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Qualitative Analysis of *Asparagus Racemosus Willd.* (Shatavari) *Root of Family Asparagaceae*

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Abstract: ***The purpose of this study is to determine the quality of bioactive phytochemicals in Asparagus racemosus willd roots. Asparagus racemosus willd. is generally known as Shatavari in the Indian traditional system (Ayurveda). It is a well-known herb in Ayurveda. It is grown in Sri Lanka, Nepal, tropical areas of India and the Himalayas. Ayurveda medicine is a medical system that has its origins in the Indian subcontinent. Modernized and globalized practices derived from Ayurveda traditions are complementary or alternative medicine. Ayurveda therapies and practices have been integrated into medical use and general wellness applications in the Western world. Therefore, this paper aims to present an overview of pharmacognostical, traditional, phytochemical investigations on the roots of the plant Asparagus recemosus Willd.***
Keywords Asparagus racemosus, phytoconstituents, pharmacognostical, phytochemical

I. INTRODUCTION

The plant is called Shatavari, which means "one who possesses a hundred husbands or acceptable to many," implying its ability to increase fertility and vitality [1]*Asparagus racemosus* willd. is a woody climber (about 2m in height) that belongs to the plant family Asparagaceae. The leaves are like pine needles, small and uniform and flowers are white andhave small spikes [2]. The roots of *Asparagus racemosus* are heavily used in Sri Lanka for Ayurveda and traditional medicines. Because local providers of Asparagus racemosus are unable to match the country's demand, roots of Asparagus racemosus are imported to fill the void. According to the importers of herbal medicines, *Asparagus racemosus* is mainly imported from India[3]. Ayurvedic writings suggest *Asparagus racemosus* to prevent and treat dyspepsia, stomach ulcers, and as a galactogogue. Some Ayurvedic practitioners have utilised Asparagus racemosus to treat neurological illnesses. [4]. A few recent reportsdemonstrated some additional beneficial effects of this herb, including antilithiatic effectsimmunomodulatory, antihepatotoxic and immunoadjuvant [5]. Traditional medicine increases due to the high cost of allopathic medicines and their potential side effects[6].

During the past time, traditional systems of medicine have become a topic of global importance. Current estimates suggest that, in many developing countries, a large proportion of the population trusts heavily on medicinal plants and traditional practitioners to meet primary health care needs[7].

Despite the availability of modern treatment in many countries, herbal medicines have remained popular for cultural and historical reasons.[8]. Its medicinal usage has been reported in the British and Indian Pharmacopoeias in indigenous systems of medicine.[9] The genus Asparagus includes about 200 species around the world. The genus is considered medicinally important because of the presence of steroidal saponins and sapogenins in various parts of the plant.[10] Out of the 21species of Asparagus recorded in India, Asparagus racemosus is most commonly used in traditional medicine.[11]

II. METHODOLOGY [12,13,14,15,16,17,18,19]

Asparagus racemosus willd, is extracted by using cold maceration method. Here different solvents like petroleum ether, methanol and ethyl acetate are used. Detailed phytochemical testing was performed to identify the presence or absence of different phytoconstituents.

A. Test for Triterpenoids and Steroids

1) Salkowski's Test: The extract was treated with chloroform and filtered. The filtrate was added with a few drops of concentrated sulphuric acid, shaken and allowed to stand.

If the lower layers turn red, steroids are present.

The presence of a golden yellow layer at the bottom shows the presence of triterpenes.

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B. Test for Flavonoids

1) *Alkaline Reagent Test:* The extract was treated with a few drops of sodium hydroxide separately in a test tube. The formation of intense yellow colour, which becomes colourless with the addition of a few drops of dilute acid, shows the presence of flavonoids.
2) Lead Acetate Test: The extract was treated with a few drops of lead acetate solution. The formation of yellow precipitate may show the presence of flavonoids.

C. Test for Tannin and Phenolic Compounds

1) *Dilute Iodine Solution Test:* To 2 ml of extract, a few drops of dilute iodine solution were added—formation of transient red colour shows the presence of phenolic compounds.
2) *Lead Acetate Test:* Some amount of extract was dissolved in distilled water. A few drops of lead acetate solution were added—the formation of a white precipitate shows the presence of phenolic compounds.

D. Test for Alkaloids

To the extract, dilute hydrochloric acid was added, shaken well and filtered. With the filtrate, the following tests were performed.

1) *Hager's Test:* To 3 ml of filtrate, a few drops of Hager's reagent were added in a test tube. The formation of a yellow colour precipitate shows the presence of alkaloids.
2) *Mayer's Test:* To 1 ml of filtrate, a few drops of Mayer's reagent were added along the sides of the tube. The formation of a white or creamy precipitate shows the presence of alkaloids.

E. Test for Glycosides

1) *Keller-Killiani Test:* To 4 ml of test solution, 4 ml of glacial acetic acid and 1 drop of 5% ferric chloride were added in a test tube. Add carefully 1 ml of concentrated sulphuric acid by the side of the test tube. The formation of blue colour in the acetic acid layer shows the presence of Cardiac glycosides.
2) *Legal's Test:* 3 ml of test solution was dissolved in pyridine. 3 ml of sodium nitroprusside solution was added and made alkaline using 10% sodium hydroxide solution. The formation ofpink to blood-red colour shows the presence of Cardiac glycosides.

F. Test for Saponins

1) *Froth Test:* The extract was diluted with distilled water and shaken in a graduated cylinder for 10minutes. The formation of a layer of foam shows the presence of saponins.

G. Test for Carbohydrates and Reducing Sugar

1) *Molish Test:* 3 ml of aqueous extract was treated with 3 drops of alcoholic α-naphthol solution in a test tube. Then 1.5 ml of concentrated sulphuric acid was added carefully along the sides of the test tube. The formation of a violet ring at the junction shows the presenceof carbohydrates.
2) *Benedict's Test:* An equal volume of Benedict's reagent and extract were mixed in a test tube and heated in the water bath for 15minutes. The solution appears green or yellow, or red depending on the amount of reducing sugar present in the test solution, which shows reducing sugar.

H. Test for Protein and Amino Acids

1) *Million's Test:* 3 ml of extract was mixed with 5 ml of Million's reagent. A white precipitate formed, which on heating turned to brick red, shows the presence of proteins.
2) *Biuret's Test:* The extract was treated with 3 ml of 10% sodium hydroxide solution in a test tube andheated. A drop of 0.7% copper sulphate solution was added to the above mixture. Theformation of violet or pink colour shows the presence of proteins.

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III. RESULT

Table: 1 Qualitative phytochemical analysis *Asparagus racemosus* willd. root extract

S. No.	Experiment	Result		
		Pet. EtherExtract	Ethyl Acetate Extract	MethanolExtract
1. Test for Triterpenoids and Steroids				
i.	Salkowski Test	-	-	+
2. Test for Flavonoids				
i.	Alkaline Reagent Test	-	+	+
ii.	Lead Acetate Test	-	+	+
3. Test for Tannins and Phenolic Compounds				
i.	Dilute Iodine SolutionTest	-	+	+
ii.	Lead Acetate Test	-	+	+
4. Test for Alkaloids				
i.	Hager's Test	-	+	+
ii.	Mayer's Test	-	+	+
5. Test for Glycosides				
i.	Keller Killani Test	-	-	+
ii.	Legal's Test	-	-	+
6. Test for Saponins				
i.	Froth Test	+	+	+
7. Test for Carbohydrates and reduce sugar				
i.	Molisch's Test	-	+	+
ii.	Benedict's Test	-	+	+
8. Test for Protein and Amino acids				
i.	Million's Test	-	-	-
ii.	Biuret's Test	-	-	-

+ shows the presence of that phytoconstituent

- shows the absence of that phytoconstituent

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IV. CONCLUSION

To increase the sensitivity of plant extract and decrease the side effect of antibiotics, a combination of antibiotics and Herbal extract was used. Day by day, bacteria gain strength and regain antibodies against traditional antibiotics. To stop their regenerating power, a combination of antibiotics and plant extracts provides one of the best results in such a direction. If nontoxic plant extracts have been taken in suitable doses, they may prove the best supplementary remedies to patients. Qualitative phytochemical analysis of *Asparagus racemosus* willd. root extract was performed in table 1 results are mentioned. Results show that

1) In petroleum ether extract, only saponin is present.
2) In Ethyl acetate extract Flavonoid, Tanin, Phenolic compound, Alkoloid, Saponin, carbohydrates, Reducing sugar are present.
3) In methanol extract, Triterpenoid, Steroid, Flavonoid, Tanin, Phenolic compound, Alkoloid, Glycoside, Saponin, Carbohydrate, Reducing sugar are present

The obtained phytochemical constituent results demonstrate that the methanol extract of *Asparagus racemosus willd. root* can be used for curing some diseases. Therefore, further work is necessary to isolate and characterize these constituents.

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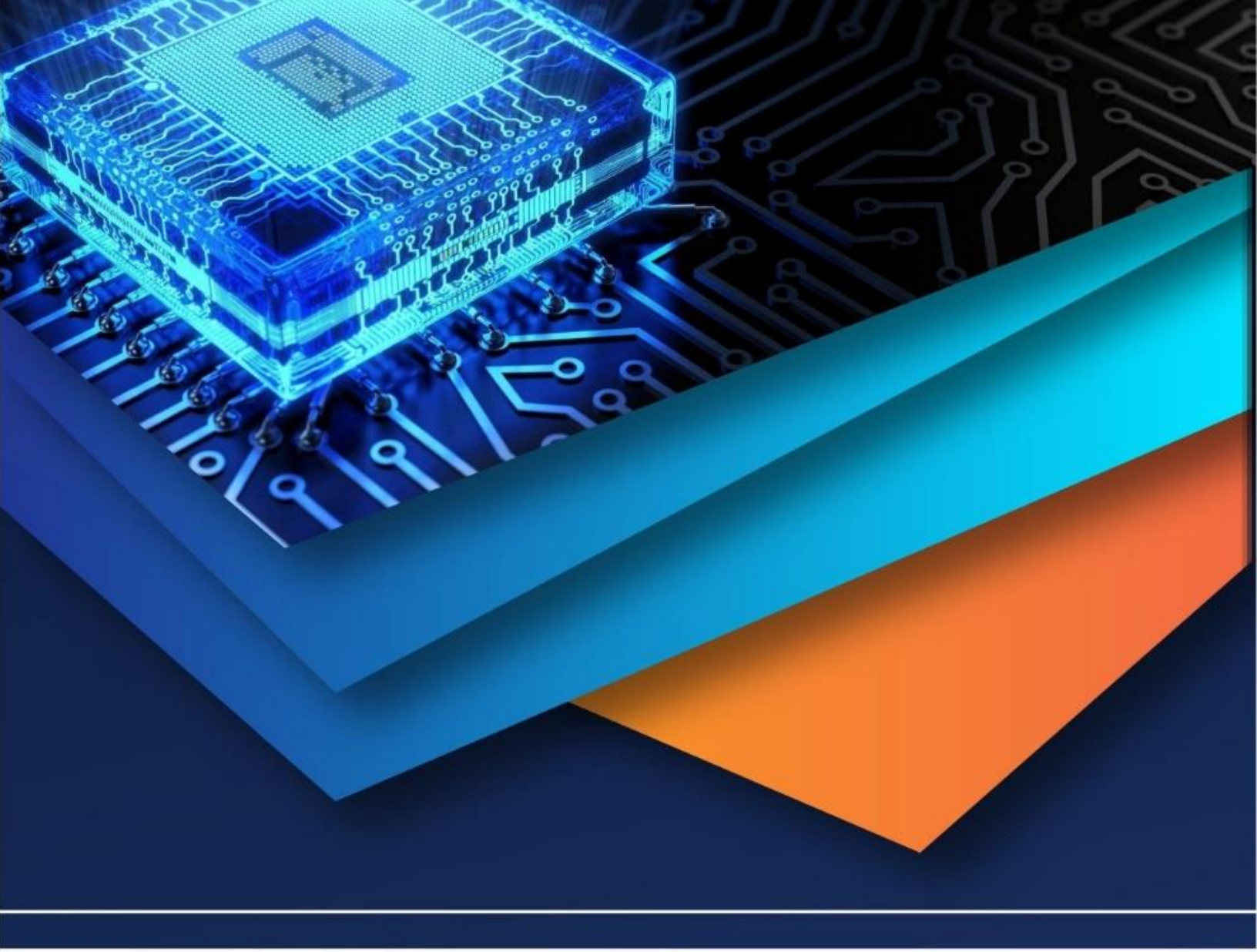

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