

# The Socrates Project



**Poisonous Plants in Virginia**

A monarch butterfly with yellow and black wings is perched on a purple columbine flower. The background is a soft-focus green.

Virginia  
Master  
Naturalist





## Project Background

### The Facts

- Tens of thousands of exposures to poisonous plants annually reported to Poison Control Centers (U.S.)
- Hundreds reported annually to the Blue Ridge Poison Center.
- Many cases are never reported.

### Action

- Educational material and outreach
- The target group: children, via parents, grandparents, teachers, friends, and public gatherings





## Project Goals

- Disseminate data in consistent & easily understood format
- PDF Publication online:
  - ❖ Virginia Master Naturalists
  - ❖ University of Virginia
- Power Point Presentation
  - ❖ Webinar
  - ❖ Zoom
  - ❖ In person

# Project Goals

- **Printed Material**
  - ❖ **The Socrates Project 2<sup>nd</sup> Edition**
  - ❖ **Distributed throughout Virginia**
    - ❖ **Virginia Master Naturalist Chapters**
    - ❖ **Virginia Counties**
    - ❖ **Poison Control Centers**
- **Possible Next Step**
  - ❖ **Mobile App (TBD)**



## Project Scope

- **Plants poisonous to humans**
- **Piedmont area of Virginia – 1<sup>st</sup> Edition**
- **State of Virginia – 2<sup>nd</sup> Edition**
- **Native or imported plants growing in the wild**
- **“Living” lists of plants**

**Table 17A.** Substance Categories Most Frequently Involved in Human Exposures (Top 25).

Substance (Major Generic Category)	All substances	% <sup>a</sup>	Single substance exposures	% <sup>b</sup>
Analgesics	285,361	11.02	182,900	9.67
Cleaning Substances (Household)	184,677	7.13	166,093	8.78
Cosmetics/Personal Care Products	159,530	6.16	153,374	8.11
Antidepressants	137,881	5.32	60,144	3.18
Sedative/Hypnotics/Antipsychotics	135,091	5.21	50,037	2.64
Cardiovascular Drugs	118,287	4.57	50,029	2.64
Antihistamines	112,819	4.36	76,309	4.03
Foreign Bodies/Toys/Miscellaneous	96,964	3.74	94,051	4.97
Pesticides	83,121	3.21	77,707	4.11
Alcohols	74,008	2.86	22,324	1.18
Dietary Supplements/Herbals/Homeopathic	69,618	2.69	59,613	3.15
Anticonvulsants	67,117	2.59	26,702	1.41
Stimulants and Street Drugs	66,822	2.58	37,755	2.00
Topical Preparations	63,145	2.44	61,517	3.25
Hormones and Hormone Antagonists	59,039	2.28	38,654	2.04
Vitamins	56,361	2.18	46,280	2.45
Cold and Cough Preparations	55,192	2.13	37,258	1.97
Antimicrobials	51,833	2.00	41,606	2.20
Gastrointestinal Preparations	47,774	1.84	33,879	1.79
Chemicals	47,067	1.82	40,816	2.16
Plants	45,612	1.76	43,479	2.30
Bites and Envenomations	41,341	1.60	40,810	2.16
Fumes/Gases/Vapors	37,833	1.46	34,910	1.85
Other/Unknown Nondrug Substances	35,403	1.37	33,207	1.76
Hydrocarbons	30,969	1.20	29,151	1.54

<sup>a</sup>Percentages are based on the total number of substances reported in all exposures (N = 2,590,499).

<sup>b</sup>Percentages are based on the total number of single substance exposures (N = 1,891,817).



**Table 17C.** Substance Categories Most Frequently Involved in Pediatric ( $\leq 5$  years) Exposures (Top 25)<sup>a</sup>.

Substance (Major Generic Category)	All substances	% <sup>b</sup>	Single substance exposures	% <sup>c</sup>
Cosmetics/Personal Care Products	109,465	11.42	107,279	12.00
Cleaning Substances (Household)	100,830	10.52	97,147	10.87
Analgesics	85,978	8.97	78,489	8.78
Foreign Bodies/Toys/Miscellaneous	68,707	7.17	67,186	7.52
Dietary Supplements/Herbals/Homeopathic	48,537	5.06	46,024	5.15
Antihistamines	43,944	4.58	39,823	4.46
Topical Preparations	42,746	4.46	41,934	4.69
Vitamins	39,122	4.08	34,892	3.90
Pesticides	34,356	3.58	33,363	3.73
Plants	26,417	2.76	25,582	2.86
Gastrointestinal Preparations	24,900	2.60	22,497	2.52
Antimicrobials	21,295	2.22	20,020	2.24
Cardiovascular Drugs	20,341	2.12	13,025	1.46
Arts/Crafts/Office Supplies	19,773	2.06	19,217	2.15
Cold and Cough Preparations	18,877	1.97	17,199	1.92
Essential Oils	17,394	1.81	16,502	1.85
Electrolytes and Minerals	16,923	1.77	15,356	1.72
Hormones and Hormone Antagonists	16,719	1.74	13,157	1.47
Deodorizers	16,170	1.69	15,984	1.79
Other/Unknown Nondrug Substances	13,013	1.36	12,597	1.41
Antidepressants	11,771	1.23	8,605	0.96
Tobacco/Nicotine/eCigarette Products	10,945	1.14	10,853	1.21
Chemicals	10,471	1.09	9,769	1.09
Stimulants and Street Drugs	10,295	1.07	9,145	1.02
Alcohols	8,843	0.92	8,603	0.96

<sup>a</sup>Includes all children with actual or estimated ages  $\leq 5$  years old. Results do not include "Unknown Child" or "Unknown Age".

<sup>b</sup>Percentages are based on the total number of substances reported in pediatric exposures (N = 958,628).

<sup>c</sup>Percentages are based on the total number of single substance pediatric exposures (N = 893,745).



**Table 20.** Frequency of Plant Exposures (Top 25)<sup>a</sup>.

	Botanical name or Category	AAPCC Generic Code Name	N
1	Unknown Botanical Name	Unknown Toxic Types or Unknown if Toxic	2,535
2	<i>Phytolacca americana</i> (L.)	Gastrointestinal Irritants (Excluding Oxalate Containing Plants)	2,244
3	Cherry Pit	Amygdalin and/or Cyanogenic Glycosides	1,537
4	Berry (not otherwise specified)	Unknown Toxic Types or Unknown if Toxic	1,498
5	Plants-general-unknown	Unknown Toxic Types or Unknown if Toxic	1,250
6	Plants-oxalates	Oxalates	1,177
7	<i>Toxicodendron radicans</i> (L.)	Skin Irritants (Excluding Oxalate Containing Plants)	876
8	<i>Spathiphyllum</i> spp.	Oxalates	769
9	Plants-cyanogenic glycosides	Amygdalin and/or Cyanogenic Glycosides	713
10	Unknown Botanical Name	Non-Toxic	649
11	Cherry (Species unspecified)	Amygdalin and/or Cyanogenic Glycosides	648
12	<i>Euphorbia tirucalli</i> (L.)	Skin Irritants (Excluding Oxalate Containing Plants)	509
13	Plants-solanine	Solanine	441
14	<i>Nerium oleander</i> (L.)	Cardiac Glycosides (Excluding Drugs)	429
15	<i>Epipremnum areum</i> (L.)	Oxalates	388
16	Unknown Botanical Name	Skin Irritants (Excluding Oxalate Containing Plants)	380
17	Unknown Botanical Name	Gastrointestinal Irritants (Excluding Oxalate Containing Plants)	354
18	<i>Colocasia esculenta</i> (L.)	Oxalates	335
19	Unknown Botanical Name	Other Toxic Types	291
21	<i>Nandina domestica</i> Thunb spp.	Amygdalin and/or Cyanogenic Glycosides	265
22	Plants-toxicodendrol	Skin Irritants (Excluding Oxalate Containing Plants)	265
23	Apple Seed	Plants: Amygdalin and/or Cyanogenic Glycosides	247
24	<i>Solanum dulcamara</i> (L.)	Plants: Solanine	246
25	Apple (Fruit)	Plants: Amygdalin and/or Cyanogenic Glycosides	245

<sup>a</sup>Number of substances related to a human exposure with a Major Generic Category of Plant. Unknown Botanical Name represents substances with a Major Generic Category of Plant and a NULL substance code. Total = 45,612.



## **U.S. Poison Center**

- **The 25 most commonly encountered plant species account for 40% of all reported U.S. plant exposures.**
- **Too often the plant is not identified, making triage and treatment recommendations difficult for healthcare providers.**
- **This highlights the need for multi-disciplinary work between medical providers and the master naturalists.**

## **THE SOCRATES PROJECT**

### **POISONOUS PLANTS IN VIRGINIA SECOND EDITION**

- Expanded from first edition 11 plants to 24 plants
- Joint effort between Virginia Master Naturalists and University of Virginia
- Exceptional peer review team
- Includes most common poisonous plants found in nature
- Designed to be user friendly





## **TOP TEN POISONOUS PLANTS in VIRGINIA**

- **1 Poison Ivy, Oak, Sumac (similar toxicity)**
- **2 Common Pokeweed**
- **3 Jimson-weed**
- **4 American False-hellebore**
- **5 Mayapple**
- **6 Foxglove, Lilly-of-the-valley (similar toxicity)**
- **7 Water-hemlock**
- **8 Poison hemlock**
- **9 Monkshood**
- **10 Giant Hogweed**

## Other Plants In Socrates Publication

- **Climbing Nightshade**
- **Cow Parsnip**
- **Eastern Black Nightshade**
- **Elderberry**
- **Horse-nettle**
- **Jack-in-the-pulpit**
- **Mountain Laurel**
- **Rhododendron and Azalea**
- **Virginia-creeper**
- **White Baneberry**
- **White Snakeroot**
- **Wild Parsnip**



## IDENTIFYING POISONOUS PLANTS







**The fact that a plant is  
poisonous does NOT mean it  
should be destroyed**

# Giant Hogweed

- 15-16 ft tall, leaves 3 - 5 ft wide
- Umbel 1 – 2 1/2 ft wide
- Stems are hollow, 2 - 4 in. diameter
- Purple-red blotches with a thick circle of hair at base of the leaves.
- Grows in moist soil along roads and grasslands
- **VERY DANGEROUS**
- Sap is strongly phototoxic
- **DO NOT TOUCH!**
- Look alikes: Cow Parsnip, Poison Hemlock, Wild Parsnip







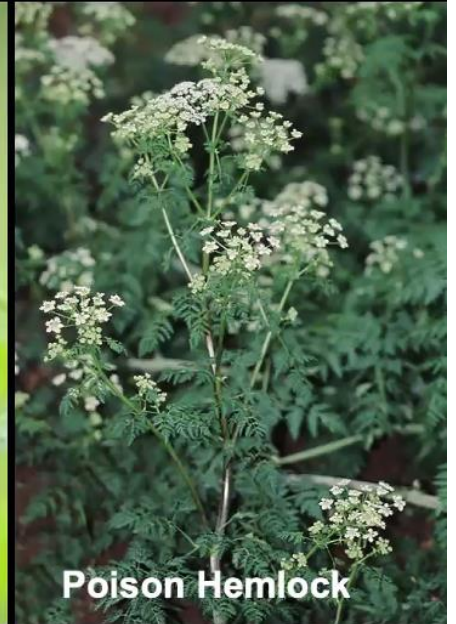
Cow-parsnip



Wild Parsnip



Poison Hemlocck



Poison Hemlock

# Giant Hogweed Look-alikes

# Water-hemlock

Also called Spotted Water-hemlock and Spotted Cowbane

- 2 - 9 ft high
- Leaves are pinnate compounded
- Stems are smooth and streaked with purple
- Highly toxic
- Seizures not responsive to medication !
- Death can occur within 15 minutes
- Used by some native American tribes on tips of arrows for hunting





## Water-hemlock Look-alikes

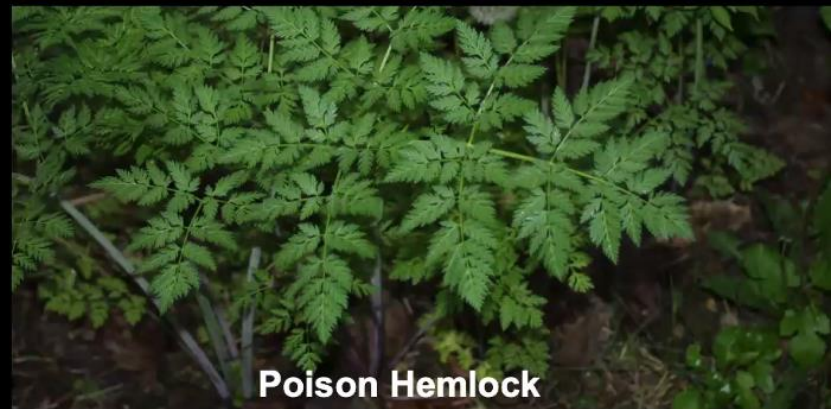
- **Poison Hemlock**
- **Wild Parsnip**
- **Carrot**
- **Queen-Anne's Lace**
- **Foraging can be very dangerous !**



Carrot



Wild Parsnip



Poison Hemlock



# Poison Hemlock

- All over Virginia !
- 6 - 10 ft tall Stem green often red / purple blotches
- All parts have a foul odor
- All parts are EXTREMELY poison !
- Contains a neurotoxin.
- Even small amounts can cause death.
- Socrates in 399 BC
- Many look-alikes - Be careful!
  - Carrot
  - Queen-Anne's Lace
  - Cow-parsnip





## Monkshood

- **Mostly we see Blue Monkshood in Virginia**
- **Also called Wolfsbane**
- **2 - 5 ft high**
- **Leaves alternate, lobed or divided**
- **Flowers on the upper part of the stem**
- **June - September Very showy .**
- **Along streams and in swamps in Southern and Central lower mountains**
- **All parts of plant are extremely toxic. Is fast acting .**
- **Do NOT TOUCH !**
- **Death can come from contact.**
- **There are anecdotes that this plant has been used in herbal remedies**
- **Do not take a chance !**



## Poison Ivy

- Plants in various forms - single plant, ground cover, small shrub, climbing vine
- All plant parts contain urushiol and are toxic at all times.
- Common symptoms itching/ burning sensation, rash and blistering
- Can be mistaken for Boxelder, Virginia-creeper, and Poison Oak (but there are distinct differences in plant and leaf structure or growing area)



# Poison Oak

- Native perennial shrub < 3 ' in height  
Prefers dry habitats, infrequent in Virginia, but common in the Coastal Plain
- Composed of three leaflet compound leaves, deeply toothed or lobed. May also be confused with Blackberry, which is thorned
- All plant parts are toxic, containing urushiol,
- With symptoms similar to those of Poison Ivy





# Poison Sumac

- Generally, grows from 5' to 20' in height as a deciduous shrub or small tree
- Related to Poison Ivy and Poison Oak, but not to other Sumacs, but can be mistaken for them, as well as Tree of Heaven or Black Walnut
- All plant parts are toxic, containing urushiol like Poison Ivy and Poison Oak, and exposure presents similar symptom



## American False-hellebore

- Grows 2' to 7' in height, principally in wet soil environments
- All plant parts are toxic, whether toxins are ingested or absorbed through the skin
- May be mistaken by foragers for other edible plants, including leeks, growing in similar or adjacent environments



## Mayapple

- One of the earliest plants to bloom in Spring
- Grows 12' to 18" in height, typically in patches in forested areas
- All plant parts, to include unripe fruit, are toxic when ingested
- Symptoms include nausea, vomiting, severe diarrhea, followed by organ failure , and potentially death.
- Mayapple is distinctive in appearance, but may be mistaken for Umbrella-leaf





## Common Pokeweed

- 3 – 10 Tall when mature
- Red, smooth, hollow stem
- Produces red berries
- Grows in and around fields and roadsides
- All parts of plant are poisonous
- Symptoms of ingestion include nausea, severe vomiting, abdominal cramps, diarrhea, and a burning sensation in the mouth.
- Convulsions and death may occur
- Look-alikes:
  - Roots similar to edible tubers
  - Berries color similar to Elderberries





## Jimson Weed

- **Nightshade family, 5 to 6 feet tall**
- **Leaves coarse textured and foul-smelling 3 to 8 inches long and green**
- **Stems are green to purple in color**
- **Flowers appear July through October**
- **Non-native plant common throughout Virginia**
- **Pastures, fields, waste areas, and around streams**
- **All parts are extremely toxic causing adverse neurologic effects**
- **Effects of ingestion include headaches, hallucinations, delirium, agitation, enlarged pupils, constipation, urinary retention, elevated pulse, hypertension, and fever.**



## Foxglove

- **Non-native biennial plant**
- **Soft, hairy, toothed, lance-shaped leaves, 4 to 12 inches wide with a distinctive vein structure**
- **First year growth a basal rosette of leaves**
- **Second flowering stems, 3 to 6 feet tall.**
- **Grows in Piedmont and coastal plain in dry hilly pastures, roadsides, and rocky places.**
- **All parts of the plant are highly toxic, can be fatal**
- **Primary toxins affect the heart, cause pulse changes and irregular heart rhythms, potentially leading to death.**
- **Other symptoms include nausea, vomiting, diarrhea, headache, weakness, drowsiness, hallucinations, and confusion.**



## Lilly-of-the-valley

- Perennial plants with two species found in Virginia
- European escaped cultivar
  - Grows in dense colonies
  - Stems grow from 6 to 10 inches tall
  - Elliptic-shaped leaves, 4 to 10 inches long
- American native:
  - Similar in appearance to the European cultivar, but with larger and longer leaves.
  - Does not grow in dense colonies
- Blooms in spring to early summer
- Prefers partial shade and warm summers
- Found in thickets, roadsides, woods
- American variety rare in the southwestern Piedmont
- All parts poisonous
- Pulse rate changes and irregular heart rhythms that can result in death
- Burning of the mouth and throat, nausea, vomiting, abdominal pain, dilated pupils, headache, and confusion





## For More Information

This publication is available on the following website:

The University of Virginia Health's Blue Ridge Poison Center:

<https://med.virginia.edu/brpc/socrates>

Find information about the Virginia Master Naturalist program at the following:

[www.virginiamasternaturalists.org](http://www.virginiamasternaturalists.org)

For any suggestions and comments please contact:

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The Socrates Project - Poisonous Plants in Virginia



