



Plant Archives

Journal homepage: <http://www.plantarchives.org>
 DOI Url : <https://doi.org/10.51470/PLANTARCHIVES.2022.v22.no1.061>

POISONOUS PLANTS OF NADIA DISTRICT, WEST BENGAL, INDIA

Sayanjit Joardar

Department of Botany, Ranaghat College, Nadia-741201, West Bengal, India.

Email: jsayanjit2@gmail.com

(Date of Receiving : 21-01-2022; Date of Acceptance : 31-03-2022)

ABSTRACT

Poisonous plants can be of immense economic importance. Several poisonous plants can be a source of medicines. Research on poisonous plants of East India is largely missing. A primary initiative has been taken to enumerate the poisonous plants naturally grown in the district of Nadia, West Bengal. This research paper reveals that the district harbours 25 poisonous plants belonging to 15 families and 14 genera.

Keywords: Poisonous Plants, Nadia, West Bengal, Toxic, Plant

Introduction

The curious nature of poisonous plants has always held the interest of human beings since the beginning. Since ancient times, the toxic plants and their study have been the subject of interest. And why not, for plants have always been of tremendous use to us. Not only plants are used to produce our foods, shelters, clothing and most importantly they are our primary source of food, they also prettify the environment and enrich the planet by releasing life-sustaining oxygen in the air, but even then, we are aware that some plants are also harmful to us, some having toxic poisons that are able to cause illness and even kill people and animals.

The knowledge of poisonous plants is useful to us for two important reasons. Firstly, the concern for its venomous effect on humans and secondly, poisonous plants have offered various sources for discovery of novel medicines. The poisonous nature of a whole plant or any plant part may be due to production of toxic substances like alkaloids, amines, saponins, tannins, terpenes and others.

The systematic study of poisonous plants, in terms of modern science, is often considered to have begun during the 16th century, when Swiss physician and alchemist Paracelsus first studied the chemical nature of poisons. However, in the Indian subcontinent, various detailed study and accounts of poisonous plants have been found that date back up to 1500 BC.

Surveys have found the existence of about 700 species of poisonous plants in India. Actually, poisonous plants have been already studied by several authors like Caius (1986, 2003), Chopra *et al.* (1949, 1965), Jain (1991), Lewis *et al.* (2007). Recently Balwant *et al.* (2011) reports some Indian plants and their toxicological effects as fatal dose. Viswanathan *et al.* (1983) record some toxic Indian plants.

Siwach and Gupta (1995) worked on poisonous plants of Haryana.

Singh *et al.* (1999) recorded some poisonous plants from Chandigarh zone. Poisoning treatments reports were based on many literatures of many authors like Jain (1991), Joshi (1995), Katewa *et al.* (2006) etc.

But, detailed survey and analysis on the poisonous plants of West Bengal, particularly in the district of Nadia have been very far and few. This study is made in hope to remedy this particular enquiry and includes some poisonous plants of district Nadia in the state of West Bengal and mentions the primary active chemical constituent of toxic plants as well as the symptoms of the poison, risk factor and the preferable method of treatment.

Materials and Methods

Study Area

The district of Nadia falls under the Presidency Division of West Bengal and is situated between 22°53" and 24°11" North latitude and 88°09" and 88°48" East longitude geographically.

Nadia district lies in the Eastern side of the state of West Bengal sharing international boundary with Bangladesh with the distance of the district from North to South and towards East to West are 135km and 45 km respectively.

The Geographical boundary of Nadia district comprises Bardhaman and Hooghly districts on the West, Bangladesh on the East, Murshidabad district on North and North West and North Twenty-Four Parganas district towards South and South-East. The slope of the district is linear with orientation of North-South. Geographical area of the Nadia district is 3,927 sq. km. and the district lies 46 ft. above sea level. The district head quarter of Nadia is Krishnanagar and its population as per Census of India 2011 is 51,67,600.

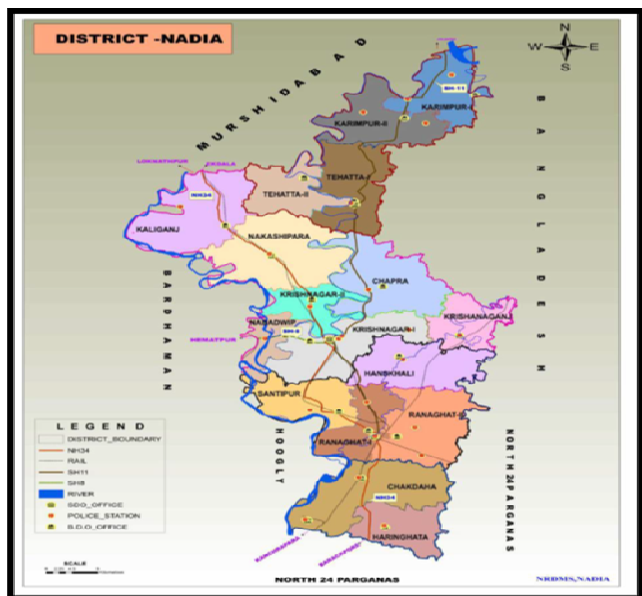


Fig. : Map of Nadia district in West Bengal

The data collection for this study was done through extensive field survey. Specific village areas with nearby surrounding forests were chosen for the survey. The villages mostly consisted of various tribal communities. The traditional information and local identification of the poisonous plants were obtained through interviews with local villagers, based on information collected standard questionnaires were prepared specially for this purpose and are recorded in Annexure I and II.

The information of the poisoning effects as well as primary first aid methods was obtained via direct interviews of aged persons, especially elder men and women over the age of 50. Plant specimens were collected, preserved and the data recorded in field books. Collected plant specimens were processed as vouchers for herbarium preservation following procedures as mentioned by Jain and Rao [1977]. The collected voucher specimens are identified via various Floras like Bengal Plants (Prain; 1903), Poisonous Plants of India (Chopra, Badhwar, Ghosh; 1965), Flora of Bankura District

(Sanyal; 1994), Medicinal Plant Resources of South West Bengal (Paria; 2005), Bibliography of Flora and Ethnobotany of West Bengal (Mitra, Bandopadhyay, Mukherjee; 2010) and Survey of common poisonous plants of Birbhum, Burdwan and Nadia district of West Bengal (Sikdar, Mondal, Ranjan; 2015).

Literature Survey

In Eastern India research on the poisonous plants are very neglected and it is missing in most of the cases. Only a few stray publications on the poisonous plants of West Bengal are obtained which are the works of Esh and Mukherjee (2019), Banerjee and Sinhababu (2017) and Sikdar, Mondal, Ranjan and Tripathi (2015). Besides these, publications on Ethnobiology from the Eastern part of India which also deal with poisonous plants or tells the cases of plants poisoning were also consulted.

Result

This present survey reveals that, Nadia district have 25 poisonous plants species belonging to 14 genera under 15 families, of which 24 belongs to dicotyledonous class and 1 belonging to Monocotyledonous class. A conspectus of the class, families, genera and species of the collected plants of the Nadia district is given in the Table 1 below.

Table 1: Conspectus of Family Genera & Species of Poisonous plants of Nadia District

Sl. No.	Class	Family	Genera	Species
1	Dicotyledons	14	13	24
2	Monocotyledons	1	1	1

The survey lasted 2 months and almost over 50 plants were identified all over the study area with the help of local villagers. 40 plant specimens were collected, photographed, observed and identified and the data stored in field record books. The information on various parameters of plants such as species name, common name, poisonous parts, toxic symptoms etc is presented in a tabular manner in Table 2 below.

Table 2: List of Poisonous Plants of Nadia District

Sl. No.	Species Name	Family Name	Common Name (Bengali)	Habit And Habitat	Poisonous Parts of Plant	Toxin Symptoms
1)	<i>Alstonia scholaris</i> (L.) R. Br	Apocynaceae	Chattim	Terrestrial, Tree	Bark, pollen and leaf	Asthma, cytotoxic effect
2)	<i>Anacardium occidentale</i> L.	Anacardiaceae	Kolke	Terrestrial, Tree	Fruit	Skin irritant, induce kidney stone
3)	<i>Argemone mexicana</i> L.	Papavaraceae	Shiyalkanta	Terrestrial, Herb	Seeds	Seed oil is emetic and narcotic
4)	<i>Blumea lacrea</i> (Burm. F.) DC.	Asteraceae	Kukurmuta	Terrestrial, Herb	Whole plant	Eliminates insects
5)	<i>Calotropis gigantea</i> (L.) Dryand	Apocynaceae	Akanda	Terrestrial, Shrub	Latex, root bark	Harmful to eyes
6)	<i>Cannabis sativa</i> L.	Cannabaceae	Ganja	Terrestrial, Tree	Dried flowers and fruits	Depression, hallucination and death
7)	<i>Cassia fistula</i> L.	Fabaceae	Sonalu, badorlathi	Terrestrial, Tree	Whole pant	Nausea, dizziness, diarrhoea, dysentery

8)	<i>Cassia Occidentals</i> L.	Fabaceae	Kalkasundi	Terrestrial, Tree	Whole plant, leaves	Ataxia, muscle weakness, stubbing, and body weight loss, eventually leading to death.
9)	<i>Catharanthus roseus</i> (L.) G. Don	Apocynaceae	Nayantara	Terrestrial, Herb	Roots, shoot	Cardiac poison
10)	<i>Datura metal</i> L.	Solanaceae	Dhutra	Terrestrial, Shrub	Whole plant, seed	Delirium, fainting and death
11)	<i>Gloriosa superb</i> L.	Colchicaceae	Ulatchanda	Terrestrial, Climber	Tuberous root	GIT irritant and respiratory poison
12)	<i>Jatropha curcus</i> L.	Euphorbiaceae	Bagbherenda	Terrestrial, Shrub	Seeds, leaf, flower, roots and nuts	Vomiting and diarrhoea
13)	<i>Kaempferia rotunda</i> L.	Zingiberaceae	Bhui Champa	Terrestrial, Herb	Juice of tuber	Nausea and vomiting
14)	<i>Lantana camara</i> L.	Verbanaceae	Kutus	Terrestrial, Tree	Green unripe berry	photosensitization, jaundice, rumen stasis, and depression.
15)	<i>Moringa pterygosperma</i>	Moringaceae	Sojnina	Terrestrial, Tree	Root, bark	Liver, kidney damage
16)	<i>Mucuna pruriens</i> (L.) DC	Fabaceae	Akolchi	Terrestrial, Climbing shrub	Fruits and seeds	Skin irritant.
17)	<i>Nerium oleander</i> L.	Apocynaceae	Karabi	Terrestrial, Shrub	Leaves	GIT, eye and skin irritant, causes cardiac arrhythmia
18)	<i>Papaver somniferum</i> L.	Papaveraceae	Posto	Terrestrial, Shrub	Ripe and dried capsules, petals, seeds	Depression and hallucination
19)	<i>Parthenium hysterophorus</i> L.	Asteraceae	GajorGhas	Terrestrial, Herb	Seeds and leaves	Eczema and allergic dermatitis on contact
20)	<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Kutki	Terrestrial, Herb	Root	External rash, GIT irritation
21)	<i>Ricinus communis</i> L.	Euphorbiaceae	Rerhi	Terrestrial, Tree	Seed	Vomiting, colic gastroenteritis and circulatory collapse
22)	<i>Solanum nigrum</i>	Solanaceae	Tit begun	Terrestrial, Weed	Unripe berry	Ripe berries causing abdominal pain, vomiting, diarrhoea, unripe berries fatal causing death
23)	<i>Strychnos nux-vomica</i> L.	Loganiaceae	Kuchila	Terrestrial, Tree	Stem bark, dried ripe seeds	Spinal poisoning, convulsion and death
24)	<i>Tragia involucrate</i> L.	Euphorbiaceae	Bicchuti	Terrestrial, Tree	Leaf, fruit, root	Itching
25)	<i>Trichosanthes cucumerina</i> L.	Cucurbitaceae	Chichinge	Terrestrial, Shrub	Juice of Whole plant	Vomiting

From the above table it becomes clear to us that the family Apocynaceae is the most important Angiospermic plant family from the point of view of the Poisonous plants as it contains 4 species and 4 genera of the poisonous plants followed by the Euphorbiaceae, Fabaceae, Asteraceae, Papaveraceae, Solanaceae families respectively.

A detailed statistical analysis of the diversity of the poisonous plant families of the District of Nadia based on the collected information during this present survey is given in the Table 3 below:

Table 3: Diversity of the poisonous plants of Nadia district

Sl. No.	Name of the Family	No. of Genera	No. of Species
1)	Apocynaceae	4	4
2)	Fabaceae	3	3
3)	Euphorbiaceae	3	3
4)	Asteraceae	2	2
5)	Papaveraceae	2	2
6)	Solanaceae	2	2
7)	Anacardiaceae	1	1
8)	Cannabaceae	1	1
9)	Colchicaceae	1	1
10)	Cucurbitaceae	1	1
11)	Loganiaceae	1	1
12)	Moringaceae	1	1
13)	Plumbaginaceae	1	1
14)	Verbanaceae	1	1
15)	Zingiberaceae	1	1

It is also very interesting to note that, among these 25 species of poisonous plants the latex or the plant sap causes the poisoning case in most of the cases. A conspectus of different poisonous plants parts is given in Table 4:

Table 4: Conspectus of the Poisonous Plants parts

Sl. No.	Plants Parts	No. of Toxic Plant Parts
1)	Roots	7
2)	Tubers	2
3)	Stem	2
4)	Leaves	6
5)	Shoot	1
6)	Flower	3
7)	Fruit	8
8)	Seeds	8
9)	Pollen and Latex	2
10)	Whole plant	5

In case of every species degree of poisoning fatality not equal. In some species it is lethal in effect and in some cases, it is very mild in its effects. Besides these there are some species which are poisonous to one group of organisms and not at all poisonous to another group of organisms. A comparative list of such degree of poisoning effects are shown in the Table 5:

Table 5: Comparative account of Level of Poisoning

Sl. No.	Level of Poisoning	No. of species
1)	Low	6
2)	Medium	5
3)	High	9
4)	Fatal	5
	Total	25

*****Poisoning first aid:**

1. Try to make sure that the person has already been poisoned.
2. If person vomits, clear the person's airway.

3. Keep the person comfortable and provide mental support.
4. If the person is having convulsions, give convulsion first aid.
5. Remove the clothing and flush the skin with watered cloth.
6. Loosen tight clothing, especially around neck.
7. If vomiting occurs, it must be made sure that the vomit is not inhaled back into the lungs.
8. Give the person syrup of Ipecac.
9. Give egg white in water mixture.
10. May use a table spoonful of brandy in water by mouth or bowel.
11. If serious coldness occurred, massage over hands plum and calves of legs.
12. May use activated charcoal mixed with water.

*** All of these advices are not authorised by doctor or any medical professional. These treatments should only be given as a first aid to the patients. In every poisoning case you should administer first aid and contact medical personnel for immediate assistance.

Discussion

Perusing the data given in the table – 1, it is clear that, 25 plant species belonging to 14 Genera under 15 families of Nadia district are poisonous in nature. Of these 15 Angiospermic plant families 14 belong to the class Dicotyledons and 1 Monocotyledon. From the view point of the diversity of the poisonous plant species Apocynaceae is the most diversified family with 4 species in its credit, while the least being one species each in Anacardiaceae, Cannabaceae, Colchicaceae, Plumbaginaceae, Verbanaceae, Zingiberaceae etc. Among the different plant parts of the poisonous plants of the district it is observed that seeds and the fruits are the most poisonous parts, a detail statistical analysis of the same is given in the table 4. Hence, information about poisonous fruits and seeds are of paramount importance so as to avoid their consumption. Finally, the level of poisoning via consumption of these plant parts have also been observed and documented in Table 5.

Conclusion

In conclusion, this study was done in hope to identify and categorise the poisonous plants that are growing in Nadia district. Knowledge of poisonous plants is very important for spreading general awareness about their toxic and harmful effects among humans. Poisonous plants also play an enormous role in providing critical information to researchers in various disciplines such as pharmacology, toxicology, ethnobotany and so on. I also hope this research paper will serve as a beacon of light and encourage others to search previously unstudied areas in our diverse country and identify the different poisonous plants and continue to make common people and researchers aware about them.

ANNEXURE I

Sl. No.	Questions	
1	Name of the village Surveyed: Asannagar	Forest Division: Kulgachi
2	Area (Acres): 60	Locality: Krishnanagar Sadar
3	Date of Survey: 20/5/2021	Time of Survey: All day from 8 AM
4	Name of the Plant Collected: <i>Alstonia scholaris</i> (L.) R. Br	
5	Family: Apocynaceae	
6	Vernacular Name (if any): Chattim	
7	Nature of Poison: Asthma, cytotoxic effect	
8	Other Importance: Used to treat low blood glucose	
9	Name of the Informant: Ashwini Biswas	
10	Age: 61	Sex: Male Profession: Farmer
11	Address of the Informant: Asannagar	
12	Language spoken: Bengali	
13	Parts of the plant used as Poison: Bark, pollen and leaf	
14	Used for: Ayurvedic medicine	
15	Any Commercial values: Bark used for malaria treatment	

ANNEXURE II

Sl. No.	Questions	
1	Name of the village Surveyed: Abhoynagar	Forest Division: Saheb Nagar
2	Area (Acres): 100	Locality: Krishnanagar Sadar
3	Date of Survey: 28/5/2021	Time of Survey: All day from 8.30 AM
4	Name of the Plant Collected: <i>Tragia involucrate</i> L.	
5	Family: Euphorbiaceae	
6	Vernacular Name (if any): Bicchuti	
7	Nature of Poison: Itching on surface contact	
8	Other Importance: Used to treat asthma, cough	
9	Name of the Informant: Deben Bala	
10	Age: 52	Sex: Male Profession: Farmer
11	Address of the Informant: asannagar	
12	Language spoken: Bengali	
13	Parts of the plant used as Poison: Leaves	
14	Used for: Ayurvedic medicine	
15	Any Commercial values: Medicinal plant	

Acknowledgement

I would like to express my wholehearted gratitude to our HOD Dr. Sunit Mitra who helped me a lot with selecting this field of study and overseeing the project as well as corrections of mistakes. I would also like to thank all the local inhabitants who helped me *get all* the field data.

References

- Esh, P. and Mukherjee, S.K. (2019). Poisonous and injurious plants of west Bengal, India. *Indian Medicinal Plants: The Herbal Kitchen*. ISBN: 978-93-84241-45-2.
- Banerjee, A. and Sinhababu, A. (2017). Some Common Poisonous Plants of Bankura Districts of West Bengal, India. *Research & Reviews: Journal of Botany*. ISSN: 2278-2222 (Online) Volume 6, Issue 2.
- Sikdar, A.; Mondal, A.K.; Kumar, R. and Tripathi, N. (2015). Survey of Common Poisonous Plants of Birbhum, Burdwan, and Nadia Districts of West Bengal, India. *International Journal of Plant Research*, 5(5): 103-106 DOI: 10.5923/j.plant.20150505.02.
- Pankti, K.; Gheewala, P.; Chakraborty, M. and Kamath, J. (2012). A Phytopharmacological Review of *Alstonia scholaris*: A Panoramic Herbal Medicine. *IJRAP* 3(3), May-Jun 2012.
- Pattewar, A.M.; Dawalbaje, A.B.; Gundale, D.M.; Pawar, P.B.; Kavtikwar, P.G.; Yerawar, P.P.; Pandharkar, T.M. and Patawar, V.A. (2012). Phytochemistry and Anthelmintic Studies on *Blumea Lacrea*. *Indo Global Journal of Pharmaceutical Sciences*. ISSN: 2249- 1023.
- Kumar, A.; Satish, K.; Ibrahim, S. and Hegde, K. (2017). Therapeutic Uses of *Cassia Fistula*: Review. *IJPACR* ISSN: 2395-3411
- Vijayalakshmi, S.; Ranjitha, J.; Devi Rajeshwari, V. and Bhagyalakshmi, M. (2013). Pharmacological Profile of *Cassia occidentalis* L- A Review. *International Journal of Pharmacy and Pharmaceutical Sciences*, ISSN: 0975-1491.
- Joy, P.P.; Mathew, S.; Skaria, B.P. and Gracy Mathew (2006). Agronomic Practices for Quality Production of *Kaempferia rotunda* L.
- Ali Esmail Al-Snafi (2019). Chemical Constituents and Pharmacological Activities of *Lantana camara*- A Review. *Asian Journal of Pharmaceutical and Clinical Research*, Vol 12, Issue 12, 2019.
- Lonare, M.K.; Sharma, M.; Hajare, S.W. and Borekar, V.I. (2012) *Lantana Camara*: Overview on Toxic to Potent Medicinal Properties. *International Journal of Pharmaceutical Sciences and Research*. *IJPSR* (2012), vol. 3, Issue 9

- Usman, M.R.M.; Barhate, S.D.; Usman, M.A.M. A Review on Drumstick Tree (*Moringapterygosperra* Gaertn): Multiuse Tree with Higher Economical Values. IJCPR ISSN: 0976-822X
- Yadav, M.K.; Upadhyay, P.; Purohit, S.; Pandey, B.L. and Shah, H. (2017). Phytochemistry and Pharmacological Activity of *Mucunapruriens*: A Review.
- Patel, S. (2011). Harmful and Beneficial aspects of *Parthenium hysterophorus*: an update. 3 *Biotech* (2011) 1:1-9 DOI 10.1007/s13205-011-0007-7
- Jena, J. and Gupta, A.K. (2012). *Riccinus communis* Linn: A Phytopharmacological Review. *International Journal of Pharmacy and Pharmaceutical Sciences*, ISSN- 0975-1491 Vol 4, Issue 4, 2012.
- Bahorun, T.; Neergheen, V.S. and Aruoma, O.I. (2005). Phytochemical constituents of *Cassia fistula*. *African Journal of Biotechnology*, Vol. 4(13): 1530-1540, December 2005.
- Liyanage, R.; Nadeeshani, H.; Jayathilake, C.; Visvanathanand, R. and Wimalasiri, S. (2016). Comparative Analysis of Nutritional and Bioactive Properties of Aerial Parts of Snake Gourd (*Trichosanthes cucumerina* Linn.). Hindawi Publishing Corporation. *International Journal of Food Science*, Volume 2016, Article ID 8501637.
- Yusuf, A.A.; Folarin, O.M. and Bamiro, F.O. (2007). Chemical composition and functional properties of snake gourd (*Trichosanthes scucumerina*) seed flour. *Nigerian Food Journal*, 25(1): 36-45.
- Pallie, M.S.; Perera, P.K.; Kumarasinghe, N.; Arawwawala, M. and Goonasekara, C.L. (2020). Ethnopharmacological Use and Biological Activities of *Tragia involucrata* L. *Hindawi Evidence-Based Complementary and Alternative Medicine*, Volume 2020, Article ID 8848676.

Websites used for data collection and research:

- <https://file.scirp.org>
- <https://www.cabi.org>
- <https://pubmed.ncbi.nlm.nih.gov>
- <https://link.springer.com>
- <https://www.ncbi.nlm.nih.gov>
- <https://www.scientific.net>
- <http://www.flowersofindia.net>
- <https://en.wikipedia.org>
- <https://www.jjpb.net>
- <https://ijpjournal.com>
- <http://www.tramil.net>
- <https://www.imedpub.com>
- <http://www.ibiblio.org>