Evaluation of Shatavarin IV Compound from Methanolic Extract of Asparagus racemosus by High Performance Thin Layer Chromatography

Guru D V Pandiyan, V Leela, S Eswari, M Ramachandran, V Ranganathan, P Visha

ABSTRACT

Asparagus racemosus is an herb of Asparagus or Liliaceae family. It is commonly utilized in human and animal husbandry care management. Asparagus racemosus has powerful antioxidant anti-inflammatory uterine tonic antimicrobial, anti-cancer, and galactagogue properties. Shatavarin is a steroidal saponin found in Asparagus racemosus roots in this experiment. roots of Asparagus racemosus were collected from Herbal Garden, Ethnos Veterinary Herbal Product Research and Development Centre Tamil Nadu Veterinary and Animal Sciences University. Shatavarin IV was identified and quantified by a simple precise and reliable High Performance Thin Layer Chromatography technique.

Keywords: Asparagus racemosus, Shatavarin, Steroidal saponin, High Performance Thin Layer Chromatography.

INTRODUCTION

India includes 15 different ago-climatic zones and (17000-18000), flowering plant species of which (6000-7000), have been determined to have medicinal use in people and archived health-care systems from Ayurveda Siddha and Unani [1].

Traditional herbs and plants are used in Indian medicine to treat a variety of ailments. Due to their extraordinary adaptability and proven efficacy traditional plant-based medications have recently received a boost in research and development in modern medicine [2]. Traditional and alternative medicinal systems are attracting traditional and alternative medicinal systems in our communities due to the high cost and adverse effects of modern treatments [3].

Shatavarin is the popular name for Asparagus racemosus Wild (Liliaceae), It's a branching spinose undershrub that grows wild in India's tropical and subtropical regions [4]. Asparagus exists in around (300), different species around the world. Because steroidal saponins and sapogenins are discovered in several portions of the plant, the genus is regarded medically valuable [5]. Asparagus racemosus has been used medicinally in Indian and British pharmacopoeias, as well as in indigenous medical systems [5].

Asparagus racemosus is recommended as a cooling agent and uterine tonic in Ayurveda. An anticancer drug asparagine present in Asparagus that can benefit with leukemia treatment. The saponins, present in the asparagus is having ant oxytocic and antispasmodic properties which is specific to uterine musculature contraction. It helps dairy animals produce more milk. Its mixture with milk aids nursing women in secretion of more milk [8].

The most active components in the roots of Asparagus racemosus are steroidal saponins (Shatavarin I-IV). Shatavarin (IV) is a glycoside having two rhamnose molecules and one glucose group that belongs to the Sars sapogenin family in cell free assays Shatavarin (IV), has been shown to have considerable inhibitory action against Core 2 GlcNActransferase as well as immunomodulation activity against particular T-dependent antigens in immune deficient animals [7].

To identify and analyses Shatavarin (IV), from Asparagus racemosus root samples growing at the Ethnos Veterinary Herbal Product Research and Development Centre's herbal garden a reliable easy and precise High performance thin layer chromatography (HPTLC), method was developed Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), Orathanadu Thanjavur District Tamil Nadu.
MATERIALS AND METHODS

Plant Source
Herbal Garden, Ethnos Veterinary Herbal Product Research and Development Centre (TANUVAS), Orathanadu Thanjavur District Tamil Nadu was used to collect raw roots of Asparagus racemosus. For additional analysis the roots were rinsed, shade dried and pulverized.

Methanolic Extract Preparation
In a Soxhlet system (30g), of Asparagus racemosus power was extracted for 12 cycles with (500ml) of methanol. The extracts were subjected to Rotary evaporator (R-300, Bauchi, Switzerland), in a vacuum, the solvent was removed to dryness. (50°C and 218 mbar), Sigma Aldrich made available the standard Shatavarin (IV), (USA). The solvents utilized in the experiment were all (HPLC), grade.

Detection of Shatavarin (IV) from Asparagus racemosus with HPTLC
A silica gel 60 (F254), Thin Layer Chromatographic (TLC), plate was used for the chromatographic separation (Merck) With help of the sample applicator (CAMAG Lino mat 5), seven different volumes of standard Shatavarin (IV), solution (1mg/mL), and replicates of (1,2,3), and 4 L of Asparagus racemosus samples (100mg/l), were loaded to (TLC), plates The type of application was banding which was done on the Y axis of the plate with an (8.0mm), spacing and a length of (8.00mm), The plate was then developed at room temperature in a twin-trough vertical development chamber (CAMAG), (20x10), with the mobile phase of ethyl acetate–methyl alcohol–water (7.5:1:5:1, v/v), which had been saturated for twenty minutes The front position of the solvent was maintained at (70 mm).

After development (TLC), plates were dried for 5 minutes with the use of an air-dryer Then the derivatization of (TLC), plate was done by derivatize (CAMAG), with anisaldehyde sulfuric acid solution, and then five minutes in a hot-air oven at 105°C. The plate was scanned with a (CAMAG), visualizer2 at a scanning speed of (20mm/s), with a slit dimension of (0.6mm ), (0.45mm), by utilising tungsten and Deuterium lamp light sources at wavelengths of R White (254nm), and (366nm), On the (HPTLC), plates the presence of Shatavarin (IV), in Asparagus samples was detected as bands with identical Retardation factor (Rf), values to the Shatavarin (IV), standard. For both the standard and sample areas the retardation factor (Rf), was measured, which is the ratio of the compound's distance moved to the solvent's distance moved in a given time.

Quantification of Shatavarin in Asparagus racemosus Samples
At R White the area calibration for substance Shatavarin (IV), was measured using a scanner (CAMAG S/N: 250410), For the analysis of Shatavarin (IV), from Asparagus racemosus samples a standard curve was created by using seven reference Standard samples and four Asparagus samples.

RESULTS AND DISCUSSION
The Rf values (Table 1), for Shatavarin (IV), standard and Asparagus samples were analysed by (HPTLC), demonstrating the availability of Shatavarin (IV), in the Asparagus extracts (Figures 1, 2, and 3), depicted the development of a (TLC), plate featuring remission of R white and (366nm), as well as the detection of Shatavarin (IV), in an asparagus sample using Rf value Because of its sensitivity and precision (HPTLC), has been used in a handful of studies for the identification and analysis of therapeutic phytoconstituents.

Previous studies with (CAMAG), (HPTLC), employed win (CATS), software however the current study used the advanced modern software vision (CATS). Furthermore, no reports on the analysis of Shatavarin (IV), from Asparagus grown in the Thanjavur area of Tamil Nadu are known.
CONCLUSION

The results obtained in the present study suggest that the roots of *Asparagus racemosus* cultivated at herbal garden of Ethnos Veterinary Herbal Product Research and Development Centre Veterinary College and Research Institute Orathanadu contain Shatavarin (IV), which has potential for use in the health care of animal kingdom.

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Conflict of Interest

None declared.

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REFERENCES


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