

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 (<i>Nerium oleander</i>)	Cardiac glycosides	Nausea, vomiting, bradycardia, arrhythmias
Deadly Nightshade (<i>Atropa belladonna</i>)	Atropine, scopolamine	Anticholinergic toxidrome
Castor bean (<i>Ricinus communis</i>)	Ricin	GI upset, cytotoxicity, multi-organ failure
Foxglove (<i>Digitalis purpurea</i>)	Digitalis glycosides	Arrhythmias, AV block, nausea
Water Hemlock (<i>Cicuta spp.</i>)	Cicutoxin	Seizures, respiratory arrest

Pathophysiology:

- Cardiac glycosides** (oleander, foxglove): Inhibit Na^+/K^+ -ATPase $\rightarrow$ increased intracellular calcium $\rightarrow$ cardiac arrhythmias.
- Alkaloids** (belladonna): Block muscarinic receptors $\rightarrow$ anticholinergic effects.
- Lectins** (ricin): Inhibit ribosomal protein synthesis $\rightarrow$ 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	<i>Amanita phalloides</i>	Amatoxins	6–24 hours	GI distress, hepatotoxicity, renal failure
Gyromitrin poisoning	<i>Gyromitra spp.</i>	Gyromitrin	6–12 hours	Nausea, seizures, liver toxicity
Muscarinic syndrome	<i>Inocybe, Clitocybe spp.</i>	Muscarine	15–30 min	SLUDGE symptoms (cholinergic)
Ibotenic acid syndrome	<i>Amanita muscaria</i>	Ibotenic acid, muscimol	30 min–2 hrs	Hallucinations, confusion, seizures
Psilocybin syndrome	<i>Psilocybe spp.</i>	Psilocybin	<1 hour	Euphoria, hallucinations, mydriasis
Coprine-alcohol reaction	<i>Coprinus atramentarius</i>	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.

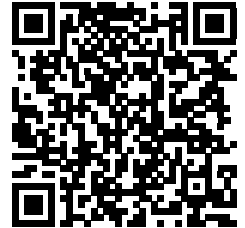


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