

## Phytopharmacological Review of *Mucuna pruriens*

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### ABSTRACT

*Mucuna pruriens* (Common cowitch) commonly known as poonaikaali in Tamilnadu is a well-known herb. It is in practice for the treatment of Parkinson's disease, libido & infertility. It is a very rich source of L-Dopa, tryptomine. It interacts with several hormones in our body. It increases the circulating dopamine level. It suppresses the prolactin level. It increases the testosterone level in healthy men. It also prevents the diabetic nephropathy. It retains the memory in rats. Moreover it is the natural source of anti-oxidant. It is a toxin antagonist for varies snake bite. The single herb is a remedy for various ailments in our siddha system. Hence the world is looking forward for a single therapy instead of many. It gives a research scope for the future world.

### KEY WORDS:

*Mucuna pruriens*, L-Dopa, Anti-oxidant, Anti snake venom, Nervine tonic, Memory retainer.

## INTRODUCTION

### GEOGRAPHICAL DISTRIBUTION [4]

America, Africa, South East Asia, largely found in Bangladesh, India, Srilanka, Malaysia.

### DESCRIPTION [2]

It is a climbing shrub that has the ability to grow white, lavender or purple flowers and causes itching on physical contact with the outer hairs and skin. It possess Anti-oxidant content.

It is actually a legume and thus has a caloric content. Mucuna beans contains 20-35% protein by its total caloric content. It also contains protein digestive enzyme inhibitors which can be reduced by processing.

Soaking in bicarbonate [following by autoclaving or cooking] has been shown to reduce a wide variety of anti nutrients in velvet beans, but also reduces levodopa content ,theactive ingredient.

TAMIL NAME[1]	Poonaiikaali Kandoothi Markadi
ENGLISH NAME [2][4]	Common cowitch Magic bean Velvet bean Werepe Karara Agbara
FAMILY [4]	Fabaceae
SUBFAMILY [4]	Faboideae
TRIBE [4]	Phaseoleae
GENUS [4]	Mucuna
SPECIES [4]	pruriens



Fig1- seeds of *Mucuna pruriens*



Fig2- *Mucuna pruriens* plant with flowers

#### **PHYTOCHEMICALS [4]& [9]**

L- DOPA , beta – sitosterol, gallic acid, glutathione, bufatenine, serotonin, 6 methoxyharman, tryptmine, linolenic acid, oleic acid, palmitic acid, stearic acid, 3-methoxy-1,1-dimethy-6,7-dihydroxy-1,2,3,4-tetrahydroquinonine , squalene, ascorbic acid, 5-hydroxytryptophane.

#### **PHARMACOLOGICAL ACTIONS [4]**

Anti-venom activity, hypoglycemic activity, aphrodisiac activity, anti-oxidant activity, anti-microbial activity, anti-Parkinson's activity, anti-inflammatory activity, As bio fertilizer, As food supplement.

## COMPOSITION [2][4]

It contains L-DOPA or levodopa, the precursor to dopamine and seen as the main constituent & eventually adrenaline. The 3 catecholamines are also present in *Mucunapruriens*.

Nicotinic acid.

Tetra-hydroisoquinoline alkaloids.

Serotonine and its precursor, 5 HTP.

NN-Dimethyltryptamine & 5-Meo-Dimethyltryptamine.

Beta-carboline.

Mucanin – a compound that causes itches.

In this plant there are various saponins, anthraquinones, flavonoids, terpenoids, cardiac glycosides & tannins are available. In cotyledon of the plant COQ10 & NADH are abundantly present. Basic dietary minerals are present in small amounts such as selenium, iron, and magnesium.

## INTERACTONS WITH HORMONES

DOPAMINE: [2][5][6][7]

*Mucuna pruriens* supplementation has been shown to increase circulating dopamine levels.

PROLACTIN: [2][5][6][7]

It has been shown to suppress prolactin levels *in vivo*.

TESTOSTERONE: [2][5][6][7]

Testosterone has been increased in healthy infertile men without any impairments in seminal parameters.

## INTERACTIONS WITH GLUCOSE METABOLISM:

### **DIABETIC MANAGEMENT: [2]**

Mucuna pruriens show efficacy in reducing the onset of diabetic cataract. Although it may suppress a rise in urinary albumin levels associated with diabetes it fail to prevent the hypertrophy of the kidneys associated with diabetes.

### **LIBIDO & INFERTILITY: [2][5]**

Mucuna pruriens supplementation in infertile men is associated with increased sperm count & motility after taking 5g of dried powder for 3 months. This same dose also increases various parameters of male semen indicative of increased fertility. In regards to testosterone, 1 study noted it could be increased over after ingestion of 5g of Mucuna pruriens seed powder daily.

### **PROTEASE INHIBITION: [2]**

#### ANTI-VENOM:

Mucuna pruriens has been traditionally used as an anti-venom agent specifically against the venom of *Echis carinatus* (a snake).

It shows efficacy against EC toxin either when pre loaded or as a single bolus in rats.

## INTERACTIONS WITH NEUROLOGY:

### **PARKINSONS & DOPAMINE: [2][7]**

Mucuna pruriens is being investigated for its ability to alleviate symptoms or to treat Parkinson's disease. Only 1 double blind study has been conducted on humans.

Mucuna pruriens definitely appears to have interactions with Parkinson's disease although its exact role (treatment, adjunct therapy, preventive medicines) is not fully examined.

## MEMORY AND COGNITION: [2][7]

*Mucuna pruriens* has been involved in blend of herbs that increased memory retention in rats.

## NEUROPROTECTION: [2][7]

One *invivo* study suggests that *Mucuna pruriens* extract increased the activity of complex 1 in brain mitochondria.

It was also found to restore levels of serotonin & catecholamines in the substantia nigra( area of the brain associated with Parkinson's) whereas isolated levodopa was not able to do this.

## ANTI-OXIDANT ACTIVITY: [3]

In a recent study, Kottaimuthu et al., (2010) found that ethylacetate & methanolic extract of *M. pruriens* plant (MEMP), which contains large amounts of phenolic compounds, exhibits high anti-oxidant & free radical scavenging activities.

These *invitro* assays indicate that this plant extract is a significant source of natural anti-oxidant.

## SAFETY AND TOXICITY :[2]

One large double blind study noted no significant adverse effects from 15-30 gm of *Mucuna pruriens* powder over the dosage of 12-30 weeks from one patient.

In rats doses of 32mg/kg or above are associated with some adverse effects (hyperventilation, reduced spontaneous motor activity, spontaneous erection) that appeared 1 hour after ingestion transiently & doses upto 100 mg/kg are free from more significant side effects for upto 12 weeks.

## LITERATURE EVIDENCE ABOUT MUCUNA PRURIENS IN SIDDHA: [1]

TASTE(SUVAI)	Astringent (thubarpu)
NATURE (THANMAI)	Cold (thatpam)
SUB-TASTE (PIRIVU)	Sweet (inipu)

### USEFUL PARTS: [1]

Seed, root, outer coat of seed (sunai).

### ACTIONS: [1]

SEED- Astringent (thubarpi).

Nervine tonic (naramburamaki).

Aphrodisiac (kaamamperuki).

ROOT-Diuretic (siruneerperuki).

Nervine tonic (naramburamaki).

OUTER COAT (SUNAI)-Vermifuge (puzhukolli).

Irritant (thadipundaki).

### TRADITIONAL USES:[1]

SUNAI – The outer coat of the seed mixed with country jaggery (panaivellam) & honey (thaen) kills the worms in gastrointestinal tract .

It is a good diuretic which heals the generalised edema.

SEED – The dried powder of the seed of dosage 520-1040 mg is taken in milk (anubanam) increases the sperm count and cures the white patches (vellai).

The mixture of seed powder and sirunerinjil (Tribulusterrestris) seed powder of dosage 4 gm is taken in milk (anubanam) results in increase of sperm count.

Leghiyam of seed is used to treat leukorrhoea, syphilitic disease, menorrhagia, Parkinsonism.

ROOT– The decoction [8] of the root with honey is used to reduce fever & cholera (oozhinooi, suranoiyl kanum muppini ). The poultice [8] (patru) of root is used in case of swellings (veekam).

In case of swelling in elephantiasis (aanaikalveekam) its root along with other drugs is used as poultice [8] (patru) to reduce the pain and swelling.

#### CAUTION: [2]

It contains L-DOPA. Compounds with levodopa/ carbidopa treatment most likely extend to *Mucuna pruriens* & should be approached with caution. This appears to be narrow eye glaucoma suffers those using pharmaceutical MAO inhibitors & those who have a history of melanoma or suspicious & undiagnosed skin lesions.

#### ADVANTAGES IN SIDDHA SYSTEM :( 1)

The properties ,action and uses of *Mucuna pruriens* which was scientifically proved now coincides with the properties , actions and uses which was written in siddha texts.

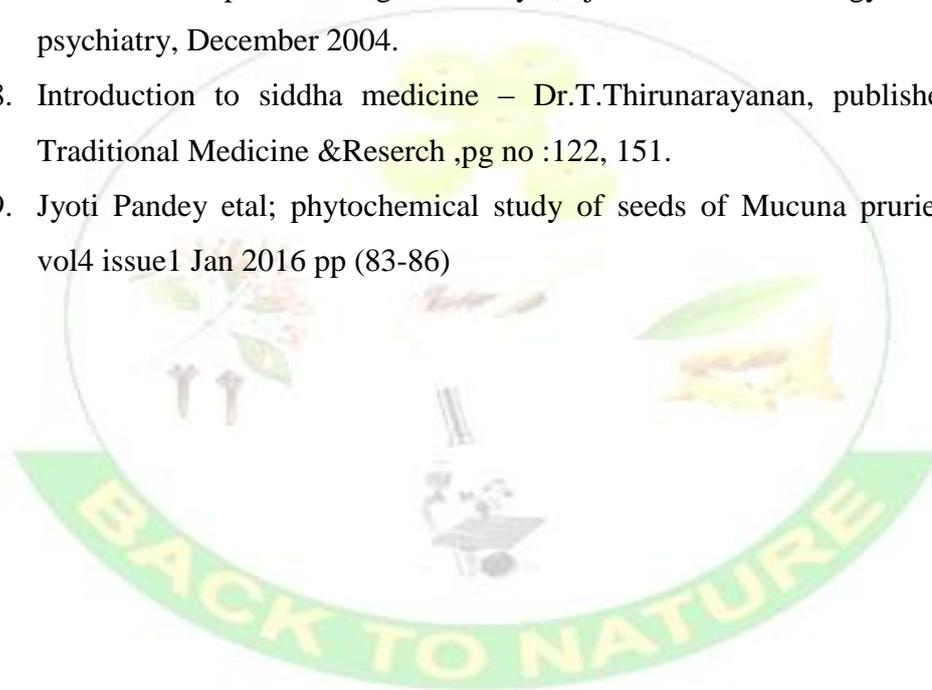
It is very well known for its Aphrodisiac, nervine tonic, vermifuge and diuretic action.

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