

Dangerously Pretty

Warnings about plant toxicity are sometimes overstated, but here are a few truly poisonous plants that you should know about, especially if you have children or pets. BY KRIS WETHERBEE

YOU COULD SAY I first learned about poisonous plants at the tender age of six. A shrub bearing beautiful white berries caught my eye one day while I was playing in the front yard. I reached out to pick a few, but was stopped short of putting them in my mouth by my sharp-eyed mom. Although I've never been sure, the shrub was likely a native snowberry (*Symphoricarpos albus*), the berries of which can cause serious intestinal distress. Thankfully I didn't have to learn about poisonous plants the hard way.

Most adults do not haphazardly eat plants in their garden. But curious children and pets sometimes do. The Poison Control Centers in the United States receive over 100,000 calls annually concerning potential plant and mushroom poisonings.

The vast majority of plants are relatively harmless. Some are only mildly toxic, with exposure or ingestion producing symptoms ranging from skin rashes or mild diarrhea to slight stomach upset. But a small percentage are truly toxic if eaten, with symptoms ranging from severe digestive upset to convulsions—and in some cases, even death.

ASSESSING TOXICITY

More than 700 plant species grown in the United States are known to be poisonous, but the degree of toxicity varies according to the type and quantity of toxic substances each species contains.

Poisonous plants are generally classified as being mildly, moderately, or highly toxic. Some plants contain allergenic or irritant compounds and produce skin irritation and/or rash after contact with the plant. For example, many of us are sensi-

As Agatha Christie knew, all parts of foxgloves (*Digitalis* spp.) are highly toxic if ingested.





Calla lilies, left, and elephant's ears and caladiums, right, contain calcium oxalate. If ingested, these microscopic needlelike crystals can irritate sensitive tissue in the mouth and throat. Contact with the plant sap can cause skin irritation.

tive to poison oak or poison ivy to varying degrees, but some people also react to boxwood (*Buxus* spp.) or chrysanthemums (*Chrysanthemum* spp.) with mild dermatitis. And while poinsettias are not poisonous, if you have a sensitivity to latex, contact with them can result in a skin rash. In addition, there are photosensitizing compounds possessed by plants such as marigold (*Tagetes* spp.) and yarrow (*Achillea millefolium* and hybrids) that make the skin more sensitive to the sun.

The potential for problems increases when a poisonous plant is ingested. At the “mild” end of the scale are plants that typically produce localized mouth or throat pain, or limited digestive distress. Calla lilies (*Zantedeschia* spp.), caladiums, and elephant's ear (*Colocasia esculenta*) contain calcium oxalate crystals that can pierce cell walls in the mouth and throat causing serious pain and swelling. Elephant's ear—also known as taro or dasheen—is a curious case, however, because its tuberous roots and young leaves are staple food items in many tropical regions. Apparently the cooking process breaks down the poisonous compounds.

Many other plants cause nausea, vomiting, and/or diarrhea if they are ingested. Common examples include holly (*Ilex* spp.), four-o'clock (*Mirabilis jalapa*), and soapwort (*Saponaria officinalis*).

The amount ingested influences the severity of symptoms. For instance, daffodils and dahlias are toxic only if consumed in large quantities. Highly toxic plants, however, cause a host of debilitating symptoms even in small doses. Azaleas and rhododendrons contain a toxic compound called andromedotoxin, a hydrocarbon present in many conifers and



Children should be warned to steer clear of the attractive orange to red fruits of daphnes, which contain poisonous glycosides.

plants in the heath family (Ericaceae) that can cause a variety of symptoms—the most extreme being paralysis or coma. Plants with berries containing certain glycosides or alkaloids—such as deadly nightshade (*Atropa belladonna*), privet (*Ligustrum* spp.) or daphnes—may even prove fatal if eaten.

“The true toxicity depends on what body tissue they impact,” says Sharon M. Douglas, a plant pathologist with the Connecticut Agricultural Experiment Station. Different plant toxins may affect the spinal cord, brain, heart, liver, kidneys, or nervous system. “The level of a particular toxic compound may also be quite variable within a plant or plant family,” Douglas adds. Take the nightshade family (Solanaceae), for example. Tomato fruits are non-toxic, and potato tubers are a culinary staple, but the leaves, vines, sprouts, and green berries are highly toxic and may even be fatal. All parts of deadly nightshade are highly toxic.

FACTORING IN THE VARIABLES

As potatoes demonstrate, one part of a plant may be edible, while other parts are toxic. Rhubarb is another classic example—the stems are edible but the leaves are highly poisonous. The fruits of apricot, peach, nectarine, and cherry are absolutely delicious, but the seeds, twigs,

TRULY TOXIC GARDEN PLANTS

Poisonous plants can vary in their toxicity and the type of reaction they produce. The truly toxic cause serious problems—even death—if ingested. Take special note of the following common garden plants.

CASTOR BEAN (*Ricinus communis*)

Annual with large, attractive leaves growing six to 15 feet tall. Ornamental fruit capsule is large, prickly, and bright red and contains beanlike seeds.

Poisonous parts: Seeds are highly toxic if ingested, leaves to a lesser extent.

Toxic principle: Contains ricin, a highly toxic protein, and ricinine, an alkaloid.

Symptoms: Nausea, vomiting, abdominal pain, bloody diarrhea, convulsions, coma; also gastrointestinal, kidney and liver damage; can be fatal. Contact with broken seeds may produce severe dermatitis in some individuals.

Comments: Carefully store seeds prior to planting; cut off flower stalks before they set seed.



DAPHNE (*Daphne* spp.)

Evergreen, semi-evergreen, or deciduous shrubs with clusters of typically fragrant flowers followed by red or yellow fruit.

Poisonous parts: All parts are poisonous, especially fruits.

Toxic principle: Diterpenoid (mezerein).

Symptoms: Swelling and ulceration of mucous membranes in mouth, throat, and stomach; nausea, vomiting, internal bleeding, kidney damage, coma, may be fatal; leaves contain irritant chemicals that may cause burning or blisters on exposed skin; ingesting berries can be fatal.

Comments: All *Daphne* species are toxic, particularly *D. cneorum*, *D. genkwa*, *D. gnidium*, *D. laureola*, *D. mezereum*, and *D. odora*.



DATURA, JIMSON WEED, COMMON THORNAPPLE (*Datura* spp.)

Nightshade family annuals with erect, funnel-shaped flow-

ers followed by spiny fruit capsules containing many seeds. Angel's trumpet (*Brugmansia* spp.), a closely related and similarly toxic tropical species, has drooping flowers and fleshy fruit.

Poisonous parts: All parts are highly toxic.

Toxic principle: Tropane alkaloids.

Symptoms: Hallucinations, headache, delirium, rapid and weak pulse, convulsions, coma; can be fatal.

Comments: Cut off spent flowers to prevent formation of seeds, which are particularly toxic.

DELPHINIUM, LARKSPUR (*Delphinium* spp.)

Annuals, biennials, or perennials with upright spikes of elongated flower clusters growing three to seven feet tall; smaller species grow to 12 inches tall.

Poisonous parts: All parts, especially young plants and seeds.

Toxic principle: Potent alkaloids, including delphinine and ajacine.

Symptoms: Burning and numbness of mouth and throat, intense vomiting and diarrhea, muscular weakness and spasms, respiratory system paralysis, convulsions; can be fatal.

Comments: Most species are also poisonous to cattle.

FOXGLOVE (*Digitalis* spp.)

Biennial or short-lived perennial with showy tubular flowers on elongated spikes growing two to eight feet in height.

Poisonous parts: All parts, including water from vases containing cut flowers.

Toxic principle: Cardiac or steroid glycosides.

Symptoms: Nausea, vomiting, diarrhea, stomach pain, severe headache, dangerously irregular heartbeat, mental confusion, tremors, convulsions; can be fatal.

Comments: Source of pharmaceutical digitalis, a potent heart medication.

LILY-OF-THE-VALLEY (*Convallaria majalis*)

Creeping perennial groundcover to nine inches tall, with white or pale pink sweet-scented, bell-shaped flowers, sometimes followed by bright red berries in fall.

Poisonous parts: All parts, including water



from vases containing cut flowers.

Toxic principle: Cardiac glycosides and saponins.

Symptoms: Irregular heartbeat and pulse, abdominal pain, diarrhea, mental confusion.

Comments: Contains cardioactive toxins similar to those in foxglove; glycoside compounds are a source of pharmaceutical heart medications.

MONKSHOOD (*Aconitum spp.*)

Perennial or biennial with showy hooded blue, purple, or yellow flowers that rise above handsome clumps of lobed or deeply cut leaves; plants are two to six feet tall.

Poisonous parts: All parts.

Toxic principle: Potent alkaloids, including aconitine.

Symptoms: Burning of mouth and numbness of throat; paralysis of the respiratory system; nausea, vomiting; muscular weakness and spasms; convulsions; can be fatal.

Comments: Avoid planting near vegetables which produce edible underground crops to avoid accidental harvesting of the toxic tuberous root.

OLEANDER (*Nerium oleander*)

Ornamental evergreen shrubs or small trees with leathery leaves and funnel-shaped, typically fragrant flowers clustered at tip of twigs or branches.

Poisonous parts: All parts are extremely toxic, green or dry, including smoke from burning branches or water from vases containing cut flowers.

Toxic principle: Cardiac glycosides, saponins.

Symptoms: Nausea, vomiting, stomach pain, diarrhea, dizziness, irregular heartbeat; can be fatal.

Comments: Do not use the stems or branches as skewers for food; a single leaf may be highly toxic if ingested.



PIERIS (*Pieris spp.*)

Attractive evergreen shrubs with drooping clusters of white, pink, or reddish urn-shaped flowers.

Poisonous parts: Leaves and nectar from flowers.

Toxic principle: Andromedotoxin.

Symptoms: Nausea, vomiting, diarrhea, hypersaliva-



tion, abdominal pain, weakness, convulsions, coma, cardiovascular collapse; can be fatal.

Comments: Andromedotoxin is a neurotoxin also found in the nectar of certain species of rhododendron (*Rhododendron spp.*) and other members of the heath family.

WISTERIA (*Wisteria spp.*)

Twining, woody vines with pealike flowers born on elongated, pendent clusters of blue, white, or pink blooms followed by velvety, pealike pods.

Poisonous parts: Seeds (most toxic), pods, and bark.

Toxic principle: Glycoside wisterin and a toxic resin.

Symptoms: Severe digestive disorders; nausea, vomiting, stomach pain, diarrhea, dehydration.

Comments: Though no fatalities have been reported, the seeds can seriously poison a child.



YEW (*Taxus spp.*)

Evergreen, coneless shrubs or trees are dioecious (male and female flowers on separate plants), with females producing red, fleshy berrylike fruits—each containing a single green seed.

Poisonous parts: Bark, leaves, seeds.

Toxic principle: Alkaloid taxine, a cardiac depressant.

Symptoms: Nervousness, trembling, slow heart rate and pulse, breathing difficulties, abdominal pain, vomiting, convulsions, cardiac failure; can cause sudden death.

Comments: The red, fleshy part surrounding the seed (called the aril) is sweet and edible, though the single seed it contains is highly toxic, along with the rest of the plant.



Photos: Opposite page, top left and bottom right: David Cavagnaro; bottom left: Mark Turner. This page, top left: Saxon Holt; bottom left: Jerry Pavia; top right: Susan A. Roth; bottom right: David Cavagnaro

and foliage contain varying levels of cyanogenic glycoside, a highly toxic compound that can produce cyanide when plant cells are damaged. Be forewarned: don't use any branches or twigs of these trees as kebab skewers or roasting sticks.

The plant species, condition of the plant, stage of its growth, and the environment all play a part in the levels of toxins present within plants. Other variables can influence the degree of reaction and sever-



Children should be warned about all toxic plants, particularly those such as rhubarb, shown here, which have edible stems but poisonous leaves.

ity of symptoms, such as a person's health status, age, and weight in relation to how much is ingested. Small children are particularly at risk because they have a lower body mass than adults and can be affected by smaller doses of toxins. Individual reaction can also vary according to a person's diet, metabolism, and medications.

AVOIDING DANGER

One of the most effective ways you can avoid the hazards of plant poisoning is to identify your plants both indoors and outdoors and learn their toxic potential *before* a poisoning occurs. Indoor plants that are within reach of children can be particularly hazardous. "We receive about 1,600 to 1,700 calls about plant ingestion per year," says Henry Spiller, director of Kentucky's

Resources

The AMA Handbook of Poisonous and Injurious Plants by Kenneth Lampe, Mary Ann McCann, and American Medical Association. American Medical Association, Chicago, Illinois, 1985.

Animal Poison Control Center, (888) 426-4435. www.asPCA.org/apcc. Note: A consultation fee may be charged.

Canadian Poisonous Plants Information System, <http://sis.agr.gc.ca/pls/pp/poison>.

Common Poisonous Plants and Mushrooms of North America by Nancy J. Turner and Adam F. Szczawinski. Timber Press, Portland, Oregon, 1995.

Cornell University Poisonous Plants Database, www.ansci.cornell.edu/plants.

Handbook of Poisonous and Injurious Plants by Lewis S. Nelson, Richard Shih, and Michael Balick. Springer Publishing, New York, New York, 2006.

National Capital Poison Center, (800) 222-1222. www.poison.org.

Poisonous Plants of the United States by Walter Conrad Muenscher. Macmillan Publishing, New York, 1972.

Regional Poison Center. "[Calls about] indoor plants are far more common, by a 3 to 1 ratio." If you're unsure as to the identity of a particular plant, bring a sample to your local nursery or county Extension agent for proper identification.

Be sure to educate everyone in your family about the potential dangers of plant poisonings. Teach kids to take a "hands

off" approach to plants that have the potential for contact dermatitis. Never use any plant parts for any food purposes unless you are absolutely sure they are safe. Young children especially should be taught never to eat any outside or inside plant—fruit, leaves, stems, seeds, flowers, or otherwise—without asking first. (Plants comprise 6.9 percent of poison exposure



Dumb cane (*Dieffenbachia* spp.), left, and lilies, right, are among the common indoor plants that are often implicated in poisonings of pets.

for children under the age of six.) And be sure to keep bulbs and seeds out of their reach by storing them in a safe location.

Should a situation arise where someone has eaten a potentially poisonous plant, stay calm and act quickly. First, remove any plant parts from the person's mouth. If it's a life-threatening emergency, immediately call 911. Otherwise, call the National Capital Poison Center (NCPC) at (800) 222-1222 and you will be connected to the poison control center nearest you. "The poison center will ask questions about what plant was ingested, information on the person who swallowed the plant, how



Delphiniums are striking garden flowers, but all parts of the plant are poisonous.

much and what part was ingested, when it happened, and if they are having any problems," explains Rose Ann Soloway, a clinical toxicologist with the NCPC in Washington, D.C. "We will then make a specific treatment recommendation."

While a plant may be toxic, it's important to keep things in perspective. Ripping out plants or avoiding new plantings because of potential toxicity is unrealistic. After all, part of the enjoyment of gardening is growing a diversity of plants, and the vast majority of plants are not poisonous. Just heed those that are. 🐾

Writer Kris Wetherbee specializes in gardening, wildlife and environmental issues. She and her husband, Rick, a photographer, recently collaborated on Attracting Birds, Butterflies & Other Winged Wonders to Your Backyard (Lark Books, 2005).

KEEPING PETS SAFE

Dogs, cats, and other pets are not immune to the effects caused by toxic substances in certain plants. Pets like to nibble—sometimes on shoes and newspapers, and other times on indoor and outdoor plants. Plants that are poisonous can cause reactions ranging from mild nausea to seizures, coma, or even death. Just as with humans, the effects can vary depending on the size, weight, and age of the animal, time of year, plant species, and plant parts consumed.

Plants that are poisonous to humans are also generally poisonous to pets, with castor bean, yew, oleander, mistletoe, rhododendron, rhubarb leaves, wild black cherry, daphne berries, and jasmine berries rating among the most toxic. Bulbs like tulips, daffodils, and autumn crocus can cause seizures and damage the heart. And when the bulbs smell like onions, which some do, they can be

quite appealing to certain dogs. The bark, leaves, and flower buds of hydrangea

Many pets, like the author's Bengal cat, like to nibble grass and other vegetation.

contain hydrangin, a cyanide-type toxin that, when ingested, induces a very quick onset of symptoms that may even result in death. Other potentially poisonous plants include those grown indoors, such as cyclamen, kalanchoe, azalea, peace lily (*Spathiphyllum* spp.), schefflera, dracaena, dieffenbachia, philodendron, and pothos (*Epipremnum* spp., syn. *Scindapsus* spp.).

Plants that are non-toxic or only mildly toxic to humans can still be deadly to pets. For example, heavenly bamboo (*Nandina domestica*) may cause seizures, respiratory failure and death in both dogs and cats. All parts of lilies (*Lilium* spp.) and daylilies (*Hemerocallis* spp.)—from the stamen to the root—are highly toxic to cats, resulting in kidney failure and death. (Dogs only get stomach irritation.) "The vast majority of ingestions are with lilies that have been brought indoors," notes Dana Farbman, spokesperson for the Animal Poison Control Center run by the ASPCA.

Mulch, too, can be just as poisonous as it is appealing—at least when it comes to cocoa bean shells and dogs. If large amounts are ingested, this by-product of chocolate production can cause symptoms similar to those seen with canine chocolate poisonings. Last year the Animal Poison Control Center received calls for around 170 cases involving cocoa bean shell mulch. The most common symptoms that occurred following ingestion were hyperactivity, muscle tremors, and vomiting, although the cocoa bean shells may be lethal if consumed in large enough amounts. There is slightly less of the toxic principle, theobromine, in the processed mulch (0.19 to 2.98 percent) than in unprocessed cocoa beans (1 to 4 percent), but it's best to be on the safe side and avoid using this mulch around dogs with indiscriminate eating habits.

In fact, it's also best to play it safe when it comes to pets and potentially poisonous plants—especially if you have a pet that is curious or likes to nibble. That can mean simply supervising pets as they explore, keeping house plants out of your pet's reach, putting a barrier between poisonous plants and your pets, or using a commercial pet deterrent. However, Farbman says they have yet to find a deterrent that is consistently effective against all animals. "With the extremely high toxic potential that lilies have, I wouldn't feel secure with using a pet deterrent," she adds. That said, you may find the best solution is to get rid of the plant altogether.

—K.W.

