



KAPIKACCHU (*Mucuna pruriens*) - A Ayurvedic drug review

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ABSTRACT

Humans are using natural products from thousands of years. Plant- based drugs have formed the basis of traditional medicine systems that have been used for centuries in many countries such as China and India.^[1] Today herbal drugs continue to play an essential role in health care. It has been estimated by the World Health Organization that 80% of the population of the world rely mainly on traditional medicines for their primary health care.^[2] *Kapikachhu* (*Mucuna pruriens* Linn.) is the most popular drug in Ayurvedic system of medicine. *M. Pruriens* are generally used to treat impotence. The aphrodisiac properties of the plant of the legume family improve the quality and quantity of the sperm.^[3] and useful in diabetes mellitus^[4] and cancer^[5] whereas the seeds have multi-diverse functions like several free radical mediated diseases management, rheumatoid arthritis, diabetes, atherosclerosis, nervous disorders, analgesic, antipyretic activity and in the management of Parkinsonism^[6]. The most important of these bioactive compounds of plants are alkaloids, flavonoids, tannins and phenolic compounds^[6]. Here the present review study is an attempt to provide reported detail information of this herb from various *samhitas* and its study in modern area like its phytoconstituents and pharmacological activities.

Keywords: *Kapikacchu*, *Mucuna pruriens*, Aphrodisiac, Alkaloids, Phytoconstituents.

INTRODUCTION

Kapikacchu or *Mucuna* is famous for its powerful aphrodisiac as it is well known to increase the sperm count and to increase testosterone levels in the body as well. *Kapikacchu* is an agent that helps the body in building up the mass as well as endurance and also helps the body to increase the muscular strength. It is very commonly known as athletes friends as many sports person uses these supplements to enhance their body performance. This herb helps in reducing the fats in the body and side by side helps in increasing the muscle mass in the body. This herb is also promoting the mood for sexual indulgence thereby increases the libido power and is also beneficial for people who are undergoing depression. This drug mentioned in the Ayurvedic classic of different book.

NIRUKTI OF KAPIKACCHU

Kapi: - It causes purities for monkeys if monkeys sit on the trees where this creeper is twining around the stem, the pods may produce itching (*Kacchu*) on hip of monkeys.^[7]

SCIENTIFIC CLASSIFICATION^[8]

Botanical name-	<i>Mucuna pruriens</i>
Kingdom-	Plantae
Division-	Magnoliophyta
dClass-	Magnoliopsida
Order-	fabales
Family-	Fabaceae
Trib-	Phaseoleae
Genus-	<i>Mucuna</i>
Species-	<i>Mucuna pruriens</i> (L.)

Parts used - Seed

Vernacular names [9]

The regional names of *Kapikacchu* in India are shown below:-

Sanskrit-		<i>Atmagupta, Kapikacchu, Kapiloma, Kapi, Markati, Vanari</i>
Hindi	-	<i>Kevanch, Kaunch</i>
Gujarati	-	<i>Kavach</i>
Marathi	-	<i>Khaja-Kuhali</i>
Tamil	-	<i>Amudari</i>
Telgu	-	<i>Pilli-addu</i>
Kannada	-	<i>Nasugunni</i>
Malayalam	-	<i>Nayakkuruna</i>

AYURVEDIC PROPERTIES [10-11]

Table 1: *Rasa : Madhura and Tikta rasa*

- | |
|---|
| 1) <i>Guna : Guru, Snigdha.</i> |
| 2) <i>Virya : Ushna</i> |
| 3) <i>Vipaka : Madhura</i> |
| 4) <i>Karma : Vatahara and Pittahara property</i> |

SYNONYMS [10-11]

Description of plants through synonyms reveals the morphology, properties, and indication etc. of plant.

Table 2: The drug has *roma* (hairs) on its pods and the monkeys also have hairs on their body. Due to this similarity of *roma* (hairs), above synonyms are given to *Kapikacchu*

<i>Pradhana Nama</i> (Main Name)	<i>Kapikacchu, Atmagupta</i>
<i>Upama</i> (Representative)	<i>Kapikacchu, Kapiloma, kapi, Markati, Vanari</i>
<i>Svarupa</i> (Morphology)	<i>Roma-valli, Adhyand Rrusyaprokta,</i>
Due to self protecting nature	<i>Atmagupt, Svayangupta, Svagupta, Gupta</i>
According to <i>Karma</i> (action)	<i>Shoth, Dusparsha, Vrisya, Harsini, Kandura</i>

BOTANICAL DESCRIPTION [7-11]

Mucuna pruriens is a semi woody annual or more often perennial twinner producing from its prenniating root system, with slender terate branches that when young are usually clothed with short whitish hair but becomes glabrescent or only slightly hairy when mature. Leaves: - Fairly large, pinnately trifoliate, alternate about 1/5th inches long. Leaflets- 3 to 4 inches long. Leaves covered with fine lustrous or silvery grey hair beneath. Flowers: - Short stalked large, dark or lurid purple turning dark when dry with bracts and bracteoles, pedicles-short, usually shorter than the calyx. Fruit: - A turgid explosively dehiscent pod; two to three or four inches long and about half an inch broad, slightly facetely curved of both ends. Fruit containing 4 to 6 or more seeds with septa or partitions between the seeds. Seeds: - Ovoid or transversely oblong slightly laterally compressed with polish dark, brown or black or occasionally mottled testa. Thickness of seed about – 0.5 mm. Hilum is prominent white to pale yellow,

somewhat oblong and little less than half of the length of the seed.

DISTRIBUTION [8]

Found wild throughout India from Himalayas to cape camorin in the plain district and upto 3000ft. elevation in the hills. It is common in Bengal, Assam, Khasi hills and Deccan as well as in the east and west coast region.

PHYTOCHEMICAL PROPERTIES

Seeds of *mucuna pruriens* are known to produce the unusual nonprotein amino acid 3-(3, 4-dihydroxyphenyl)-1-alanine (L-Dopa). [12] It also contains glutathione, Gallic acid and beta-sitosterol. It has unidentified bases like mucunine, mucuna and dine, prurienine, prurieninine. Other bases isolated from the pods, seeds, leaves and roots include indole-3-alkylamines-N, N-dimethyltryptamine. Leaves also gave 6-methoxyharman. Serotonin is present only in pods. The seeds also contain oils including palmitic,

stearic, oleic and linoleic acids.^[13] GC-MS analysis showed the presence of photochemicals like n-hexadecanoic acid (48.21%), squalene (7.87%), Oleic acid (7.62%), ascorbic acid (3.80%) and Octadecanoic acid (6.21%) were present in the extract.^[14] The seed also two tetrahydroquinoline alkaloids namely (-) 3-methoxy-1, 1-dimethyl-6, 7-dihydroxy-1,2,3, 4- tetrahydroquinoline and (-) 3-methoxy-1, 1-dimethyl-7,8-dihydroxy-1,2,3,4-tetrahydroquinoline.^[15] It also contains serotonin (5-hydroxy tryptamine, 5-HT), 5-hydroxy tryptophan (5-HTP), nicotine, N, N-dimethyl tryptamine(DMT), bufotenine, and 5-imethoxy-N,N-dimethyl tryptamine (5-MeO-DMT) 5-imethoxy-N,N- dimethyl tryptamine-n-oxide (5-MeO-DMT-n-oxide). The mature seeds of the plant contain about 3.1-6.1% L-DOPA, with trace amounts of serotonin, nicotine, Bufotonine, 5-MeO-DMT-n-oxide, and beta-carboline. The leaves contain about 0.5% L-DOPA, 0.006% DMT, 0.0025% 5-MeO-DMT and 0.003% DMT n-oxide.^[16]

PHARMACOLOGICAL ACTIONS:

Antivenom activity: Fung et al (2010) investigated antivenom activity of seeds where there was reduction in neuromuscular and cardiovascular depressant effects of *Naja Sputatrix* venom in rats which was pretreated with *M. Pruriens* seed.^[20] The same group of researchers also described similar effects against *Calloselasma rhodostoma* venom. Where *M. Pruriens* aqueous extract was given intra-peritoneal for 3 weeks. After 3 weeks, *Calloselasma rhodostoma* venom was administered intra-venous and studied various pharmacology parameters like blood pressure, heart rate, respiratory rate and muscle twitch tension in rats. All pharmacological responses were found to be decreased in treated groups with respect to control group.^[17] Seed part showed strong antivenom activity which might be due to presence of higher amount of phytochemicals.

Hypoglycemic Activity: The hypoglycemic activity of seeds aqueous extract was evaluated using streptozotocin induced diabetic, normal and glucose load condition rat models. The seed extract of *M. Pruriens* at doses of 100 and 200mg/kg body wt. reduced oral glucose load from ~ 127 to 75mg% after 2 h of oral administration. In another experiment there was reduction of blood glucose from ~ 250 to 90mg% in streptozotocin diabetic rats after 21 days. The previous investigation suggested that the antidiabetic activity may be due to its dietary fiber content.^[17] It is reported that cholesterol, urea and creatinine is responsible for

increase the blood glucose level. They observed that both cholesterol and creatinine levels were decreased in streptozotocin diabetic rats in similar experiment. They explained that this hypocholestric activity is due to presence of squalene content.^[18]

Aphrodisiac Activity: In this study *Kapikacchu Churna* effectively raised the sperm count. The results on sperm count found highly significant. It also showed good improvement in other seminal parameter like Volume of semen, Ph of semen, motility of sperms etc. It showed mild significant result in Non progressive sperm (NP) and Not significant in Slow linear progress of sperm (SLP). It also significantly increased the sexual desire, penile rigidity, erection and duration of ejaculation with orgasm.^[19]

Antioxidant Activity: The various parts of this plant contain total phenols which might have antioxidant activity. The similar findings were observed for this plant where free radical scavenging activity was evaluated via nitric oxide scavenging method. The alcohol extract showed significant antioxidant activity which was comparable with standard ascorbate and total phenol content.^[20]

Antimicrobial Activity: The methanolic extract at whole plant had antimicrobial properties against gram +ve and gram -ve organism. This extract is mainly effective against *Escherichia coli*, *Salmonella tcyphi*, *Bacillus subtilis* and *Shigella dysenteriae*. The antimicrobial potency was evaluation by zone of inhibition (ZI) where *Escherichia coli* showed higher ZI (2.8cm) than *Bacillus subtilis* ZI (2.1cm).^[21]

Antiparkinson's Activity: Its seeds contain levodopa, a direct precursor of the neurotransmitter dopamine; it has shown to be as effective as pure levodopa /carbidopa in the treatment of Parkinson's disease.^[22]

TYPES OF KAPIKACCHU

Two types of *Kapikacchu Bija* are described as wild and cultivated.

- Wild variety has better utility in clinical practice than cultivated.
- According to seed colour, two types are explained by some authors as *Sveta Bija* (white seed) and *Krisnabija* (Black seed).^[25]
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SAMANYA KARMA OF KAPIKACCHU

(Actions mentioned in various Ayurveda Texts) ^[24-26]

Table.4

KARMA	C.S.	S.S.	A.S.	B.N.	SO.N.	R.N.	D.N.
<i>Balya</i> (Strengthening)	+			+			
<i>Brmhna</i> (Nourishment)			+	+			
<i>Hridya</i> (Cardiotonic)			+				
<i>Purisavirajaniya</i> (To form normal stool)	+						
<i>Sukrakara</i> (Spermatogenic)					+		
<i>Vajikara</i> (Aphrodisiac)				+		+	
<i>Vrisya</i> (Aphrodisiac)		+		+	+	+	+
<i>Yonisankirnikara</i>				+			

ADULTERATION

Adulteration was not common but other varieties of *Mucuna pruriens* are used at different parts of India, among them *Mucuna utilis* is commonly using as a substitute.

- Increases the stamina in the body.
- It significantly ameliorates psychological stress and seminal plasma lipid peroxide levels along with improved sperm count and motility. ^[27]

SOME IMPORTANT PREPARATION

- *Vanari vatika*
- *Ashwagandha ghrita*
- *Shatavari modak*
- *Kameshwar modak*
- *Mahakameshwar modak*
- *Rativalabh modak*
- *Godhumadhya ghrita*
- *Mopharava* ^[26]

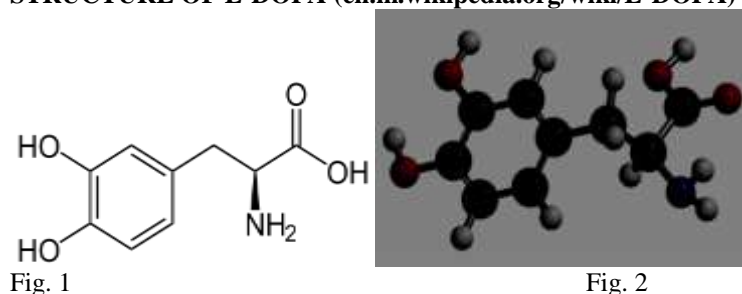
THERAPEUTIC USES

- *Vatavyadhi* (e.g. Parkinsons disease)
- Worms – The hair on fruit of *Kapikacchu* with jiggery.
- *Mucana* helps in improving the libido.
- *Kapikacchu* helps in making our nervous system work to the optimum levels.
- It is very helpful in increasing the muscle mass of the body naturally.
- Very beneficial in increasing the sperm count when using with milk and sugar.

Conclusion

Kapikacchu is one of the most powerful *Rasayanas* in *Ayurveda*. *Kapikacchu* is a nutritive tonic commonly used in *Ayurveda* as an aphrodisiac and to support proper function of the reproductive system. It increases sexual energy and strengthens and tones the reproductive organs. In men, *kapikacchu* supports potency, stamina and control. It increases the sperm population by improving the testosterone level. In women it promotes a healthy libido and fertility. The vitality bestowed by *kapikacchu* nourishes the entire body and calms the nerves making it an excellent rejuvenator for *vata*. It is also natural source of *levodopa* (L-dopa) which is an essential precursor to the neurotransmitter *dopamine*. So, it can be proved that a magical drug due to its multidirectional work. ^[28-31]

STRUCTURE OF L-DOPA (en.m.wikipedia.org/wiki/L-DOPA)



MORPHOLOGY



Fig. 3



Fig.4

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