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Review article

Asparagus Racemosus - A Review

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ABSTRACT

Asparagus racemosus (*A. racemosus*) commonly known as Shatavari or satavar belongs to family of Liliaceae. It is grown in tropical areas of India, Sri Lanka and Himalayas. Shatavari crop generally shows resistance to pest and insects and unaffected with diseases. The crop grows well in tropical and hot climate. Well drained fertile black soil is most preferred for the cultivation of crop. The dried root extracts of the plant are used as drug. The root extracts are proved for to possess pharmacological efficacies such as antioxidant potential, antimicrobial property, anti-tumor potential, hepatoprotective role and antidiabetic activity. The present article explores the therapeutic properties of *A. racemosus* root which are reported so far.

Key words: *Asparagus racemosus*, Shatavari, root extract, hepatoprotective role, antimicrobial property.

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INTRODUCTION

Asparagus racemosus (*A. racemosus*, Shatavari) is a widely occurring medicinal plant belonging to the family of Liliaceae. This species is found abundantly in subtropical and tropical zones such as India, Asia, Australia and Africa. The phytochemical constituents of the plant vary depending on its geographical zone of availability. During hot climatic conditions the plant shows the presence of rhizomes, aerial parts and tuberous roots. When the plant goes to dormant phase, the aerial part gets withered. *A. racemosus* is frequently used in ayurvedic drug preparations as it is known to treat conditions such as ageing, to boost immunity, improve longevity, vigor, mental function. *A. racemosus* also finds its application in curing neurological disorders, hepatopathy, tumors and dyspepsia[1]. Various therapeutic property of root of *A. racemosus* is well documented in ancient ayurvedic literature. The therapeutic property is owing to the presence of various pharmacological properties such as antioxidant property, anti inflammatory property antiseptic and antimicrobial property. The major phytochemical constituents present in the roots of *A. racemosus* is steroidal saponins. This review aims at exploring the pharmacological properties of *A. racemosus*[2,3].

Cultivation of Shatavari

Shatavari crop generally shows resistance to pest and insects and unaffected with diseases. The crop grows well in tropical and hot climate. Well drained fertile black soil is most preferred for the cultivation of crop. Usually 20-22 tons of manure is added to the farm and about 1 kg of seed is sown for a hectare. When the seedlings are ready by 6-7 weeks, it is transplanted to main field. Timely weeding operations should be ensured for a healthy growth of the crop. It is always better to cultivate both male and female plants to ensure the optimum production of seeds[4].

Phytochemical constituents

The root extract of *A. racemosus* was screened for phytochemical constituents to determine the presence of alkaloids, flavanoids, tannins, phytosterols, glycosides. The ethanolic root extract of *A. racemosus* revealed the presence of alkaloids[5,6], flavanoids, tannins, phytosterols, glycosides, carbohydrates, proteins and fats.

Antibacterial activity

Antibacterial activity is the efficacy of the plant extract to inhibit the growth of bacterial pathogens. Plant extract with antibacterial property depends on its phytochemical constituents. Plant extracts with antibacterial property can be used as a medicinal plant and replace synthetic antibiotics. Methanolic and ethalonic root extract shows antibacterial activity against Escherichia coli, Shigella dysenteriae, Vibrio cholerae, Basillus subtilus, Staphylococcus aureus, Shigella sonnei, Shigella flexneri[7]. Owing to its antibacterial property Shatavari can be utilized in place of synthetic antibacterial drugs.

Anti-inflammatory potential

Inflammation is the body's defense against infection. Before starting treatment for any type of infection, inflammation need to be reduced in order to treat better and to reduce pain in patients. Although there are number of synthetic anti-inflammatory drugs which are available, it is always reliable to make use of herbal extracts, as it is safe for the individuals. Studies shows that the root extracts of Shatavari do possess anti-inflammatory property[8]. Intake of the root extract reduces inflammatory cytokine production, skin thickness, myeloperoxidase activity. Anti-inflammatory activity was also evident histopathologically too.

Antioxidant activity

Antioxidants have a vital role in scavenging the free radicals produced in the body. Though our body has its own antioxidants to protect, it is always advisable that our diet is enriched with antioxidants to boost the immune system of our body. Various studies have proved the antioxidant potential of *A. racemosus*. Studies have proved the role of aqueous Shatavari root extract in protecting the gamma radiation induced damage in liver. The antioxidant potential was well characterized against lipid peroxidation[9].

Antidepressant activity

Depression is the most common disorder associated with psychology. The synthetic drugs used to treat depression usually ends up with various side effects. Moreover, most of the drugs are effective for a few of the patients. Plant extracts with antidepressant property

can reduce the ill effects synthetic drugs and patients can rely on it. Right from ancient time different herbal preparations are used to treat psychiatric disorders. Numerous studies were conducted to assess the antidepressant activity of Shatavari *invitro* and *invivo*. Exposure to stress plays an important role in depression. Studies in animal models are done by inducing physical stress which leads to depression[10,11]. *A. racemosus* root has been reported to have a significant antidepressant activity. Various scientific studies have been done to evaluate its use in psychological disorders like depression. Thus, it is proved that the methanolic extract of Shatavari has promising antidepressant activity, which is probably mediated through the serotonergic, noradrenergic systems and augmentation of antioxidant defenses.

Cardio protective role

Development of cardiovascular diseases and atherosclerosis is mainly due to the increase in the serum cholesterol especially LDL cholesterol. The release of free radicals has been found to play a key role in the development of coronary artery disease. Studies exhibit a significant hypocholesterolemic role of *A. racemosus* extract[12,13]. Methanolic root extract of Shatavari supplements are potential component in decreasing lipid peroxidation. Extracts also exhibits a decrease in low-density lipoproteins, very low-density lipoproteins and triacylglycerol levels in blood.

Hepatoprotective role

Root extracts of *A. racemosus* has showed a remarkable hepato-protective activity. Studies conducted on animal models treated with the aqueous extract of the roots of *A. racemosus* has been shown to prevent the incidence of hepatocarcinogenesis. Immunohistochemical picture of the hepatic tissues of wistar rats treated with diethylnitrosamine (DEN) showed the presence of p53+ foci (clusters of cells expressing the mutated p53 protein), whereas expression of p53+ foci was absent in Wistar rats pretreated with the aqueous extract of the roots of *A. racemosus* and also in rats treated with DEN followed by treatment with the aqueous extract of *A. racemosus*. The results of the biochemical parameters also showed that pretreatment of wistar rats with the aqueous extract of *A. racemosus* has led to the amelioration of oxidative stress and hepatotoxicity brought about by treatment with DEN. These results strongly prove that the aqueous extract of the roots of *A. racemosus* has the potential to act as an effective formulation to prevent hepatocarcinogenesis[14,15].

Hypoglycemic activity

Ethanolic root extracts of *A. racemosus* exhibited a significant hypoglycemic activity. Studies with animal models proves a significant increase in the levels of insulin release. The release of insulin further increased with a subsequent increase in the concentration of glucose in blood. When compared to methanol and aqueous extracts, ethanolic extracts showed a significant hypoglycemic activity. Invitro antidiabetic studies also proved the efficacy of asparagus in decreasing the serum glucose levels[16-18]. Further studies can help in the preparation of antidiabetic drug from Shatavari extract which can replace synthetic drugs available in market.

Effect on uterus

Methanolic extracts of Shatavari can be used as uterin sedative. Many research studies, both *in-vivo* and *in-vitro* has proved that root extracts of *A. racemosus* have been responsible for the competitive block of contraction of rat, guinea pig and rabbits' uteri induced by oxytocin. Shatavari root extracts also possess active components that fight against female infertility, increases libido, decreases inflammation of sex organs, improves conception rate, reduces or prevents abortion, increases lactation and improves the hormonal balance after postportum[19-21].

CONCLUSION

Different parts of *A. racemosus* has been extensively studied for its medicinal properties. *A. racemosus* extracts has proved to possess various pharmacological properties and a potent therapeutic agents[22,23]. Further research is required to formulate the extract as a drug in near future. In the current era where there is alarming problem with the use of synthetic medicines, promoting traditional knowledge of the medicinal herbal plant is essential and inevitable.

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