

A preliminary survey of poisonous plants in and around Bhadravathi, Karnataka

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Abstract

The present paper deals with the preliminary survey of poisonous plants in and around Bhadravathi taluk of Karnataka during 2013-14. A total of 30 plants belonging to 27 genera and 18 families were recorded. The plant species with their families are also reported in this article. Toxic properties of few plants are discussed in this paper.

Keywords: Poisonous plants, Bhadravathi taluk, Karnataka

Introduction

Plants cannot move to escape their predators, so they must have other means of protecting themselves from herbivorous animals. Some plants have physical defenses such as thorns, spines and prickles, but by far the most common type of protection is chemical (Keddy, 2007). Over millennia, through the process of natural selection, plants have evolved the means to produce a vast and complicated array of chemical compounds in order to deter herbivores. Tannin, for example, is a defensive compound that emerged relatively early in the evolutionary history of plants, while more complex molecules such as polyacetylenes are found in younger groups of plants such as the Asterales. Many of the known plant defense compounds primarily defend against consumption by insects, though other

animals, including humans, that consume such plants may also experience negative effects, ranging from mild discomfort to death (<https://en.wikipedia.org>).

No work has been carried out on diversity of poisonous plants occurring in and around Bhadravathi taluk, Karnataka. Hence, the present study has been carried out and it is helpful for further scientific research.

Materials and methods

Study area

Bhadravathi, is located at 13° 52' N latitude and 75° 40' E longitude. Bhadravathi is situated at a distance of about 20 kilometres from the district headquarters Shimoga. It is an industrial town of Shimoga district of Karnataka. Bhadravathi is at an altitude of 597 metres (1,959 ft) above sea level. The Bhadra river flows through the city, then flows into the Bhadra Wildlife

Sanctuary south of the city. The Bhadravathi taluk has a total area of 675.08 square kilometres (260.65 sq mi), a population of 338,611, and a population density of 501.56 inhabitants per square kilometre (1,299.0/sq mi). The taluk borders five other taluks, the Shimoga taluk to the west, the Honnali taluk to the north, the Channagiri taluk to the east, the Tarikere taluk to the south-east, and the Narasimharajapura taluk to the south-west (Census of India 2001; en.wikipedia.org).

Collection of data

Field explorations were conducted during 2013-14 to know the variety of Poisonous plants occurring in Bhadravathi taluk of Karnataka. The study was based on extensive and intensive field surveys undertaken in and around Bhadravathi area *i.e.* Singanamane, Kudreshed, Shanti Nagara, Shankaraghatta, Malenahalli, Nellisera, Tavaraghatta, Gonibeedu, H.K.Junction and Bommanakatte during the period February 2013- January 2014. The plant specimens have been studied and identified by using floras (Sharma *et al.* 1984, 1988; Saldanha 1984, 1996; Kirtikar, 2003; Lewis Nelson *et al.*, 2007; Pillay, 2010; Caius, 2012; Bhattacharjee and Sushmita Bhattacharjee, 2013), besides other new monographs and books.

Results and discussion

Table 1 depicted list of poisonous plants of Bhadravathi taluk. In this study 30 poisonous plants belonging to 27 genera and 18 families were recorded. Figure 1 shows the number of poisonous plants in each family.

The plants toxic to pet animals include *Ricinus communis*, *Jatropha curcas*, *Lantana camara*, *Chrysanthemum*, *Nerium oleander*, *Cascabela thevetia* and *Solanum tuberosum*.

In *Phaseolus vulgaris*, the toxic compound phytohaemagglutinin, a lectin, is

present in many varieties of common bean but is especially concentrated in red kidney beans. The lectin has a number of effects on cell metabolism; it induces mitosis, and affects the cell membrane in regard to transport and permeability to proteins. It agglutinates most mammalian red blood cell types. Consumption of as few as four or five raw kidney beans may be sufficient to trigger symptoms, which include nausea, vomiting, and diarrhea. Onset is from 1 to 3 hours after consumption of improperly prepared beans, and symptoms typically resolve within a few hours ("Foodborne Pathogenic Microorganisms and Natural Toxins Handbook: Phytohaemagglutinin". *Bad Bug Book*. United States Food and Drug Administration. July 2009. (<https://en.wikipedia.org>).

Citrus fruits are known to contain aromatic oils and compounds of Psoralen which is toxic to dogs, cats, and some animals. The acid is found all over the entire plant. Symptoms include vomiting, diarrhea, depression and photosensitivity.

Mangifera indica peel and sap contain urushiol, the allergen in poison ivy and poison sumac that can cause urushiol-induced contact dermatitis in susceptible people. Cross-reactions between mango contact allergens and urushiol have been observed. Those with a history of poison ivy or poison oak contact dermatitis may be most at risk for such an allergic reaction. Urushiol is also present in mango leaves and stems. During mango's primary ripening season, it is the most common source of plant dermatitis. Many members of the *Allium* genus contain thiosulphate, which in high doses is toxic to dogs, cats and some types of livestock. Cats are more sensitive to *Allium* (<https://en.wikipedia.org>).

Solanum tuberosum contain toxic compounds known as *glycoalkaloids*, of which the most prevalent are *solanine* and *chaconine*. The concentration of glycoalkaloid in wild potatoes is sufficient to produce toxic effects

in humans. The toxin affects the nervous system, causing headaches, diarrhea and intense digestive disturbances, cramps, weakness and confusion, and in severe cases *coma* and death. Poisoning from cultivated potatoes occurs very rarely, however, as toxic compounds in the potato plant are generally concentrated in the green portions of the plant and in the fruits, and cultivated varieties contain smaller concentrations than wild plants ("*Tomato-like Fruit on Potato Plants*". Iowa State University, 2009; *Glycoalkaloid and calystegine contents of eight potato cultivars*, 2003).

Table 1: Poisonous plants of Bhadravathi taluk, Karnataka.

Sl. No.	Scientific Name	Family
1.	<i>Areca catechu</i>	Arecaceae
2.	<i>Asparagus sp.</i>	Asparagaceae
3.	<i>Agave sp.</i>	Asparagaceae
4.	<i>Allium sp.</i>	Amaryllidaceae
5.	<i>Argemone mexicana</i>	Papaveraceae
6.	<i>Aloe sp.</i>	Xanthorrhoeaceae
7.	<i>Bougainvillea sp</i>	Nyctaginaceae
8.	<i>Colocasia esculenta</i>	Araceae
9.	<i>Catharanthus roseus</i>	Apocynaceae
10.	<i>Calotropis procera</i>	Apocynaceae
11.	<i>Cascabela thevetia</i>	Apocynaceae
12.	<i>Citrus sp.</i>	Rutaceae
13.	<i>Datura metel</i>	Solanaceae
14.	<i>Datura stramonium</i>	Solanaceae
15.	<i>Dieffenbachia sp.</i>	Araceae
16.	<i>Eucalyptus sp.</i>	Myrtaceae
17.	<i>Euphorbia sp.</i>	Euphorbiaceae
18.	<i>Eupatorium odoratum</i>	Asteraceae
19.	<i>Ipomea carnea</i>	Convolvulaceae
20.	<i>Jatropha curcas</i>	Euphorbiaceae
21.	<i>Jasminum officinale</i>	Oleaceae
22.	<i>Lantana camera</i>	Verbenaceae
23.	<i>Millettia pinnata</i>	Fabaceae
24.	<i>Mangifera indica</i>	Anacardiaceae
25.	<i>Nerium oleander</i>	Apocynaceae
26.	<i>Parthenium hysterophorus</i>	Asteraceae
27.	<i>Ricinus communis</i>	Euphorbiaceae
28.	<i>Solanum nigrum</i>	Solanaceae
29.	<i>Solanum tuberosum</i>	Solanaceae
30.	<i>Solanum lycopersicum</i>	Solanaceae

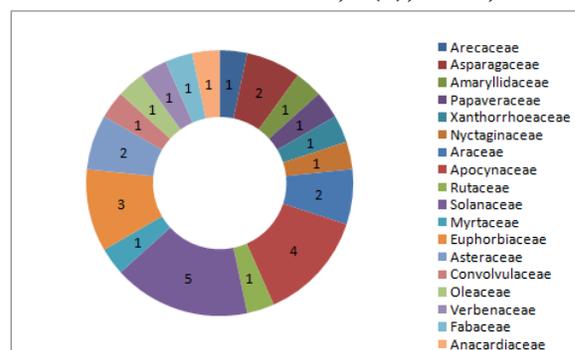


Fig. 1: Each family with number of poisonous plants.

Solanum lycopersicum like many other members of the nightshade family (Solanaceae), tomato leaves and stems contain solanine that is toxic if ingested, causing digestive upset and nervous excitement. In *Solanum nigrum*- all parts of the plant except the *ripe* fruit contain the toxic glycoalkaloid solanine. Solanine poisoning is primarily displayed by gastrointestinal and neurological disorders. Symptoms include nausea, diarrhea, vomiting, stomach cramps, burning of the throat, cardiac dysrhythmia, headache and dizziness. In more severe cases, hallucinations, loss of sensation, paralysis, fever, jaundice, dilated pupils and hypothermia can result. In large quantities, solanine poisoning can be fatal (<https://en.wikipedia.org>).

Ricinus communis seeds contain ricin, an extremely toxic and water-soluble ribosome-inactivating protein; it is also present in lower concentrations in other parts of the plant. Also present are ricinine, an alkaloid, and an irritant oil (<https://en.wikipedia.org>). *Nerium oleander* parts are toxic, the leaves and woody stems in particular. Contains nerioside, oleandroside, saponins and cardiac glycosides. Causes severe digestive upset, heart trouble and contact dermatitis. The smoke of burning oleander can cause reactions in the lungs, and can be fatal. *Datura* species containing the tropane alkaloids scopolamine, hyoscyamine, and atropine, all parts of these plants are

poisonous, especially the seeds and flowers. Ingestion causes abnormal thirst, hyperthermia, severe delirium and incoherence, visual distortions, bizarre and possibly violent behavior, memory loss, coma, and often death (<https://en.wikipedia.org>).

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