DOI:10.33451/florafauna.v23i2pp3019-315

FLORA AND FAUNA

2017 Vol. 23 No. 2 PP 309-315

ISSN 2456-9364 (Online) ISSN 0971 - 6920 (Print)

TOXIC PROPERTIES AND INTAKE SYMPTOMS OF SOME WILD PLANTS IN RELATION TO REPORTED FROM THE FOREST OF NORTH WEST SATPUDA **REGION OF MAHARASTRA, INDIA** SANJAYA, KHAIRNAR

Department of Botany, M.V.P. Samaj's, Arts, Science and Commerce College, Saikheda, NIPHAD, NASHIK (M.S.) INDIA Email: sanjaykhairnar6@gmail.com

Received : 20.08.2017; Accepted : 04.10.2017

ABSTRACT

In modern era about 80% of the world population depends on herbal alternative system of medicine. Seventy thousand plants are used in medicine and about 2000 plants are used in Indian Ayurveda. The activities of the curative plants are evaluated by their chemical components. Few of them are important as a medicine but also posses poisonous or toxic properties. The toxicity is produced in them due to the synthesis of toxic chemical compounds may be in primary or secondary phase of their life. Most of the users of such medicinal plants in crude form are tribal and peoples living in the forests and their domestic stock. Most of the time these peoples may not aware about the toxicity of such plants used by them and probably get affected sometimes even leads to death. In the study area during the field survey of poisonous plants, information are gathered from the traditional practicing persons, cow boy and from shepherds. About 20 plant species belonging to 17 families are reported as a medicinal as well as toxic. From the available literature, nature of toxic compound and symptoms of their intake on human being are recorded. In the study area the plants like, Abrus precatorious commonly known as a Gunj or Gunjpala, Jatropha curcas, (Biodiesel plant), Croton tiglium (Jamalgota), Citrullus colocynthis (Kadu Indrawan, Girardinia diversifolia (Agya), Mucuna purriens (Khajkuairi), Euphorbia tirucali (Sher), E. ligularia (Sabarkand), Datura metel (Kala Dhotara), Datura inoxia (Pandhara Dhotara) and Asparagus racemo-sus (Shatavari) etc. are some of the toxic plants used as a medicine and harmful also.

Table : 01 References : 15 Figures : 12 KEY WORDS : Ayurveda, Forest, Satpuda Region, Toxic wild plants.

Introduction

It is necessary to know that the nature is not still so kind and peaceful as we could believe it. Since ancient time human being learnt to recognize toxic plants to avoid their consumptions and too recognize useful plants, uses them and start cultivating them nearby their living territory. Nature boosted one and many defensive mechanism to the each living organisms to protect himself from the predators and enemies. Plants are also not exceptions. In nature different types of plant have different mode of defense mechanisms. Most of

the plants have common physical mode of defense like thorns, spines and prickles etc. Apart from these common physical mode, some plants have physiologically synthesized chemical compounds in the form of primary and secondary metabolites which play an important role⁶. It is interesting to know that during the process of natural selection and evolution, plants showed changes in production of the chemicals useful in their defense mechanism from simple nature i.e. Tannins to complex nature i.e. Poly acetylenes⁶. Many of such compounds defend against consumption by

ACKNOWLEDGEMENTS : Author is thankful to Principal and authority of M.V.P. Samaj for their support and encouragement.

herbivores including humans and showed negative effect from discomfort to death to the consuming organisms¹². Austrolia in (1907) 700 carcasses of cattle's found killed in overnight because of poisonous plants consumptions (Wikipedia, the free encyclopedia). This indicates that like other organisms plants not escapes their predators by means of their one of the defense mechanisms i. e. toxicity. But we must also see that, such compounds produced by the plants may also has a +ve role as a medicines when ingested in proper way and quantity¹¹. Sometime plants which are commonly used as a food may also found poisonous. The accidental ingestion of toxic plants may results cause of human fatalities¹⁰. It has been noted that about more than 700 plants have been identified as a producing physiologically active or toxic substances in sufficient amount to cause harmful effect on living organisms. Toxic plant produces variety of toxic substances and cause reaction ranging from mild nausea to death².

81

Workers reviewed on this kind and biodiversity conservation of medicinal plant resources on Indian plants.^{1,2,5,7,8,13} Technically almost all plants could be toxic even the common apple (because its seeds are mildly toxic). It mean the difference between poison and medicine is the dosage taken, same holds true for most of the toxic plants around us, they all have a role to play in nature and their toxicity is there defense mechanism to protect them from animals and insects who eat them.

Materials and Methods

Field survey of toxic plants were carried out form 2011 to 2014 in the forest of west Northern part of Satpura mountain. The toxicity information were obtained from the tribal residents like traditional practitioners, cow boy, shepherd of the area and from available literature. These plants were identified^{4,11,15}. More information's of toxicity like allergy and poisonous nature were studied.

Results and Discussions

The study area comprises the moist and dry deciduous type of forests. Vegetation occurred in the forest of this region includes trees, shrubs, herbs, linas, climbers, epiphytes, parasites and ephemerals etc. Most of the plants are found useful to tribal⁸ and they are using these plants by many ways. Vegetation, medicinal and plan resources study of forest of this region was carried earlier.^{9,10}

SANJAY A. KHAIRNAR

Food and medicine use of these plants is related to the health of tribal's. Lack of information's regarding toxic and poisonous properties of plants and their effect on human being, many a time uses of such plants found dangerous and leads to death especially the children and adults in food scarcity. Most of the plants from the forest of this region has been used in ethnic drugs by local tribal and others since past. This inspire to undertake study related to toxicity of the wild plants of the region . While looking over the literature available about toxic plants and their uses, it was came to know that, many time incidences of toxicity and poisoning happened in the world and in India was because of improper ingestion plants parts.

In the study area 20 plant species belonging to 17 different families (Table-1) are used as medicinal and they possess a toxic, poisonous and allergic properties too. A seed of climber Abrus precatorious commonly known as a Gunj or Gunjpala is bicoloured; red and black and very beautiful and attracts children. It is used for cultural decoration but small children if mistakenly ingest it, a single seed may lead to death. A seeds of plant Jatropha curcas, (Biodiesel plant) if ingested mistakenly by children, severe vomiting started and may a time it found lethal. A plant Croton tiglium (Jamalgota) (Fig. 1), Citrullus colocynthis (Fig.6) (Kadu Indrawan) useful on constipation and gaseous swelling of stomach of animal when intake in proper quantity, otherwise responsible to disturbs bowel and uncontrolled loose motions and omitting respectively. In nature some of the plant can immediately response by means of their toxicity and allergic reaction by secreting toxic nature protein. The plants Girardinia diversifo -lia (Agya) (Fig. 3) and Mucuna purriens (Khajkuairi) (Fig. 4) after touch to them and latter one fruits immediately allergic to skin and start long lasting irritation. In the nature most of the plant posses latex some occurred in the study area are Euphorbia tirucali (Sher) and E. ligularia (Sabarkand). Most of the people can having a oldest kind of skin dermatitis. When the contact of latex of some plants occurred with a skin is becomes allergic and may cause skin diseases or dermatitis. The dust deposited on these plants may also became allergic and cause irritation and itching symptom to skin and eyes. Datura metel (Kala Dhotara) (Fig. 2) and Datura inoxia (Pandhara Dhotara) have been used since long in the ayurvedic medicine system since long past. The incorrect dosage of these may result





Fig. 1 : Croton tiglium (Jamalgota)



Fig. 3 : Gerardinia diversifolia (Agya)

Fig. 2 : Datura metel (Kala Dhotara)



Fig. 4 : Mucuna purriens (Khajkuairi)



Fig. 5 : Lufa acutangula (Ran dodka)



Fig. 6 : Citrullus colocynthis (Kadu Indravan)

TABLE -1 : Toxic	principles and in-	gestion Sympto	ms of recorded	toxic plants.

Botanical Name	Family	Toxic Part & Property	Symptoms of Intake		
<i>Abrus precatorious</i> (Gunj)	Fabaceae	Abrin protein	Ribosome inactivation, Single seed consumption lead to death of adult		
<i>Agave Americana</i> (Ghaypat)	Agavaceae	Cell sap/ juice present in leaves	Skin contact with juice causes dermatitis can be recurring for several years		
<i>Asparagus raceme-sus</i> (Shatavari)	Liliaceae	Saponins present in the mature berries	Ingestion of 5 to 6 berries cause abdominal pain & vomiting		
<i>Colocasia esculenta</i> (Jangali alu)	Araceae	Oxalic acid crystals	Nub, swells tongue & pharynx		
<i>Citrullus colocynthis</i> (Kadu Indrawan)	Cucurbitaceae	Bitter, acute purgative property	When ingested orally in large quantity found lethal and cause intense omitting		
<i>Croton tiglium</i> (Jamalgota)	Euphorbiaceae	Acute purgative property	When ingested in large quantity intense loose motions started		
Datura metel Datura inoxia	Solanaceae	Scopolamine & atropine	Poison & hallucinogenic effect		
Dioscorea bulbifera (Dukkar kand) D. pentaphylla	Dioscoreaceae	Saponins in the tubers	Bitter tuber, eaten without washing cause inflammation of stomach and mucous membrane of mouth		
Euphorbia tirucali E. ligularia	Euphorbiaceae	Latex and accumulated dust	Skin irritation, redness & irritation of eyes by dust & white milky latex		
Girardinia diversifolia (Agya)	Urticaceae	Stinging hairs	Touch gives sudden shocks then irritation		
<i>Gloriossa superba</i> (Kal Lavi)	Liliaceae	All parts of plant	Colchicines, nausea, vomiting, burning throat		
Hibiscus aculeatus (Ambadi)	Malvaceae	Tetrahydrocanibinol More in flowers	Toxic to nervous system, blurred vision, hallucination, poor coordination		

TOXIC	PROPERTIES	AND	INTAKE	SYMPTOMS OF	SOME WILD	PLANTS .	NORTH WEST	SATPUDA	REGION	OF MAHARASTRA	INDIA	313
-------	------------	-----	--------	-------------	-----------	----------	------------	---------	--------	---------------	-------	-----

<i>Holoptelea integrifolia</i> (Papdi)	Ulmaceae	Leaves	Leaves are used as fish poisoning
<i>Jatropha curcas</i> , (Biodivesal Plant)	Euphorbiaceae	Fruit and seeds	Children in rural areas eats fruits, found poisonous and became lethal
<i>Lufa acutangula</i> (Ran dodka)	Cucuirbitaceae	Narcotic	When eaten produces narcotic effect
<i>Mucuna purriens</i> (Khajkuairi)	Papilionaceae	5-hydroxy tryptamine	Touch produces acute and long lasting irritation
<i>Plumbago</i> zeylanica (Chitrak)	Plumbaginaceae	Root is toxic	External rashes and GIT irritation
<i>Semecarpus anacardium, (</i> Bibba)	Anacardiaceae	Oily compound present in the fruit	Oil is dermicide, may allergic to skin and cause spread of dermatitis
<i>Solanum nigrum</i> (Kangani)	Solanaceae	Glycoalcoloid solanine in lvs., stem	Nausea, diarrhoea, stomach cramp, throat burning
Viscum articulatum	Loranthaceae	Alkoloid tryamine, lectin-viscumin	Leaves & berries, acute gastroi-ntestinal discomfort, weak pulse
Xanthium strumar-ium (Landgu)	Asteraceae	Toxic to live stock	Nausea, Vomiting, twisting of neck muscle

to death². Asparagus racemo-sus (Shatavari) a medicinally important plant but ripe berries of this plant are toxic, it is said that, ingestion of 6 to 7 ripe berries may lead to death. As well as, Sulfur compounds in the young shoots are also considered responsible for mild skin reactions in some people who handle the plant9. Lufa acutangula (Ran dodka) (Fig. 5) produces narcotic effect after consumption. Dioscorea bulbifera (Dukkar Kand) (Figs. 9 & 10) tuber of it when ingested without washing for more 12hrs.cause stomach inflammation. A semi parasitic plant Viscum articulatum (Fig. 8) Leaves & berries when ingested shows acute gastrointestinal discomfort. A cell sap of Agave americana (Ghaypat) (Fig. 7) leaves causes skin dermatitis and long term irritation after contact. Tuber of Colocasia esculenta (Ranalu) (Fig. 11) after ingestion, causes swellings of tongue and pharynx. Roots of *Plumbago zeylanica* (Chitrak) (Fig. 12) are toxic and causes external rashes and gastro intestinal irretation.

This study reveals that plant has +ve as well as -ve role in the human welfare. The physiological metabolic activities occurred in the plants may responsible for synthesis of toxic proteins and other chemical substances, which has varied kind of reaction with the physiological metabolic activities of human and animals, like inactivation of ribosome in human being and lethality in animals. It also mean that, difference between poison and medicine is the dosage taken, same holds true for most of the toxic plants around us, they all have a role to play in nature and their toxicity is there defence mechanism to protect them from animals and insects or their enemies who eat them. Human



Fig. 7 : Agave americana (Ketaki, Ghaypat)



Fig. 9 : Dioscorea bulbifera (Dukkar Kand)



Fig. 10 : Tuber of Dioscorea bulbifera



Fig. 11 : Colocasia esculenta (Ranalu)

Fig. 12 : Plumbago zeylanica (Chitrak)



TOXIC PROPERTIES AND INTAKE SYMPTOMS OF SOME WILD PLANTSNORTH WEST SATPUDA REGION OF MAHARASTRA, INDIA 315

fatalities caused by poisonous plants especially resulting from accidental ingestion¹¹. Countless other plants not commonly used as food are also

poisonous, and care should be taken to avoid accidentally contacting or ingesting them for our and livings defence.

References

- 1. ANTONY, ANJU AND MARY, JOSHEPH (2014) A survey of poisonous plants in Nilamber, Kerala, Ind., *Int. Jour. of Curr. Microbiology and App. Sciences* **3** (11): 957-963.
- 2. BHATIA, HARPREET, MANHAS, K.K AND MAGOTRA, RANI (2013) Some new additions in the poisonous plants flora of the world. *Jour. of Bio- pharmacy* **2** (1):74-77.
- 3. CEREDA, M.P. AND MATTOS, M. C. Y. (1996) "Linamarin: the Toxic Compound of Cassava". *Journal of Venomous Animals and Toxins.* **2** (1) : 6-12.
- 4. COOKE, T. (1958) The Flora of Bombay Presidency, BSI, Calcutta, I to III.
- JAYAPRIYA, V.K. AND GOPALAN, R. (2015) A survey of some poisonous plants and their medicinal values in Dhani forest, Palkahd, Ind., *Int. Jour. of Curr. Microbiology and App. Sciences* 4 (12): 234-239.
- 6. KEDDY, P.A. (2007) Plants and Vegetation: Origins, Processes, Consequences. Cambridge University Press, Cambridge, UK. 666 p. Chapter 7.
- KHAIRNAR, S.A. AND KOKATE, D.M. (2015) Studies on qualitative plant diversity and conservation of Patanadevi and Pitallkhore forest range, Chalisgaon from Jalgaon District, India (M.S.) *Jour. Basic Sci.* 2 : 96-100.
- 8. KHAIRNAR, S.A. AND PATIL, DNYAN (2009) Vegetation and floristic analyses of forest of Toramal and environs of the Satpuda ranges, *Nat. Env. Poll. Tech., Technosci. Pub., Karad* 8 (4) :709-714.
- KHAIRNAR, S.A, (2013) Studies on wild plant based medicines practiced by Tribes of Toranaml and nearby villagers from the Satpura Mountain, *Proc. Recent advances in biodiversity conservation*, *Govt. New Sci. Coll.*, Rewa (MP), 80-83.
- 10. KRENZELOK, E.P. AND MRVOS R.(2011) Friends and foes in the plant world: A profile of plant ingestions and fatalities. *Jour. Clin. Toxicol (Phila).* **49** (3):142-9.
- 11. LAKSHMINARASIMHAN AND SHARMA, (1991) The Flora of Nashik District, BSI, Calcutta, 641p.
- 12. LEWIS, W.H. AND ELVIN-LEWIS, M.P.F. (1977) Medical Botany. Plants Affecting Man's Health. Wiley, New York. 515 p. p. 123-124.
- 13. NARAYANSWAMI, T., TGIRUNAVNKKARASU, T., PRABHAKAR, S. AND ERNET, D. (2014) A review of some poisonous plants and their medicinal values. Jour. of Acute Diseases, 85-89.
- 14. SEN, DEVID, N., PAWAN, K.K., KASAERAAND VERMA, V. (2007) Plant resources with special reference to medicinal plants of Rajsthan. *Proc. Nat. Sem. On Curr.* Tred. in bio-resources, Dept. of Bot., *Univ. of Pune* 27-31.
- 15. SING, N.P. AND KARTIKEYAN, S. (2000) Flora of Maharashtra State Vol. I & II., BSI, Calcutta.