

AN INVENTORY OF POISONOUS PLANTS OF SAGAR DISTRICT, MADHYA PRADESH (INDIA)

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Introduction

Since of time and immemorial human population has been dependent on plant resources for a number of benefits. These include timber, food, medicines and other uses. Although most of the plants of direct benefit are known but their other properties may cause harm to human and livestock, if not properly used.

Poisonous plants contain chemical substances that inhibit metabolic activities which lead to death (Bhujel *et al.*, 1984). These plants are used as a medicine for the treatment of diseases in small amount but large doses of the same can be toxic or poisonous to man as well as to animals (Choubey and Khare, 2005a; 2007b).

A large number of plants used for medicinal purposes do contain some toxic principles and therefore may be harmful. Voluntary and accidental intake of such plants may result in considerable harm even it has been known for its better use (Leporatti *et al.*, 1996). The toxicity of plants has been reported due to the presence of toxic principles including saponins, alkaloids, glycosides, tannins, acids, etc. (Chopra *et al.*, 1949). When these toxic principles are injected or introduced into the body of living organisms including human being, they can cause serious impairment of bodily functions leading to death (Chopra *et al.*, 1949). It is therefore imperative that these plants can be misused by antisocial eliminates (Choubey and Khare, 2005, b). A number of cases are known where toxic or poisonous plants have been used for homicidal purpose (Rasoanaivo *et al.*, 1993).

The knowledge of these plants may be of great importance in forensic science investigations. The present paper deals with some important toxic and poisonous plants found in forests around Sagar. Some are cultivated in agriculture fields as well.

Method

A survey has been conducted to record occurrence and of commonly reported poisonous plants (Chopra *et al.*, 1949, 1965; Wealth of India, 1948; Kirtikar, 2003; Caius, 2003; Kirtikar and Basu, 1935; Smith, 1996; Choubey, 2006; Choubey and Khare, 2007, a; b). These plants are listed along with their scientific and local names, toxic principles, habits and probable level of toxicity.

Present study was carried out in different selected sites of Sagar during winter, summer and rainy seasons. Plants were collected, identified and a herbarium was prepared.

Geographically Sagar is located a few kilometers north of the tropic of cancer at 25°50' N latitude and 70°40' E longitude on an average height of 583 m. amsl. Sagar occupies almost the central part of the country. Hills are mainly made from two types of rocks i.e. substances Vindhyan and basalt. One third area of district is covered by forest of tropical dry deciduous type (Champion and Seth, 1968). Climate of the region is monsoonic with three cleanly defined seasons viz., rainy, winter and summer. Average rainfall of the area is 1200 mm. Summers are hot with maximum temperature touching 45°C.

Result and Discussion

A total number of 52 plant species form Sagar district and surrounding area have been record as poisonous. These were trees, herbs and shrubs, belonging to different families.

Common toxic plants belong to the families including Solanaceae, Euphorbiaceae, Araceae and Poaceae. Solanine, essential oil and saponin are major constituents found in large quantity in plants belonging to these families. Toxic principles found in these plants indicate various symptoms of toxicity e.g. neurotoxicity, hemorrhagic, irritation, diarrhoea, etc. If taken in higher doses, may cause emeticity, skin and eyes allergy, irritant poisoning and liver disturbance (Rasoanaivo *et al.*, 1993).

Some of these plants such as *Cannabis sativa* are deadly poisonous having deadly narcotic poison. *Manihot utilisima* and *Physalis minima* are used in arrow poisoning. *Mucuna prurita* is a very irritant poison and *Partherium hysterophorus* is lungs poison. *Sorghum vulgare*, *Zey mays* and *Agave americana* are poisonous to livestock.

Table 1 incorporates the details of toxicity of different plants. If used for homicidal purposes or otherwise in the form of decoction/powdered it is difficult to identify the plant used in the act. A detailed work on identification parameters either on the basis of morphology or chemical constituents is needed for certification in forensic scientific investigations. Further studies on these plants are undergoing.

Table 1
List of Poisonous Plants Recorded from Sagar District and Adjoining Area.

S. No.	Name of Species	Habit	Family	Local Name	Toxic Plant Part	Toxic Principles	Toxicity
1.	<i>Acorus calamus</i> L.	Herb	Araceae	Bach	Rhizome, leaf	Asarone, essential oil	Purgative, vomatic
2.	<i>Acorus gramineus</i> Aiton.	Herb	Araceae	Hanthi-panv	Hole plant	Asarone	Fatal, vomatic
3.	<i>Agave americana</i> L.	Shrub	Amaryllidaceae	Hathi - sengar	Leaf, root	Saponin, acrid volatile oil	Emetic for livestock
4.	<i>Aloe vera</i> (L.) Burm. f.	Shrub	Liliaceae	Gawarpatha	Plant juice	Barbaloin	Purgative, emetic
5.	<i>Amorhalla paeonifolia</i> (Dennst.) Nicolson	Herb	Araceae	Suran	Tuber, leaf	Unknown	Acrid, irritant
6.	<i>Andrographis paniculata</i> Nees.	Herb	Acanthaceae	Kalmegh	Hole plant	Andrographolide	Emetic, vomatic acrid
7.	<i>Anthocephalus cadamba</i> Miq.	Tree	Rubiaceae	Cadamb	Bark, seed	Anthocephalin	Purgative, abortifacient
8.	<i>Arisaema tortuosum</i> Schott.	Herb	Araceae	Dhei	Tuber, leaf	Unknown	Acrid, irritant
9.	<i>Aristolochia indica</i> L.	Herb	Aristolochiaceae	Isharmul	Root	Aristolochine, essential oil	Purgative, abortifacient
10.	<i>Baliospermum montanum</i> Muell.Arg.	Shrub	Euphorbiaceae	Danti	Seed	Corrode iron	Acronarcotic poison
11.	<i>Brassica campestris</i> L.	Herb	Brassicaceae	Sarson	Aerial parts	Tennin	Livestock poison
12.	<i>Bridelia retusa</i> Spreng.	Tree	Euphorbiaceae	Ritha	Seed	Tannin	Abortifacient
13.	<i>Cannabis sativa</i> (Tourn.) L.	Herb	Cannabinaceae	Bhang	Leaf, seed	Terpene, cannabinal	Deadly narcotic poison
14.	<i>Capsicum annuum</i> L.	Herb	Solanaceae	Lal - Mirich	Seed, Fruit	Capsicin, Capsaicin	Irritant, poison
15.	<i>Capsicum frutescens</i> L.	Herb	Solanaceae	Lal - Miricha	Seed, Fruit	Capsicin, Capsaicin	Irritant, poison
16.	<i>Cassia fistula</i> L.	Tree	Caesalpiniaceae	Amaltas	Seed, root	Tannin	Emetic, purgative
17.	<i>Celastrus paniculatus</i> Wild.	Herb	Celastraceae	Malkangni	Bark, Seed	Celastrine, paniculatine	Abortifacient, emetic
18.	<i>Croton tiglium</i> L.	Tree	Euphorbiaceae	Jamalgota	Seed	Alkaloid, tiglic acid	Very purgative
19.	<i>Daucus carota</i> L.	Herb	Umbelliferae	Gajar	Seed	Daucol, daucine	Abortifacient
20.	<i>Dendrocalamus strictus</i> Nees	Herb	Poaceae	Bans	Leaves, young shoot	Hydrocyanic acid	Abortifacient
21.	<i>Dioscorea bulbifera</i> L.	Herb/ Climber	Dioscoriaceae	Anghetha	Tuber	Histomine	Emetic, irritant
22.	<i>Duranta plumieri</i> L.	Shrub	Verbenaceae	Mehndi	Leaves	Saponin	Vomatic, purgative, for livestock
23.	<i>Eucalyptus lanceolata</i> L.	Tree	Myrtaceae	Eucalyptus	Seed, leaf	Eucalyptol	Emetic, purgative
24.	<i>Euphorbia antiquorum</i> L.	Shrub	Euphorbiaceae	Thour	Milky juice	Euphorbin	Eye poison, purgative
25.	<i>Euphorbia hirta</i> L.	Herb	Euphorbiaceae	Dudhi (snake weed)	Flower juice	Phytosterolin, essential	oil Irritant
26.	<i>Euphorbia royleana</i> L.	Shrub	Euphorbiaceae	Senhur, thour	Milky juice	Euphorbin	Irritant and eye poison
27.	<i>Fleurya interrupta</i> Gaudich	Herb	Urticaceae	Lal bichua	Leaf, stem hair	Unknown	Irritant poison
28.	<i>Gossypium herbaceum</i> L.	Shrub	Malvaceae	Cotton	Seed	Gossypol	Abortifacient

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S. No.	Name of Species	Habit	Family	Local Name	Toxic Plant Part	Toxic Principles	Toxicity
29.	<i>Hemidesmus indicus</i> L.	Shrub	Asclepiadaceae	Hindisalsa	Root	Saponin	Purgative
30.	<i>Hyoscyamus niger</i> L.	Herb	Solanaceae	Khurasani - ajvayan	Hole plant	Hyoscine, hyoscyamine	Emetic (Indian emetic plant)
31.	<i>Jatropha gossypifolia</i> L.	Shrub	Euphorbiaceae	Bhernda, verenda	Seed bark	Jatrophine	Purgative, emetic
32.	<i>Lantana aculeata</i> L.	Shrub	Verbenaceae	Vantulsi	Leaves, flower	Lantanin, essential oil	Purgative, irritant
33.	<i>Lantana camara</i> L.	Shrub	Verbenaceae	Vantulsi	Leaves, flower	Lantanin, essential oil	Irritant, purgative for livestock
34.	<i>Manihot esculenta</i> Crantz	Shrub	Euphorbiaceae	Rotialu	Tuber, root	Hydrocyanic acid saponin	Purgative
35.	<i>Mucuna pruri</i> Hook.	Herb/Climber	Fabaceae	Karench	Fruit, hair	Mucunine	Irritant poison
36.	<i>Murraya paniculata</i> L.	Tree	Rutaceae	Marchula	Leaves, flower	Murrayin	Livestock poison
37.	<i>Parthenium hysterophorus</i> L.	Herb	Astraceae	Gajar gass	Aerial part	Parthenin, coronopillin	Lungs poison pur. Livestock poison
38.	<i>Paspalum scrobiculatum</i> L.	Herb	Poaceae	Kodo	Seed, hole plant	Unknown	Narcotic, purgative
39.	<i>Phyllanthus urinaria</i> L.	Herb	Euphorbiaceae	Hazar-mani	Root	Bitter substance	Narcotic poison
40.	<i>Physalis minima</i> L.	Herb	Solanaceae	Chirpoti	Fruit (Plant juice)	Solanine	Purgative
41.	<i>Plesmonium margaritiferum</i> (Roxb.) Schott.	Herb	Araceae	Dhei, azomut	Tuber, seed	Unknown	Purgative, irritant
42.	<i>Psoralea caryifolia</i> DC.	Herb	Fabaceae	Babchi	Leaf, seed	Psoralen, psoralidin	Purgative Livestock poison
43.	<i>Sauromatum guttatum</i> (Wall.) Schott.	Herb	Araceae	Bhasamkand	Tuber, leaf	Unknown	Acrid, irritant
44.	<i>Scilla indica</i> Baker.	Herb	Liliceae	Jangli-piyaz	Root, bulb juice	Scillin, scillain	Vomative, emetic, purgative
45.	<i>Sesamum orientale</i> L.	Herb	Pedaliaceae	Tili	Seed	Sesamin, sesamolin	Purgative
46.	<i>Solanum incanum</i> L.	Shrub	Solanaceae	Asind	Plant juice	Solanine	Arrow poison
47.	<i>Solanum tuberosum</i> L.	Herb	Solanaceae	Alu	Green sprouted tuber	Solanine	Fatal poison
48.	<i>Sorghum vulgare</i> L.	Herb	Poaceae	Juar, Jowar	Seed, root	Hydrocyanic acid	Livestock poison
49.	<i>Urginea indica</i> Kunth.	Herb	Liliaceae	Jangli-pyaz	Root, bulb juice	Urginosides, uriginonine	Purgative, narcotic
50.	<i>Verbena officinalis</i> L.	Herb	Verbenaceae	Pamukh	Leaf, root	Verbenin, verbanalin	Emetic, irritant
51.	<i>Withania somnifera</i> Dun.	Shrub	Solanaceae	Asgand	Root	Somniferine, withanine	Abortifacient
52.	<i>Zea mays</i> L.	Herb	Poaceae	Makka	Stalk, root	Hydrocyanic acid	Livestock fatal poison

SUMMARY

Important wild and cultivated poisonous plants of Sagar district, Madhya Pradesh (India) were recorded during survey in deciduous forests and surrounding area of the district. Total number of 52 species belonging to 25 families were collected. Out of these, 32 Herbs, 14 shrubs and 06 trees were classified. These species are known to possess different toxic and poisonous properties used for various purposes like brain, cardiac, blood poisoning, etc. Toxic plant part, toxic principles, toxicity, local name, family and habit of these plants are described and discussed.

Keywords : Poisonous and Toxic plants, Tropical dry deciduous forests, Sagar district, Herbs, Shrubs and Trees.

जिला सागर (मध्य प्रदेश, भारत) के विषैले पादपों की तालिका

वी.बी. चौबे व पी.के. खरे

सारांश

जिले के पर्णपाती वनों और उनके आसपास के क्षेत्र का सर्वेक्षण करने के दौरान महत्वपूर्ण जंगली और लगाए गए विषैले पादप आलेखित किए गए। कुल मिलाकर 25 कुलों में आती 52 जातियां संग्रह की गईं। इनमें से 32 शाक 14 क्षुप और 6 वृक्ष वर्ग में आए। इन पादप जातियों में भिन्न-भिन्न मादक और विषैले तत्व रहते ज्ञात हैं जिन्हें विभिन्न प्रयोजनों जैसे मस्तिष्क, वक्ष, रक्त विषाक्त रोगों आदि में उपयोग किया जाता है। इन पादपों में विषैले पादपभाग, विषैला तत्व, विषालुता स्थानीय नाम, कुल और प्रवृत्ति वर्णित और विवेचित की गई है।

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