International Research Journal of Ayurveda & Yoga
Vol. 5 (11),81-87, Nov,2022
ISSN: 2581-785X;https://irjay.com/
DOI: **10.47223/IRJAY.2022.51111**

Medicinal Value of Poisonous Plants - A Review Article

Rajni Devi,[1] Munna Lal Prajapati,[2] Rajveer Sason,[3] Sanjeev Kumar[4]

1-Post Graduate Scholar, P.G Dept of Agada Tantra Evam Vidhi Vaidyaka, R.G.G.P.G Ayurvedic College and Hospital Paprola, Himachal Pradesh, India
2-Reader, P.G Dept of Agada Tantra Evam Vidhi Vaidyaka, R.G.G.P.G Ayurvedic College and Hospital Paprola, Himachal Pradesh, India
3-Lecturer, P.G Dept of Agada Tantra Evam Vidhi Vaidyaka, R.G.G.P.G Ayurvedic College and Hospital Paprola, Himachal Pradesh, India
4-Lecturer, P.G Dept of Ras Shastra R.G.G.P.G Ayurvedic College and Hospital Paprola, Himachal Pradesh, India

Article Info

Article history:
Received on: 20-09-2022
Accepted on: 18-11-2022
Available online: 30-11-2022

Corresponding author-
Rajni Devi, Post Graduate Scholar, P.G Dept of Agada Tantra Evam Vidhi Vaidyaka, R.G.G.P.G Ayurvedic College And Hospital Paprola, Himachal Pradesh, India

Email: rajnikeor123@gmail.com

ABSTRACT:

Background : Since the *Ayurveda* is a centre for many therapeutic herbs, However, certain plants are poisonous by nature, making it impossible to consume them without purification . If used properly, these deadly plants are incredibly beneficial. Various techniques are suggested in *Ayurvedic* writings for the *Shodhana* of toxic plants. Many ailments, such as *Pandu*, *Jwara*, *Aaamvata*, etc., are treated with plants like *Vatsanabha. Kuchla* is used to treat a number of illnesses, including *Grahani*, *Unmada*, *and Adhmaan*. Both humans and animals have frequently been observed ingesting these toxic plants. These poisonous plants have the potential to cause accidental, homicidal and suicidal deaths.

Aim: By learning about the medicinal properties of dangerous plants, this project aims to raise public knowledge about them.

Material And Method: consulted from a range of databases, books, websites, and publications.

Result: Poisonous plant classification was done. These deadly plants's typical chemical components are outlined. Their mode of action has been documented. The *Shodhana* of these toxic plants have been described These poisonous plants have been used therapeutically.

Discussion and Conclusion : This entire investigation came to the conclusion that, when used properly, deadly plants can have medical value. These toxic herbs are employed in a variety of compositions with special care. The knowledge of toxicity and usefulness of the poisonous plants are the main concern in present day scenario.

Keywords : Poisonous plants, *Ayurvedic*, *Shodhana*, Toxicity, medicinal value

INTRODUCTION

In India different plants are used for the medicinal purposes. Some of them are poisonous plants which also have medicinal values. After proper purification they are used in many *Ayurvedic* formulations. It is mandatory to have proper knowledge of the poisonous plants which when used in well-mannered way, acts as a potent therapeutic agent. The toxicity could be in the form of higher concentration of the drug. The toxicity of the

poisonous plants also varies in its form like some plant seeds are non poisonous if ingested directly and are poisonous if taken in chewable form. The poisoning could be in the form of ingestion, inhalation, absorption, contact poisoning etc[1]. Most of the plants are very beneficial because of their therapeutic use, while others are poisonous to the living being due to the presence of harmful by-products. The nature of the toxicity of the plants depends upon many factors like chemical, physical biological and environmental. The toxicity of the plants can be grouped into many groups. These poisonous plants could be acts as a cardiac poison, spinal poison, irritant poisons, deliriants, narcotic poisons etc. The whole part of the plant could act as a poisonous or sometimes it is just leaves, flowers, fruits, seeds, bark, shoots which acts as a poisonous part. Most of the individuals are not aware to the toxic nature of the plants around them. Due to which the toxicity is seen among those individuals who consume them accidently. In animals the poisoning is also reported because of accidental consumption of these poisonous plants. The best way to minimize the accidental poisoning is by educating the people about the harmful effects of poisonous plants on them and on animals. This study helps to gain the knowledge of poisonous plants that are responsible for their toxicity to the human beings and the animals. The main focus of this study is to gain the information on the medicinal properties of the poisonous plants[2]

MATERIALS & METHODS

The systematic review was done from various databases, books and official websites of concerned departments. Searches were re- crossed from original articles.

Some Poisonous Plants mentioned in *Ayurvedic* Texts : *Kuchila, Ahifena, Jayapala, Dhatura , Bhaanga, Gunjja, Bhallataka, Arka, Snuhi, Langli, Karveera, Vatsnabha*[3]

Medicinal Use

Several plant-derived medications, such as reserpine and atropine, have been employed to treat various illnesses by contemporary medicine. However, due to their toxicity, many of them have been removed or are no longer in use. However, ancient medicine has used all such medicines for centuries in their raw form or after a suitable process of purification and detoxification known as *shodhana.* Furthermore, Ayurvedic science classifies many herbal medications as visha (poison) or *upavisha* (moderately dangerous) and employs them after *shodhana.* According to the literature, the Chinese method of detoxification reduced the toxicity and increased the potency of nux vomica seeds. They also attributed it to qualitative and quantitative changes in the phytochemical profile of the seeds as a result of the detoxification process. Charaka recognised the importance of comprehensive understanding of herbs and their therapeutic applications. According to Charaka, if a fatal poison is delivered correctly, it can become a very good medication.

DISCUSSION

In this review article the study on poisonous plants, their toxicity, active principles, part used, has been studied. Purification methods which have been mentioned in *Ayurvedic* texts also has been recorded. The mechanism of action of these poisonous plants, as well as their role in curing a variety of diseases also has been reported. After proper purification, the formulations of these poisonous plants are being used in many ailments. These drugs give tremendous results in the disorders of every body system. Many poisonous plants have some important applications. Like strychnine is used in surgery as a relaxant; belladonna's alkaloid atropine is used in ophthalmology to dilate the pupils of the eyes; opium poppy produces the painkiller morphine. Some of the poisonous plants are being harvested due to their high medicinal values and because of their overexploitation they are categorized as threatened species. Therefore, it is urgent need to develop conservation methods for these poisonous plants as well as aware the people about their toxicity. On the other hand, the high demand of some poisonous plants has caused their overexploitation in their natural habitat and they are facing a high risk of extinction. There is need for the better understanding of the detailed mechanism of action of these poisonous plants, as well as their role in the management of the diseases. Hence, there is a requirement of policy for the conservation of these poisonous plants.

CONCLUSION

This study conclude that by doing proper *Shodhana* process these poisonous plants can be used in the diseases. These toxic herbs are employed in a variety of compositions with special care. Many Ayurvedic preparations which are made with these plants shows great results in multiple disorders. The proper awareness of toxicity and usefulness of these poisonous plants are the main concern in present day scenario.

Acknowledgements - Nil
Conflict of interest - None
Source of finance & support – Nil

ORCID

Rajni Devi , https://orcid.org/ 0000-0001-6836-2604

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How to cite this article: Devi R, Prajapati M.L, Sason R, Kumar S "Medicinal Value Of Poisonous Plants - A Review Article" IRJAY.[online]2022;5(11); 81-87.Available from: https://irjay.com
DOI link- https://doi.org/10.47223/IRJAY.2022.51111

Table 1 Shows General properties of the toxic plants

PLANT	GENERAL DESCRIPTION	MECHANISM OF ACTION
Kuchila	BOTANICAL NAME : Strychnos nuxvomica Linn. FAMILY : Loganiaceae POISONOUS PART : The ripe fruit contains seeds which are poisonous. ACTIVE PRINCIPLES : Strychnine- Alkaloid, Brucine- Alkaloid, Loganin - Glucoside	Strychnine competitively antagonizes the inhibitory neurotransmitter glycine by blocking its post – synaptic uptake by brainstem and spinal cord receptors. The inhibiting effect of glycine is reduced and nerve impulses are triggered with lower levels of neurotransmitters[4].
Ahifena	BOTANICAL NAME : Papaver somniferum Linn FAMILY : Papaveraceae POISONOUS PART : Unripe fruit capsule, latex juice ACTIVE PRINCIPLES : A. Phenanthrene Derivatives i Natural Alkaloids : Morphine, Codeine, Thebaine ii Semi-synthetic Opioids : Hydromorphone, diacetylmorphine (heroin, brown sugar or smack), oxymorphone and oxycodone. iii Synthetic Opioids : Methadone, fentanyl, pentazocine, tramadol and meperidine (pethidine) B. Benzyl – isoquinolone derivatives i. Papaverine ii Noscapine	Opioids act by binding to opioid receptors on neurons distributed throughout the nervous system and immune system. Inhibition of synaptic neurotransmission in the CNS and PNS is the outcome of opioid receptor activation[5]
Jayapala	BOTANICAL NAME : Croton tiglium Linn. FAMILY : Euphorbiaceae POISONOUS PART: Entire plant is poisonous but seeds contain the highest level. ACTIVE PRINCIPLES : Crotin (a toxalbumin), Crotonoside (a glycoside)[6]	The toxalbumin present in the seeds is a toxic protein that disable ribosomes and thereby inhibit protein synthesis. It is antigenic in nature, it agglutinates cells and causes haemolysis and cell destruction[7].
Datura	BOTANICAL NAME: Datura metal Linn. FAMILY : Solanaceae POISNOUS PART : All parts of plants are poisonous (highest concentrations of alkaloids are found in roots and seeds) ACTIVE PRINCIPLES : Hyoscine, Hyoscyamine, Atropine	Atropine and hyoscine block the acetylcholine receptor and produces sympathomimetic or parasympatholytic actions. CNS stimulant in early phase, but later CNS depression occurs, especially of the respiratory center[8].
Bhaanga	BOTANICAL NAME : Cannabis sativa Linn. FAMILY : Cannabinaceae POISONOUS PART : Whole plant is poisonous. ACTIVE PRINCIPLES : Fat soluble oleoresin cannabinol, the active form being (delta -9 tetrahydrocannabinol (THC) . Additionally, it has benzopyrene, a substance linked to cancer that is also present in tobacco.	THC which binds to anandamide receptors in the brain may have stimulant, sedatives or hallucinogenic actions, depending on the dose and time after consumption[9].

Gunjja	BOTANICAL NAME: Abrus precatorius Linn. FAMILY: Fabaceae POISONOUS PART: All parts of the plant are poisonous. But the seeds are highly toxic. ACTIVE PRINCIPLES : Abrin (a thermolabile toxalbumin), Abrine (An amino acid) Abralin (a glycoside)[10]	Abrin is a toxalbumin that causes cell death by preventing protein synthesis[11].
Bhallataka	BOTANICAL NAME :Semecarpus anacardium Linn. FAMILY : Anacardiaceae POISONOUS PART: Seeds, juice ACTIVE PRINCIPLES : Bhilawanol, Semecarpol, Anacardic Acid, Anacardoside[12]	It causes irritation & inflammation to mucus membrane of GIT with vesication[13].
Arka	BOTANICAL NAME: Calotropis procera (Ait) R. Br. FAMILY : Asclepiadaceae[14] POISONOUS PART: All parts of the plant are toxic, the stems and roots being more toxic than the leaves[15]. ACTIVE PRICIPLES: Calotoxin, calactin, gigantin and calotropin[16].	Calotropin inhibit the sodium – potassium pump, Na+/ K+- ATPase. Inhibition of this enzyme in cardiac tissue is proposed as the receptor for calotropin and cardiac glycosides in general, and this is responsible for the toxic effects[17].
Snuhi	BOTANICAL NAME : Euphorbia neriifolia Linn. FAMILY : Euphorbiaceae POISONOUS PART : Latex ACTIVE PRINCIPLES : Latex- Euphol, neri foliol, neriifolene[18].	It causes irritation & inflammation to mucuc membrane of GIT & skin with vesication[19]
Langli	BOTANICAL NAME: Gloriosa superba Linn. FAMILY: Liliaceae POISONOUS PART: Root – All part is poisonous but root is most. ACTIVE PRINCIPLES: Colchicine , Gloriocine Superbine[20].	Colchicine inhibit the polymerization of microtubules and formation of mitotic spindle in cell division. Therefore the rapidly dividing cells of the intestinal mucosa are severely affected[21].
Karveera	BOTANICAL NAME: Nerium odorum Mill. FAMILY: Apocynaceae POISONOUS PART: All parts of the plant are poisonous. ACTIVE PRINCIPLES: Neriodorin, neriodorein, karabin	Neriodorein causes muscular twitching and tetanic spasm. Karabin has similar effects on the heart and spinal cord to digitalis and strychnine[22].
Vatsnabha	BOTANICAL NAME: Aconitum ferox Wall ex Seringe FAMILY: Ranunculaceae POISONOUS PART: Root and root tubers ACTIVE PRINCIPLES: Aconitine, mesaconitine, hypaconitine, pseudo- aconitine, indaconitine, aconine	Due to their effects on the voltage-sensitive sodium channels of the cell membranes of excitable tissues, aconitine and related alkaloids are known as. Aconitine first stimulates and then paralyzes the peripheral termination of sensory and secretory nerves, CNS, and nerves of the myocardium, skeletal and smooth muscles[23].

Table 2 Shows Toxic plants its purification with some medicinal properties

PLANT NAME	SHODHAN	MEDICINAL USE
Kuchila	*Kaanji* *Ghee* *Godugdha*[24]	Antioxidant, Anti allergic, Anti inflammatory,Antimicrobial,Anticancer,Antipyretic[25]
Ahifena	*Aardraka Swarasa*[26]	Analgesic, Antitussive, Anti- diarrheal[27]
Jayapala	*Godugdha*[28]	Hair loss, Haemorrrhoids, Abscess[29]
Datura	*Godugdha* *Gomutra*[30]	Anticancer, Antiproliferative, Antifungal Antibacterial, Antioxidant[31]
Bhaanga	*Goghruta* Decoction of Acacia arabica[32]	Anti- inflammatory, Anticonvulsive, Analgesic, antihypertensive, Antioxidant[33]
Gunjja	*Godugdha* *Kaanji*[34]	Anti- diabetic, Anti- cancer, Anti- malarial Anti- fertility[35]
Bhallataka	Brick powder Coconut water[36]	Antioxidant, Anti- carcinogenic, Antimicrobial[37]
Arka	*Tamrind rasa*[38]	Analgesic, Antitoxic, Antifertility, Anticonvulsant[39]
Snuhi	*Tamrind rasa*[40]	Antiinflammatory, Analgesic, Antioxidant, Aphrodisiac[41]
Laangli	*Gomutra*	Anti- bacterial, Anti- fungal,Anti-anxiety,Anthelmintic[42]
Karveera		Antipyretic, Antimicrobial Anthelmintic, Anti- leprosy[43]
Vatsnabha	*Gomutra* *Godugdha* *Goat's milk*[44]	Anti- arrhythmic, Analgesic Anti- epileptic,Antimicrobial[45]