

TOXIC EFFECTS OF PLANTS AND MANAGEMENT THROUGH NATURAL APPROACHES

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ABSTRACT

Toxins are produced by many natural and synthetic substances; wide variety of plants also produces toxins. Phytotoxins exerts their effects in special conditions including false identification of herbs and overdosing of natural plants. Some plants or herbs produce potent toxins that will significantly damage physiological functioning at cellular level. Plant toxins enter into the body through inhalation, direct contact and ingestion, etc. They contain chemicals such as alkaloids, tannins and steroids, etc. which may exerts some toxic events inside the body. These compounds targets receptors, enzymes and genetic material within cells thereby causing tissues damage. Natural toxins mainly present in various parts of plants including vegetables, fruits and seeds, etc. These toxins, often secondary metabolites, produced in plants through various biosynthetic procedures. Ayurveda suggested various approaches to combat against the natural toxins. This review presents information on plant toxins and their management through ancient approaches.

KEYWORDS: Toxins, Poison, Phytotoxin, Agadtanatra, Vishagna.

INTRODUCTION

Plant toxins are endogenous substances or secondary metabolites produced naturally amongst the various plant species. These secondary metabolites are considered useful for defense purpose against fungi and bacteria, but natural substances can also produces toxic effects if ingested improperly. The main chemical classes of plant toxins include alkaloids which possess strong physiological activity. Colchicine, solanine and nicotine, etc. are amongst them. Similarly cyanogenic glycosides, release toxic cyanide and goitrogenic glycosides affect the activity of the thyroid. Tannins as toxins interfere with cellular activity; some toxins in the form of salt may cause hypocalcemia and interfere with vitamin metabolism. Some toxins acts as photosensitizing agents and causes allergic reactions, on other hands some

volatile oils acts as toxins and causes irritation. **Table 1** depicted some category of natural toxins and their impacts on body.^[1-4]

Effects of Natural Toxins

- ✓ Skin irritation
- ✓ Respiratory failure
- ✓ Neurotoxicity and disruption of autonomic functions of the nervous system
- ✓ Heart arrhythmia
- ✓ Sudden rise in blood pressure
- ✓ Severe headache and unconsciousness
- ✓ Mental confusion
- ✓ Dry mouth and thirst
- ✓ Numbness and locomotors dysfunction
- ✓ Hepatotoxicity and gastric trouble

Table 1: Descriptions of various categories of toxins.

Category	Examples	Effects
Neurotoxins	Nicotine and atropine	Causes CNS dysfunction.
Respiration Inhibitors	Cyanogenic, glucosides	Depletion of energy and organ failure.

Cytotoxins	Colchicine, vinblastine	Disrupt cell division and transport.
Skin irritant	Diterpenes,	Necrosis and blisters.
Phytoallergy	Pollen	Urticaria, allergic alveolitis.

Poisonous plants contain toxic elements in their seeds, leaves, fruits and roots. In case of natural toxins the toxicity and clinical symptom severity vary directly with dose ingested. In certain condition non toxic substance become toxic if consumed inappropriately or overdosing arises.^[4-6]

Management of Toxicity Induced by Natural Toxins:

Various Ayurvedic approaches (Figure 1) can be used to manage toxicity induced by natural toxins. These include Vishahara Karma, uses of Vishagna Dravyas, Panchakarma therapies and Rasayana therapy. Vishahara

Karma causes re-establishment of balance of body which also helps to detoxifies body, Vishagna Dravyas includes herbs and formulations which possess detoxifying properties, examples are Haridra, Gomutra, Guduchi and Neem, etc. Panchakarma therapies facilitate detoxification through the elimination of toxin; Vamana, Virechana and Basti are main therapies under this category. Rasayana therapy imparts rejuvenative effect; this includes herbs such as Amalaki and Ashwagandha, etc. Table 2 depicted symptoms based therapy for natural toxins.^[6-9]



Figure 1: Various approaches to combat against natural toxins.

Table 2: Symptoms based therapy of natural toxins.

Symptom	Treatment Type	Specific Remedies
Skin Dermatitis	Topical Application	Haridra, Neem and Manjishtha
	Medications Internally	Gandhaka Rasayana and Mahamanjishthadi Kwatha
Gastrointestinal Toxicity	Vomiting	Shankha Bhasma with lemon juice
	Purgation Therapy	Avipattikar Churna
Neurological Symptoms	Oral medication	Brahmi and Shankhpushpi
	External therapy	Abhyanga and Shirodhara
Respiratory Distress	Swasa-Hara Dravyas	Pushkaramula and Kantakari

Ayurvedic formulations for Toxins

- ✚ Triphala Kashaya detoxifies gut.
- ✚ Chandanaadi Lepa helps to alleviate burning sensations and inflammation caused by toxins.
- ✚ Vishaghna Taila relieves skin poisoning.
- ✚ Mahatikta Ghrita used for systemic detoxification purpose.

- ✚ Madar causes skin burns and irritation. Treatment includes uses of Ghee and external application of Chandana Lepa.
- ✚ Jangli Peeli causes hepatotoxicity. Treatment includes Guduchi and Bhumyamalaki to detoxify liver.^[7-10]

Specific Management of Toxic Plants

- ✚ Datura causes confusion and dry mouth. Treatment includes uses of Gomutra and Shweta Durva.
- ✚ Vatsanabha causes numbness, arrhythmias and vomiting. Treatment includes uses of Pippali along with honey.

CONCLUSION

Plant derived toxins can be a potent factor in human health by ingestion, inhalation, and direct contact. Most of these are secondary metabolites, which acts as toxic substances through their action on enzymes and receptors, etc. Toxicity of these toxins varies from mild irritation to the skin or serious neurotoxicity and organ failure. Ayurveda suggested approaches such as

Vishahara Karma, Panchakarma procedures, and the use of Vishaghna Dravyas for combating these toxins. Ayurvedic formulations and Rasayana therapies not only neutralize toxins but also rejuvenate the body. Triphala Kashaya detoxifies the gut, whereas Chandanaadi Lepa helps to reduce the burning sensation. Vishaghna Taila is helpful in case of skin poisoning, whereas Mahatikta Ghrita supports systemic detoxification. Guduchi and Bhumyamalaki are suggested for liver detoxification. Specific treatments based on symptoms using herbal remedies and specialized formulations ensure relief and support recovery.

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