IJBPAS, January, 2013, 2(1): 187-191

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

PHYTOCHEMICAL INVESTIGATION AND THIN LAYER CHROMATOGRAPHY OF *Asparagus racemosus* (*ASPARAGACEAE*) METHANOLIC LEAVES EXTRACT

VERMA A, SINGH N* AND KUMAR A

Department of Chemistry, Government Science & Commerce College, Benazir, Bhopal, India

***Corresponding Author: Email: namrata.rajpoot@yahoo.com**

ABSTRACT

The present study is aimed at the development of phytochemical parameters and to investigate the medicinally active substances present in methanolic extract obtained from leaves of *Asparagus racemosus* plant. Preliminary phytochemical screening of the extracts revealed the presence of flavanoids, tannins, alkaloids, saponins and phenolic compounds.TLC is a technique with large applicability in the fields of plant material analysis. TLC is a simple, quick and inexpensive procedure that indicates how many components are in a crude extract. TLC has many advantages such as lower cost, short time analysis, the possibility of multiple detection and specific derivatization on the same plate. Among the different extracts methanolic extract was used for Thin Layer Chromatography. For the TLC new solvent system developed for the best separation of the phytoconstituents present in the extract. The solvent system selected for the best results of TLC was chloroform and methanol of the ratio of 5:1 for methanolic extract.TLC resulted in identification of three spots found in the methanolic extract. The Rf values of the extract were 0.4, 0.45 and 0.48. The study will provide referential information for the correct identification of the crude plant extract of *Asparagus racemosus*.

Keywords: *Asparagus racemosus*, Phytochemical Analysis, Extraction, TLC

INTRODUCTION

Medicinal plants would be the best source to obtain a variety of newer herbal drugs. For centuries plants have provided mankind with useful, sometimes life saving drugs. Modern pharmaceutical in cases where correlation between chemical structure and biological

activities were noted, emperical science began to give way to rational drug design. This emerging approach to identify and develop potential new drug is largely successful, due to the intellectual cooperation of chemistry (medicinal). Therefore such plants should be investigated to better understand their properties, safety and efficacy. The use of drugs derived from plants has been in practice for a very long time **[1]**. Using plants for medicinal purpose is an important part of the culture .Thus up to 80% of the population depend directly on the traditional medicines for the primary healthcare. Asparagus is the Greek word for "stalk" or "shoot". About 300 species of Asparagus are known to occur in the world in many countries in both; hemispheres and throughout temperate and tropical regions. Some of the European species *are A. Officinalis, A. sprengeri* and *A. acutifolius. A. recemosus* are most commonly used in indigenous medicine **[2]**. Asparagus racemosus wild (family-Asparagaceae;Liliaceae) is commonly called Satawar ,Satavari or Satmuliin Hindi ; Satavari in Sanskrit; Shatamuli in Bengali; Shatavari or Shatmuli in Marathi; Satawari in Gujarati; Toala-gaddalu or Pilli-gaddalu in Telegu;Shimaishavari or Inli-chedi in Tamil;Chatavali in Malayalam; Majjigegadde or Aheruballi in Kannada ; Kairuwa in Kumaon; Narbodh or atmooli in Madhya Pradesh ; and Norkanto or Satawar in Rajasthan **[3]**. Asparagus racemosus has been referred as bitter-sweet, emollient, cooling, nervine tonic, constipating, galactogogue, aphrodisiac, diuretic, rejuvenating, carminative, stomachic, antiseptic **[4]**.

MATERIALS AND METHODS

Collection of Plant Material

Fresh plant leaves were collected from Govt. Nursery of Bhopal (M.P.), India in July-September 2012. The taxonomic identification of plant was confirmed by a botanist. The collected plant material was under shade dried for further use.

Preparation of Crude Methanol Extract

The dried plant leaves of *Asparagus racemosus* was grounded mechanically till the fine powder in a mixer grinder and weighed accurately. The powdered material was subjected to solvent extraction with methanol by Soxhlet apparatus at room temperature for 48 hours. The resulting mixture was filtered and evaporated in a shaker water-bath; temperature maintained at 55-65^{0}C. The obtained dried crude extract was used for phytochemical analysis.

Phytochemical Screening

A small portion of the dry crude extract was used for the phytochemical analysis. Dried methanolic extract of *Asparagus racemosus*

was investigated with the various chemical tests by **[5, 6]**.

Thin Layer Chromatography

The TLC was performed on precoated 20×20 cm and 0.25 mm thick plates. The plates were prepared by using silica gel G for TLC, were left overnight for air drying. These plates were activated by hot air oven at 100ºc for 1hr.Cold alcoholic extract was plotted on TLC plates **[7]**. The plates were dried and developed in suitable solvents for rapid screening chloroform/ methanol in the ratio 5:1. The plates were run in the above solvent systems and dried at room temperature. Derivatisation of TLC plates was done by UV light at 254mm. Different bands were observed and corresponding Rf values are determined. Rf value of each spot was calculated as:-

Rf = Distance Travelled by the Solute / Distance Travelled by the Solvent

RESULTS AND DISCUSSION

Table 1 below shows the results of preliminary phytochemical screening of methanol extracts of *A. racemosus*.

Thin Layer Chromatography of Methanolic Extract

Methanolic extract was subjected to TLC in order to identify the bioactive compounds. In the present study, the most suitable TLC system for analysis was shown to be choloroform: methanol with the largest discriminating power. Three bands **(Figure 1)** were found with Rf values of 0.4, 0.45 and 0.48 **(Table 2)**.This values indicate the presence of phenolic compounds.

Table 1: Preliminary Phytochemical Screening of *A. racemosus*

S. No.	Plant	REMARKS
1.	Alkaloids	++
2.	Flavanoids	+
3.	Tannins	+
4.	Saponins	++

NOTE: + = Higher Presence of Bioactive Compounds; ++ =Lower Presence of Bioactive Compounds

Table 2: Thin Layer Chromatography of Methanolic Extract of *A. racemosus*

S. No.	Rf Values
1.	0.40
2.	0.45
3.	0.48

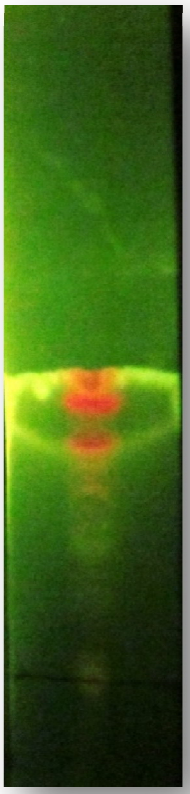

Figure 1: Thin Layer Chromatography of Methanolic Extract of *A.racemosus*
NOTE: Solvent system: Chloroform: methanol (5:1); Total length: 8 cm

CONCLUSION

The methanolic leaf extract obtained through successive solvent extraction from *Asparagus racemosus* in order to prove the ethnopharmacological application of the plant in Indian folk medicine. The present article includes the detailed exploration of pharmacological properties of the leaves extract of *Asparagus racemosus* reported so far.

REFERENCES

[1] Lewis HW and Elvin-lewis MPF, Medical Botany: Plants Affecting Man's Health, New York: John Wiley and sons Inc., 1997.

[2] Rao SB, Indian J. Pharm.,14, 1952, 131-2

[3] Anonymous, The Wealth of India, Raw materials, Publication and Information Directorate, CSIR, 1987, 468.

[4] Chopra RN, Chopra IC, Handa KL and Kapur LD, Indigenous Drugs of India, Academic Publishers, Calcutta, 1994, 496.

[5] Harborne JB, Phytochemical methods of analysis, Jackmann and Hall, London, 1973, 64-190.

[6] Kokate CK, Practical Pharmacognosy, 3rd Ed., Vallabh Prakashan, New Delhi, 1994, 07.

[7] Wagner H and Bladt S: Plant drug analysis-A thin layer chromatography atlas, 2nd Ed., New Delhi: Thompson Press Ltd., 2004.