

A toxicological review of Gunja

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Abstract

GUNJA is mentioned under the group of Sthavara Vanaspatic Visha, in agad Tantra text books and in the texts of Rasashastra it is classified under Upavishas. It is an irritant organic poison, according to modern all parts of the plant are toxic, but the most toxic part is the seed which contains the active principle Abrin.

Visha dravyas , according to Ayurvedic theory, can be used to treat a number of disorders after the Shodhana procedure. The primary goal of this study is to compile all available data about Gunja and its toxicity.

Keyword: Gunja, visha, Toxicology, Medico-legal.

Introduction

Agada Tantra is a branch of Astang Ayurveda that explains the origins and types of Visha, as well as the symptoms and treatment . Sushruta in the third chapter of the kalpasthana (Jangam-Visavijaniya Adhyaya) explained Visha (poison) as producing visada .

Visha is classified into three types Sthavara Visha Jangama Vish, Kritrima Visha.

Gunja is a plant poison mentioned in Ayurveda under the Sthavara Vanaspatic Visha. Acharya Sushruta mentioned Gunja under MoolaVisha. In Bhavprakasha Nighantu it is mentioned under Guduchyadi varga, and in other Rasashastra texts it is mentioned under UpaVisha . According to modern texts , it is an irritating organic plant poison belonging to the Leguminosae family. Gunja's botanical name is Abrus precatorius Linn. Abrus precatorius is known commonly as Rosary Pea, Jequirity bean, Indian bead, Buddhist Rosary bead, Seminole bead, Prayer bead, Jungle bead, Crab's eye, Weather plant, Love bean, Lucky bean, Ojo de pajaro, Indian liquorice . It's a little climbing plant that can be found all over India. Though all parts of the plant are deadly, the seed, which contains the active abrin, is the most lethal. Gunja seeds used to be very similar in weight. These seeds were used to measure by the Indians, and the measure was known as Ratti.

Morphology:

- It is tropical slender twinning climber having woody base.
- Leaves - Long pinnate leafleted leaves
- Flowers- pea like, long , purple, pink, yellowish and white in colour.
- Seeds- Egg shaped, bright scarlet red in colour , it is marked with a large black spot at one end . Rarely the seeds may be coloured white with black spots or maybe all white, black, yellow, or blue.

Vernacular Name:

- Marathi: Gunja
- Hindi: Ratti, Ghunghuchi,
- English: Indian liquorice, Jequirity, Rosary pea,
- Sanskrit: Gunja, Raktika, kakananti, Tamrika,
- Telugu: Guriginja,
- Gujarati: Chanothi

Types of Gunja :

It is two types-

1. Shweta Gunja
2. Rakta Gunja

Classification:

- Sushrut- Mool visha
- Kaiyadeva Nighantu- oshadhi varga
- Dhanvantari Nighantu- karveeradi varga
- Bhavaprakasha- Upavisha, Guduchyadi varga
- Rasashastra - Upavisha

- Agadtantra- Sthavara visha

Synonyms

- Rakta Gunja: Chudamani, Tamra, Kakachincha, Kakanthika Rati.
- Shweta Gunja: Shweta, Kakapiluka, Kakadani, Durmukha, Chakrika, Chakrashalya, Uhcata, Angaravalli, Billabushana.

Rasa Panchaka

- Rasa: Tikta, Kasaya
- Veerya: Usna
- Vipaka: Katu
- Guna: Laghu, Ruksha
- Karma: Kaphavatahara, Vrisya, Balya.

Shodhan of Gunja :

Method is prepare Pottali by keeping Gunja seeds and keep the Pottali in Dolayantra which contains Kanji or Godugdha and Swedana for 3 hours and dry it in sunlight.

Toxic plant part-

Seeds , Root, Leaves. But the most toxic part is a Seed.

Chemical constituents –

Seeds contain Abrin, a toxalbumin like-Ricin and its action resembles that of viper snake venom . In addition, some poisonous proteins - Abrine, N-methyl tryptophane, abraline (a glucoside), a lipolytic enzyme, abruccic acid, haemagglutinin are present

Mode of action:

Abrin is a potent gastrointestinal toxin, with one of its polypeptide chains (B) binding to the intestinal cell membrane and the other (A) entering the cytoplasm. Once within the cell, the A chain binds to the 60S ribosomal subunit, preventing elongation factor 2 from attaching, limiting protein synthesis and eventually killing the cell.

Signs & symptoms :

As per Ayurveda :

- Daurbalya (weakness)
- Rakt srava (bleeding)
- Tandra (fatigue)
- Moha(stupor)
- Gatra vrana (ulceration)

As per Modern Toxicology:

1. Ingestion of seed or extract:
 - GIT Irritation
 - Abdominal pain
 - Nausea and Vomiting
 - Diarrhoea
 - Rectal bleeding
2. Injection of extract :
 - Painful swelling
 - Necrosis
 - Vertigo
 - Arrythmia, Convulsion ,death .

Fatal dose: 90 -120 mg by injection
1-2 seeds by mouth
Fatal period: 3 - 5 days

Treatment:

Ayurvedic :
Meghanada (tanduliya) swarasa along with sharkhara.
Madhu, sharkara yukta ghrhitapana, cow milk.

Modern :

- ◆ Resuscitation: monitor and maintenance of ABC.
- ◆ Removal of unabsorbed poison
- ◆ Stomach wash with KMNO4 solution.
- ◆ Removal of absorbed poison –forced dieresis.
- ◆ Excision of the local part of injection .
- ◆ Anti-abrin an antiserum is to be used antidote.

Post-mortem appearances:

- Swelling and necrosis of site of injection.
- Congestion of mucosa of stomach

Medico-legal importance:

- Accidental poisoning:common
In children who, out of curiosity, chew beautiful attractive seeds
- Cattle poisoning
- Arrow poisoning

Conclusion:

Gunja (Abrus precatorius) is a poisonous plant that is stated in diverse Samhitas of Ayurveda under Sthavara Vanaspatik Visha. It is likewise stated in Upavisha Varga. All elements of this plant

are poisonous, but the seed is the maximum poisonous part. The seeds of Gunja plant are purple and black, because of its coloration it appears very appealing. Due to its ample availability in villages and its appealing coloration the kids of villages play with those appealing seeds and so accidental poisoning is pretty common amongst them. In the Ayurvedic concept, if poisonous vegetation are used after right purification techniques i.e. Shodhana process, they're beneficial in various types of diseases. So, there is a need to have greater information concerning its poisonous properties, its detrimental results and its Shodhana process, which performs a wonderful function to reduce its toxicity

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