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Review Article

AN OVERVIEW OF *SHATAVARI* (*ASPARAGUS RACEMOSUS*) AN AYURVEDIC DRUG

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ABSTRACT

Shatavari, *Asparagus racemosus* is one of the most important herbal drug used by Ayurvedic *Vaidyas* since ancient days. The drug is having wide range of therapeutic activity and mentioned as a *Rasayan* by ancient Ayurvedic texts. The main part used by Ayurvedic doctors is a root. It is mentioned as a tonic and having lactogenic function. *Shatavari* has also been successfully used by several Ayurvedic practitioners for Nervine disorders, Acid peptic diseases, certain infectious diseases and as a immunomodulant. Main use of this drug is in female disorders specially as a galactagogue and several menstrual disorders. Scientific fraternity is working on this drug at multidimensional level to prove this drug as a potent medicinal drug in multiple disorders. Various scientific studies are proved that this drug worked as a potent antitussive, antineoplastic, galactologue, antidiarroheal, and as immunomodulant. The main focus of this article is to review the scientific studies done on *A.racemsosus* mainly on its phytochemistry, pharmacology, therapeutic uses mentioned in both modern sciences as well as in ancient Ayurvedic texts. Additional attempt is made to find the clinical studies done on *A.racemosus.* The present review article includes the detailed scientific exploration of root extract of *A.racemsosus* in systematic way so that it can highlight future research prospects of this famous and commercially useful drug.

KEYWORDS: *Shatavari, Asparagus racemosus, Rasayan,* Galactagogue.

INTRODUCTION

Ayurveda is gaining popularity worldwide. It has a very rich tradition of herbal medicines. The Ayurveda is totally natural remedy and its major base is herbal medicines. Now days Ayurveda started to become a mainstream healthcare system. Modern medicine is giving relief to the patients but at the cost of heavy side effects. So people are attracted towards Ayurvedic drugs specially herbs and herbal preparations from Ayurveda system. In last decade over the counter sale of herbal medicines has drastically increased. There are several popular herbal drugs are mentioned in Ayurvedic texts and their demand is increased both among Ayurvedic doctors as well as in common man. *Shatavari A. racemosus* is one of the most popular drug from Ayurveda stream. It is first described botanically in 1799.[1] The genus *Asparagus* consisted of about 300 species around the world, out of which 22 species are recorded in India. *A. racemosus* is widely distributed across the globe and its distribution ranges from tropical Africa, Java, Australia, Sri Lanka, Southern parts of China and India, but it is mainly cultivated in India.[2]

Shatavari is main *Rasayan* drug mentioned by Ayurvedic texts. It is also called as Queen of herb in folklore medicine. The drug is having wide range of therapeutic activity. The plant is easily available all over the India. It is considered as a rejuvenative for female like *Withania somniphera* for male. The drug is useful in several female reproductive system disorders. *A.racemosus* prevents aging, antitumor, useful in nervine disorders, and act as anti inflammatory agent. Ancient Ayurvedic texts claimed special use of this drug as a galactagogue and in abortion cases. *Charaka* mentioned use of root of *A.racemosus* as an aphrodisiac, in *Somaroga* as a uterine tonic as well as used in hepatopathy.[3] Several Ayurvedic preparations of *A.racemosus* is readily available in the market. *A.racemosus* is one of the cost effective herbal drug. The major advantage of this drug is that it can be used both as a single drug as well as in polyherbal combination.

Background

A.racemosus was mentioned by various Ayurvedic texts like *Bhavparakash*, *Charak Samhita*, *Sushruta Samhita* and several *Nighnatus*.

Plant description

A.racemosus is readily available throughout India specially Himalaya region and Sri Lanka. The plant grows high up to 3 to 4 meters tall. The leaves are like pine needles, small and uniform and flowers are white and have small spikes. The plant belongs to genus *Asparagus*.

Figure 1: Plant of *Shatavari*

Figure 2: Root of *Shatavari*

Scientific classification

Kingdom: Plantae
Clade: Angiosperms
Clade: Monocots
Order: Asparagales
Family: Asparagaceae
Subfamily: Asparagoideae
Genus: Asparagus
Species: A. racemosus

Habitat

It is habitat is common at low altitudes in shade and in tropical climate throughout Asia, Australia and Africa. Out of several species of Asparagus grown in India *A.racemsosus* is most useful in folk medicine.[4]

Phytochemicals of *A.racemosus*

*Shatava*ri known to have a wider range of phytochemical constituents which are mentioned as below.

Kaepfrol- Kaepfrol with Sarsopgenin can be isolated from tuberculous root of *A.Racemosus*[5]

Saponins known as Shatavrins, Shatavarin I to VI present.[6,7,8,9]

Furan compound– Racemofuran[10]

Flavenoids- Glycosides of quercetin, rutin, and hyperoside and present in flower and fruits.[11]

Sterols- Root contains sitosterols, 4-6-dihydryxy-2-0 benzaldehyde and undecanylcetanoate.[12]

Polycyclic alkaloid- Asparagimne A.[13]

Cyclic hydrocarbon- racemosol, dihydrophenan-threne.[14]

Trace minerals such as Zinc, Copper, Cobalt, with calcium, potassium and selenium.[15]

Essential fatty acids- Gamma linoleinic acids, Vitamin A and quercetin.[16]

***A.racemosus* in Ayurvedic texts**

Synonyms

Shatavari, Vara, Narayani, Shatvha, Keshika, Laghuparnika, Shatvirya, Madhura, Shatpatrika, Vrukshya, Dipya.[17]

Vernacular names[18]

Sanskrit: Shatavari
Hindi: Satavari, Shatawar or Satmuli
Bengali: Shatamuli
Marathi: Shatavari or Shatmuli
Gujarati: Satawari
Rajasthan: Norkanto or Satawar
Telugu: Toala-gaddalu
Tamil: Shimaishadavari or Inli-chedi
Malayalam: Chatavali
Kannada: Majjigegadde or Aheruballi
Madhya Pradesh: Narbodh or atmooli

Gana- *Vayasthapan, Balya, Madhurskandha*[19]

Kantakpanchmula, Pittashaman, Vidharigandhadi[20]

Guna Karma

Guru, Shita, Rasayani, Medhangnivardhak, Snigdha, Netra, Atisarjit, Shukrastanykar, Balya, vrushya, Grahanijit[21]

***Guna* as per Ayurvedic text**

Rasa- Madhur Tikta,
Virya- Shit,
Vipak- Madhur[22]

Ayurvedic Formulations of *Shatavari*

Shatavarighrut[23]

Narayan tail[24]

Bala Tail[25]

Chyawanprash[26]

***Asparagus racemosus* Scientific studies**

Antitussive effect

Roots of *A.racemosus* methanolic extract at the dose of 200 and 400mg/kg showed very effective as an antitussive agent in mice. The study was a comparative study with standard antitussive drug called codeine phosphate.[27]

Antiprotozoal activity

A.racemosus crude alcoholic extract in vivo is working as an inhibitory agent in growth of Eintamoeba histolytica.[28]

Antihepatotoxic activity

A.racemosus alcoholic extract of root has been shown to significantly reduce the enhanced levels of alanine transakinase, aspartate transaminase and alkaline phosphate in carbon tetra chloride CCl_4 induced hepatic damage in rats indicating antihepatotoxic potential of *A. Racemosus.*[29-30]

Antineoplastic activity

Fresh root of *A.racemosus* in Choloroform/ methanol (1:1) extract of has been reported to reduce the tumor incidence in female rats. The report suggested it as a mammotropic or lactogenic.[31] Influence of *A.racemosus* on normal as well as estrogen primed animals, which reflects it as the mammary epithelium refractory to the carcinogen.[32,33]

Immunomodulatory activity

Immunomodulating property of *A.racemosus* has proved to protect the rat and mice against experimental induced abdominal sepsis.[34-35] Parcentage mortality of *A.racemosus* treated animals was founded significantly reduced while survival rate was comparable to that of the group treated with a combination of metronidazole and gentamicin. Since *A.racemosus*is also act as a antibacterial action, so function offered by *A.racemosus* against sepsis by altering function of macrophages, indicating it's immunomodulatory property.[34-35]

Immunoadjuvant potential activity

The immunoadjuvant potential of *A.racemosus* aqueous root extract was evaluated in experimental animals immunized with diphtheria, tetanus, pertussis vaccine. Immunostimulation was evaluated using serological and hematological parameters. Oral administration of test material at 100mg/kg per day dose for 15 days resulted significant increase in antibody titre to Boredtella pertussis as compared to untreated (control) animals. Results concluded that the treated animals did show significant increase in antibody titre as compared to untreated animals. It proved as a potential immunoadjuvant agent in animals.[36-37]

Antioxidant effects

The study of extracts of *A.racemosus* worked as a potential anti oxidant agent in free radicals induced damage in rats. *A.Racemosus* extract was studied against oxidative damage term of protection against lipid peroxidation, and protein oxidation. The antioxidant effect of polysaccharide fraction was more useful against lipid peroxidation, as assessed by thiobarbituric acid reactive substance formation, while that of crude extract was more effective in inhibiting proteins oxidation.[38-41]

Antidepressant activity

A.racemosus worked as adaptogenic agent means as a antidepressant agent. Adaptogenic drugs are those which are useful as anti- stress agents by promoting non-specific resistance of the body. *A.racemosus* evaluated as an antidepressant effect in rats where methanolic extract of roots of *A.racemosus* in various doses of 100, 200 and 400mg/kg daily for 7 days and then subjected to tests like forced swim test (FST) and learned helplessness test (LH). The results indicated that immobility in FST and increased avoidance response in LH indicating antidepressant agent in behavioral experiments. So *Shatavari* can work as significant antidepressant agent and its effect is mediated through serotonergic, noradrenergic systems.[42]

Anti-inflammatory effects

A.racemosus root extract at the dose of 200mg/kg can reduce the tissue weight, inflammatory cytokine production, neutrophil-mediated myeloperoxidase activity, so it can be worked as potential anti inflammatory agent.[43]

Aphrodisiac activity

A.racemosus aqueous root extract Chlorophytum borivilianum, and rhizomes of Curculigoorchioides were studied for sexual behaviour effects in male albino rats and compared with untreated control group animals. Seven measures of sexual behaviours were tried to evaluated. Administration of dose of 200mg/kg body weight of the aqueous extract of *A.racemosus* had pronounced anabolic effect in treated animals as evidenced by weight gains in body and reproductive parts. There was a significant improvement in the sexual behavior of animals as reflected by reduction of mount latency, ejaculation latency, post

ejaculatory latency, intromission latency, and an increase of mount frequency. The penile erection is improved. This function can compare with the testosterone.[44]

Anti-stress activity

Chlorophytum arundinaceum, Asparagus adscendens and *A.Racemosus* are used in the Ayurveda for general health as well as for stress relieved agents. The effects of the methanol and aqueous extract of roots of these plants were examined in an experimental mouse stress model, induced by swimming. The extracts were shown to exert an inhibitory effect on pro-inflammatory cytokines, namely interleukin1β and tumour necrosis factor α, and on the production of nitric oxide in mouse macrophage cells. Inhibition was also observed in the production of interleukin 2 in EL4 lymphoma cells. Corticosterone levels in serum and adrenal glands were measured. The findings in the study suggest that *A.racemosus* can be useful as a anti stress agent.[45,46]

Cytotoxicity, analgesic and anti-diarrhoeal activities

The study was done on ethanolic root extracts of *A.racemosus* to evaluate the cytotoxicity, analgesic and antidiarrhoeal agent. The test for analgesic activity of the crude ethanolic extract was performed using acetic acid induced writhing model in mice. On the other hand, antidiarrhoeal test of the ethanol extracts of *A.Racemosus* was done according to the model of castor oil induced diarrhoea in mice and brine shrimp lethality bioassay was used to determine cytotoxic activity of ethanol extract of the plant. The results obtained support the traditional uses of the *Shatavari* and require further investigation to identify the chemical constituents responsible for cytotoxicity, analgesic and anti-diarrhoeal activities.[47]

Function on Uterus

Ethyl acetate and acetone extract of the root of *A.racemosus* on guniea pig's ileum, useful in spontaneous motility of the virgin rat's uterus.[48] Alcoholic extract of *A.racemosus* which specifically block pitiocin sensitive receptor through not other in the uterus.[48] *Shatavari* can be used as uterin sedative.

Shatavari isolated from the roots of *A.racemosus* has been found to be useful for the competitive block of oxytocin induced contraction of rat, guinea pig and rabbit, in vitro as well as in vivo.[49-50]

Galactogogue Effect

Ayurveda explains that *A.racemosus* can be used in increased milk secretion.[51]

The aqueous fraction of alcoholic extract of root of *A.racemosus* which was administered intra muscularly shown to increase in the weight of mammary glands as well as yield of the milk.[52]

Clinical studies

Shatavari is worked as a excellent gastric emptying agent as studied in one of the clinical study.[53]

Double blind trial suggested it can worked as a good galactogogue agent.[54] *A.racemosus* is having anti ulcerogenic activity so working in peptic ulcer conditions in volunteers[55]. In females *Shatvari churna* and *Shatavari taila* is very useful for use in *panchkarma* for *Uttarbasti* in *Atyartva* (Menorrohea) conditions [56]. In modern era *Shatavari* very useful in aschyotan of eye conditions of computer related vision syndrome.[57]

DISCUSSION

A.racemosus is very useful drug from Ayurveda stream. Several studies are conducted on this plant shows its utility as promising therapeutic agent in alternative therapies. Phytochemicals and pharmacology of this drug provide useful scientific data to promote this as an important Ayurvedic drug in several ailments. The review can add information of this drug as an evidence based drug.

CONCLUSION

Review of *Shatavari* from the Ayurvedic texts focus the importance as well as wide range of the therapeutic uses in ancient texts. Scientific studies of *A.racemosus* raise the chances of involvement of Ayurvedic doctors, Pharmacologists, Biotechnicians, and other related research field related personnel for vast research on this commercially valued plant. Detailed documentation and cataloguing of this plant is need of hour. This will helpful for promoting this plant more scientific way as a useful medicinal drug.

REFERENCES

1. Asparagus racemosus information from NPGS/GRIN. Germplasm resources information network. United states: Department of Agriculture; 2009.
2. Kirtikar, Basu. Indian medicinal plants. Dehradun, India: Bishen Singh Mahendra Pal Singh 1985.
3. Sharma RK, Dash B. Charaksamhita text with English translation and critical exposition based on Chakrapani Datta's Ayurved Dipika: Chaukhamba Varanasi; 2003.
4. Simon D. The wisdom of healing, New York, Harmony Books; 1997, p.148.

5. Ahmad et al, Chemical composition of Shatavari Asparagus Racemosus, Bull-Medico-Ethano, Bot, Res1991, 12(3-4); 157-160.
6. Gaitonde et al, Antioxytocic action of saponin isolated from Asparagaus racemosus wild (Shatavari) on uterine muscle. Arch Int Pharmacodyn Ther 1969,179:121-129.
7. Joshi JDS. Chemistry of Ayurvedic crude drugs; Part VIII; Shatavari. Structural elucidation of bioactive shatavarin I and other glycosides. Ind J Chem Section B Organ Chem 1988;27(1);12-16.
8. Nair AGR, et al, Occurance of diosgenin in Asparagus racemosus, Current Science, 1969, 17, p.414.
9. Patricia YH et al, Structural clarification with isolation of shatavarin V, Tetarhed Lett, 2006, 47, 8683-8687.
10. Wiboonpun et al, Identification of antioxidant compound from Asparagus racemosus, Phytotherapy Research,2004:8(9):771-773.
11. Sharma SC, Constituents of fruits of Asparagus racemosus, Pharmazie, 1981, 36(10); 709.
12. Singh J et al, Chemical examination of roots of Asparagus racemosus, Journal of Indian Chem Society, 1991, 68(7): 427-428.
13. Kukawasa N, et al, Structure of asparagamine A, novel polycyclic alkaloid from Asparagus racemosus. Chem pharm Bull, 1994,42;1360-1362.
14. Sekin TN et al, 9,10 dihydrophenanthrene from Asparagus racemosus. Phytochemistry 1997; 44(4): 763-764.
15. Choudhary BK, et al, Mineral contents of Asparagus racemosus. Indian drugs 1992; 29(13): 623.
16. Subramanian SS et al, Chemical components of Asparagus racemosus, Current science, 1968, 37(10):287-288.
17. Vd. V. M. Gogate, Dravyaguna Vidnyana, Manohar Pimplapure & Co. Publisher, Nagpur, 2nd Edition, 1997, P. 412.
18. Acharya Priyavat Sharma, Dravyaguna Vijnana, 1998, Chaukhamba Bharati Academy, Varanasi, P. 562.
19. Acharya Priyavat Sharma, Dravyaguna Vijnana, 1998, Chaukhamba Bharati Academy, Varanasi, P. 562.
20. Acharya Vidyadhar Shukla, Prof.Ravidatta Tripathi, Charak Samhita, 2004, Chaukhamba Sanskrit Pratistan, Delhi, P. 71-72.
21. Vaidyaraj Datto BallalBorkar, Sarth Sushrut Samhita, Rajesh Prakashan Pune, P. 158.
22. Dr.K.C.Chunekar, edited by G.S.Pandey, Bhavprakash Nighantu, 2006, Chaukhamba Bharati Academy, Varanasi, P. 392.
23. Sharma RK, Charak Samhita text with English Translation and critical exposition based on Chakrapani Dutta's Ayurved pradipika; India; Chaukhamba Varanasi, 2003.
24. Dr.Indradev Tripathi, Chakradatta, 2nd edition, Chaukhamba Sanskrit Sansthan, Varanasi, P.87, 434.
25. Ayurvedacharya Ambikadatta Shastri, Bhaishajya Ratnavali, 2014, Chaukhamba Prakashan, Varanasi, 2014, P. 559.
26. Ayurvedacharya Ambikadatta Shastri, Bhaishajya Ratnavali, 2014, Chaukhamba Prakashan, Varanasi, 2014, P. 555.
27. Mandal SC et al, Antitussive effect of Asparagus racemosus root against sulphurdioxide induced cough in mice. Fitoterapia, 2000; 71(6):686.
28. Roy RN et al, Preliminary pharmacological studies on extracts of root of Asparagus racemosus, Wild, J Res Indian Med 1971;6:132-138.
29. Zhu X, etal, Hypoilidemic and Hepatoprotective effects of ethanolic extracts from Asparagus officinalis, by products in mice fed high fat diet. J Sci Food Agriculture 2010, 90(7):1129-1135.
30. Muruganadan S, et al, Studies on the immunomodulant and antihepatotoxic activities of Asaparagus racemosus root extract, Journal of Arom PI sci, 2000, 22;49-52.
31. Rao AR. Inhibitory action of Asparagus racemosus on DBMA-induced mammary carcinogenesis on mammary glands of rats. Indian J Cancer, 1981; 28:607-610.
32. Sabnis PB et al, Effect of alcoholic extract of Asparagus racemosus on mammary glands of rats. Indian J Exp Biol, 1968; 6:55-57.
33. Liu et al, Asparanin A induced G2/M cell cycle arrest and apoptosis in human hepatocellular carcinoma, HepG2 cells, Biochem Biophys, Res Commun, 2009; 381(4): 700-705.
34. Dahanukar S et al, Protective effect Asparagus racemosus against induced abdominal sepsis; Indian drugs: 24: 125-128.
35. Thatte U et al, Immunotherapeutic modification of E.coli induced abdominal sepsis and mortality in mice by Indian medicinal plants. Indian Drugs; 1987:25, 95-97.
36. Gautam M et al, Immunomodulatoty activity of Asparagus racemosus aqueous extract on systemic Th1/Th2 immunity; Implications for immunomodulant adjuvant potential. J Ethno Pharmacol 2009; 121(2): 241-247.
37. Sharma P et al, A unique immunostimulant steroidal sapogenin acid from roots of Asparagus racemosus. Steroids 2011; 76(4):358-364.
38. Kamat JP et al, Antioxidant properties of Asparagus racemosus against damage induced by

gamma radiation on rat liver mitochondria. J Ethanopharmacol; 2000: 71: 425-435.
39. Wiboonpun et al, Identification of antioxidant compound from Asparagus racemosus; Phytother Res;2004:8(9):771-773.
40. Takeungwongtrakul S, et al. Lipids from cephalothorax and hepatopancreas of Pacific white shrimp (Litopeanuesvanamei): Food chem; 2012, 134(4): 2066-2074.
41. Visavadiya NP, et al, Suppression of reactive oxygen species and nitric oxide by Asparagus root extract using in vitro studies. Cell Mol Biol; 2009; 55:1083-1095.
42. Ojha R et al, Asparagus racemosus enhances memory protects against amnesia in rodent models. Brain cogn 2010, 74(1)1-9.
43. Do Yeon Lee, Byung Kil Choo, Taesook Yoon, Myeong Sook Cheon, Hye Won Lee, A. Yeong Lee, Ho Kyoung Kim. Anti-inflammatory effects of Asparagus cochinchenesis extract in acute and chronic inflammatory inflammation. Journal of Ethnopharmacology, 2009; 121(1): 28-34.
44. Thakur M et al, A Comparative study aphrodisiac activity of some Ayurvedic herbs in male albino rats; Arch sex behave 2009; 38(6): 1009-1015.
45. Kanwar AS, Bhutani KK. Antistress activity of ethanolic extract Asaparagus racemosus on pro-inflammatory cytokine and cortisone levels produced by stress. Phytother Res 2010; 22(9):1562-1566.
46. Joshi T et al, Anti stress activity of ethanolic extract of Asparagus racemosus Willd roots in mice. Indian J Exp Biol, 2012;50(6):419-424.
47. Karmakar UK, et al, Cytotoxicity, analgesic and antidiarrhoeal activities of Asparagus racemosus. J Appl sci 2012;12:581-586.
48. Jetmalani MH et al A Study on pharmacology of various extracts of Shatavari- Asparagus racemosus Willd. J Res Indian Med 1967;2:1-10.
49. Joshi J Dev.S. Chemistry of Ayurvedic Drugs: Part VIII- Shatavari-2: Structure elucidation of bioactive Shatavarin-I and other glycoside. Indian J Chem, 1988; 27:12-16.
50. Pandey SK et al, Effect of Asparagus racemosus rhizome (Shatavri) on mammary gland and genital organs of pregnant rat. PhytotherRes 2005; 19(8):721-724.
51. Nadkarni AK, Indian material medica. Popular book Depot; 1954: P.153-155.
52. Joglekar GV, Ahuja RH, Balwani JH. Galactogogue effect of Asparagus racemosus, Indian Med, j 1967; 61:165.
53. Dalvi SS, Nadkarni PM, Gupta KC, Effect of Asparagus racemosus (Shatavari) on gastric emptying time in normal healthy volunteers, Journal of post graduate Medicine, 1990, Vol.36:2 p.1-4.
54. Gupta M, Shaw B. A Double-Blind Randomized Clinical Trial for Evaluation of Galactogogue Activity of Asparagus racemosus Willd. Iranian Journal of Pharmaceutical Research. 2011; 10(1): 167-172.
55. Datta GK, Sairam K, Priyambada S, Debnath PK, Goel RK. Antiulcerogenic activity of Satavari mandur- An Ayurvedic herbo- mineral preparation. Indian J. Exp. Biol. 2002; 40(10): 1173- 1177.
56. Pratibha Ramchandani, Sunita Suman, A clinical study on the effect of Shatavari churna and Shatavari taila uttarbasti in Atyartava, International Journal of Green Pharmacy Oct-Dec 2018 (Suppl) 12 (4), S937.
57. Swati. S. Suvarna1, Rathi.S, S.M. Pasha, Shatavari ghrita aschyotana in computer in Vision syndrome A Pilot Study, International Journal of Ayurveda and Pharma Research, Aug. 2018; Vol 6: Issue 6(8), 7-14.

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