Plants poisoning

Plant Poisoning

Overview:

- Plant poisoning refers to toxic effects from ingestion, inhalation, or dermal exposure to plants containing harmful substances.
- Plants produce various toxic compounds as a defense mechanism, and these can have serious or even fatal consequences in humans.



Common Toxic Plants:

Plant Name	Toxin(s)	Clinical Presentation
Oleander (*Nerium oleander*)	Cardiac glycosides	Nausea, vomiting, bradycardia, arrhythmias
Deadly Nightshade (*Atropa belladonna*)	Atropine, scopolamine	Anticholinergic toxidrome
Castor bean (*Ricinus communis*)	Ricin	GI upset, cytotoxicity, multi-organ failure
Foxglove (*Digitalis purpurea*)	Digitalis glycosides	Arrhythmias, AV block, nausea
Water Hemlock (*Cicuta spp.*)	Cicutoxin	Seizures, respiratory arrest

Pathophysiology:

- **Cardiac glycosides** (oleander, foxglove): Inhibit Na^+/K^+-ATPase → increased intracellular calcium → cardiac arrhythmias.
- **Alkaloids** (belladonna): Block muscarinic receptors → anticholinergic effects.
- **Lectins** (ricin): Inhibit ribosomal protein synthesis → cell death.

- **Neurotoxins** (cicutoxin): CNS excitation → seizures.

Common Toxidromes:

- **Anticholinergic syndrome**: Dry mouth, flushed skin, dilated pupils, confusion, tachycardia (e.g., belladonna).
- **Cardiotoxicity**: Bradycardia, heart block, arrhythmias (e.g., oleander, foxglove).
- **Neurotoxicity**: Seizures, coma (e.g., water hemlock).
- **GI toxicity**: Nausea, vomiting, diarrhea (common to many plant toxins).

Clinical Management:

1. Supportive care:

- Mainstay of therapy.

2. Decontamination:

- Activated charcoal if within 1 hour of ingestion.

3. Antidotes:

- Digoxin-specific antibody fragments (Digibind) for cardiac glycoside toxicity.
- Physostigmine for severe anticholinergic poisoning (use with caution).

4. Monitoring:

- Continuous ECG, serum electrolytes, renal and hepatic function.

5. Consultation:

- Poison control center, medical toxicologist.

Mushroom Poisoning (Mycetism)

Overview:

- Mushroom poisoning occurs from ingestion of toxic fungi, often due to misidentification.
- Symptoms and severity vary depending on the species, dose, and individual susceptibility.



Major Types of Mushroom Toxins and Associated Syndromes:

Syndrome	Mushroom Species	Toxin(s)	Onset	Symptoms
Amatoxin poisoning	*Amanita phalloides*	Amatoxins	6–24 hours	GI distress, hepatotoxicity, renal failure
Gyromitrin poisoning	*Gyromitra spp.*	Gyromitrin	6–12 hours	Nausea, seizures, liver toxicity
Muscarinic syndrome	*Inocybe, Clitocybe spp.*	Muscarine	15–30 min	SLUDGE symptoms (cholinergic)
Ibotenic acid syndrome	*Amanita muscaria*	Ibotenic acid, muscimol	30 min–2 hrs	Hallucinations, confusion, seizures
Psilocybin syndrome	*Psilocybe spp.*	Psilocybin	<1 hour	Euphoria, hallucinations, mydriasis
Coprine-alcohol reaction	*Coprinus atramentarius*	Coprine	With alcohol	Flushing, headache, tachycardia

Pathophysiology:

- **Amatoxins**: Inhibit RNA polymerase II → halt protein synthesis → hepatocellular necrosis.
- **Muscarine**: Stimulates muscarinic receptors → cholinergic syndrome.

- **Gyromitrin**: Metabolized to monomethylhydrazine (MMH) → inhibits GABA synthesis → seizures.
- **Psilocybin**: Acts as serotonin receptor agonist → hallucinations.
- **Ibotenic acid/muscimol**: Act on glutamate and GABA receptors → neuroexcitation or depression.

Clinical Management:

1. Supportive care:

- Stabilize airway, breathing, circulation.

2. Decontamination:

- Activated charcoal within 1 hour of ingestion.

3. Specific treatments:

- **Amatoxins**:
  - High-dose IV penicillin G (historical).
  - **Silibinin** (from milk thistle) inhibits hepatic uptake of toxin.
  - **N-acetylcysteine** (for hepatic support).
- **Muscarinic poisoning**: Atropine.
- **Gyromitrin toxicity**: Pyridoxine for seizures.

4. Monitoring:

- Liver function (AST, ALT, INR), renal function, electrolytes.

5. Advanced care:

- Consider liver transplant in fulminant hepatic failure.

First Hope

FREE PREVIEW

Click here to visit our website

PHARMACY PREMIUM NOTES

Complete subject and semesters are available on FirstHope app only.

Scan or click here

Click here to get the app >

Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram >

Scan or click here

@FirstHopeNotes

Instagram

@firsthope.official

Click here to follow >

YouTube channel

FirstHope-Pharmacy / Live streams

Click here to watch >

WhatsApp channel

Follow FirstHope on WhatsApp

Click here to join >

FirstHope website

firsthope.co.in

Click here to visit >

B.Pharm / D.Pharm / M.Pharm / Pharm.D

Preview notes. Complete subjects and semesters in the FirstHope app.