

**Toxic Plants**  
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Dogs and cats are notorious for chewing on plants in the house and yard. Any plant, including grass, can cause gastrointestinal upset, but there are many toxic plants that can affect the heart, liver, kidney, and central nervous system.

**Poinsettia (*Euphorbia pulcherrima*)** contain a milky latex sap that is composed of diterpenoid euphorbol esters. Signs can consist of hypersalivation, nausea, vomiting, anorexia, and possibly diarrhea.

**Holly (*Ilex sp.*), hosta or plantain lily (*Hosta sp.*), and ivy (*Hedera sp.*)** contain glycosides called saponins. Saponins have foaming characteristics like soap and have a bitter taste. Signs can consist of GI upset and mild central nervous system signs such as depression and ataxia with larger ingestions.

**Peace lily (*Spathiphyllum sp.*), Pothos/devil's ivy (*Epipremnum sp.*), elephant's ear (*Caladium sp.*), dumb cane (*Dieffenbachia sp.*), cut leaf philodendron (*Monstera deliciosa*), and calla lily (*Zantedeschia aethiopica*)** contain insoluble calcium oxalate crystals called idioblasts. The crystals cause a needle-like or burning sensation when the plant is chewed on. Signs can include vomiting, diarrhea, anorexia, irritation, and pain and swelling in the mouth. Rarely, dyspnea can develop from oropharyngeal swelling.

**Begonia (*Begonia sp.*), rhubarb (*Rheum rhabarbarum*), lambsquarters (*Chenopodium album*) green/purple shamrock (*Oxalis sp.*), and beetroot (*Beta vulgaris*)** contain soluble calcium oxalate crystals. The soluble oxalates can enter the blood stream and combine with calcium leading to hypocalcemia. The crystallization of excreted calcium oxalate in the kidneys causes renal tubular necrosis. Signs can include drooling, vomiting, diarrhea, anorexia, lethargy, facial rubbing, weakness, ataxia, muscle tremors and potentially seizures from the hypocalcemia. Hypocalcemia can also result in arrhythmias. Small animals rarely develop a systemic toxicity, because they tend to eat small quantities of plant material.

**Amaryllis (*Amaryllis sp.*), dahlia (*Dahlia sp.*), iris (*Iris sp.*), daffodil (*Narcissus sp.*), tulip (*Tulipa sp.*), hyacinth (*Hyacinthus orientalis*), spring crocus (*Crocus sp.*)** contain various alkaloids and are considered ornamental bulb plants. All parts of the plant are toxic, but the bulb is the most toxic. Signs may vary depending on what part of the plant is ingested. Ingestions of the foliage (leaf, stem, petal) can cause drooling, vomiting, and diarrhea. Ingestion of the bulb or large quantities of foliage can cause bloody vomiting and diarrhea, abdominal pain, and rarely neurological signs such as tremors and seizures. Hypotension can develop secondary to dehydration leading to ataxia and weakness.

**Sago palm (*Cycas revoluta*), cardboard (*Zamia furfuracea*) or Coontie palm (*Zamia integrifolia*)** contain three toxins including cycasin. All parts of the plant are toxic, with the seed containing the highest amount of cycasin. Sago palms affect the gastrointestinal tract, central nervous system, and the liver. Signs of vomiting generally occur within a few hours and often becomes bloody. Animals may become lethargic, anorexic, and develop diarrhea and elevated liver enzymes. Within 2 to 3 days, signs of acute hepatic necrosis (increased liver enzymes, icterus, melena, vomiting, hepatic encephalopathy) and secondary coagulopathies develop. Animals may also develop central nervous system signs such as weakness, ataxia, tremors and seizures. Hypoglycemia and thrombocytopenia can also develop.

**Yew (*Taxus sp.*), Japanese yew (*Taxus cuspidate*), and English or European yew (*Taxus baccata*)** contain taxine alkaloids which causes cardiac conduction disturbances due to interference with the ion channels in the heart leading to arrhythmias. Taxines are most concentrated in the bark, leaves, and seeds. The ripe red berry is not toxic. Signs can include vomiting (+/- blood), diarrhea, abdominal pain, lethargy, depression, panting/dyspnea, dilated pupils, ataxia, tremors, seizures, bradycardia, and sudden death from cardiac failure. Stressing the patient can also cause sudden collapse and death. Dogs and cats generally develop signs within 2-6 hours, so if they are still alive after 12 hours, they are likely to survive the toxicosis.

**Hydrangea (*Hydrangea arborescens*); cherry, apricot, and plum (*Prunus sp.*) seeds; apple (*Malus sp.*) seeds; and pear seeds (*Pyrus sp.*)** contain cyanogenic glycosides. Signs generally include vomiting and diarrhea, and foreign body obstruction from the seeds. Rarely does a cyanide toxicosis develop unless large quantities of foliage are ingested, or the seeds are masticated and swallowed. Signs of cyanide toxicosis include rapid onset of distress, weakness, labored breathing, bright red mucous membranes, collapse, and lateral recumbency. Seizures may occur. The signs are so rapid that the animal either dies or recovers quickly. This also makes it difficult to initiate treatment right away.

**Day Lily (*Emerocallis sp.*), Easter lily (*Lilium longiflorum*), Japanese lily (*Lilium speciosum*), tiger lily (*Lilium lancifolium*), and Stargazer lily (*Lilium orientalis*)** contain an unknown toxic principle and are known to cause acute kidney injury in cats by causing necrosis of the renal tubular epithelial cells. All parts of the plant are toxic to cats; the stamen, petal, stems, leaves, pollen, and even water from runoff or from a vase. Signs in cats include vomiting within a few hours of exposure, but the vomiting usually subsides after a few hours. Cats can then look normal or may be mildly depressed and anorexic. Within 24-72 hours oliguric to anuric renal failure develops, accompanied by vomiting, depression, and anorexia. Changes in bloodwork can occur as early as 12 hours and changes in the urinalysis within 24 hours.

**Lily of the valley (*Convallaria sp.*), oleander (*Nerium oleander*), and foxglove (*Digitalis sp.*)** contain cardiac glycosides. The glycosides inhibit the cell membrane sodium-potassium ATPase, resulting in decreased electrical conductivity and various cardiac arrhythmias (both tachy- and bradyarrhythmias). Signs can develop within 6-8 hours and include vomiting, diarrhea, arrhythmias, hypotension, hyperkalemia. Seizures and sudden death can also develop.

**Azalea (*Rhododendron sp.*), laurels (*Kalmia sp.*), and Japanese pieris (*Pieris japonica*)** contain grayanotoxins and are also cardiotoxic. Grayanotoxins bind to sodium channels and cells are maintained in a prolonged state of depolarization. These effects occur in the heart, skeletal muscles, and the central nervous system. Signs can include drooling, vomiting, depression, ataxia, weakness, tremors, brady- or tachycardia, arrhythmias, hypotension, and dyspnea. Signs can develop within 4-12 hours and last up to 2 days.

**Autumn crocus (*Colchicum autumnale*) and glory lily (*Gloriosa sp.*)** contains colchicine with the highest concentrations in the flowers and seeds. Colchicine inhibit mitotic spindle formation and can cause multiple organ failure and impair cardiovascular, pulmonary, renal, metabolic, and neuromuscular function. Signs can range from vomiting and diarrhea (possibly with blood), abdominal pain, weakness, disorientation, seizures, cardiac abnormalities, dysphagia, paralysis, hypovolemic shock. There have been reports of elevated liver enzymes. If the animal survives the initial signs, bone marrow suppression may occur within 4 to 5 days after ingestions. Death is generally caused by respiratory failure.

**Hops (*Humulus lupulus*)** are used in beer brewing and contain several components. However, the exact toxic principle is unknown. Ingestion of hops by dogs causes malignant hyperthermia. Signs generally develop within 30-60 minutes and can start with agitation, restlessness, hyperactivity, panting/tachypnea, vomiting, abdominal pain, and hyperthermia. Tachycardia, injected mucous membranes, tremors, and seizures can also develop. The temperature can elevate rapidly and be >105 degrees. Sequelae include secondary renal damage from myoglobinuria and rhabdomyolysis, liver injury, disseminated intravascular coagulation, acidosis, and elevated creatinine phosphokinase. Clinical signs can last 24-48 hours.