RESEARCH REVIEW JOURNALS
Volume-03
Issue-07
July-2018

ISSN: 2455-3085 (Online)
RESEARCH REVIEW International Journal of Multidisciplinary
www.rrjournals.com [UGC Listed Journal]

Pharmacological Review of *Asparagus Racemosu* (Liliaceae) among Folklore

Garima

ARTICLE DETAILS

Article History
Published Online: 05 July 2018

Keywords
Demulcent, Diuretic, Aphrodisiac, Galactagogue, Phytoestrogen, Menopause.

ABSTRACT

This paper presents review of studies conducted on the pharmacological activities of *Asparagus racemosus* keeping in the view fifteen different properties which deals with effects on neurological disorder, phytoestrogen, antidirrhoeal, antidyspepsia, adaptogenic, antiulcerogenic, antioxidants, cardio protection, antibacterial, immunoadjuvent, antitussive, styptic, geriatric tonic, anti-diabetic and aphrodisiac, These data presented along with experimental model in which studies were conducted; the formulation/extract which are tested, the mode of actions and their effects are being mentioned.

1. Introduction

Asparagus racemosus Willd. (LILIACEAE) is an important medicinal plant of tropical and subtropical India. Its medicinal usage has been reported in the India and British Pharmacopoeial and in traditional systems of medicine such as Ayurveda, Unani and Siddha. The plant enjoys considerable reputation in Indial system of medicine *Asparagus racemosus* Willd. is commonly called Satavari, Satawar or Satmuli in India, Satavari in Sanskrit, Shatamuli in Bengali, shatavari or shatmuli in Marathi, Satawari in Gujarati, Toala-gaddalu or Pilligaddalu in Telegu, Shimaishadaveri or Inlichedi in Tamil, Catavali in Malayalam, Majjigegadde or Aheruballi in Kannada, Kairuwa in Kumaon, Narbodh or Satmooli in Madhya Pradesh, and Norkanto or Satawar in Rajasthan (Anonymous, Wealth of India, 1987). The genus Asparagus includes about 300 species around the world. Out of the 22 species of *Asparagus* recorded in India; *Asparagus racemosus* is one of the most commonly used in traditional medicine. The roots are cylindrical, fleshy and tuberous – fasciculated, 30-100 cm long and 1-2 cm thick. Stem is woody pale grey or brown in colour and armed with strong spines (Bingen, E. *et al*., 2000). *Asparagus racemosus* leaves are reduced to scales. Flowers are tiny, white in colour, fragment and prefuse in simple or branched racemes.

Medicinal Uses :

Asparagus racemosus has been widely used in folk medicine and is today a highly commercially important target species. *Asparagus racemosus* is also considered to be an Ayurvedic rejuvenating tonic for overall health and vitality in females. The plant has been shown to aid in the treatment of neurodegenerative disorilders and in alcohol abstimence induced withdrawal symptoms. In Ayurveda, *Asparagus rucemosus* has been described as a rasayana herb and has been ased extensively as an adaptogen to increase the non-specific resistance of organisms against a variety of streses. It has also long been used in Aryuveds in prompting milk, secretion and has a demulcent, diuretic, aphrodisiac, tonic, antidiarroheal (Soman, C.R. 1987). It is also used in women and infertility impotence, menopause, hyperacidity, dehydration, haematemesis, cough, herpes, chronic fever. The genus is considered to be medicianally important because of the presence of steretial sapoins and sapogenins in various parts of the plant. It has been indicated as uterine tonic, thus it cleames, nourishes, and strengthens the female reproductive system and so is traditionally used to remove sexual debility, amenorrhea. Dysmenorrhea, Dysfuncitonal. Uterine Bleeding (Swarup and Umadevi, 1998 Chopra and Simon, 2000), menopause and pelvic inflammatory disease like endometriosis (Hemprabha *et al.* 2001, Prasad *et al.* 2002) and gonorrhea (Thomsen, 2002) It also supports deeper tissue and builds blood and so it helps to remove infertility, prepare the womb for conception, prevents miscarriage and acts as a post-partum tonic where it helps to increase lactation and normalize the uterus, prolapsed of uterus and the balancing reproductive hormones level (Tirha, 1998). The other traditional used is in arthritis (Chaudhary and Singh, 1965), diarrhoea, dysentery (Roy *et al*. 1971), edema, rheumatism, chronic and common fevers, aphrodisiac, cooling tonic, antispasmodic (Nadkarni, 1976), Singh and Ali, (1994), dysperpsia, indigestion (Dalvi *et al*. 1990), thirst sunstroke (Kapoor, 1990) rejuvenator, promoter of strength, breast milk and semen (Dash, 1991), long terms treatment of diabetes, cough (Mandal *et al.* 2000), and peptic ulcers (Sairam *et al.* 2003, Dharmani and Gautam, 2006). Shatavari is also used for enhancing milk production in the freshly parturient and lactating woman (Chopra and Simon, 2000). The general pharmacology of shatavari are galactagogue and mammogenic, it enhance the blood prolatin level and stimulates the cellular division of mammary gland (jetmalani *et al.* 1967, Subnis *et al.* 1968, Pandey *et al*. 2001, Prasad *et al.* 2002), immunostimulant and immunomodulator (Dahanukar and Thatte, 1997, Rege *et al.* 1999, Murganandan *et al.* 2000), anabolic (Sharma *et al.* 1986), antistress (Rege *et al.* 1989, Kamat *et al.* 2000), hypoglycemic (Kar *et al.* 1999), antibacterial, anti-amoebic, antifungal (Bhatnagar *et al.* 1961, Mandal *et al*. 2000 a, Nair and Chanda, 2006), cancer and chemopreventive (Dhar *et al*. 1968), cancer and chemopreventive (Dhar *et al.* 1968), antitumor activity (Seena *et al*. 1993, Dhuley, 1997) gastroprotective/ antiulcerogenic (Sairam *et al.* 2003), antiviral (Rajbhandar *et al.* 2001) antioxidant (Kamat *et al.* 2000, Wiboompun *et at.* 2004, Visavadiya *et al.* 2005). The reputed adaptogenic properties of the plant are attributed to the presence of high concentrations of saponins, known as Shatavarins. It is considered as very good energy provider to the weak body system. The rejuvenative effect of the herb on the female reproductive organs is very high (John, B.M., 2003). Many more medicinal uses are reported without validation.

2. Materials and methods

Extensive literature review from online as well as printed journals have been done keeping in the mind ethnopharmacological research work done on *Asparagus racemosus* for fifteen different important properties. The properties are effects on neurological disorder, phytoestrogen, antidirrhoeal, antidyspepsin, adaptogenic, antilecrogentic, antioxidants, cardio protection, antibacterial, immunoadjuvent, antitussive, styptic, geriatric tonic, antidiabetic and aphrodisiac properties. These data have been tabulated in Table-1 along with properties, experimental model in which experiment is performed, the formulation/extract which is tested, mode of actions and their effects name of the researchers/scientists.

Sl.	Property/Condition	Expermental Model	Farmulation/ Extract	Mode of Action	Effect
1.	Effect on neurological disorderes (a) Reveral of neuronal diagram (b) Anti-stress	Rats (in vivo) Rats (in vivo)	Methanol extract of Asparagus racemosus roots EuMil	Antioxidant effect by attenuating free radical induced damage (polyherbal formulation) Normalization of augmented serotonergic function	Stimulatory Stimulatory
	(c) Treatment of withdrawal symptoms	Rats (in vivo)	Mentat (polyherbal formulation)	Anticonvulsant and anxiogenic action of Asparagus racemosus	Stimulatory
2	Phytoestrogen (a) Breast cancer	Rats (in vivo)	Asparagus racemosus root powder	Mammotropic and/or lactogenic influence rendering the mammary epithelium refractory to the carcinogen	Inhibitory
	(b) Lactogogue	Rats (in vivo)	Aqueous extract of Asparagus racemosta	Action of released corticoids of prolactin	Stimulatory
		Pregnant rats	Alcoholic extract of Asparagus racemosus rhizome	*	Stimulatory
		Humans (in vivo)	*Asparagus racemosus* in form of Ricalex tablets (40 mg concentrated root extract per tablet)	*	Stimulatory
		Humans (in vivo)	100g medicine containing 15g *Asparagus racemosus* root extract (polyherbal formulation)	*	No effect
	(c) Uterine weights	Rat uterus (in vitro)	Polyherbal formulation 'U-3107' or EveCare (32 mg *A*sparagus racemosus per 5ml syrup)	Increases the serum oestrogen levels but mechanism is not clear	Stimulatory
		Rat (in vivo)	Polyherbal formulation Mensosan (containing 110 mg *Asparagus racemosus* extract per tablet)	Phytoestrogen binds directly to the oestrogen receptor without enhancing the endogenous oestrogen levels	Stimulatory
	(d) Anti-oxytocin	Rat Uterus (in vitro)	Saponin fraction of Asparagus rasemosus	*	Inhibitory to oxytocin
		Rats (in vivo)	'U-3107'	*	Did not possess oxytocin activity
	(e) Dysfunctional uterine bleeding	Humans (in vivo)	EveCare	Local healing of the Endometrium stimulated by endometrial microvascular Thrombosis	Inhibitory
	(f) Pre-menstrual syndrome	Humans (in vivo)	Polyherbal formulation with 85 parts *Asparagus racemosus*	*	Effective in treatment of symptom

		Humans (in vivo)	EveCare	*	Effective in treatment of symptoms with 80% relief observed
	(g) Treatment of mensopusal symptoms	Humans (in vivo)	Mensosan	Stimulation of immune response	Effective in treatment of symptoms
	(h) Teratogenicity	Rats (in vivo)	Methanolic extract of *Asparogus racemosus* roots	*	*
	(i) Testes weight	Rats (in vivo)	*Asparagus racemosus* roots powder (0.5g/kg rat feed)	*	Stimulatory

3. Result and discussion

The pharmacological studies conducted on *Asparagus racemosu*s indicate the immense potential of this plant in the treatment of conditions such as menopausal symptoms, neurodegenerative disorders, diarrohoea, dyspepsia, etc. There are also several gaps in the existing literature with regard to the pharamacological actions of *Asparagus racemosus*. These include an incomplete understanding about the interaction/synergy between *Asparagus racemosus* and other plant constituents in polyherbal formulations; lack of information regarding the mode of action of the various constituents of *Asparagus racemosus,* etc. Since most drugs containing Satavari that are available in the market are in the form of polyherbal formulations, it is difficult to attribute a particular medicinal action as being solely due to the *Asparagus racemosus* component of the drug. Also, plant extracts are always complex mixtures composed of multiple components and therefore unless proper investigations are conducted there would be no method to connect a particular constituent vis-à-vis a specific action within the biological system. In several instances the authors have only '*hypothesized' (Rege et al., 1989, Dalvi et al*., 1990) on the rationale behind a certain function and therefore further research is imperative to delve into the actual mode of action responsible for the medicinal effect. While most of the researches have been *in vivo* which has helped to validate the applicability on the human system; *in vitro* studies would have facilaitated a better understanding of the mode of action of *Asparagus racemosus.* Due to the non availability of commercial Shatavarin standards, most studies first involve the extraction and purification of the active principle to be used as a reference standard which makes the process more cumbersome. The availability of authentic metabolite standards would not only hasten secondary metabolite assays but also make the results more reliable and reproducible. Another shortcoming observed in several studies is that the level of statistical significance does not find any mention and hence the efficacy of the drug or plant extract cannot be commented upon even by the reviewers. Although there have been no adverse reports regarding the pharmacological actions of *Asparagus racemosus* in human beings. Goel *et al.* (2006) demonstrated teratogenicity in rats after the administration of methanolic extract of the plant. In light of this finding it would be desirable to carefully analyse the safety profiles of drugs developed from *Asparagus racemosus.*

4. Conclusion

There are several gaps in the existing literature with regard to the pharmacological actions of *Asparagus racemosus* which must filled with further research. Plant extracts are always complex mixtures composed of multiple components and therefore unless proper investigations are conducted there would be no method to connect a particular constituent vis-à-vis a specific action within the biological system. Further research is imperative to delve into the actual mode of action responsible for the medicinal effect of *Aspargus racemosus,* while most of the researches have been performed *in vivo* which has helped to validate the applicability on the human system; *in vitro* studies would have facilitated a better understanding of the mode of action of *Asparagus racemosus. Asparagus racemosus* remains a species with tremendous potential and although considerable work has been done to exploit the biological activity and medicinal applications of this plant, countless possibilities for investigation still remain in relatively newer areas of its function.

References

[1]. Bhattacharya, A. Murugandam, A.V. Kumar, V., Bhattacharya, S.K., (2002). Effect of polyherbal formuation, EuMil, on neurochemical perturbations induced by chronic stress. Indian. N. of Exp. Biology 40.1161-1163.

[2]. Bhattacharya, S.K. Bhattacharya, A, Chakrabarti, A., (2004). Adaptogenic activity of Siotone, a polyherbal formulation of ayurvedic rasayanas. Indian J. of Exp. Biology 38, 119-128.

[3]. Bhatanagar, M., Sisovia, S.S. Bhatnagar, R., (2005), Antiulcer and antioxidant activity of Asparagus racemous Willd and Withania somnifera Dural in rats. Annals of the New York Academy of Science 1056, 261-278.

[4]. Diwanay, S. Chitre, D., Patwardhan, B., (2004). Immunoprotection by botanical drugs in cancer chemotherapy. Journal of Ethnophamacology 90, 46-55.

[5]. Gautam, M., Diwanay, S., Gairula, S., Shinde, Y., Patki, P., Patwardhan, B., (2004). Immunoadjuvant potential of Asparagus recemous aqueous extract in experimental system. Journal of Ethnophamacology, 91, 251-255.

[6]. Goel, R.K., Prabha, T., Kumar. M.M., Dorababu, M., Prakash, H., Singh, G., (2006), Teratogenicity of Asparagus racemous willd Root, a herbal medicine. Indian J. of Exp. Biology 44(7), 570-573
[7]. Kamat, J., Bollor, K.K., Devasagayam, T.P.A. Venkatachalam, S.R. 2000. Antioxidant properties of Asparagas racemous against damage induced by radiation in rat liver mitochondria J. of Ethnophamacology 71, 425-435.
[8]. Khanna, A.K., Chander, R., Kapoor, N.K. (1991). Hypolipidaemic activity of Abana in rats. Fitoterapia (Italy) 62, 271-275.

