



The 10 MOST TOXIC Plants

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Over their evolution, plants have developed numerous toxic agents to protect themselves from being eaten; many of these substances are extremely poisonous. Even plants that are considered nontoxic—that is, ingestion should not cause serious systemic signs—may result in vomiting and other gastrointestinal disorders. The plants discussed in this article are considered to be among the most toxic for dogs and cats; serious illness and death can result from consumption of relatively small amounts. These plants are commonly found in the home or yard.

Identification of a plant may be difficult. Plants have common names that may differ between various regions of the country. In some cases, plants of different species may share common names, making determination of a genus or species important for proper identification. If necessary, nursery personnel or a florist can be consulted to help identify the plant.

GENERAL TREATMENT CONSIDERATIONS

All cases of toxic plant ingestion are best treated by early, aggressive decontamination. (See Procedures Pro, November 2004, pages 65-70.) Attempts at emesis should be made in asymptomatic patients, followed by administration of activated charcoal. Charcoal administration can be repeated every 4 to 6 hours while plant matter remains in the gastrointestinal tract. An enema given about 6 to 12 hours after ingestion may further clear plant matter

from the gastrointestinal tract. Other treatments are aimed at controlling such signs as vomiting, diarrhea, and arrhythmias.

LILIES

Various members of the *Lilium* genus, including Easter lilies (*L. longiflorum*), tiger lilies (*L. lancifolium*), stargazer lilies (*L. auratum*), and various species of day lilies (*Hemerocallis* species); depending on the species, the flower's stem is about 1 to 8 feet tall uncut.

- Occur wild throughout North America.
- Commonly sold as cut flowers or as part of floral arrangements; day lilies are a common landscaping plant.
- Toxicosis occurs only in cats.

Principal Toxin

- Unknown
- All parts of the plant are toxic (even the pollen).
- Causes acute renal failure secondary to acute tubular necrosis.

Clinical Signs

- Initially, vomiting, anorexia, and lethargy starting within hours of ingestion; vomiting may subside by 12 hours.
- Renal values (blood urea nitrogen, creatinine, and phosphorus) and potassium levels begin to increase by 24 to 72 hours.
- Renal epithelial tubular casts and glucosuria can be seen within 18 hours.

Treatment

- Decontamination; fluid diuresis—twice maintenance amounts for at least 48 hours

Prognosis

- Guarded with delayed onset of treatment (24 hours or greater) and in presence of oliguria/anuria.
- Renal function can return but may take weeks; chronic renal failure may be sequela.

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Stargazer lily (*L. auratum*)



Day lily (*Hemerocallis*)

CASTOR BEAN



Castor bean plants (*Ricinus communis*)

Ricinus communis (castor bean plant); also known as castor oil plant, mole bean, wonder tree

- Occurs in the South, Southwest, and California; may be wild or cultivated for castor oil; plants can stand 3 to 14 feet tall and have large leaves (12 inches or greater).
- The beans are used as decorative beads.



Castor beans

Principal Toxin

- Ricin, a glycoprotein
- Blocks protein synthesis, leading to cellular death.
- Is present in all parts of the plant but most concentrated in the beans.
- Highly toxic; a single bean can kill a dog.
- The outer coating of the bean must be ruptured (chewed) to release the ricin.

Clinical Signs

- May take up to 24 hours to appear; initial signs include vomiting and often bloody diarrhea, abdominal pain, weakness, and ataxia.
- Hemoconcentration, leukocytosis, and elevated liver enzymes can be seen on clinical laboratory testing.

Treatment

- Decontamination; gastrointestinal protectants, such as sucralfate and histamine blockers, intravenous fluids, and general supportive care

Prognosis

- Good with prompt decontamination; guarded once signs develop

CYCAD PALMS



Sago palm (*Cycas revoluta*) Courtesy Dr. Camilla Lieske

Many species, but principally sago palm (*Cycas revoluta*) and fern palm/false sago palm (*C. circinalis*); size varies with species and can range from 6 to 30 feet tall with long leaves (up to 9 feet).

- Used as ornamental plants in Florida and occasionally in California; can be houseplants in northern climates.
- Sago palms are available as bonsai trees.

Principal Toxin

- Cycasin, a glycoside, yields methylazoxymethanol after bacteria metabolism
- Cycasin is present in the whole plant, but concentration is highest in the seeds; ingestion of as few as 1 to 2 seeds can cause severe clinical signs and death.

Clinical Signs

- Initially, vomiting, possibly beginning within a few minutes of ingestion of the seeds; vomiting may last for hours.
- Hypersalivation and polydipsia can be seen.
- Over the next few days, anorexia, diarrhea or constipation, hepatomegaly, and icterus are seen.

- Neurotoxic effects can be seen but these may be secondary to hepatic failure.
- Clinical pathology includes thrombocytopenia, bilirubinemia, elevated hepatic enzymes, and azotemia.

Pathology

- Liver has a nutmeg appearance.
- Acute centrilobular hepatic necrosis occurs.
- Fibrosis, bile stasis, and fatty changes develop over time.
- Petechial hemorrhage and renal tubular necrosis are also seen.

Treatment

- Symptomatic and supportive care for gastrointestinal and hepatic signs (antiemetics, gastrointestinal protectants, such as sucralfate, adenosyl for liver signs)

Prognosis

- Poor once hepatic necrosis has occurred

RHODODENDRON, AZALEA, LAUREL



Rhododendron (*Rhododendron*)

Many species of plants from the Ericaceae (heath) family, including *Rhododendron* species (rhododendron, azalea, rosebay), *Kalmia* species (laurel), *Leucothoe* species (black laurel, fetterbush), *Lyonia ligustrina* (maleberry, staggerbush), *Pieris japonica* (Japanese pieris), *Ledum glandulosum* (Labrador tea)

- Ornamental plant found throughout North America; size of plant and leaves varies greatly with species.

Principal Toxin

- Grayanotoxins (formerly known as andromedrotoxin)
- Toxin blocks the sodium channel in cells; principally affects muscle and nerve cells.
- Whole plant is toxic.

Clinical Signs

- Predominately vomiting, starting within a few hours of ingestion; diarrhea is rare.
- Aspiration pneumonia is a possible sequela.
- Cardiac arrhythmias are possible.
- Neurologic signs may include depression, ataxia, weakness, and seizures.

Treatment

- Symptomatic and supportive care for vomiting, arrhythmias, and seizures

Prognosis

- Good if seizures or aspiration has not occurred

YEWS



Yew (*Taxus*)

Numerous *Taxus* species

- Occur throughout the United States; often used as hedges; can grow up to 75 feet high depending on species, but often are trimmed.

Principal Toxin

- Various taxane derivatives or taxines, which are negative inotropes and chronotropes
- All parts of the plant are toxic; deaths following chewing on branches have been reported in dogs.

Clinical Signs

- Death may be so rapid that there are no signs.

- Vomiting and neurologic signs are most common in dogs, although bradycardia can also be seen.

Treatment

- Symptomatic care for neurologic and cardiac signs with atropine and/or lidocaine

Prognosis

- Guarded if signs appear

AUTUMN CROCUSES



Showy autumn crocus (*Colchicum speciosum*)

Colchicum autumnale (autumn crocus, meadow saffron); *Colchicum speciosum* (showy autumn crocus)

- Occur throughout the United States; leaves, which grow from the base, can reach about a foot long; flowers appear after the leaves have died in the autumn.

Principal Toxin

- Colchicine and similar alkaloids which prevent cell division
- All parts of the plant are toxic but highest concentration of the toxin is found in the flower, the corm, and the seeds.

Clinical Signs

- Signs may take 12 to 24 hours to develop and initially occur as hypersalivation, depression, vomiting, milky or bloody diarrhea, and abdominal pain.
- Progress to weakness, paresis, and collapse.
- Multiple organ failure can occur.

Treatment

- Supportive care including IV fluids with dextrose and calcium; aspartate should be given in the IV fluids early in the course of toxicosis.

Prognosis

- Guarded

FOXGLOVE

Three species occur in the United States: *Digitalis purpurea* (common or purple foxglove); *D. lanata* (Grecian foxglove); and *D. lutea* (straw foxglove).

- Occurs wild in the Pacific Northwest but is grown as an ornamental throughout North America; stems can range from 1 to 6 feet tall with 1- to 2-inch conical flowers.



Common foxglove (*Digitalis purpurea*)

Courtesy Dr. Anthony Knight. Reprinted from *A Guide to Plant Poisoning of Animals in North America*. Knight AP, Walter RG, Jackson, WY: Teton New Media, 2001, p 62, with permission.

Principal Toxin

- Cardenolides, principally digitalis, a cardiac glycoside
- All parts of the plant are toxic, but highest concentrations are found in the flowers, fruit, and immature leaves.
- Dried plant matter retains toxicity.

Clinical Signs

- Initially, gastrointestinal signs are present.
- Cardiac arrhythmias of any type can occur.

Treatment

- Repeated doses of activated charcoal are especially efficacious.
- Supportive care for gastrointestinal signs
- Symptomatic control of arrhythmias (e.g., atropine for bradycardia, lidocaine for ventricular tachycardia). Digibind (Savage Laboratories, Melville, NY), a Fab antibody, can be used to bind and enhance elimination of digitalis. However, because Digibind is expensive, use is generally restricted to patients with nonresponsive arrhythmias and severe hyperkalemia.

Prognosis

- Good, unless intractable arrhythmias or hyperkalemia develops

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Tx at a glance

LILY OF THE VALLEY



Lily of the Valley (*Convallaria majalis*) Courtesy Dr. Camilla Lieske

Convallaria majalis

- Grown as ornamental throughout United States; plant has broad, erect leaves (4 to 8 inches) with small, bell-shaped flowers.

Principal Toxin

- Cardenolides, potent cardiotoxins
- Toxin is concentrated in the roots, but all parts of the plant are toxic.

Clinical Signs

- Initial signs are gastrointestinal with vomiting and hypersalivation; diarrhea is less common.
- Cardiac signs include bradycardia and other arrhythmias.
- Seizures may also occur.
- Death may be sudden without any prior signs.

Treatment

- Same as for foxglove

Prognosis

- Good, unless intractable arrhythmias or hyperkalemia develops

OLEANDER



Oleander (*Nerium oleander*) Courtesy Dr. Linnaea Stull

Nerium oleander, also known as laurel rosa, laurel blanco, laurel colorado, rosa laurel

- Not native to North America; found in the South and California
- Frequently planted as roadside hedge or backyard ornamental; can grow from 7 to 20 feet tall.

Principal Toxin

- Cardiac glycosides
- Toxicity often due to ingestion of dead/dry leaves; green leaves are bitter and less likely to be eaten; when the leaf dies, the sugar moiety is released from the cardiac glycoside, which improves palatability.

Clinical Signs

- Initially vomiting and diarrhea (the latter may contain blood)
- Signs may progress to cardiac arrhythmias of any type (similar to digitalis toxicity).

Treatment

- Symptomatic care for gastrointestinal signs
- Arrhythmias should be treated symptomatically (e.g. atropine for bradyarrhythmias, propranolol/lidocaine for tachyarrhythmias); consider use of Digibind.

Prognosis

- Good with aggressive therapy

YESTERDAY, TODAY, AND TOMORROW



Yesterday, today, and tomorrow (*Brunfelsia grandiflora*) Courtesy Dr. Anthony Knight

Brunfelsia australis. Photograph shows *B. grandiflora*; flowers are identical to those of *B. australis* but appear in clusters whereas in *B. australis* they are spread out over plant.

- Ornamental found mainly in the South; grows as a shrub or small tree.

- If no significant systemic signs are expected, treat vomiting and diarrhea.
- If ingestion is recent and significant systemic signs are possible:
 - Decontaminate via emesis
 - Administer multiple doses of activated charcoal.
 - Give an enema 6 to 12 hours after ingestion.
- If clinical signs develop:
 - Administer IV fluids
 - Control vomiting
 - Administer gastrointestinal protectants (if indicated)
 - Monitor for and control arrhythmias as needed
 - Consider Digibind in cardiac glycoside toxicity if nonresponsive arrhythmias or hyperkalemia occurs
 - Monitor renal and hepatic values; electrolytes

Principal Toxin

- Brunfelsamidine, a neurotoxin that causes seizures
- All parts of the plant are toxic.

Clinical Signs

- Coughing, gagging, and nystagmus can be seen within minutes to hours; tremors and seizures, usually characterized by extensor rigidity (may resemble those of strychnine toxicity)

Treatment

- Supportive care with IV fluids
- Control seizures with diazepam, barbiturates.

Prognosis

- Guarded; signs can last for days and complete recovery may take weeks. ■

See Aids & Resources, back page, for references, contacts, and appendices.