www.ijrps.pharmascope.org

ISSN: 0975-7538
Research Article

A HPTLC report on *Desmodium gangeticum*

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ABSTRACT

Traditional medicine also known as indigenous or folk medicine comprises medical knowledge systems that developed over generations within various societies before the era of modern medicine. Indian contribution to herbal market and emphasis on novel research is continuously increasing. The importance of phytochemical standardisation of herbal drugs and highly processed materials in herbal formulation has been well understood. *Desmodium gangeticum* is one such plant which is found all over areas that are up to the height of 5000 feet including lower Himalayan region and throughout the plains of India. The HPTL chromatogram helps in characterisation of active constituent of any herbal plant. *D. gangeticum* is used as anti-inflammatory, anti ulcer, anti oxidant, and febrifuge. The methanolic extract of *Desmodium gangeticum* (Fabaceae) leaf was found to contain simple indole base namely N, N dimethyltryptamine. The indole base was isolated and identified by Camag HPTLC. The coarse dry powdered leaves was first extracted with petroleum ether (60-80)˚C by soxhalation process and then with methanol for next 72 hrs. Solvent system was developed for this extraction and then TLC and HPTLC fingerprint were recorded by using silica gel G.F. as stationary phase.

Keywords: *Desmodium gangeticum;* Fabaceae; HPTLC; Indole bases.

INTRODUCTION

Plant medicines were regarded as highly important in the lives of our ancestors since they did not have any alternative therapy. Their dependence on the plants in their surroundings made them acquire the knowledge about the medicinal properties of many plants by trial and error. Due to the various side effects of allopathic medicines, global trend is now going back to herbal medicines. There has been an increase in worldwide realization of the use of medicinal plants in various traditional health systems of developing countries. For example, recent estimates by the World Health Organization (WHO) revealed that about 80% of the population in Africa relies on traditional medicine of which the botanicals constituted greater components. It is estimated that about 30,000 botanical species are now recorded for their medicinal properties.The present study focuses on the *Desmodium gangeticum* which is found in the lower Himalayan regions of India. Total 108 species were reported as per the literature (Desmodium online). Vernacular names are sarvani / sarivan (Hindi); shalparni (Sanskrit).

It is a small plant that has a height of 2 to 4 feet. The stem is angular. Leaves are ovate in shape that is 3 to 6 inch in length the lower surface of the leaf is of light green in colour (Haines H). Flowers are white in colour. Fig1. Shows the picture of the plant. The plant flowers and fruits whole year especially in early summers. Its roots are used as astringent, in diarrhoea, in chronic fever, biliousness, snake-bite, and poisoning (D.gangeticum online). The aerial extract of plant caused a significant increase in insulin secretion and also caused a significant decrease in blood cholesterol level (Govindarajan R, 2007). The leaves are used as Antiinflammatory, Antioxidant, antiulcer, Decoction of the plant is used as febrifuge, Analgesic, anti-arthritic, bronchial muscle relaxant. The chromatographic data of HPTLC reveals the presence of active constituents in the methanolic extract of the leaves of *D. gangeticum*. This data can be used for the prediction of quality and stability of herbal extract which has an increasing demand in the current global scenario.

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Contact: +91-7893204867
Received on: 28-04-2011
Revised on: 13-05-2011
Accepted on: 15-05-2011

EXPERIMENTAL

Chemicals and reagents

Petroleum ether, Methanol, sulphuric acid, ethylacetate, benzene, chloroform, acetone.

Collection and Authentication

The plant is an erect, diffusely branched undershrub, 90-120cm in height with a short woody stem and numerous prostrate branches provided with soft grey hairs; leaves unifoliate and mottled with Grey patches. The authenticated plant of *Desmodium gangeticum* were procured from the garden of BIT MESRA campus, the plant material was authenticated further by Dr. S. Jha, Professor, Department of Pharmaceutical Sci-

ences, Birla Institute of Technology, Mesra and the voucher specimen was preserved in the Department.

Figure 1: Desmodium gangeticum plant

Extraction

75 gm leaves were dried, powdered and was defatted with petroleum ether (60-80 ^{o}C) and kept in thimble, this was then fitted below to a bolt-head flask containing methanol as solvent and above to a reflux water condenser for 72 hrs and extraction was done with Methanol by soxhalation process.

Phytochemical screening

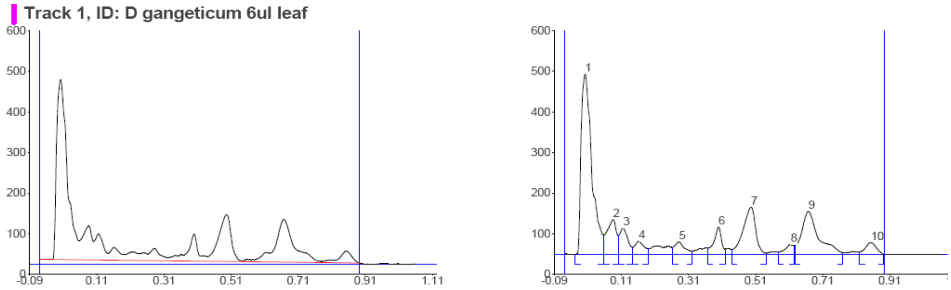
Phytochemical screening of *D. gangeticum* were performed by standard procedures like test for alkaloids using dragendroffs reagent, mayer's reagent, wagner's test and hager's reagent and test for flavonoids and flavones such as Shinoda test.(Khandelwal 2007)

Solvent system

The solvent system used was Chloroform: ethyl acetate: benzene (3:1:1.5, v/v)

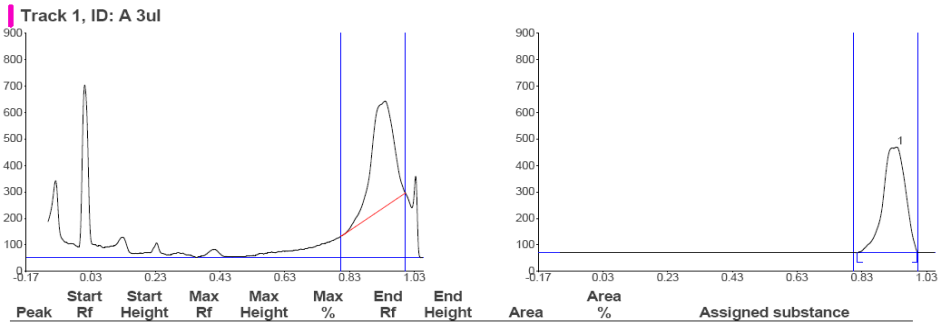
Isolation of compound

The HPTL Chromatogram of methanolic extract of leaves showed the presence of 10 compounds (**Fig.2**). The compound DG1 was isolated from the methanolic extract through PTLC using proper solvent system (**Fig.3**)



Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	-0.03	0.0	0.00	443.3	44.60	0.06	46.9	10766.9	43.05	unknown *
2	0.06	47.0	0.08	84.8	8.53	0.10	45.7	1867.7	7.47	unknown *
3	0.10	46.0	0.12	64.1	6.45	0.14	16.8	1233.2	4.93	unknown *
4	0.14	17.0	0.16	31.5	3.17	0.19	14.1	693.4	2.77	unknown *
5	0.26	16.3	0.28	30.6	3.07	0.32	7.6	719.8	2.88	unknown *
6	0.37	14.9	0.40	66.7	6.71	0.42	12.5	1178.3	4.71	unknown *
7	0.44	11.3	0.50	115.6	11.63	0.54	2.7	3325.6	13.30	unknown *
8	0.58	5.1	0.62	23.1	2.32	0.63	21.7	475.1	1.90	unknown *
9	0.63	21.7	0.67	105.5	10.61	0.77	3.9	4035.6	16.14	unknown *
10	0.82	5.8	0.85	28.8	2.90	0.89	0.3	713.1	2.85	unknown *

Figure 2: HPTL Chromatogram of leaf methanolic extract



Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	0.82	0.5	0.94	399.9	100.00	1.00	3.9	23626.5	100.00	unknown *

Measurement Table

Wavelength	300
Lamp	D2 & W
Measurement Type	Remission
Measurement Mode	Absorption
Optical filter	Second order
Detector mode	Automatic
PM high voltage	238 V

Detector properties

Y-position for 0 adjust	5.0 mm
Track # for 0 adjust	0
Analog Offset	10%
Sensitivity	Automatic (35)

Figure 3: HPTL chromatogram of isolated compound DG1

Chromatography

The chromatography of the methanolic extract was done on aluminium plate (10x10) coated with silica gel 60GF, activated at 110˚C for 5 min. The methanolic extract and the isolated compound were applied on the plate in the form of 6mm wide bands using a sample applicator at a distance of 12mm. Nitrogen gas was also supplied for simultaneous drying of bands. The plate was developed in Chloroform: ethyl acetate: benzene in 3: 1 : 1.5 ratio as mobile phase. The chamber was first saturated with the mobile phase for 15-20 min. After development of the plate, scanning was performed using CAMAG TLC Scanner 3.

RESULT AND DISCUSSION

The R_f value was found from the HPTLC data to be 0.82. These spectral data were quite similar to N, N-dimethyltryptamine (Rastogi P.R, 1960., Haines H., Banerjee P. K, 1969.)Obtained from the aerial parts of the plant *Desmodium gangeticum* (D.gangeticum online). However in the absence of ^{1}H-NMR, ^{13}C-NMR and Mass, this conclusion may be treated as tentative. So it may be N, N-dimethyltryptamine.

CONCLUSION

As in the above work it has been revealed that the methanolic extract of *Desmodium gangeticum* has 10 peaks in chromatogram which has been produced by HPTLC. The methanolic extract of *Desmodium gangeticum* (Fabaceae) leaf was found to contain simple indole base namely N, N dimethyltryptamine. The indole base was isolated and identified by Camag HPTLC. This type of charecterization of phytochemicals can provide a set of data to identiy the phytopharmaceuticals and also herbal formulations containing those active substances.

ACKNOWLEDGEMENT

The author is thankful to Dr. S. Jha for the proper authentication of the plant. Sincere thanks to the Department of Pharmaceutical Sciences for providing proper instrumentation facility for the work.

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