

## Nomination of Angel's Trumpet as the Poison of the Month for September

... came from Dr. Heike Franke, scientific director of the PGS "Toxicology and Environmental Protection" at the University of Leipzig (Medical Faculty), scientific staff member at the Rudolf Boehm Institute for Pharmacology and Toxicology, and, together with Ms. Adelgunde Graefe, chair of the "AK Tox Wiki" of the GT. The focus of the working group is the development of a toxicology database. The goal of the project is to systematically collect, organize, and further utilize existing material that has been gathered and processed as part of the new edition of the Lexicon of Toxicology.

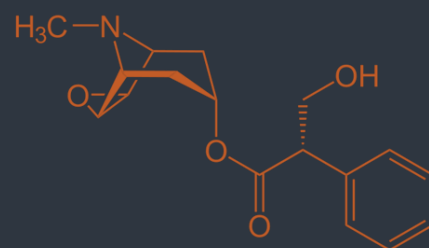
Heike Franke's areas of interest include plant toxins. She was also involved in the analysis of plant poisonings by the Joint Poison Information Center in Erfurt (GGIZ).

The purpose of this article on the angel's trumpet is to raise public awareness of poisonous native plants and to strongly warn against the abusive use of angel's trumpet flowers or leaves as a bio-drug.

### Plant Poisonings

Out of the approximately 3,000 native plant species, around 150 have significant poisoning potential. The toxicity depends on factors such as plant ingredients, ripeness, and environmental conditions, while the severity of poisoning is influenced by the dose, sensitivity, and duration of exposure. Plant poisonings are particularly common in children. This is shown by a survey and extensive statistical evaluation of data (from the period 2010-2019) conducted by the Joint Poison Information Center in Erfurt (GGIZ), which serves the population of the states of Saxony, Saxony-Anhalt, Thuringia, and Mecklenburg-Western Pomerania.

In childhood, plant poisonings account for 15% of inquiries, whereas in adults, they only account for 2%. Children are particularly at risk, as they are unable to assess the toxic potential, especially when it comes to attractive fruits, which



Scopolamine

## The Angel's Trumpet – A Dangerous Bio-Drug

The Angel's Trumpet (*Brugmansia spec.*), a striking plant with large, trumpet-shaped flowers and a captivating fragrance, is currently a highlight in many gardens and parks. However, despite its aesthetic appeal in the autumn season, this plant poses a significant toxicological risk.

Originally native to South America, this member of the *Solanaceae* family has spread globally, including in Germany, where it is commonly cultivated as an ornamental plant. Yet its beauty belies its potential danger: Angel's Trumpet is classified in Risk Category 3 (RK3), indicating that it is "highly toxic."

The toxicity of Angel's Trumpet is primarily attributed to tropane alkaloids, a group of naturally occurring organic compounds derived from tropane. To date, approximately 140 different tropane alkaloids are known. The most significant tropane alkaloids in Angel's Trumpet are scopolamine (L-hyoscyine), L-hyoscyamine, and atropine (D,L-hyoscyamine). These substances are not only found in Angel's Trumpet but also in other toxic plants such as deadly nightshade (*Atropa belladonna*) and jimson weed (*Datura stramonium*). Scopolamine, the main active ingredient of the angel's trumpet, like atropine, is not only of toxicological significance but is also used pharmacologically, though rather rarely and only to a limited extent, for example, as an antiemetic to prevent nausea or vomiting (motion sickness) or to dilate the pupils (ophthalmic use).

Scopolamine and atropine act as antagonists at muscarinic acetylcholine receptors, leading to inhibition of the parasympathetic nervous system. This explains their anticholinergic effects, which, in cases of overdose, result in toxic symptoms such as dry mucous membranes, tachycardia, confusion, and hallucinations. Particularly concerning is the loss of control, which in delirious states can trigger horrifying trips and may even lead to

accounts to 53.7 % of exposures. Plants with a high real risk of poisoning include castor bean, deadly nightshade, jimsonweed, and angel's trumpet.

### Risk Classification of Poisonous Plants

The German Federal Gazette classifies plants into three risk categories to better assess their toxicity to humans:

- **Risk Category 1 (RK1):** Slightly toxic – minimal risk, only mild poisoning symptoms expected.
- **Risk Category 2 (RK2):** Toxic – moderate risk, poisoning possible with significant exposure.
- **Risk Category 3 (RK3):** Highly toxic – highest risk level, even small amounts can cause severe, potentially life-threatening poisoning.

In this system, RK3 represents the highest level of danger. Plants classified in RK3 require special caution and clear warning labels, as even small amounts of these plants can lead to severe or life-threatening poisoning. This classification system differs from other international systems, such as the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), where the highest risk level is typically referred to as Category 1.

### Therapy for Poisoning

Physostigmine acts as an antidote and must therefore be administered in time to mitigate the effects as much as possible. Symptomatically, impending respiratory paralysis can be countered through artificial respiration, and timely non-pharmacological measures to lower body temperature should be initiated. The same treatment is also used in cases of atropine poisoning.

self-mutilation. In extreme cases, poisoning can be fatal. In indigenous South American cultures, the plant was traditionally used in rituals to induce trance-like states. Today, Angel's Trumpet is abused as a bio-drug, especially among adolescents. The active compounds are present in all parts of the plant. Primarily, flowers and leaves are smoked, eaten, or prepared as tea to induce hallucinations.

The recreational use of Angel's Trumpet as a drug is highly dangerous due to the difficulty in estimating the dosage of its toxic alkaloids. Additionally, the onset of symptoms occurs 30-60 minutes after ingestion, which may lead users to take more before experiencing any effects, often with severe consequences. Poison control centers frequently report cases of severe poisoning resulting from the misuse of Angel's Trumpet, documenting extreme delirium, feverish hallucinations, and, in some instances, death.

The widespread availability of this plant, given its popularity as an ornamental species, makes it easily accessible at no cost. Furthermore, the internet provides readily accessible information on its preparation and purportedly "safe" dosing, which can encourage experimentation among adolescents.

While the active compounds of Angel's Trumpet, as well as those of the deadly nightshade (scopolamine, atropine) hold valuable applications in Western pharmacology, where their controlled use is both safe and beneficial, the unregulated use of this plant as a recreational drug poses extreme risks and should be strictly avoided.

*By Ute Haßmann*

### Literature and links:

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- Foto: Heike Franke