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Plant Profile, Phytochemistry and Pharmacology of Asparagus Racemosus (Shatavari): A Review

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Abstract: ***Asparagus racemosus is one of the member of family Liliaceae and popularly called as Satavari. It is observed all over in INDIA at a low altitude. It is utilized as herbal medicine and served as food. All the parts of the plant have therapeutically importance for the treatment of the various disorders such as liver disorder, stomach ulcer, inflammation, stress related disorders, dyspepsia. It also regulates blood fat and cholesterol levels. It is found that the drug also control the symptoms of AIDS. This mini review highlights the importance and pharmacological Activity of the A. racemosus.***
Key points: Asparagus racemosus, morphology, Classification, phytochemicals, pharmacological Activity.

I. INTRODUCTION

Shatavari is an essential medicinal plant of tropical and subtropical India. In Ayurveda, this herb is called as "Queen of herbs", as it promotes love and devotion. This herb is helpful in problems related with female reproductive system. It is used to rectify gynecological problems like irregularities in menstrual cycle and sexual dysfunction. It is well known Ayurvedic rasayana which prevent ageing, increase longevity, impart immunity and improve mental function[1]-[6].

II. MORPHOLOGY

A. Racemosus is grow about 1- 2m in height. It is highly branded, consist of thorn under shrubs. The leaves look like pine needles, Uniform and small in size. The roots have a finger like structure and clustered. It has a white coloured flower. The plant has bittersweet in taste[7],[8].


Fig. 1 Flower of A. Racemosus


Fig. 2 Leaves of A. Racemosus

III. SCIENTIFIC CLASSIFICATION

Kingdom : Plantae
Class : Tracheophytes
SubClass : Angiosperms
Class : Monocots
Order : Asparagales
Family : Asparagaceae
Subfamily : Asparagoideae
Genus : Asparagus
Species : Asparagus racemosus
Bionomial name - Asparagus racemosus
Synoname - Asparagus rigidulus- Protasparagus racemosus[9].
Habitat : It is common at low altitude in shade and in tropical climates throughout Africa, Asia, Australia, Java and southern part of China[10].

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IV. PHYTOCHEMICALS

The chemical constituent are as follows –

Steroidal saponins, known as shatvarins. Shatvarin I to VI are present. Shatavarin I is the main glycoside with 3-glucose & rhamnose moieties connected to sarsapogenin [11-14]; Oligospirostanoside referred to as Immunoside [15]; Poly-cyclic alkaloid-Aspargamine A, a cage type pyrrolizidine alkaloid [16-18]; Isoflavones-8-methoxy-5, 6, 4-trihydroxy isoflavone-7-0-beta-D-glucopyranoside [19]; Cyclic hydrocarbon-racemosol, dihydrophenanthrene [20, 21]; Furan compound-Racemofuran[22]; Carbohydrates-Polysaccharides, mucilage[23]; Flavonoids-Glycosides of quercetin, rutin & hyperoside are present in flower & fruits[24]; Trace minerals are examined in roots- zinc, manganese(19.98 mg/g), copper(5.29 mg/g), cobalt(22.00 mg/g) along with calcium, magnesium, potassium zinc & selenium[25 , 26]; Kaepfrol-Kaepfrol along with Sarsapogenin from woody portions of tuberous roots could be isolated[27]; Miscellaneous- Essential fatty acids-Gamma linoleinic acid, vita. A, diosgenin, quercetin 3-glucourbnides[28-30].

V. PHARMACOLOGICAL ACTIVITY

A. Galactagogue Effect

Alcoholic extract of shatavari have effects on lactating mother to increase milk production and increases the growth of mammary gland alveolar tissue and acini [31-37] .

B. Antiulcer Activity

Ulcer is induced due to imbalance among aggressive factors, especially gastric acid and pepsin and protective factors including gastric mucosa, bicarbonate and prostaglandin. Shatavari is antiulcerogenic agent whose activity can compared with that of ranitidine hydrochloride. It causes an inhibitory effect on release of gastric hydrochloric acid and protect gastric mucosal damage[38 - 40].

C. Antitussive Effect

Shatavari is used in treatment of cough and in minor infections of upper respiratory tract. In the experimental setup by Akanksha Singh and Sinha 2014 , the Activity against Sulphur induced cough in mice [41].

D. Gastrointestinal Effects

Shatavari is used for constipation, and stomach ulcers. It can be also used for anxiety, cancer, diarrhoea, bronchitis, TB, and diabetes[42 - 46].

E. Molluscicidal Activity

Aqueous and ethanolic extract of shatavari show a high mortality rate (100%) against Biomhalaria pfeifferi and lymnaea natalensis. The LC50 was noticed to be 0.1, 5, 10 and 50 mg/mL for Biomphalaria pfeifferi and 0.5, 5, 1, 10 mg/mL for Lymnaea natalensis. The action was attributed to the presence of terpenoids, steroids and saponins in the extract [47].

F. Antihepatotoxic Activity

Alcoholic extract of A. Racemosus significantly reduces the increased levels of alanine transakinase, alkaline phosphate in CCI4 induced hepatic damage in rats. [48,49]

G. Antineoplastic Activity

Alcoholic extract of root of shatavari has been shown remarkably to reduce the increased levels of alanine transakinase, aspartate transaminase and alkaline phosphate in CCl4 induced heptic damagein rats indicating antihepatotoxic potential of A. racemosus [50 - 52] .

H. Cardiovascular Effect

Alcoholic extract of roots of shatavari produces posit- ive ionotropic and chronotropic effects on frog heart with lower doses and cardiac arrest with higher doses. The extract produces hypotension in cats and show no effect on i.v. administration in rabbits [53].

I. Effect on CNS

Shatavari did not produce catalepsy in experimental animals such as rats even massive oral doses are given [54 -55].

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J. Immunomodulatory Activities

Dried roots of shatavari modulates the action of immune system. It induces immunity system to fight against immune deficiencies like AIDS, infections and cancer. It also helps to obtain higher protective antibodies against different vaccinations, which response against various bacterial, viral and other diseases [56 -57].

K. Antioxidant Action

Antioxidants are moieties which are involved in prevention of cell damage. As given by Aarti K, the Methanolic extract of roots posses significant antioxidant properties when administered through the oral root [58].

L. Anti-inflammatory Effects

ACE inhibited topical edema in the mouse ear administered at 200 mg/kg (I.P.), leading to substantial reductions in skin thickness and tissue weight, inflammatorycytokine production, neutrophil-mediated myeloperoxidase activity, various histopathological indicators [59].

M. Anti-stress Activity

Shatavari is used in the indian traditional medicine system to enhance general state of health and for stress related immune disorders. The action of methanol and aqueous extract of roots of shatavari was studied in experimental mouse stress model induced by swimming [60-61].

N. A Versatile Female Tonic

In Ayurveda, shatavari is considered as a female tonic. It is useful in female infertility as it increases libido, cures inflammation of sexual organs . moistens dry tissue of sexual organs. Play role as post-partum tonic by increasing lactation. Normalise uterus & changing hormones [62].

O. Cytotoxicity, analgesic and antidiarrhoeal Activities

Ethanol extracts of A. racemosus was investigated for biological action. The test for analgesic action of the crude ethanol extract was performed using acetic acid induced writhing model in mice [63].

P. Anticancer Activity

As described by Shankar et. al the isolated Asparagus racemosus IV with AR - 2B having 5.05% shatavarin IV show potent cytotoxicity. This shows increase in non - viable cell count when compared to untreated groups of mice in study [64].

Q. Antidiabetic Effect

In treatment of DM the extract of shatavari has been observed to reduce blood glucose levels in the rats and rabbits[65].

VI. CONCLUSION

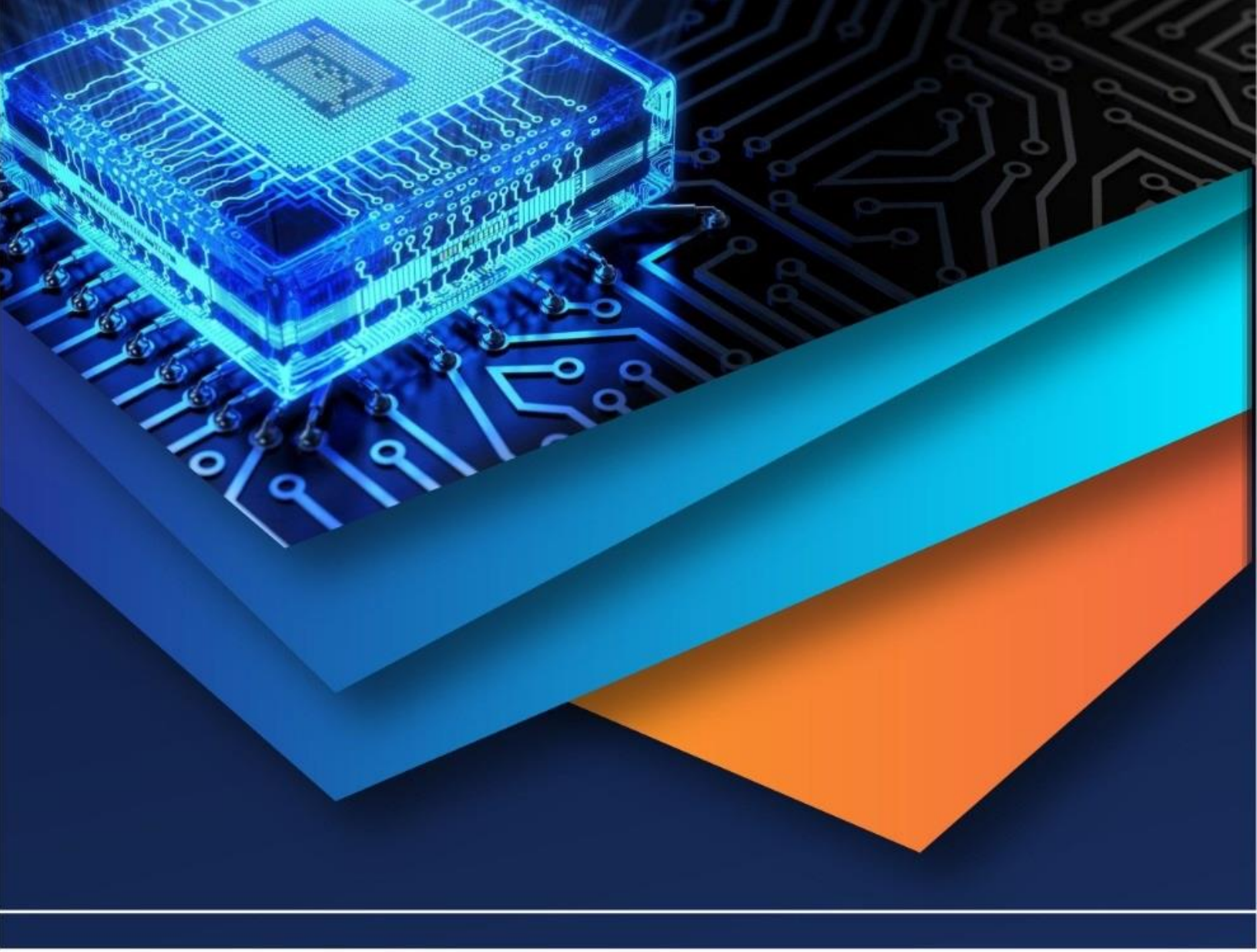
Various studies have been conducted on shatavari. It is a very important medicinal plant, which can be employed in different phases of medicament.

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