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Effects of *Asparagus racemosus*, (shatavari) on mounting behaviour of male rats

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Abstract

Shatavari, (*Asparagus racemosus*), belonging to family Liliaceae is a climbing plant which grows in low jungles areas throughout India. It is useful for infertility, decreased libido, threatened miscarriage, menopause and leucorrhea and has the ability to balance pH in the cervical area. The present paper deals with the mounting behavior of satavari in male fats and found profound results.

Key-Words: Shatavari, mounting behaviour, aphrodiasiac agents

Introduction

Aphrodisiac agents are used to modify the impaired sexual functions of human beings. These agents have been used since a pretty long time and there are enough evidence showing their use by the ancient Greek and Arab physicians eg. Hippocrat (460 B.C.), Dioscorides (70 A.D.), Raazi (926 A.D.), Ibn-e-Sina (1038 A.D.) etc. The availability of the large number of sexual function improving drugs in the traditional (Ayurveda, Siddha & Unani) System of Medicine is a unique and distinctive feature of this system. Besides having many specific drugs for enhancing sexual functions, there are certain most commonly used plant drug like *Myristica fragrans* (Nutmeg), *Withania somnifera* (Ashwagandha), *Tribulus terrestris* (Gokhru) etc. which are empirically used as promising aphrodisiacs in traditional medicine practice in cases of sexual debility or depressed desire.

There are quite a number of herbs and nutrients that are excellent aphrodisiacs. As medical science has given us a greater understanding of human sexuality and our own chemical processes that put us in the mood, research has uncovered how some well-known and not so well-known male and female aphrodisiacs actually work with our body chemistry to lead to arousal and excitement. Various substances of animal and plant origin have now been identified, allowing for testing and scientific understanding of their chemical composition and mechanisms of action. Many scientists casually dismiss the possibility that herbal aphrodisiacs are possible.[1]

Plant Profile[2-9]

Shatavari, (*Asparagus racemosus*), belonging to family Liliaceae is a climbing plant which grows in low jungles areas throughout India. This sweet and bitter herb is particularly balancing to Pitta Dosha. In India, Shatavari is considered the women's equivalent to Ashwagandha. The name translates to "she who possesses 100 husbands", referring to the herbs rejuvanitive effect upon the female reproductive organs. In Australia the herb is more often used to treat gastrointestinal disorders and as an external wash for wounds. The healing qualities of Shatavari are useful to a wide array of ailments. It is well known for it effects on the female reproductive system. It is also effective in a number of other systems of the body and is therefore of use to both men and women.

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Macroscopic identification: Shatavari is a thorny climber, which grows to the height of 180 cm. The plants are hardy vines found trailing on bushes along the dry hill slopes

Chemical constituents: Shatavari roots contain 4 steroids saponin; Sahtavarin I –IV (0.2%). Shatavarin-I is the major glycoside with three glucose & a rhamnose moieties attached to saraspogenin, whereas in sahatvarin –IV two glucose & one rhamnose moieties attached.

Indications: It is used to increase semen count, cure bareness in females and remove disorders of female genitals. It is also used to promote lactogenesis.

Preparations: Decoction, oil, powder

Therapeutic action: Reproductive system Shatavri roots are used mainly as lactogogue which promotes secretion of breast milk. Known as the 'Female Rejuvenate', Shatavari is helpful for low milk production, low sex drive, menopause and infertility. The plant has been used in ayurveda to increase milk secretion during lactation. Asparagus Racemosus is described as 'Jeevaneeya' in Ayurveda. It may help in regeneration of seminiferous tubule population and thus help in increase of spermatogenesis

Use of *Asparagus racemosus* in gynecological disorders: One of the well-known major therapeutic potentials of Asparagus racemosus is its effect on female reproductive system. The study supporting this fact showed that an alcoholic extract of Asparagus racemosus exhibits anti-oxytocic activity. It has also been discovered that the saponin called shatavarin IV, an active component present in Asparagus racemosus is responsible for this activity. When studied in dose range of 20 µg to 500 µg/ml in various animal models like rat, guinea pig and rabbit uteri in vitro and in situ it produced a specific blockade of syntocinon, (oxytocin) induced contraction of uteri

Pharmacological action: Mucilaginous, antidiarrhoetic, refrigerants, nutritive, tonic, antidysenteric, galactogogue, aphrodisiac, demulcent, & antispasmodic.

Indications: Shatavari is perhaps best known as a female rejuvanitive. It is useful for infertility, decreased libido, threatened miscarriage, menopause and leucorrhea and has the ability to balance pH in the cervical area. Dry membranes, such as those on the vaginal wall, are also brought into balance through the herbs demulcent action. Men may benefit from the herb as well in the treatment of impotence and general sexual debility. In addition to it's applications for reproductive organs, Shatavari is also quite effective for stomach ulcers, hyperacidity and diarrhoea. Dry and irritated membranes in the upper respiratory tract are soothed by this herb making it useful in cases of bronchitis and chronic fevers. It is believed to bring into balance all of the body's fluids.

Material and Methods

The crude dried drug root was provided; afterwards roots were grinded into mixer to fine. Powdered drugs passed through sieve no.200 for obtaining very fine powder.

- Two samples were prepared

1. The authenticated sample of dried powder of Shatavari (*Asparagus racemosus*) was dissolved in 1% tween-80 which results in the formation of suspension.
2. The given extract of shatavari which is diluted with water to make a solution.
3. A sample of Standard drug (Sildenafnil citrate) in water as solution.

The test drugs were separately administered to the animals and the doses of 3000mg /kg were selected. The dose of the referent drug (5 mg/kg) was administered to animals.

Animals

Adult Albino rats (less than 200 g) six males and six females were used for the study. The animals were housed under standard laboratory conditions. They were fed with grams, maize flour and tap water. The study was approved by the college ethical committee for animal care and use.

Mounting behavior test[10-11]

Mount is operationally defined as the male assuming the copulatory position but failing to achieve intromission. To quantify mounting behavior, non-oestrous female mice were paired with males treated with single dose of the drugs (3000mg/kg). Animals were observed for 3 hrs and their behaviors were scored. Males were placed individually in a cage. After 15 minutes of acclimatization, a non-oestrous female was introduced into a separate cage with a male. The numbers of mounts were recorded during a 15 minutes observation period at the start of 1st hr. Then the female was separated for 30 minutes. Again the female was introduced and the number of mounts was observed for 15 minutes as before at 3rd hr. All the experiments were performed between 09.00 to 12.00 hrs during day time at room temperature 26–27°C. To determine the effects of sample of Shatavari & standard Sildenafil citrate(Cavetra) on mounting three groups of four animals each were taken for the study. All drugs were dissolved in distilled water just before the administration. The first group received distilled water (1 ml/kg) and served as control. Groups II were given the sample of Shatavari (3000 mg/kg), while the group III received Cavetra (5 mg/kg) and served as standard.

Assessment of mating performance

Male rat divided into three groups of two each were used in the study. Group I served as control and received distilled water (1 ml/kg). Group II were administered sample of Shatavari (3000 mg/kg), while group III received Cavetra (5 mg/kg) and served as standard. The drugs were administered in the evening (17.00 – 18.00 h.) and each male was placed in a separate cage. After 1 hr, six female were admitted into each cage and they were cohabitated overnight. Afterwards they have been continuously watched for three hour and during this time male mounting over female were counted.

Results and Discussion

The test drugs Shatavari & standard drug Sildenafil citrate (Cavetra) treated male rats,1 hr after the treatment as well as 3 hrs after the treatment, displayed excessive mounting behaviour .As in the group treated with Shatavari shows 631 mounting in seven days and in the group treated with Sildenafil citrate (cavetra) shows 874 mounting in seven days as compared to control which shows 589 mounts by male rat. However, this activity was found to a higher extent in the group treated with the standard drug. It was also observed that mounting behaviour activity (no. of mounts) in Shatavari group, at 1st hr and 3rd hrs, was greater than Control. The test drugs produced significant increase. in mounting behaviour of animals. The extract of test drugs Shatavari (3000 mg/kg;) and standard drug Sildenafil citrate (cavetra) (5 mg/kg) at 1st or 3rd hrs after treatment increased the number of mounts. Administration of extract of a single dose of Shatavari and Sildenafil citrate(cavetra) resulted in the increase in the mating performance of the rats.In ethnomedical practices, several formulations containing these drugs are used for sexual function improvement. The present study revealed that the extracts of Shatavari can significantly enhance male sexual activity in normal rats. In the present study, it was observed that the sexual behaviour of male rat with Shatavari was significantly enhanced. Whereas, it was found highly significant in the animals treated with cavetra.. However, since these drugs are clinically used in the Unani System of Medicine without any recorded toxicity, thereby suggesting that the short term use of these drugs for this purpose is apparently safe.Generally elevated testosterone level also enhanced the sexual behaviour in humans. Moreover, drugs induced changes in neurotransmitter levels or their action at cellular level could also change sexual behaviour . In this connection it should be noted that in ethno medical texts, drug especially Shatavari has the action as sexual invigorator's property. Further, shatavari has also been reported to have inhibitory effect on the digestive enzymes in the body. The enhanced effect of Shatavari, as observed in sexual behaviour of animals, may be owing to this property in conjunction. The drug exhibited more increament of mating performance in rat in comparison with the increased sexual motivation.The standard drug Sildenafil citrate was used as a referent only for quantitative comparison and not for mechanistic purpose. For conducting the study the parallel experimental design is used. However, for more corroborative evidence of the drug's activity the twin crossover method may be used. The results are statistically significant. The study suggested that the systemic use of extracts of Shatavari have sexual behaviour enhancing effect in male rats. The extracts of the shatavari was found to stimulate the mounting behaviour of male rat and also to significantly increase their mating performance. The drugs were devoid of any conspicuous general short term

toxicity. Thus the experimental findings substantiate the claim of unani physicians that the Shatavari is clinically useful as Aphrodiasic in males

Table No. 1 Mounting latency with crude drug

Days	Control		Standard		Treated	
	I	II	I	II	I	II
First	35	30	45	47	38	38
Second	40	42	50	45	30	35
Third	40	42	50	48	39	45

Table No. 2 Mounting latency with drug extract

Days	Control		Standard		Treated	
	I	II	I	II	I	II
First	40	42	55	47	40	43
Second	35	40	60	55	43	44
Third	42	44	65	57	42	44
Forth	40	37	62	60	45	42
Fifth	45	39	62	65	47	45
Sixth	50	47	67	69	50	42
Seventh	48	40	78	72	55	49

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