The Toxicity of Plants

Introduction

Plant materials are often used as experimental subjects because they do not have some of the inherent problems associated with live animals. Plants can more easily be subjected to experimental treatments without concerns for plant welfare. There are, however, some safety considerations relative to plant study.

General Safety Considerations

- Students should never eat or taste seeds or plant material used or grown in the laboratory. Many plants contain toxic materials that may trigger allergic reactions or cause severe illness to humans (see Table 1). Most plant material (especially seeds) are treated with pesticides. These materials should be washed prior to experimentation and students should wash their hands thoroughly after handling any plant materials.
- Plant materials tend to stimulate allergic reactions. Pollen, mold spores, and other plant tissues (flowers, mushrooms, fungi, extracts) can cause allergic reactions in some individuals. Request student allergy records prior to work with plant materials or before any field work. Be alert for any unexpected allergic reactions during laboratory work.
- Many plants have thorns and/or needles that can be irritating or dangerous especially around eyes—safety glasses should be worn. Gloves should be worn during field work or when handling specific plant tissues.
- Do not release plants, seeds, pollen etc. into the environment. Introduction of "foreign" plant materials can potentially cause an imbalance in the natural fauna in an area.
- Plants are often used as a source of "natural-product chemicals" such as indicators and pigments. Follow all normal laboratory safety guidelines when extracting, grinding, or chopping plant material for natural product studies. Review all Material Safety Data Sheets for any extraction chemicals.
- Some plants have poisonous or irritating exudes. Poison ivy, poison oak and the like should never be used in the classroom. Learning to identify these poisonous plants will help students avoid these plants in the field and will also be a valuable life lesson.

Many lists of plant allergies and poisonous plants can be found for your area. The table on the following page lists some common plants and toxicity information regarding their use.

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Table 1. Toxicity of Some Plants

African Violet	1	Cypress, Monterey	4, 7	Hosta	6	Rubber Tree	1, 5
Allium Canadense	3, 5	Daffodil	3, 7	Hyacinth	3, 5, 7	Sago Plant	4, 7
Aloe Vera	3, 7	Dahlia	1	Hydrangea	3, 5	Salvia	1
Alyssum	4, 5, 7	Daisy	3, 5	Impatiens	1	Schefflera	2, 5 7
Amaryllis Belladonna	1	Dandelion	1	Iris	3, 5	Sedum	1, 5
Anemone	1	Daphne	4, 5, 7	Ivy	4, 5	Sensitive Plant	1
Apple Tree	1	Day Lily	6	Jack-in-the-Pulpit	2, 5	Snapdragon	1
Apricot Tree	3, 7	Delphinium	4, 7	Jequirity Bean	4, 7	Sphagnum Moss	1
Arrowhead Vine	2	Dogwood	5	Jimson Weed	4, 7	Spider Plant	1
Azalia	4, 7	Douglas Fir	1	Kaffir Lily	4, 5, 7	Spirea	1
Baby's Breath	1	Dusty Miller	4, 7	Kalanchoe	1	Split Leaf Philadendron	2
Baby Tears	1	Easter Lily	1	Larkspur	4, 7	Spruce Tree	6, 7
Bachelor Buttons	1	Elderberry	3, 7	Licorice Plant	4, 7	St. John's Wort	4, 5, 7
Bamboo, common	1	Elm Tree	5	Lilac	1	Sweet Pea	3, 7
Barberry	3, 5	English Ivy	3, 5	Lily of the Valley	4, 7	Sycamore	1
Begonia	2	Euonymus	4, 7	Lobelia	4, 5, 7	Tomato	4, 7
Birch Tree	3, 5	Evening Primrose	1	Lupine	4, 7	Tulip	5
Bird of Paradise	6	Fir	1	Maple Tree	1, 7	Viburnum	6
Black Acacia	4, 7	Flax	4, 7	Marigold	5	Virginia Creeper	2
Black Eyed Susan	3, 5	Forget-me-nots	1	Mistletow	6	Walnut Tree, Black	4, 5, 7
Black Locust	4, 7	Forsythia	1	Mock Orange	4, 7	Windflower	4, 7
Bleeding Heart	4, 5, 7	Foxglove	4, 7	Morning Glory	4, 7	Wisteria	4, 7
Blue Spruce	1	Fuchsia	1	Mother-in-law Tongue	3	Yarow	3, 5
Boston Fern	1	Gardenia	1	Mountain Ash	1	Yellow Locust	4, 7
Bottle Brush	1	Geranium, California	4, 7	Mountain Laurel	4, 7	Yellow Jasmine	4, 5, 7
Cactus	1, 5	Geranium	5	Mulberry Tree	1	Yew	4, 7
California Poppy	6	Ginkgo Biloba	4, 5, 7	Nightshade, Black	4	Yucca	1
Calla Lily	2	Gladiola	3, 5	Oak Tree	3, 7	Zinnia	1
Cardinal Flower	4, 5, 7	Gloxinia	1	Oleander	4, 5		
Carnation	3, 5	Gopher Plant	4, 5, 7	Olive, Russian	5		
Carolina Jasmine	4, 5	Gopher Purge	4, 5, 7	Orchid	1		
Castor Beans	4	Gourd	1	Palm	1, 5		
Catnip	3	Grape Hyacinth	1	Pansy	3		
Cameleon Flower	4, 7	Hackberry	5	Peach Tree	4, 7		
Cherry Tree	4, 7	Hawthorne	1	Peony	4, 5		
China Berry	4, 7	Helleborus	4, 7	Phlox	1		
Christmas Cactus	1	Hemlock, Common	4	Pine Tree	6, 7		
Christmas Rose	4, 7	Hemlock, Water	4	Poinsettia	3		
Clematis	4, 5, 7	Hen and Chickens	1	Pomegranate	6		
Coffe Tree Plant	3, 5	Hibiscus	1	Potato Plant	4, 7		
Coleus	1	Holly	3	Potentilla	1		
Columbine	6	Hollyhock	1	Pussywillow	5		
Corn Plant	1	Honey Locust	1	Red Bud	1		
Crocus, Autumn	4, 7	Honeysuckle	6	Rhododendron	4, 7		
Crown Vetch	4, 5,			Rhubarb Leaf	2, 5		
				Rose	1, 5		

1 ***Non-toxic*:** These plants are not poisonous or there is no known record of toxicity. Exposure to these plants is not expected to cause any symptoms.

2 ***Oxalates*:** The juice or sap of these plants contains microscopic oxalate crystals. Oxalate crystals are shaped like tiny needles. Chewing these plants may result in pain and irritation of the mouth, lips and tongue. In severe cases, swelling of the throat may cause breathing difficulties.

3 ***Minor toxicity*:** Ingestion may cause some minor symptoms such as rash, vomiting or diarrhea. Ingestion of small amounts may not cause any symptoms at all.

4 ***Major toxicity*:** Ingestion of these plants, especially in large amounts, are expected to cause serious effects to major body organs such as the liver, heart, or kidneys. If ingested, call the poison center immediately for more advice.

5 ***Dermatitis*:** Exposure to juice or sap from these plants or a puncture wound from the thorns may produce a skin rash or irritation.

6 ***Possible toxicity*:** Information on these plants is incomplete.

7 ***Animal toxicity*:** These plants are known to cause problems in animals.