

## GUNJA – THE ALLURING POISON

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## ABSTRACT

*Gunja* is one among the *upavishas* mentioned in *Ayurveda*. Due to its bright colored and attractive seeds, it is a common source of accidental poisoning especially in children. The majority of abrin poisoning cases involve ingestion of a small number of intact *Abrus* seeds resulting in mild symptoms & full recovery. But some cases may prove fatal. Prevention is better than therapy; hence increased public awareness of toxicity is the best method to avoid poisoning cases. The present review discusses the toxic effects of *gunja*, its management and the medico-legal aspects involved.

**Keywords:** *Gunja*, toxicity, poisoning, management.

## INTRODUCTION

The scientific name of *gunja*, *Abrus precatorius*, is derived from two Greek words, *Abrus*- meaning graceful, as it has beautiful flowers, and *Precor* which means to pray (as it is used to make garlands meant for prayers). In ancient India, its seeds were used by goldsmiths as they are fairly constant in weight i.e. about one-tenth of a gram. Hence the name *ratti*.<sup>1</sup> It is said to be the symbol of love in China. When powdered and mixed with *dhatura* it becomes highly toxic and makes it one of the most beautiful poisonous plants in the world. Ancient stories have mentioned the use of '*sutaris*' by Kings to kill their enemies. Also it is believed to have magical properties. Some used it as a means of *vashikaran*, in exorcism cases etc.<sup>2</sup> It is an irritant, organic, vegetable poison.<sup>3</sup> As per *Ayurveda*, it is considered as *sthavaravisha* and *moola visha*.<sup>4</sup> It is one among the *upavishas*.<sup>5,6</sup>

**Toxic principles:** Abrin, a toxalbumin, also

known as phytotoxin is described as a toxic protein and causes agglutination of RBCs and hemolysis. It is antigenic in nature and is therefore, capable of producing antibodies when injected into the body.

Other active principles include abrine (amino acid), abralin (glucoside), abricacid, glycyrrhizin (lypolytic enzyme) and N-methyltyrophan.<sup>7</sup>

**Toxico kinetics:** Due to its cytotoxic and neurotoxic action presents with various clinical presentation even with conjunctival exposure, due to its high dispersibility and absorptive rate. In addition, it also causes hemagglutination and fat depletion, due to fat splitting. Subcutaneous injection proves fatal with in very short duration.<sup>8</sup>

**Fatal Dose:** 60 to 120mg of abrin or 1 to 2 crushed seeds.<sup>9</sup>

**Fatal period:** 3 to 5 days.<sup>10</sup>

**Toxicity rating:** 5 to 6 (supertoxic).<sup>11</sup>

**Main risks and Target organs:** The main risks include severe gastroenteritis leading

to dehydration and shock. Ingested seeds can affect GIT, liver, spleen, kidneys & lymphatic system. Infusion of seed extracts can cause eye damage after contact.<sup>12</sup>

**Toxic symptoms:** Early features of toxicity include burning of the mouth and oesophagus, severe gastroenteritis with vomiting, haemetemesis, diarrhoea, melaena, abdominal pain, drowsiness, disorientation, weakness, stupor, convulsions, cyanosis and shock.<sup>13</sup> Later, oliguria can occur. Contact with the eyes can cause conjunctivitis and even blindness.<sup>14</sup>

**Diagnosis:** Diagnosis is made by the presence of typical manifestations following ingestion like gastroenteritis with risk of dehydration, haemetemesis and melaena. Drowsiness and convulsions may occur. Toxicological analysis of body fluids for the poison is not helpful. Plant material, seeds or remnants of seeds, vomitus & gastric aspirate should be collected in clean bottles for identification.<sup>15</sup>

**Prognosis:** Mortality is rare, if prompt, adequate and proper treatment is provided.<sup>16</sup>

**First Aid:** As a first aid, remove all seed particles from the mouth, induce vomiting and save it for identification. Make sure that the patient's airway is clear & there is adequate ventilation. If eyes are contaminated, wash the eyes thoroughly with running water for 10 mins.<sup>17</sup>

**Treatment:** General measures include Gastric Lavage with plain water or potassium permanganate or the use of activated charcoal.<sup>18</sup>

In case of oral poisoning, acid hydrochloric pepsin mixture and 10 percent sodium bicarbonate can be given as IV. In case of locally injected poisoning, the *suis* (needles) are to be dissected out.<sup>19</sup>

**Antidote:** Anti-abrin injection is said to be the antidote for the poisoning.<sup>20</sup>

**Household Remedy:** Juice of *Amaranthus spinosus* with sugar candy can be given.<sup>21</sup> The juice of *chavali* (*Rajmasha*) is given with sugar.<sup>22</sup>

**Medico Legal Importance:** Commonly used as cattle poison. For this purpose, the seeds are crushed with opium, dhatura, onion and water, ground to a paste and rolled to form needles around 15mm, dried in the sunlight till it becomes hard. 2-3 of these needles are kept in a hollow bamboo and blown to the buttocks of the animal. The animal becomes drowsy, unable to move, goes into coma, followed by convulsions and death. These needles are also used criminally and for homicide as well. Also used as arrow poison. Due to its alluring nature, accidental poisoning is common in children.

The seeds were used as birth control pills in the past. When taken internally, it disturbs the uterine function and prevents conception. Seeds are used as an abortifacient as well.<sup>23</sup>

**Postmortem findings:** Findings show inflammatory changes and congestion of the gastro-intestinal tract.<sup>24</sup>

**Shodhana:** Roots kept in the decoction of nut grass tubers (*Cyperus rotundus*) for an hour in intense sunlight for drying. Seeds should be crushed & tied in a piece of cloth in the form of *potali*. It should be cooked in *Dolayantra* by adding cow's milk for 6 hours. Then washed with warm water & dried.

The same procedure, if carried out in *kanji* for 3 hours also detoxify the *gunja* seeds.<sup>25</sup>

**Properties of purified seeds:** The *gunja* seeds are bitter, pungent and astringent in taste, pungent in the post-digestive effect and have hot potency. It possesses light, dry

and sharp attributes. It alleviates kapha and vata doshas.<sup>26</sup>

## CONCLUSION

One among the upavishas, gunja is a toxic plant. Due to its attractive seeds, it is always a source of accidental poisoning among children. Hence it is necessary to know its toxic effects and treatment aspects to avoid or treat poisoning cases due to gunja seeds.

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**Source of Support:** Nil

**Conflict of Interest:** None Declared