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COMMON POISONOUS PLANTS OF GUJARAT: A REVIEW

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ABSTRACT

This review has the precedency on the toxicity of plants belonging to Gujarat. The realm of plants staggers the whole world. Some plants help in restoring health, some are carnivorous while others can be toxic. There is no simple way to tell which plants are toxic. The poisons can be found in certain parts, or sometimes throughout the plants. Plant toxins come in the list of commonest poisoning agents of India. The harm caused by these poisonous plants is often not serious, and is primarily limited to curable gastrointestinal irritation or mild effects of the nervous system. However, deaths resulting from consumption of parts of highly toxic plants have led to death. The review focuses on the common poisonous plants of the Gujarat state, chemical constituents and human specific physiological effects of poisoning in relation to each plant. The review has been presented in a tabular form.

KEYWORDS: Toxic plants, Flowering Plants, Gujarat state, Defence, Chemicals, Symptoms, Pharmacological activities, Biological activities.

1. INTRODUCTION

Plant kingdom has an astounding range of plants where some are carnivorous, some cure diseases while others can actually be deadly. Poisonous plants which are also referred as toxic plants come on the boundaries between the harmful and the harmless plants [S Ahmad *et. al.*, 2012]. There is no perfect definition that can define poisonous plants but one can say that their consumption is harmful or can be lethal. The contents of some specific secondary metabolites in higher concentration makes the plant toxic. For example, foxglove and oleanders are known to contain high amounts of cardiac glycosides and therefore they are highly toxic in

nature. Some of the poisonous plants are found universally whereas others are found in specific regions. This paper has made an attempt to list the top ten common poisonous plants of the Gujarat State. The Scientific name, common name, growth habit, toxic parts, chemical constituents and occurrence of the plants are summarised in **Table 1** and their Pharmacological activities and Biological activities are summarised in **Table 2.**

Table 1: Summary of the poisonous plants of the Gujarat state.

Sr. No.	Scientific Name and Family	Common/Local Name	Growth Habit	Toxic Parts	Chemical Constituents	Occurrence	References
1.	*Datura Sp.* (Solanaceae)	Angel's trumpet, Devil's trumpet, Thorn apple, Jimsonweed, Moonflower	Temperate and Tropical regions of the globe	Entire Plant	Scopolamine, Daturadiol, Daturalone, Factusiene, Hyosiene, Hyoscyamine, Fastusic acid Fastusiedne, Daturanolone, Datumatine, Niacin and Vit. C	occasionally found on disturbed or fallow land	Shaival M., 2018 Renuka P. *et. al.*, 2018 AE Al-Snafi *et. al.*, 2017
2.	*Calotropis Sp.* (Asclepiadaceae)	Giant milkweed, Crown flower, Madar, Aakando, Akanda	Tropical and Sub-tropical regions	Latex	Flavonoids, Cardiac glycosides, Sterols, Teraxasterol, Gigantin, Giganteol, Isogiganteol and β-sitosterol, Alkaloids Cardenolide, Triterpinoids, Resins, Anthocyanins, Tannins, Saponins	in dry places	Chandrawat P. *et. al.*, 2017 CJ Palejkar *et. al.*,2012 SRM Ibrahim *et. al.*, 2015
3.	*Abrus Sp.* (Fabaceae)	Jequirity bean or Rosary pea or Crab's eye or Love pea or Prayer bead or Gunja or Gumchi	Tropical and Sub-tropical regions	Seeds	Abrol, Abrasine, Precol, Essential amino acids like Serine, Alanine, Valine, Choline and Methyl ester, Abrine, Abraline, Abrasine, Abricin, Abrin, Abrusgenic- acid, Abrusgenic-acid- methyl-ester, Abruslactone, Abrussic-acid, Anthocyanins, Calcium, Campesterol, Choline, Cycloartenol, Delphinidin, Gallic-acid, Glycyrrhizin, Hypaphorine, N, N- dimethyl-tryptophan, N,N-dimethyltryptophan-metho-cation-methyl-ester, P- coumaroylgalloyl glucodelphinidin, Pectin, Pentosans, Phosphorus, Delphinidin, Gallic-acid, Glycyrrhizin, Picatorine, Polygalacturonic-acids, Precasine, Precatorine and Protein trigonelline.	very common wild herb	Sunita V., 2016 Bhumi G. *et. al.*, 2015 N Boggula *et. al.*, 2013

4.	*Lantana Sp.* (Verbenaceae)	Big-sage, Wild-sage, Red-sage, White-sage, Tickberry, West Indian lantana and Umbelantena	Tropical regions	Berries	Tannin, Alkaloids, Catechin, Steroids, Saponins, Phenol, Anthraquinone, Protein, Terpenoids, Flavonoids, Glycosides, Different reducing sugars and Essential oils which consists Sabiene, 1,8-Cineole, β-caryophyllene, α-humulene.	cultivated/self-grown	RS Mane *et. al.* 2019
5.	*Parthenium Sp.* (Asteraceae)	Feverfew, Featherfew, Altamisa, Bachelor's button, Featherfoil, Febrifuge plant, Midsummer daisy, Nosebleed, Santa Maria, Wild Chamomile, Wild quinine, Chamomile grande, Bitter weed, White top, Star weed	Sub-tropical regions	Entire Plant	Sesquiterpene lactones (SQL), Hysterin, Ambrosin, Quercelagetin 3,7-dimethylether, 6-hydroxyl kaempferol 3-0 arabinoglucoside, Fumaric acid, P-hydroxy benzoin, Vanillic acid, Caffeic acid, P- Courmaric, Anisic acid, P-anisic acid, Chlorogenic acid, Ferulic acid, Sitosterol and some unidentified alcohols.	self-grown	S Patel, 2011 Anil P., 2011
6.	*Nerium Sp.* (Apocynaceae)	Kaner, Oleander	Tropical and Sub-tropical regions	Entire Plant	Neriine, Digitoxigenine, Amorphane, 1.8-Cineole, α-pinene, Calarene, Limonene, β-phellandrene, Terpinene-4-ol, Sabinene, Isoledene, 3-Carene, Humulene, β-Pinene, Cymen-8-ol, α-tocopherol, Oleandrin, Ursolic acid and Quercetin	cultivated/Self grown	E. Derwich *et. al.*, 2010 G. Zibbu *et. al.*, 2010

7.	*Jatropha Sp.* (Euphorbiaceae)	Ratanjyot, Nettlespurge	Tropical regions	Entire Plant	Sesquiterpenoid germacrene D-4-ol, Hexahydrofarnesylacetone, Lanosterol, (-) – globulol, Humulane-1,6-dien-3-ol, Phytol, 2,6-di-tertbutyl-p- cresol, Cadinene, Heptadecanoic acid, Linoleic acid, Linoleic acid, Oleic acid, Palmitic, δ-cadinene, Tetradecanal, Cubenol	cultivated/Self grown	SA Aboaba *et. al.*, 2015 XP Zhang *et.al.*,2009
8.	*Ricinus Sp.* (Euphorbiaceae)	Gandharvahasta, Vatari, Rubu, Urubu, Pancangula,	Tropical regions	Seed coat	Rutin, Gentistic acid, Quercetin, Gallic acid, Kaempferol-3-O-beta-d-rutinoside, Kaempferol-3- O-beta-d-xylopyranoid, Tannins, Ricin A, B & C, Ricinusagglutinin, Indole-3-acetic acid and Ricinine	Cultivated and found in the Wild	M Rana *et. al.*, 2012
9.	*Plumeria Sp.* (Apocynaceae)	Temple tree, Champa	Tropical and subtropical-regions	Entire Plant	Plumieride, Stigmast-7- enol, Lupeol carboxylic acid, Lupeol acetate and Ursolic acid, Fulvoplummierin, Plumericin, Isoplumericin, β-dihydroplumericin and β-dihydroplumericinic acid, Primary alcohols, Geraniol, Citronellol, Farnesol, Phenylethyl alchol, Aldehyde and Ketones	Cultivated/Self grown	Ashraf MD F. *et. al.*, 2012
10.	*Thevetia Sp.* (Apocynaceae)	Be-still tree, Captain Cook tree, Dicky plant, Foreigner's tree, Lucky nut, Mexican oleander, Still tree, Yellow oleander, Currant-tree	Tropical regions	Entire Plant	Tannins, Saponin, Flavonoids, Alkaloids, Quinones, Glycosides, Terpenoids, Triterpenoids, Phenols, Coumarins, Cyanine, Cardiac glycosides, Proteins and Carbohydrates	Self-grown	KM Sowjanya *et. al.*, 2013 Seetharaman S. et. *al.*, 2017

Table 2: Summary of biological and pharmacological activities of the poisonous plants.

Sr. No.	Scientific Name and Family	Effects and Symptoms	Pharmacological Activity and Biological Activity	References
1.	*Datura Sp.* (Solanaceae)	vomiting, dryness of mouth, initial stimulations of the C.N.S with excitement and restlessness followed by subsequent depression, delirium and coma	anti-bacterial, anti- cancer, anti-microbial, anti-fungal, nematocidal activities, asthma, and contact toxicity	Renuka P. *et. al.*, 2018 HJ Altameme *et. al.*, 2015 AE Al-Snafi *et. al.*, 2017 LR Singh *et. al.*, 2013
2.	*Calotropis Sp.* (Asclepiadaceae)	nausea, vomiting, diarrhoea	anti-diarrheal, anti- bacterial, anti-inflammatory, anti- pyretic, hepatoprotective, cytotoxic, and insecticidal activities	Chandrawat P. *et. al.*, 2017 G. Parihar *et. al.*, 2016 CJ Palejkar *et. al.*, 2012
3.	*Abrus Sp.* (Fabaceae)	nausea, vomiting, convulsions, liver failure, and death	anti-diabetic, anti- spasmodic, anti-fertility, anti-malarial, anti- bacterial and neuromuscular blocking activities	Bhumi G. *et. al.*, 2015 N Boggula *et. al.*, 2013 Sunita V., 2016
4.	*Lantana Sp.* (Verbenaceae)	loss of appetite, diarrhoea, jaundice, oedema of the affected parts, serous fluid oozing out from affected skin, lesions, itching and removal off of the superficial layer of skin	anti-microbial, anti- motility, anti-ulcerogenic, anti- hyperglycaemic, anti-urolithiasis, anti- inflammatory and haemolytic activities	H. B. Patel *et. al.*, 2012 RS Mane *et. al.*, 2019
5.	*Parthenium Sp.* (Asteraceae)	skin inflammation, itching, asthma, allergic rhinitis, hay fever, black spots, burning and blisters around eyes, diarrhoea, erythematous eruptions, breathlessness and choking	anti-inflammatory, anti- pyretic, anti-cancer, anti- spasmodic and cardiotonic activities	S Patel, 2011
6.	*Nerium Sp.* (Apocynaceae)	irregular heart rate, irregular circulation or the central nervous system i.e. drowsiness, collapse and even coma and gastrointestinal system i.e. vomiting, diarrhea, and abdominal pain	antinociceptive, antimicrobial, anticancer, locomotor activities and diuretic effects	E. Derwich *et. al.*, 2010 G. Zibbu *et. al.*, 2010
7.	*Jatropha Sp.*	nausea, vomiting, abdominal pain, burning	anti-inflammatory, analgesic, anti-	Apurba S. A. *et. al.*, 2013

	(Euphorbiaceae)	sensation of the throat, hyper salivation, headache, dizziness, myosis, lethargy, diarrhoea and dehydration	diarrheal and neuropharmacological activities,	SA Aboaba *et. al.*, 2015 Yerramsetty N *et. al.*, 2013
8.	*Ricinus Sp.* (Euphorbiaceae)	poultice or fomentation on sores, boils and swellings, jaundice, vomiting	application to the breastsof women to increase the secretion of milk, in the form of a paste for toothache, anti-diabetic, anti -microbial, anti-fungal, anti-oxidant, activities, anti-insecticidal, anti-inflammatory, anti-tumour, anti-nociceptive, anti-asthmatic, anti-fertility, analgesic, cytotoxic, free radical scavenging and bone regeneration activities	M Rana *et. al.*, 2012
9.	*Plumeria Sp.* *(*Apocynaceae)	blood disorder, vomiting and abdominal pain	anti-inflammatory, anti-pyretic, anti-nociceptive, anti-oxidant, anti- microbial and free radical scavenging activities	Ashraf MD F. *et. al.*, 2012
10.	*Thevetia Sp.* *(*Apocynaceae)	nausea, vomiting, abdominal pain, diarrhoea, cardiac dysrhythmias and hyperkalaemia	anti-microbial, anti-inflammatory, anti-oxidant, anti-cancer, anti-fungal activities	KM. Sowjanya *et. al.*, 2013 Seetharaman S. *et. al.*, 2017

3. CONCLUSION

On one hand the poisonous plants bear high amount of toxins while on the other hand they too have medicinal properties. It is impossible for plants to move from one place that is why to protect themselves from micro-organisms, insects and animals they have toxins. Like the other states of India, the state of Gujarat is also having many toxic plants. In this review only top 10 of the toxic plants have been listed with certain important details.

This review will be certainly helpful for further studies on the toxic plants of Gujarat.

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