Mucuna pruriens

TAXONOMIC CLASSIFICATION:[1]

- Kingdom :Plantae
- Subkingdom : Tracheobionta
- Superdivision : Spermatophyta
- Division : Magnoliophyta
- Class : Magnoliopsida
- Subclass : Rosidae
- Order: Fabales
- Family: Fabaceae
- Genus: Mucuna Adans.
- Species : *Mucuna pruriens*

(https://www.theplantattraction.com/products/mucuna-pruriens-vine-white-strain-5-seeds-herbal-velvet-bean-cowitch-edible-medicinal-climber)

INTRODUCTION:

Mucuna pruriens is a tropical legume known by a multitude of common names such as Atmagupta, Cowhage, Cowitch, Cow-Itch Plant, Kaunch, Kawach, Kawanch, Kevanch, Kiwach, Velvet Bean etc. The seeds contain high concentrations of levodopa, a direct precursor of the neurotransmitter dopamine. It has long been used in traditional Ayurvedic Indian medicine for diseases including Parkinson's Disease.[2] *Mucuna pruriens* (Fabaceae) is also an established herbal drug used for the management of male infertility, nervous disorders, and also as an aphrodisiac. It has anti-parkinson and neuroprotective effects, which may be related to its anti-oxidant activity. In addition, anti-oxidant activity of *M. pruriens* has been also demonstrated *in vitro* by its ability to scavenge DPPH radicals and reactive oxygen species.[3]

The plant has long, slender branches; alternate, lanceolate leaves; and white flowers with a bluish-purple, butterfly-shaped corolla. The pods or legumes are hairy, thick, and leathery; averaging 4 inches long; are shaped like violin sound

(https://www.plantsguru.com/mucuna-pruriens-seeds)

holes; and contain four to six seeds. They are of a rich dark brown color, and thickly covered with stiff hair. The genus thrives best under warm, moist conditions, below 1500 m above sea level, and in areas with plentiful rainfall. Like most legumes, the velvet bean has the potential to fix atmospheric nitrogen via a symbiotic relationship with soil microorganisms.[3]

CHEMICAL CONSTITUENTS:

Seeds of velvet beans are known to produce the unusual non protein amino acid 3-(3,4-dihydroxyphenyl)-l-alanine (L-DOPA). It also contains glutathione, gallic acid, and beta-sitosterol. It has unidentified bases such as mucunine, mucunadine, prurienine, and 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.[12] The seeds also contain oils including palmitic, stearic, oleic, and linoleic acids.[13] Gas chromatography-mass spectrometry analysis showed the presence of phytochemicals such as 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.[10] The seed also contains 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[5]

(https://blog.daveasprey.com/mucuna-pruriens-dopa-bean/)

PROPERTIES AND USES:[3]

- Protective effect of seeds against snake venom poisoning
- Anti- microbial properties of leaves
- Neuro protective effect of seeds)
- Aphrodisiac effect of seeds
- Anti-diabetic effect of seeds
- Anti – oxidant
- Skin treatment
- Anti- cancer property

SIDE EFFECTS OF EXCESS CONSUMPTION:[2]

- Apathy
- Body Tremor
- Essential Tremor
- Excessive Yawning
- Fatigue
- Heart Palpitations

DOSAGE:

As mentioned in Ayurvedic Pharmacology, 3gm to 6gm of seed powder is safe for consumption [13]

RESEARCH:

1. This study assessed the clinical effects and levodopa (L-dopa) pharmacokinetics following two different doses of mucuna preparation and compared them with standard L-dopa/carbidopa (LD/CD). Eight Parkinson's disease patients with a short duration L-dopa response and on period dyskinesias completed a randomised, controlled, double blind crossover trial. Patients were challenged with single doses of 200/50 mg LD/CD, and 15 and 30 g of mucuna preparation in randomised order at weekly intervals. L-Dopa pharmacokinetics were determined, and Unified Parkinson's Disease Rating Scale and tapping speed were obtained at baseline and repeatedly during the 4 h following drug ingestion. Dyskinesias were assessed using modified AIMS and Goetz scales. Compared with standard LD/CD, 30 g mucuna preparation led to a considerably faster onset of effect (34.6 *v* 68.5 min; p=0.021), reflected in shorter latencies to peak L-dopa plasma concentrations. Mean on time was 21.9% (37 min) longer with 30 g mucuna than with LD/CD (p=0.021); peak L-dopa plasma concentrations were 110% higher and the area under the plasma concentration *v* time curve (area under curve) was 165.3% larger (p=0.012). No significant differences in dyskinesias or tolerability occurred. The rapid onset of action and longer on time without concomitant increase in dyskinesias on mucuna seed powder formulation suggest that this natural source of L-dopa might possess advantages over conventional L-dopa preparations in the long term management of Parkinson's disease.[7]
2. Mucuna pruriens seed powder when administered in a dose of 75 mg/kg body weight daily as an aqueous suspension, increased the sexual activity of male albino rats considerably. The different components of copulatory behaviour vis. mount frequency mount latency, intromission frequency and intromission latency were found to be influenced by the test drug. L-dopa, one of the constituents of the title plant was also reported to arouse sexual desire in patients suffering from Parkinson's disease. At 100 mg/kg body weight, though L-dopa was found to arouse sexual activity, the low content

of this constituent (0.69%), could not account for the activity shown by the seed powder in the dose employed.[8]

3. The present study investigated the anti proliferative action of isolated M1 (6,7-dimethoxy-1,2,3,4-tetrahydroisoquinoline-3-carboxylic acid) from Mucuna pruriens seeds using human hepatic carcinoma cell line (Huh-7 cells). Docking study was performed to find out the binding affinities of M1 to caspase-3 and 8 enzymes. Cytotoxic action of M1 was measured by cell growth inhibition (MTT), followed by caspase-3 and 8 enzymes assay colorimetrically. The results collectively suggested that M1 had strong binding affinity to caspase-8 in molecular modelling. M1 possessed antiproliferative activity on Huh-7 cells (EC50 = 13.97 μM) and also inhibited the action of caspase-8 enzyme, signified process of apoptosis. M1 was active against Huh-7 cells that may be useful for future hepatic cancer treatment.[9]

PRECAUTIONS & WARNINGS:[4]

- The seed is a known teratogen
- and has uterine stimulant activity and should not be used during Pregnancy.
- Velvet bean is contraindicated in combination with M.A.O. inhibitors.
- Velvet bean has androgenic activity, increasing testosterone levels. People with Androgen syndromes should avoid using Velvet bean.
- Velvet bean inhibits prolactin. If you have a medical condition resulting in inadequate levels of Prolactin in the body, do not use Velvet bean unless under the direction or your healthcare Practitioner.
- The seed contains high quantities of L-dopa. Levodopa is the pharmaceutical medication used for Parkinson's disease. Those with Parkinson's should only use Velvet bean under the supervision of a qualified healthcare practitioner.

INTERACTION WITH MEDICATIONS:[4][6]

- May potentiate androgenic medications.
- May potentiate hypoglycemic medications.
- May potentiate levodopa.
- **Medication for depression (MAOIs) interacts with Mucana**: Mucana contains chemicals that stimulate the body. Some medications used for depression can increase these chemicals. Taking Mucana along with these medications used for depression might cause serious side effects including fast heartbeat, high blood pressure, seizures, nervousness, and others. Some of these medications used for depression include phenelzine (Nardil), tranylcypromine (Parnate), and others.

- **Methyldopa (Aldomet) interacts with Mucana**: Mucana can lower blood pressure. Methyldopa (Aldomet) can also lower blood pressure. Taking Mucana and methyldopa together might lower blood pressure too much. Some of these medicines used for depression include amitriptyline (Elavil), imipramine (Tofranil), and others.

- **Antidiabetes drugs interacts with Mucana:** Mucana might decrease blood sugar. Diabetes medications are also used to lower blood sugar. Taking Mucana along with diabetes medications might cause your blood sugar to go too low. Some medications used for diabetes include glimepiride (Amaryl), glyburide (DiaBeta, Glynase PresTab, Micronase), insulin, pioglitazone (Actos), rosiglitazone (Avandia), chlorpropamide (Diabinese), glipizide (Glucotrol), tolbutamide (Orinase), and others.

- **Antipsychotic drugs interacts with Mucana**: Mucana seems to increase dopamine. Some medications for mental conditions help to decrease dopamine. Taking Mucana along with some medications for mental conditions might decrease the effectiveness of some medications for mental conditions. Some medications for mental conditions include chlorpromazine (Thorazine), clozapine (Clozaril), fluphenazine (Prolixin), haloperidol (Haldol), olanzapine (Zyprexa), perphenazine (Trilafon), prochlorperazine (Compazine), quetiapine (Seroquel), risperidone (Risperdal), thioridazine (Mellaril), thiothixene (Navane), and others.

- **Anesthesia interacts with Mucana:** Mucana contains a chemical called L-dopa (levodopa). Taking L-dopa along with medications used for surgery can cause heart problems. One should stop taking Mucana at least two weeks before surgery.

- **Tricyclic anti depressants interacts with Mucana:** Some medications used for depression can slow down the stomach and intestines. This might decrease how much Mucana is absorbed. Taking some medications used for depression might decrease the effects of Mucana.

REFERENCES:

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