

Survey of Poisonous Plants of Gondia District of Maharashtra, India

B. K. Mendhe¹, A. K. Aney², M. P. Nandeshwar¹

¹Shankarlal Agrawal Science College Salekasa, District Gondia (M.S.)

²SSES Amravati's Science College Pauni, District Bhandara (M.S.)

mendhebk@gmail.com

Abstract:

The survey of poisonous plants belonging to various families of angiosperms from Gondia district of Maharashtra state was undertaken during 2013-2014. The present paper deals with the toxic range, poisonous parts and the identification of the toxic chemical constituents available in these plants. Based on the available literature on clinical symptoms and the traditional information gathered from the local people, about 46 angiospermic plants belonging to different angiospermic families have been identified and recorded as poisonous plants.

Keywords: Poisonous plants, Clinical symptoms, toxicity, Gondia

Introduction:

Since time immortal human being explored and exploited plants for fulfilling their various fundamental needs. Since ancient civilization, the plants were used not only for the fulfillment of food, clothing and shelter but also one of the major sources of various kinds of crude medicine by the local people. Different kinds of chemical constituents were extracted in crude way by the ancient people and were used for curing various diseases. In modern age, the herbal drugs obtained from different parts of the plants are widely used for the treatment of various ailments. The pharmaceutical industry is solely depends on different kinds of chemical constituents obtained from the plants. Under certain circumstances, some of these plants has also turned and observed to be poisonous for the man and his domestic animals. They were also observed to be responsible for the death of the consumer animals including man. Under all or certain circumstances, the whole plant or the parts thereof, in any manner, consumed or brought into contact with an organism exerts the harmful effects or even death either immediately or by the cumulative action of the toxic property due to the presence of known or unknown chemical substances in it and not by mechanical action, are referred to as poisonous plants (Chopra *et al.*, 1984).

Geographically, Gondia is one of the eastern districts of Maharashtra state, having shared with the border of Madhya Pradesh. It has included 9 talukas. Major part of the district is occupied by evergreen, subtropical and deciduous types of forests, and is blessed with the diversity of plants belonging to various groups.

Material and Methods:

The survey was undertaken during 2013-2014 in various parts of the district. The survey was intended to collect the information and identify various poisonous plants from different talukas of the district. Efforts have been made to gather the relevant information from the villagers about various plants of the locality. We preferred the old aged people for the collection of specific information. The intoxicant incidences among the children were also surveyed from different daily news papers. The collected information was cross-checked with available and earlier published literature. The specimens of the poisonous plants were preserved in the form of herbarium. Finally, the all the properly identified plants were alphabetically arranged in accordance with their botanical names and the information was tabulated along with the poisonous parts, clinical symptoms, toxicant and the toxicity range (Table: 1.).

Result and Discussion:



In the present survey in all 46 species of poisonous plants belonging to 25 families have been identified and recorded from Gondia district. Highest number of different 8 poisonous species recorded was from family Euphorbiaceae, followed by Papilionacea and Solanaceae, each with 4 species of poisonous plants. So far as the toxic action is concern, 10 plants were found to be responsible for skin irritation and inflammation. Gastrointestinal irritation was caused by 9 plant species, while 9 plant species were identified causing diarrhea. Vomiting, hallucination, cardiac arrest, nerve paralysis, abortifacient, headache, muscular cramps, eye's injury and respiratory arrest were the other prominent problems caused by some of the poisonous plant species recorded in this survey. The poisonous parts of majority of plants identified were latex, fruits, seeds, corm, bulb and leaves. External injuries after contact with the plants was generally found to be caused by stinging hairs and the variety of types of latex exuded from different parts of the plants. Gastrointestinal irritation was reported to be caused due to presence of calcium oxalate crystals and latex present in corms and tubers of some of the plants surveyed. Different poisonous plants exhibited varied range of toxicity. Sixteen plants, out of total identified poisonous plants were found to be highly toxic and have potential to the death of different animals including man. Minor toxicity with observable clinical symptoms could be attributed to 20 plants, while remaining 10 were observed to be responsible for causing dermatitis. Some of the plants enlisted and identified as poisonous plants were reported to be harmful to cattle.

Table.1-Showing the list of identified poisonous plants along with their family, local names, poisonous parts, the available toxicant and the toxicity range, from Gondia district of Maharashtra state.

Sr. No.	Botanical Name	Family	Local Name	Poisonous part	Symptoms	Toxicant	Toxicity range
1	<i>Abrus precatorius</i> L.	Papilionaceae	Gujna	Seeds	Convulsion, vomiting	Abrin	M
2	<i>Argemonemexicana</i> L.	Papaveraceae	Pivladhotra	Seeds, Latex	Dyspnoea	Berberine, Protopine, Sanguinarine	M
3	<i>Amorphophalluspaeoniifolius</i> (Dennst.) Nicols	Araceae	Suran	Leaves, Corm	GI irritation	insoluble calcium oxalate crystals	m
4	<i>Balanitesaegyptiaca</i> (L.) Dell.	Balanitaceae	Jamalgota	Bark, Seeds	Diarrhea and Dysentery		m
5	<i>Calotropis gigantea</i> (Ait.) R. Br.	Asclepidaceae	Rui	Latex	Injuries to eyes	-	M
6	<i>Calotropis procera</i> (L.) R. Br.	Asclepidaceae	Rui	Latex	Injuries to eyes	-	M
7	<i>Cannabis sativa</i> L.	Cannabaceae	Ganja	Leaves	Hallucination		m
8	<i>Catharanthus pusillus</i> (Murr.) G. Don*	Apocynaceae	Ran sadafuli	Whole plants	Madness in cattle		m
9	<i>Citrullus colocynthis</i> (L.)	Cucurbitaceae	Indrayani	Fruits	Gastrointestinal disorders		M
10	<i>Cleistanthus collinus</i> (Roxb.)	Euphorbiaceae	Garadi	Leaves, fruits	Neurovascular weakness	Diphyllin, Cleistanthin A and B	m
11	<i>Cicer arietinum</i> L.	Papilionaceae	Harbhara	Leaf	Dermal irritation	Malic acid	D
12	<i>Colocasia esculenta</i> (L.)	Araceae	Alu	Corm	GI irritation	insoluble calcium oxalate crystals	
13	<i>Crinum viviparum</i> (Lam.) R.	Amaryllidaceae	Kardali	Tuber			M
14	<i>Crotalaria spectabilis</i> Roth*	Papilionaceae		Leaves	Hepatotoxicity	Pyrrrolizidine alkaloides	m
15	<i>Datura metel</i> L.	Solanaceae	Dhotara	Fruit, seeds	Tremors, hallucinations, convulsions, coma	Atropine, hyoscyanine,	M
16	<i>Dioscoria bulbifera</i> L.	Dioscoreaceae	Mataru	tubers	Paralysis	Dioscorine	M

17	<i>Dioscoria hispida</i> Dennst.	Dioscoreaceae		Tubers	Inflammation Of mucus membrane	Dioscorine	m
18	<i>Drimys indica</i> (Roxb.) Jessop	Utricaceae	Janglikanda	Bulbs	Convulsion of heart ,nausea		m
19	<i>Euphorbia tricullis</i> L.	Euphorbiaceae		Latex	irritation and inflammation		D
20	<i>Euphorbia ligularia</i> Roxb.	Euphorbiaceae	Katethuwa	Latex	irritation and inflammation		D
21	<i>Gloriosa superba</i> L.	Liliaceae	Kardali	Tuber, Root	Abortifacient	Colchicine, Gloriosine Glucosine	M
22	<i>Hibiscus cannabinus</i> L.	Malvaceae	Ambadi	Fruits stellate hairs	Acute skin irritation		D
23	<i>Lathyrus sativus</i> L.	Papilionaceae	Lakh	Seeds	Nuerolathyrism	Beta-N-oxaly amino-L-alanine	M
24	<i>Laportea interrupta</i> (L.)	Utricaceae		Hairs	Skin irritation	Formic acid	D
25	<i>Leucaenalisiliqua</i> (L.) *	Mimosidae	Subabul	Leaves, fruits	hypothyroidism and alopecia in animals	Mimosine	m
26	<i>Jatropha curcas</i> L.	Euphorbiaceae	Chandarjot	Seeds	diarrhoea	Curcin	M
27	<i>Jatropha gossypifolia</i> L.	Euphorbiaceae	Chandarjot	Seeds, latex	Diarrhea, eye injury	curcin	M
28	<i>Ipomoea carnea</i> Jacq var. <i> fistula</i> *	Convolvulaceae	Sadasawli	Leaves	Ataxia, head tremors, nystagmus	Swainsonine, calyptegine glycosidase inhibitors	m
29	<i>Lantana camera</i> L.*	Verbanaceae	Haldi-kunku	Leaves	appetite, ruminal stasis, diarrhoea and severe depression	pentacyclitriterpene acids	m
30	<i>Melia azadirachta</i> L.	Meliaceae		Berries	vomiting, diarrhoea, muscle tremors and convulsions in children		M
31	<i>Mucuna pruriens</i> (L.) DC.	Papilionaceae	Khaj-khujli	Fruits hairs	Acute skin irritation		D
32	<i>Moringa oleifera</i> Lam.	Moringaceae	Mugna	Root bark	Skin Inflammation, abortifacient	Behenic acid	m
33	<i>Nerium indicum</i> Mill.	Apocynaceae	Kanher	Raoot, leaves, seed	Nausea, vomiting, diarrhoea, cardiac arrest	Oleandrin	M
34	<i>Parthenium hysterophyrous</i> L.	Asteraceae	Gajargavat	pollens	Respiratory allergy, diarrhoea in cattle		m
35	<i>Physalis minima</i> L.	Solanaceae		Fruits	gastroenteritis and diarrhoea	solanine	m
36	<i>Ricinus communis</i> L.	Euphorbiaceae	Arand	Seed oil	diarrhoea.	Ricin	M
37	<i>Semicarpus anacardium</i> L.	Anacardiaceae	Biba	Fruits, seed oil	Skin inflammation		D
38	<i>Solanum nigrum</i>	Solanaceae		Fruits	Solanine	irritation of the digestive tract	m
39	<i>Solanum tuberosum</i>	Solanaceae	Batata	Green part	Glycoalkaloids-solanine, chaconine	Headach, diarrhoea cramps	m
40	<i>Sterculia urens</i> Roxb.	Sterculiaceae		Fruit hairs	Skin irritation		D
41	<i>Passiflora foetida</i> L	Passifloraceae		Fruit	GI		m
42	<i>Terminalia bellerica</i>	Combrataceae	Behada	Seeds	Vomiting, convulsion		m
43	<i>Thevetia peruviana</i>	Apocynaceae	Kanher	Leaves	Gastric and Cardiotoxic	Nerifolin, thevetoxin	M
44	<i>Theriophonum minutum</i> (Willd.)	Araceae	Undirkan	Leaves, com	GI irritation		m,D
45	<i>Tragia pulkenetii</i> L.	Euphorbiaceae		Hairs	Skin irritation		D
46	<i>Tragia involucrata</i> L.	Euphorbiaceae		Hairs	Skin irritaion		D

M=Major Toxicity, m=Minor Toxicity, D=Dermatitis, * Toxic to Cattle, GI=Gastro-intestinal



Conclusion:

Secondary metabolites, particularly alkaloids and cardiac glycosidase synthesized in the plant are mainly responsible for toxicity in plants. The present survey was aimed to make the layman and children aware of these plants. We suggest the people living in this area to keep their children away from these plants and also educate the other about the bad consequences of eating or touching parts of these plants. Many incidences of children suffering from various healths related problems and even their death, published in different news papers have been thoroughly analyzed and most of them was found to be associated with seeds of 'Chandrajyoti' plant. The proper identification of edible parts or the entire plants is essential to avoid the accidental poisoning caused by various plants.

References :

Angunawela, R. M., Fernando, H. A. 1971. Acute ascending polyneuropathy and dermatitis following poisoning by tubers of *Gloriosasuperba*. *Ceylon Med. J.*, 16: 233-235.

Behl, P.N., R.M. Captain, B.M.S. Bedi, and S. Gupta. 1966. Skin irritant and sensitizing plants found in India. Published by Dr. P.N. Behl, Dept. of Dermatology, Irwin Hospital and M.A. Medical College, New Delhi, India. Asian Printers, Bombay, India. xxii, 179 p.

Chopra, R.N., R.L. Badhwar, and S. Ghosh. 1965. Poisonous plants of India. Vol. 1: 2nd rev. ed.; Vol. 2. Indian Council of Agricultural Research, New Delhi, India. xx,

Davis, J. H. 1978. *Abrusprecatorius* (rosary pea). The most common lethal plant poison. *J. Fla. Med. Assoc.*, 65: 189-191.

Der Marderosian, Ara. 1966. Poisonous plants in and around the home. *American Journal of Phamaceutical Education* 30(1): 115-140.

Edwards, R.O. 1965. Poisoning from plant ingestion. *Journal of the Florida Medical Association* 52(12): 875-881.

Gunn, C. R. 1969. *Abrusprecatorius*: a deadly gift. *Gard. J.*, 19:2-5.

Jelks, Mary. 1986. Allergy plants that cause sneezing and wheezing. World-Wide Printing, Tampa, FL. 64 p.

Lampe, Kenneth F. 1974. Systemic plant poisoning in children. *Pediatrics* 54(3): 347-351.

Lampe, Kenneth F. and Rune Fagerstrom. 1968. Plant toxicity and dermatitis: a manual for physicians. The Williams and Wilkins Co., Baltimore, MD. x, 231 p.
Massive generalized alopecia after poisoning by *Gloriosasuperba*. *Br. Med. J.*, 1: 1023-1024.

O'Leary, Shirley B. 1964. Poisoning in man from eating poisonous plants. *Archives of Environmental Health* 9(2): 216-242.

Wilson, F. W. 1909. Oleander poisoning of livestock. Univ. Ariz. Agric. Exp. Stn. Bull., 59. 383-397 pp.

Wolfson, S. L., Solomons, T. W. 1964. Poisoning by fruit of *Lantana camara*. *Am. J. Dis. Child.*, 107: 109-112.

Maria Laura Colombo et al ., Most commonly plant exposures and intoxications from outdoor toxic plants, J. Pham. Sci. & Res. Vol.2 (7), 2010, 417-425.



