

Plant in Focus, September 2018
Brugmansia Angel's Trumpet



Brugmansia GBG.
February 2016
Photo: DJ

Brugmansia are native to regions of South America, along the Andes from Venezuela to North Chile and also coastal rainforests of South Eastern Brazil below 1,000m, along river banks and forest edges with warm weather, heavy rainfall and high humidity. They are grown world-wide and naturalized in isolated tropical areas around the globe from North America, Africa, Australia and Asia. *B. candida* was originally from Columbia and Ecuador where it is very common. It was mainly found between 1500-2000m.

All 7 species are listed as extinct in the wild in their native habitat in South America by the IUCN Red List, but are popular as ornamental plants and still exist wild in other areas as an introduced species. Because these plants are valued for their medicinal qualities and their use in spiritual ceremonies, local people have cultivated and preserved them in their gardens. The poisons from these plants, or artificial versions of them, are used in western medicine.

Plant description

Brugmansia are large ornamental shrubs or small trees, with semi-woody, often many branched trunks. They can reach heights of 3-11 metres high. The leaves, dull green and softly hairy, are alternately arranged along the stems, generally large 10-30 cm long and 4-18 cm wide, with an entire coarsely toothed margin. The fruits are smooth, narrow cylindrical pods, pointed at the end. It is closely related to *Datura*, the main difference being the spines on the fruit of the *datura*, which the *Brugmansia* don't have.

The common name refers to the large pendulous, trumpet-shaped flowers 14-50 cm long and 10-35 cm across at opening. The corolla body is slightly recurved to 5 main points, but the very peaks in the true species are always curved outwards and these peaks are short, only 1-2.5 cm long. They come in shades of white, yellow, pink, orange, green and red. They hang downward from fully pendulous up to nearly horizontal. They often have strong, pleasing fragrance, mostly in the



Brugmansia GBG.
June 2015
Photo: DJ

evening. This attracts pollinating moths. Flowers may be single, double or more. The red-flowering species lacks scent as pollinated by long-billed hummingbirds.

Growing *Brugmansia*

Brugmansia are easily grown in moist, well-drained soil, in sun to part shade, in frost-free climates. They begin to flower in late spring in warm climates and continue into autumn, or early winter. In cool winters, they need protection from frost, but the roots are hardy and may resprout in spring. The species from higher elevations prefer moderate temperatures and cool nights, and may not flower if temperatures are too high. *Brugmansia* can only be propagated through cuttings, though propagation is simple, most are propagated easily by rooting 10-20 cm cuttings from the end of a branch in summer. *Brugmansia* have 2 stages to their life cycle. The vegetative stage of young seedlings, grow straight on a single stalk, until it reaches the main fork at 80-150 cm. It won't flower till it reaches this fork and then only on new growth above the fork. Cuttings taken from the lower vegetative region must also grow to a similar height before flowering, but cuttings from upper flowering region will often flower at a very low height. There are several hybrids and numerous cultivars developed for use as ornamental plants. Cultivars can have double flowers and some have variegated leaves.

Poisons

Brugmansia suaveolens have an interesting plant-animal interaction, which involves the butterfly *Placidula euryanassa*. This butterfly uses *Brugmansia* as one of its main larval foods. These can sequester the plant's tropane alkaloids and store them through the pupal stage to adult butterfly, where it can be used as a defence mechanism. This makes the caterpillars and butterflies less palatable to vertebrate predators.

Every part of the Angel trumpet plant is highly poisonous, including the leaves, flowers, seeds and roots. All contain the toxic alkaloids scopolamine, atropine and hyoscyamine, which are widely synthesized into modern medicinal compounds, but are deadly poisonous if used outside a doctor's supervision. Symptoms may include intense thirst, difficulty with speech, breathing and swallowing, vomiting and diarrhoea, fever, confusion, hallucinations, delirium, dilated pupils, seizures and coma. Deaths have occurred. The perfume can cause respiratory irritation, headaches, nausea, and light-headedness. Eye contact with the sap may cause dilated pupils and temporary blindness. Atropine (originally discovered in the related plant Deadly Nighshade *Atropa belladonna*) is used by opticians to dilute pupils and was used in the past as a beauty aid. The entire *Brugmansia* plant is toxic to animals when ingested, specially the seeds. It is toxic to dogs and they should be taken to the vet immediately if any part of the plant is ingested.

Brugmansia and *Atropa* are members of the Nightshade family, Solanaceae. Many solanaceous plants are



Brugmansia pods, GBG August 2018. Photo DJ.



Brugmansia x candida, GBG February 2016. Photo DJ.

toxic to humans. However we have learned how to prepare them or have bred them to reduce their toxins. The family also includes tomatoes, tamarillo*, potato, eggplant, chilli, capsicum, tobacco*, cape gooseberry*, petunia, box thorn, *Cestrum**, *Datura*, *lochroma**, *Solandra**. (* = in GBG)

A plant with superficially similar appearance is the Trumpet Creeper or Chalice Vine *Campsis radicans*. It is prized for its magnificent orange-red blooms, a little smaller than *Brugmansia*. Although it is in a distant family, Bignoniaceae (containing *Catalpa**, *Jacaranda**, *Pandorea* and *Tecoma*), its fruit, foliage, flowers and sap are also toxic and can cause mild to severe skin rashes and irritation if handled. *Campsis radicans* is also originally from South America. It is a woody tree or shrub with pendulous flowers, and has no spines on its fruit. Trumpet Creeper has many different cultivars.

Modern uses of Brugmansia

- As flowering ornamental plants.
- In modern medicine, important alkaloids such as scopolamine, hyoscyamine, and atropine, found in *Brugmansia* and other related members of Solanaceae, have proven medicinal value for their spasmolytic, anti-asthmatic, anticholinergic, narcotic and anaesthetic properties, although many of these alkaloids, or their equivalents, are now artificially synthesized.
- Medicinally used externally as a part of a poultice, tincture, ointment, or where the leaves are applied directly to the skin for distribution of the plant chemicals around the body. Treatment of aches and pains dermatitis, orchitis, arthritis, rheumatism, headaches, infections, and as an anti-inflammatory. *Brugmansia* products are rarely used internally, due to inherent dangers of ingestion. Internally, highly diluted preparations, as a portion of a larger mix, have included treatments for stomach and muscle ailments, as decongestant, to induce vomiting, to expel worms and parasites, and as a sedative.

Traditional uses of Brugmansia

- Traditionally in South American indigenous cultures in medical preparations, and as an entheogen, ie. a psychoactive substance that induces a spiritual experience used in religious or spiritual ceremonies. It is used by the Urarina, Ingano and Siona in the region of the Putumayo River, Brazil, Ecuador and Columbia, a tributary of the Amazon.
- Brugmansia* is also used by some Amazonian tribes as an admixture to increase the potency of Avahuasca *Banisteriopsis caapi* in Family Malpighiaceae. Avahuasca has a long history of entheogenic use and has the status as a "plant teacher" among the indigenous peoples of the Amazon rainforest.

f. The flowers and the seeds of *Brugmansia* are traditionally used in Rio Grande du Sul, Southern Brazil, mixed in water and ingested for its analgesic effect. Flower extracts have shown pain-killing antinociceptive activity in mice. This is the action of blocking the detection of a painful or injurious stimulus by sensory neurons.

g. In Colombia leaf extracts were used for ceremonial divination, prophecy and healing. It was only used for divinations in very serious cases, as it causes the shaman who works with it to go into a coma for around three days.

h. In Mexico it is used for divination and the diagnosis of illness. Three flowers are macerated in hot water, then pressed with a cloth. The Tzeltal (Mayan people) smoke the dried leaves blended with tobacco or other herbs for divination purposes.

i. In Peru leaves and flowers make a potent psychoactive drink.

j. In Colombia, *B. candida* is prepared as a plaster for tumors, swelling, swollen joints, muscle cramps, inflammation and colds.

k. Several South American cultures have used *Brugmansia* as a treatment for unruly children that they might be admonished directly by their ancestors in the spirit world, and made more compliant.

l. Mixed with maize beer and tobacco leaves, it has been used to drug wives and slaves before they were buried alive with their dead lord.

References

Wikipedia: en.Wikipedia.org/wiki/Brugmansia

Plant of the Month, March 2013

The Plant List: www.theplantlist.org

International Union for the Conservation of Nature: www.iucnredlist.org

Summary

Family: Solanaceae, Subfamily Solanoideae, Tribe Datureae

Species: *Brugmansia* (6 species and 5 hybrids accepted in The Plant List)

Common name: Angel's Trumpet

Conservation status: EW All species are assessed as Extinct in the Wild, by the IUCN

