

Atlas of Poisonous Plants

Despite an appreciable, but unassessed, incidence of poisoning, and despite the existence of an extensive literature, few medical men know much about poisonous plants and the effects of their toxins on the human body. The situation is not helped by the wide variation that characterizes so many facets of the subject. In this atlas, 16 examples of common poisonous plants from various parts of the world have been selected from many hundreds of species.

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The number of persons poisoned by plants cannot be assessed accurately. Symptoms vary from the negligible to death; moreover there is the problem of where to draw the line. A variety of transient symptoms due, for instance, to smoking too much tobacco could be blamed, strictly speaking, on poisoning by a plant; and a medicinal dose of castor oil produces symptoms that, in other contexts, would certainly be acknowledged as poisoning. (Castor oil does in fact contain a moderate amount of toxic agents.)

As a rule, only sudden and severe cases of accidental poisoning come to the physician's notice, but he may sometimes find himself faced with chronic complaints. Poisoning is usually due to eating parts of the plant – the fruits, seeds, or leaves – but other possibilities that may give rise, for example, to skin eruptions, eye irritation, allergic symptoms, etc., should not be forgotten.

Wide variation in toxicity

Although the toxic agents in many plants are known, the degree of toxicity varies widely even within a single species. There appear to exist "physiological races", and this may in some cases explain contradictory reports. A well-known example is the black nightshade, *Solanum nigrum*, a weed that grows near all human habitation and is of world-wide distribution outside the tropics. Its black, sweet-tasting berries are frequently eaten by children at play, many of whom are poisoned. Nevertheless, there are reports of the berries' being eaten without harm, and there is evidence, often overlooked, that a closely related species, *S. americanum*, grows in North America and may have different poisonous properties.

In addition, the effect of toxic agents in herbs varies widely from person to person depending, among other factors, on age, sex, and state of health. Common plants (weeds) are a particular danger to

children, who may eat berries or young pods (e.g. *Cytisus*, golden shower).

Many poisonous plants have curative properties but only if correctly administered. Clearly, therefore, "healing herbs" or seeds, sold in shops to the general public without medical control (exact diagnosis, conditions for treatment) or botanical control (identification) are a potential danger. Drug taking (marijuana, lysergic acid diethylamide – LSD) is a current phenomenon; prepared parts of some species of hemp (*Cannabis*) and the red skin of the hood of the fly mushroom (*Amanita muscaria*) are among the means for evoking psychic experiences. Again, it seems difficult to know when and where to speak of plant "poisoning"; a related species of *Amanita* produces a yearly death roll from mushroom poisoning. In many instances, it just depends on the dose whether a plant is to be considered poisonous, beneficial, or, occasionally, a relatively harmless stimulant.

Surprises are always possible. Plants reputed toxic may prove to be harmless, and under exceptional circumstances (errors in harvesting or storage, for example) the reverse may be the case.

Symptoms are extremely variable; vomiting and diarrhoea, abdominal pains and colics, impaired vision and dizziness, and palpitations and clouding of the consciousness are among the most frequently observed.

If an acute case of plant poisoning is suspected, there is rarely time for laboratory investigations, and even with these, it may prove very difficult, if not impossible, to identify the plant with certainty. The more practical approach is to trace closely the patient's contacts with plants during, say, the 48 hours before the symptoms were noticed. By obtaining, if at all possible, a specimen of the suspected plant, and demanding instant information from a botanical institute (herbarium), a pharmacological institute, or a poisons centre, the name of the plant, the identity of the toxic agent, and perhaps the spe-



*"Poppy Field near Giverny",
Claude Monet, 1840-1926.
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cific antidote may often be discovered. Until then, or in the absence of such information, treatment is symptomatic. The science of poisonous plants, outside the limits of medicine, is a large and specialized subject with an extensive literature. Two books that contain hundreds of references, as well as a vast amount of information that reaches far beyond the area specifically treated, are *The Medicinal and Poisonous Plants of Southern and Eastern Africa* by J. M. Watt and M. G. Breyer-Brandwijk (2nd ed., 1962), and *Poisonous Plants of the United States and Canada* by J. M. Kingsbury (1964).

Fig. 1. *Datura stramonium* (thorn apple, Jamestown weed, Jimson weed, apple of Peru, tolguacha). World-wide distribution as a weed in temperate to subtropical areas. Widely branching, herbaceous plant, up to 5 ft tall. Flowers large, showy, trumpet-shaped, containing poisonous nectar. Erect, usually spiny, capsule, 2 in long, with basal skirt (calyx); it splits open by four regular valves; seeds numerous, poisonous. A number of alkaloids, e.g. atropine, hyoscyamine, in all parts. Large doses (eating of parts, decoction) may cause death; smaller doses cause varying symptoms (intense thirst, impaired vision, flushed skin) leading to convulsions and coma.

Fig. 2. *Nerium oleander* (oleander). Widely cultivated ornamental shrub in warm-temperate regions; native of southern Europe. Evergreen bushy shrub with long narrow leaves and clusters of showy, pink, red, or white flowers. All parts extremely toxic to man and all livestock. Meat barbecued on oleander sticks may cause severe poisoning. Varying toxicity in different varieties. Poisons are cardiac glycosides (oleandroside and nerioside) allied to digitalis glycosides and of similar physiological effect. Symptoms include increased pulse rate, discoloration of the mouth, nausea, dizziness, cardiac irregularities, dyspnoea, and coma.

Fig. 3. *Abrus precatorius* (rosary pea, crab's-eye, precatory bean, jequirity bean). Cultivated as an ornamental climber in warm climates; wild in Africa; also met with as a weed. A woody vine with blue-purple papilionaceous flowers and feathered leaves. Pods clustered, with seeds bright red and black, containing abrin (a phytotoxin), one of the most potent poisons known to science. Unbroken seeds less dangerous and may pass without harm through the intestinal tract.

Fig. 4. *Taxus baccata* (English yew, yew). Wild and cultivated throughout



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temperate northern hemisphere. A dense, dark, evergreen needle-leaved shrub or small tree, contains taxine in needles, bark, and seeds. (The red, fleshy [ornamental] seed mantle is not dangerous.) Affects heart and nervous system. After a large dose, sudden death may follow without warning symptoms. Symptoms include severe gastrointestinal irritation, petechial haemorrhages throughout the body, congestion of many organs, clumping of erythrocytes.

Fig. 5. *Lantana camara* (lantana). Widely occurring as a weed in all warm parts of the world; grown as (herbaceous) ornamental plant in temperate regions. Shrubs, often thorny, with leaves borne opposite each other on the stem and paired heads of small, pretty tubular flowers, varying between brown, pink, yellow, and white. Fruits resemble green-blue or black berries and are strongly suspected to have caused death among children. Contain lantadene or lantanin. Dangerous to animals. Symptoms include gastrointestinal irritation, extreme muscular weakness, circulatory collapse.



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Fig. 6. *Gloriosa superba* (glory lily, climbing lily). In warm regions planted as a twining herbaceous plant; wild in tropical Asia and Africa. Leaves with rolled tops. Flowers large, bright orange; petals directed upwards with the stamens below, spread horizontally. Poison is an alkaloid related to colchicine. Symptoms resemble those caused by colchicum and include gastrointestinal irritation, nervousness, oral paraesthesia. Death may follow some hours after ingestion of the tubers, but the whole plant is dangerous.



Fig. 7. *Strophanthus sarmentosus*. Climber or straggler in West Africa to Congo; sometimes cultivated, as are other species of *Strophanthus*. Leathery leaves growing opposite each other; milky juice, showy flowers. From the seeds is obtained sarmentogenin, a dangerous poison (cardiotoxic action), but



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also basis for production of cortisone. Used with criminal intent and as popular medicine (abortifacient, emetic).

Fig. 8. *Acokanthera venenata*. Wild in tropical Africa; often grown in warm greenhouses as an ornamental shrub. Dark green leaves borne opposite each other on the stem and deliciously fragrant, white flower heads. All parts carry abundant white latex known as ouabain or venenatin, a dangerous (arrow-) poison arresting the heart in systole.

Fig. 9. *Colchicum autumnale* (autumn crocus). Wild in Europe; widely planted as a garden ornamental elsewhere. Flowers cup-shaped, appearing after the tuft of large, flabby leaves has withered (in late summer). Toxic plant; symptoms mainly gastrointestinal. Poison is heat-stable and excreted by animals (e.g., in milk) that have eaten the plants.

Fig. 10. *Convallaria majalis* (lily-of-the-valley). Wild throughout the temperate northern hemisphere, planted in shady gardens or for commerce. Tufts of finely parallel-nerved leaves rise from the earth and enclose elegant sprays of white, fragrant, bell-shaped flowers; berries red. Contains cardiac glycosides (allied to digitalis), but plant is possibly less dangerous than its repute.

Fig. 11. *Digitalis purpurea* (foxglove). Everywhere in Europe as a weed in deforested areas; naturalized in temperate America. Numerous horticultural varieties. Large, erect racemes of spotted, purple to white, bell-shaped flowers. Leaves highly toxic, also other parts. Symptoms include gastric distress, drowsiness, cardiac irregularities.

Fig. 12. *Aconitum* spp. (aconite, monkshood, wolfsbane). Dozens of species, indigenous in the northern hemisphere, often cultivated. Perennial herbs, with stiffly erect inflorescences of hooded, usually blue, flowers; fruits podlike. Toxicity varies according to species



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which are often confused with the equally dangerous larkspurs). Poisons are delphinine and other alkaloids. Death may occur in a few hours. Symptoms include nausea, vertigo, blurred speech and vision, anxiety.

Fig. 13. *Atropa belladonna* (belladonna, deadly nightshade). Native to Europe, sometimes cultivated, rarely as a weed. A fleshy coarse herb, with dull purple, bell-shaped flowers; black, shining berries. Ingestion of three berries may cause a child's death, but all parts of the plant are poisonous. Poisons several, e.g., atropine. Symptoms are dyspnoea, convulsions, coma. Pharmacologically a useful plant in small doses.

Fig. 14. *Calotropis procera*. Native to all warm parts of Africa; widespread elsewhere as a weed. A large-leaved herb or small tree, with umbels of dull, purple-spotted flowers and apple-sized, velvety, green, grooved, pointed fruits. Latex contains trypsin, calotoxin, and calotropin, a cardiac poison, and may cause death. A valued popular medicine in Africa.

Fig. 15. *Rauvolfia* spp. (African quinine-allied species). Native to all warm parts of Africa; often grown in warm greenhouses. *Rauvolfia* species are numerous. Shrubs, lianas, or trees are of medicinal value and poisonous in all parts (containing e.g. rauwolfine, reserpine, rescinnamin). Fruits like twin berries, black or red.

Fig. 16. *Gelsemium sempervirens* (Carolina jessamine, yellow jessamine, evening trumpet flower). Indigenous in the southeastern United States, but often cultivated in subtropical gardens. Woody, evergreen vine, with 2 in long leaves borne entirely opposite each other. Trumpet-shaped, fragrant, bright yellow flowers. A dangerous poisonous plant in all its parts. (Alkaloids uncertain, related to strychnine.) Children have died from respiratory failure after sucking nectar. ☐



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