the compounds which are readily soluble but not strongly adsorbed moves up along with the solvent and those not so soluble but mere strongly adsorbed move up less, leading to separation of components.

Solvent system: Acetic acid: n-butanol: water (4:3:2 v/v/v)

Application mode: Camag Linomat IV

Development mode: Camag Twin Trough Chamber.

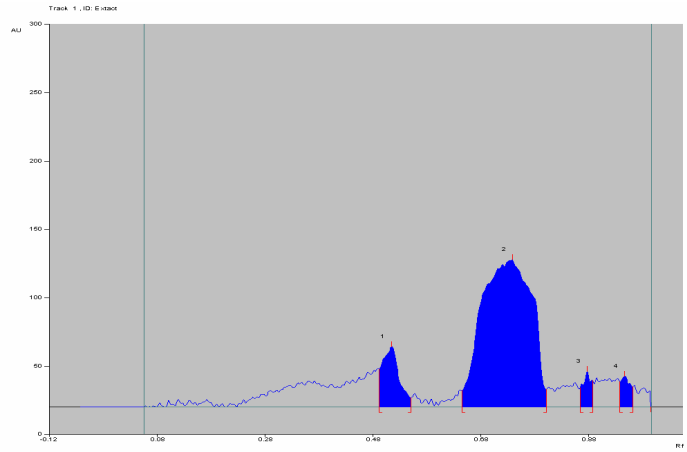
UV Detectors Wavelength selection: 366 nm

Hptlc reports of chloroform extract of powdered whole plant of Polygonum glabrum

HPTLC Datas
Mobile phase: Acetic acid:n-butanol:water(4:3:2 v/v/v)
Detection wave length =254nm

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.50 Rf	27.7 AU	0.52 Rf	44.1 AU	22.00%	0.55 Rf	6.8 AU	1363.9 AU	11.27%
2	0.65 Rf	12.0 AU	0.74 Rf	107.8 AU	53.81%	0.81 Rf	12.9 AU	9946.1 AU	82.16%
3	0.87 Rf	14.2 AU	0.88 Rf	25.9 AU	12.94%	0.89 Rf	19.2 AU	401.5 AU	3.32%
4	0.94 Rf	18.3 AU	0.95 Rf	22.5 AU	11.25%	0.97 Rf	14.8 AU	395.0 AU	3.26%

Mobile phase: Acetic acid: n-butanol: water (4:3:2 v/v/v)



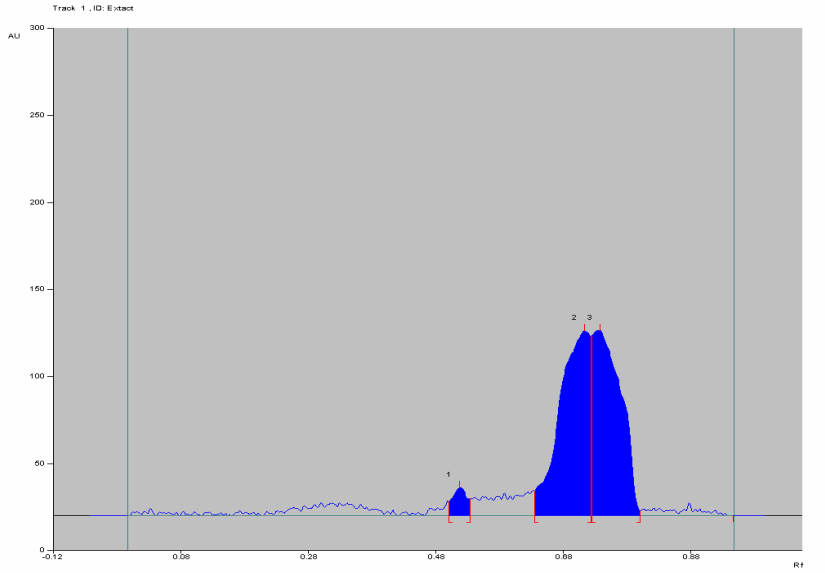
HPTLC Datas
Mobile phase: Acetic acid:n-butanol:water(4:3:2 v/v/v)
Detection wave length =366nm

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.50 Rf	8.1 AU	0.52 Rf	16.1 AU	7.05%	0.54 Rf	9.5 AU	356.0 AU	3.54%
2	0.64 Rf	14.2 AU	0.72 Rf	106.2 AU	46.42%	0.73 Rf	103.0 AU	4941.9 AU	49.14%

3	0.73 Rf	103.1 AU	0.74 Rf	106.4 AU	46.52%	0.80 Rf	2.9 AU	4759.7 AU	47.32%

Mobile phase: Acetic acid: n-butanol: water(4:3:2 v/v/v)

UV SPECTRAL ANALYSIS

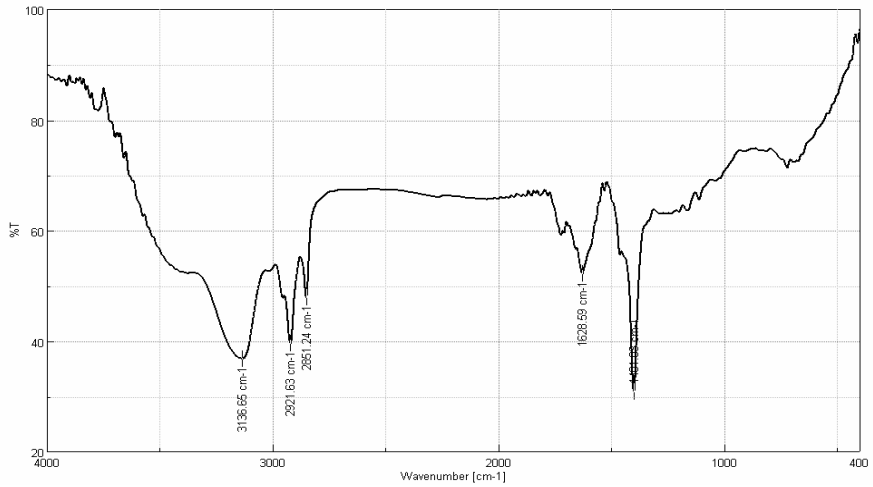


Extracts	Fraction	λ max.(nm)	Absorbance
Chloroform extract	Chloroform : Water(80:20)	791.0	0.1234

FT-IR SPECTROSCOPY

Number	Position	Intensity
1	3136.65	36.8342
2	2921.63	39.5382
3	2851.24	47.9125
4	1628.59	52.2475
5	1401.03	30.8522

Infra Red Spectroscopy of Chloroform Extract of Polygonum glabrum (willd.)



RESULT AND DISCUSSION

The plant *Polygonum glabrum (Willd.)* belongs to the family Polygonaceae. It is distributed in various parts of the world. Phytochemical screening including Paper Chromatography, UV, IR Spectral analysis of its fractions and HPTLC Studies. The preliminary phytochemical studies indicate the presence of Alkaloids, Carbohydrates and Flavonoids from Chloroform extract.

The paper chromatography was performed and the R_f Values are recorded, which shows two spots respectively for the solvent system of n-butanol: acetic acid: water with the ratio of 5:4:1 & 4:3:3 with R_f value of 0.89, 0.87 & 0.91, 0.89.

The HPTLC were done. The chloroform extracts were subjected to HPTLC procedure. The Chloroform extract of Plant shows 4, 3 spots with respect to the detection wave length of 254nm and 366nm respectively. The UV Spectral analysis was performed. It gave a max peak at 791nm. It was further investigated by FTIR. In first position at wave number 3136.6 cm^{-1} Miscellaneous Chromophoric group is present, in the second and third positions at wave numbers 2921.6 & 2851.2 cm^{-1} Hydrocarbon Chromophore group is present, in the fourth position at wave number 1628.59cm^{-1} C-H bending group is present and in the fifth position at wave number 1401.03 cm^{-1} Carboxylic acid group is present.

SUMMARY AND CONCLUSION

The Plant *Polygonum glabrum (Willd.)* (Family Polygonaceae) is claimed to have medicinal uses such as Astringent, diuretic, rubefacient, vermifuge, treatment of Pneumonia, Piles, Jaundice, Rheumatism, relieves pain, and in some areas used as remedy for fever.

The Phytochemical screening of Chloroform extract shows the presence of chemical compounds like Alkaloids, Carbohydrates and Flavonoids. The maximum absorbance of the chloroform extract was also studied by UV spectral analysis. The HPTLC and paper chromatography of Chloroform extract was done the R_f value and number of components present was recorded. The Chloroform extract was further subjected to FTIR spectroscopy and their spectrum was recorded. And thus these are the preliminary work for the detection of some alkaloidal contents in the plant.

Since the Chromatographical studies shown various spots (Paper/ HPTLC) with the chloroform extract may confirms that presence of alkaloidal content in the plant. Nevertheless there is a need of further studies including isolation of individual secondary metabolites,

structural elucidation, and pharmacological screenings in order to prove the folklore claims and ethnomedical information.

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