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Pharmacological recommendation of *Daturastramonium* L. as eminentmedicinal tree: a Recapitulation

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Abstract:

All over the world *Datura* has known to us from the ancient time due to its anti-inflammatory property. Due to the presence of one or more such components like alkaloids, tannins, saponins and cardiac glycosides the therapeutic activities of most plant are seen. The presence of saponins, tannins, steroids, alkaloids, flavonoids, phenols and glycosides divulge the phytochemical screening. The highest number of alkaloids over all parts of the plant is contained in the ripe seeds. For varieties of ailments there has been extensively used as curative agents at the time of immemorial. The bioactive constituents, ethnopharmacology along with the scientifically assert medicinal uses of *D. stramonium* information is broadly in present study. Poisonous and medicinal properties both are shown by *stramonium*. With a great utility and usage as folklore medicine it has huge pharmacological potential. The presence of saponins, tannins, steroids, alkaloids, flavonoids, phenols and glycosides are shown in phytochemical investigations. An exclusive review work on the ethnomedical, phytochemical, pharmacological activities of the plant are shown in present paper.

Keywords: Atropine, Ethnomedical, *Datura stramonium*, Solanaceae

1. Introduction:

Over worldwidefor the treatment of human laceration and diseases plants play a major role in it.Due to growing consciousness of natural product, there is a rapidly growing in the demand for medicinal plant in both developed and developing countries. In Solanaceae family there is a plant known as *Datura stramonium* (*D. stramonium*) which is use as ubiquitous annual plant.It was investigated as a source for tropane alkaloids because it is a wild growing flowering plant and contains a methylated nitrogen atom (N-CH_3) and containsthe anti-cholinergic drugs atropine, and scopolamine. For treatment of asthma and sinus infections, and stripped bark unsheathe made from leaves are taken orally and appertain externally to treat swellings, burns and ulcers. In the 1990s and 2000s the incidence of *D.* stramonium poisoning is patchy with a cluster of poisoning cases, most of the adolescents and young adults this is reported by United State. Dying or becoming seriously ill from ingesting all these are problem are reported. Stimulation of the central nervous system is a anti-inflammatory property of all parts of the plant and respiratory decongestion, treatment of dental and skin infections, alopecia and in treatment of toothache all these are some of medicinal uses of plant. After researching it found that ingesting 125 seeds may leads to heart failure and death of the person, the reason behind this is that the seeds contain the highest

agglomeration and has a rapid arrival of action.Numerous incidents in humans occur due to the highly toxicity nature and prospective occurrence in food [1].

2. Scientificcategorizing of *D. stramonium*

Kingdom	Plantae
Division	Magnoliphyta
Class	Magnoliopsida
Order	Solanales
Family	Solanaceae
Genus	Datura
Species	Daturastromonium

3. Botanical elucidation

- Appearance of plant

D. stramonium is herbaceous, branched and glabrous or only lightly hairy all are the appearance of stem. The repetition in a divaricate manner followed by the branching stems has attribute of spreading, leafy, stout, erect, smooth and pale yellowish green in color, branching. Leaves has silent aspect like hairy, big, simple dentate, oval glabrous, suitable veins of leaves are pale black, stalked, 4-6 inch long, ovate and pale green. When dried it become minutely wrinkled and the upper surface of the plant is dark and grayish-green, generally smooth, the under surface is paler. The calyx which is the outermost whorl of flower is long, tubular and slightly a swollen below and very patently five angled conquer by five sharp teeth. Corolla which composed of petals is funnel shaped. Stem pedicel look like pale blue or greenish white. Seeds are look like black, kidney shape and flat. Walnuts and full of thorns ("thorn apple") are as short as fruits. Acute Jimsonweed poisoning has symptoms include dryness of the mouth and ultimate thirst, dryness of the skin, pupil dilate ion, diminish vision, urinary preservation, rapid heartbeat,skepticism,restlessness,apparition and loss of consciousness[2].

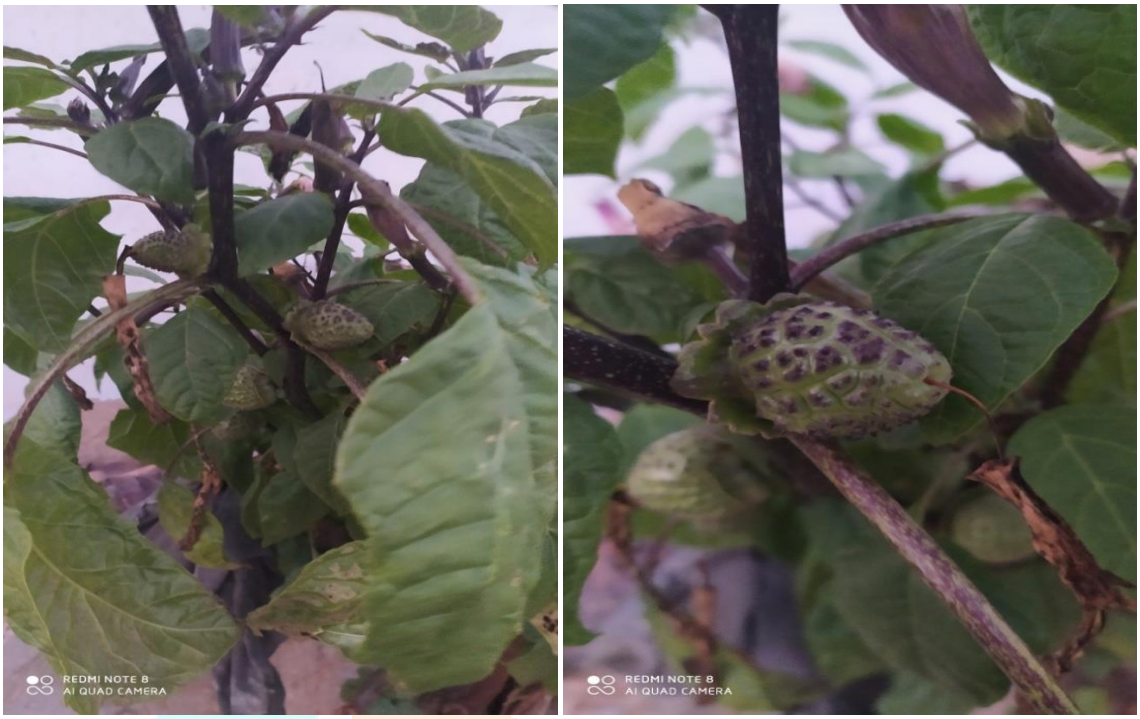

Figure 1.Dhatura stramonium L

- Administering
  The origination of the *D. stramonium* is likely in Caspian Sea territories and the first century spread to Europe. In Europe, Asia, America and South Africa at present it originate in waste places. In Germany, France, Hungary, South America *D. stramonium* plant is cultivated and all over the world.

- Cultivation and troupe
  Thorn apple is a plant which is known to us and easily cultivated, growing well in open, sunny situation. At the month of May the seed which are sown opens and barely covered. As the plants achieve a good size because disperse thinly and grow candidly from seed. The young plants which are thin to a distance of 12 to 15 inchesamalgamate each plant in the drill. The early stages of weed should be kept free in the soil. Give a straw of rotted cow-manure at the summer is hot and dry. The height of 1 meter is achieved by the plant in August and bears flowers and fruits. Stems having leaves and flowering tops are collected and dried at the end of August. When the plant is at full bloom then the leaves converge and carefully dried. At the late summer it is generally harvested [3].

4. Ethnomedicinal use:

Plant material is used as primeval cure in folklore or traditional systems of medicine though which plants comes into the use of the modern medicine. For the relief of headache, the leaf of *D. stramonium* is used and to remove pain of rheumatism and appetite thehaze of leaf strain is used.For smooth painful wounds and inflammation it is applied. The relaxation of smooth muscles of the bronchial tube and asthmatic bronchial spasm is also done by this plant. For the treatment of madness, epilepsy and depression *D. stramonium* was used this case is reported. The cornerstone of emollient for burns and rheumatism it is used externally and for the treatment of parkinsonism and hemorrhoids it is also used. For the treatment of fistulas, abscesses scratch and severe neuralgia this plant is used as externally. Immensely powerful mind-altering drug, the leaves of this plant is used due to the presence of hyoscyamine and atropine. Analgesic, anthelmintic and anti-inflammatory are the properties of seeds of *Datura* and stomach and intestinal pain is also treated by this plant which cause worm scourge, toothache, and fever from soreness. For the treatment of dandruff and falling hair the juice of the fruits are pertain to the capitulum.The protection of neighboring plants from insects by the growing plant which works as insect repellant. The uses of these plant by farmers and marshal in there sectors are continued recorded [4].

5. Phytochemicals:

Hyoscyamine and scopolamine are the major type of tropane alkaloid. The example of minor alkaloids of *D. stramonium* areapo scopolamine, tigloidin, apoatropin, hyoscyamineN-oxide and scopolamine N-oxide17-20. 6â-ditigloylox7-hydroxyhyoscyamine and 7-hydroxyhyoscyamine are reported first time in this species.

In *D. stramonium* the manufacturing of hycyamine and scopolamine are at different stages of their life cycle. In the stems and leaves of young plants the maximum contents were found. Atropine, hyoscamine and scopolamine are*D. Stramonium* compounds which contain diversity of alkaloids. *stramonium* has sixty-four tropane alkaloids which distinguished.

*D. stramonium*incorporates: Hygrine, 3á, 6â-Ditigloyloxy-7-hydroxytropane, 6-Hydroxyhyoscyamine,Pseudo tropine, 3á-Tigloyloxytropane, Hydroxy-6-tigloyloxytropane, Phenylacetoxytropane, 3-Tigloyloxy-6-(2-methylbutyryloxy) tropane, Hyoscyamine, 3-Tigloyloxy-6-isovaleroyloxy-7-hydroxytropane, Scopolamine, Tropinone, Scoping, 6-Hydroxyacetoxytropane, 3,6-Diacetoxytropane, 3-Tigloxyloxy-6-acetoxytropane, 3-Tigloyloxy-2-methylbutyryloxytropane, 3á, 6â-Ditiglotoxytropane, 3-Acetoxy-6-isobutyryloxytropan, 3-(2-Phenylpropionyloxy) tropane, Littorina, 6-Hydroxyapoatropine, 3â, 6â-Ditigloyloxy-7-hydroxytropane, 3-Tropoyloxy-6-acetoxytropane, 3,6-Dihydroxytropane, 3â-Tigloyloxytropane, 3-Tigloyloxy-6-propionyloxy-7-hydroxy tropane, 3á-Apotropoyloxytropane, Apo scopolamine, 3â, 6â-Ditigloyloxytropane, 3-(3′-Acetoxytropoyloxy) tropane, 3á-Tigloyloxy-6-hydroxytropane, Tropine, 3-Acetoxytropane, 3-Hydroxy-6-acetoxytropane, 3-Hydroxy-6-methylbutyryloxytropane, 3-Tigloloxy-6-isobutyryloxytropane, Aponorscopolamine, 7-Hydroxyhyoscyamine, Meteloidine, 3â, 6â-Ditigloyloxytropaneall these are the type of alkaloid are reported first time in this plant. The study of Banso A and Adeyemo S in the secondary metabolites recognize in the plant materials indicate antimicrobial activity [5].

6.Pharmacological activity:

- Antiasthmatic activity:
  The treatment and feasible consequence of asthma on prenatal development was studied in *D. stramonium*. When a mother use *D. stramonium* for asthma there is vulnerability to foetus, will inaugurate uninterrupted liberation of acetylcholine, resulting in the anesthetize of nicotinic receptors, this leads permanently damage of the foetus.

- Anticholinergic activity:
  As clinically and anticholinergic agents *D. stramonium* are used and have alkaloids are which organic esters.The*D. stramonium* has been intricate in accidental poisoning of humans and animals and jimson weed has been reported as a drug of abuse. Dryness of the mouth and extreme thirst, dryness of the skin, pupil dilation and impede vision, urinary retention, rapid heartbeat, confusion, restlessness, hallucinations, and loss of alertness all these are the symptoms of acute jimson weed poisoning. The inhibition of central and peripheral muscarinic neurotransmission is due to anticholinergic syndrome[6].
- Antimicrobial activity:
  The Gram-positive bacteria in a dose dependent manner are against both D. stramonium (methanol extracts) and Dhaturainoxia Escherichiacoli and Psuedomonasaeruginosa there are little or no antimicrobial activity found for antibacterial and antifungal activity cup plate diffusion method in which stramonium, terminalia arjuna and with an iasomnifera are anti-microbial activity integrate crude ethanolic unclasped.To perceive potential antimicrobial activity the extracts were put through to screening against Staphylococcus aureus, Bacillus subtilus, Escherichia coli, Klebsiellapneumoniae, Micrococcus luteus and Candida albicans with differentiate Ciprofloxacin caliber drug [7].

- Anti-inflammatoryactivity:
  Coriandrumsativum (*C. sativum*), *D. stramonium* and *Azadirachtaindica* (*A. indica*) are consistently used in ministration of tenderness. Ethanolic extracts of fruits of *C. sativum*, leaves of *D. stramonium*. Ethanolic extracts of fruits of *C. sativum*, leaves of *D. stramonium* and *A. indica* shows in albino rat

Santi-inflammatory activity were put through to preliminary screening in albino rats. All ethanolicabstraction demonstrate significant anti-inflammatory activity commensurate to the standard drug diclofenac sodium against carrageenan instigate rat paw edema method. [8]

- Toxicity studies:

  In rats the toxicity of ethanol extract of the leaves of *D. stramonium* studied. On rats the extracts were orchestrate for five weeks giving two doses of 50 and 200 mg/kg. At the time of extract administration, the studies which were not affected are feed intake, final body weight, serum AST, ALT, bilirubin, total protein, urea and the electrolyte. When we administered the rat with ethanol extract at the dose of 200 mg/kg body weight we see that serum creatinine levels were however significantly raised. The main fragment of the active principle of *D. stramonium*with toxic properties, all these are found in male Albino Wistar rats according to the report when we studied the effects of acute, sub-acute and chronic management of alkaloids atropine and scopolamine. A significant reduction after twenty four hourand also notice that there were evidence of liver, spleen brain and kidney function and some biochemical and hematological parameters. There is no resulting mortality or signs of toxicity showed in four weeks of sub-acute study. At daily doses of 4.2 mg/kg of atropine and 1.6 mg/kg of scopolamine in the synthetic alkaloids administration in chronic study and did not produce death. There is observation of diarrhea and hypo activity. The control group has significantly higher relative weight of liver [9].

7. Safety slant:

Before the use of plant there must be the requirement of careful deliberation of the toxicity. Characteristic symptoms prompt due to ingestion. There is increase of heart rate, mouth augment dry, an acute thirst develops, visiongets blurred with preeminent mydriasis. By respiratory failure there is ultimately death of the patient due to following symptoms hallucinations, delirium, and loss of motor coordination [10].

8. Quantitative standards:

- Dosage must be at the same amount in infusion and dried leaf of 50-100 mg.
- Total ash amount must not be more than 20.0%.
- Total alkaloid amount must not be less than 0.05% calculated as hyoscyamine.
- Foreign matter amount must not more than 3.0% of stem having a diameter distinct 5 mm.
- Acid insoluble ash amount must not more than 4.0% [11].

9.Conclusion:

Bioactive constituents, ethnopharmacology along with the experimentally insist medicinal uses of *stramonium* information is broadly in present review.Various alkaloids, carbohydrates, fat, proteins and tannins are found in different part of *D. stramonium* which have been reported. Due to the presence of the investigated active chemical constituents the plant shows several types of activities such as analgesic and antiasthamatic activity. *In vitro* and *in vivo*the pharmacological studies have been carryout so far.

References:

1. Devi MR, Meenakshi B, Paul SB, Sharma GD. Neurotoxic and medicinal properties of *Datura stramonium* L.-Review. BiolEnvir Sci. 2011;7(1):139–144.

2.Singh S., Diabetes: Treating Wounds and Injuries, International Journal of Pharmaceutical and Biological Science Archive, 2017; 5 (1): 30-316.

3. Oseni OA, Olarinoye CO, Amoo IA. Studies on chemical compositions and functional properties of thorn apple (*Datura stramonium* L) Solanaceae. Africa J Food Sci. 2011;5(2):40–44.

4.Singh S. and Chakaraborthy G. S, Evaluation Of Anti-Asthmatic And Antioxidant Potentials of Seed Extract of StrychnosNux Vomica L. Research Journal of Pharmacy and Technology,2020; 13(1): 114-118.

5. Strahil B, Rawia Z, Tsvetelina D. Alkaloid patterns in some varieties of *Datura stramonium*. Fitoterapia. 2006;77(3):179–182.

6. Pretorius E, Marx J. *Datura stramonium* in asthma treatment and possible effects on prenatal development. Environ Toxicol Pharm. 2006;21(3):331–337.

7. Singh S., The Medical Value of Reserpine, University Research Resource Journal, 2020; 3 (4):124-128.

8. Diker D, Markovitz D, Rothman M, Sendovski U. Coma as a presenting sign of *Datura stramonium* seed tea poisoning. Eur J Int Med. 2007;18(4):336–338.

9. Boumba A, Mitselou A, Vougiouklakis T. Fatal poisoning from ingestion of *Datura stramonium* seeds. Vet Human Toxicol. 2005; 46:81–82.

10. Kurnal NA, Yalcin SCC. Acaricidal, repellent and oviposition deterrent activities of *Datura stramonium* L. against adult *Tetranychusurticae* (Koch) J Pest Sci. 2009;14:54–57.

11. Gupta S, Raghuvanshi M, Jain D. Comparative studies on anti-inflammatory activity of *CoriandrumSativum, Daturastramonium* and *AzadirachtaIndica.* Asian J ExpBiol Sci. 2010;1(1):151–154.