

## Shedding Light on the Solanaceae: An Exploration of Our Relationship with Nightshades

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- Many nightshades contain the alkaloids solanine, atropine, and scopolamine.
- Solanine poisoning, which can result from eating “green” potatoes, can cause nausea, vomiting, and diarrhea.
- Atropine and scopolamine are responsible for the hallucinogenic and psychoactive effects of many nightshade plants. They also affect our parasympathetic nervous system – the “rest and digest” part – inhibiting secretions like sweat, tears, saliva, and digestive juices, as well as smooth muscles like those in the lungs, bladder and GI tract.
- Some familiar members of the Solanaceae family are potatoes, tomatoes, tomatillos, eggplants, tobacco, petunias, and peppers.
- Mandrake (*Mandragora officinarum*)
  - Earliest known anesthetic
  - Associated with fertility, and by extension, used as a love charm and in love potions
  - Used historically to treat insanity, memory loss, demonic possession, infertility, pain, diarrhea, insomnia, wounds, and eye inflammations
  - *Morion* (“death wine”) may have been given to Christ on the cross to ease his suffering
- Deadly nightshade (*Atropa belladonna*)
  - Atropa, from the Greek fate of the same name, who cut the thread of life
  - Belladonna (beautiful woman), from Venetian women who used the plant extract to dilate their pupils
  - Many early scientific names reference its sleep- and death-inducing properties
  - Causes hallucinations, the sensation of flying, and increased sexual arousal
  - Belladonna-infused wine may have been imbibed at festivals honoring the Greek god Dionysus
  - An ingredient in flying ointment recipes of medieval witches
  - Used to treat palsy, epilepsy, whooping cough, hydrophobia (rabies), to dilate the pupils for cataract surgery, and in plasters to treat pain
  - Verse to remember overdose symptoms: “Hot as a hare, blind as a bat, dry as a bone, red as a beet, mad as a hen”.
  - Atropine, originally extracted from belladonna, is still used today in ophthalmology, and issued to U.S. soldiers to prevent effects of nerve gas
- Henbane (*Hyoscyamus niger*)
  - Produces a compound that smells like rotting flesh
  - Can cause madness, aggression, and death
  - Used externally as a topical anesthetic, and inhaled as a general anesthetic
  - Called *Bilsenkraut* in German, and used to be added to beer. Pilsen, the city in the Czech Republic, got its name from henbane being used in this way, and the town lends its name to pilsner-style beer.
  - Also used as an ingredient in flying ointments, and as a poison in French high society in the 1600s.
  - Scopolamine, originally extracted from henbane, is still used today to treat motion sickness, postoperative nausea, and gastrointestinal muscle spasms
  - Scopolamine helped researchers understand the parasympathetic nervous system

- Scopolamine is now extracted from hybrids of *Duboisia* spp., another nightshade, in Australia
- Thornapple (*Datura* spp.)
  - Jimsonweed (*D. stramonium*) refers to British soldiers in Jamestown, VA eating the plant, then hallucinating for 11 days
  - Considered a plant of the gods in Mexico
  - In Mexico, it's mixed into an ointment used to induce hallucinations, similar to how belladonna and henbane were used in Europe
  - The smoked was inhaled to treat asthma in Germany and the U.S.
  - Considered sacred in China – the heavens sprinkled it with dew or rain when Buddha preached, and the Taoists said it was a star, whose visitors would bring the flowers to earth
- Angel's trumpet (*Brugmansia* spp.)
  - A extremely sacred South American plant, it's used by shamans to induce hallucinations and cure illnesses
  - Used as a rite of passage at puberty, and "to see clearly"
  - Causes violence, hallucinations, and eventually unconsciousness in those who take it
  - Used also to treat pain, wounds, infections, insomnia, and asthma
- Huckleberry (*Solanum scabrum*)
  - Part of the *Solanum nigrum* plant complex
  - Not related to the other huckleberry, which is related to the blueberry
  - The leaves are eaten in Africa as a nutritious pot herb
  - The berries, especially unripe ones, can cause solanine poisoning
  - Pigment extracts of the fruit used as a dye for juice and apple sauce, as well as ink
- Potato (*Solanum tuberosum*)
  - Solanine content increases in potatoes stored in the light, with high levels in the eyes and just under the skin
  - Eating these "green potatoes" can cause solanine poisoning
  - Cooking does not affect solanine levels

Atropine poisoning case:

Lee, M.R. (2007). Solanaceae IV: *Atropa belladonna*, deadly nightshade. *J R Coll Physicians Edinb*, 37: 77-84. Accessed 4/10/2021 from [http://www.rcpe.ac.uk/journal/issue/journal\\_37\\_1/R-lee.pdf](http://www.rcpe.ac.uk/journal/issue/journal_37_1/R-lee.pdf)

Brugmansia book:

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