

Development of Botanical Information Sheets with Photographic Images as Educational Tools for Allergy Practitioners and Their Patients

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Abstract

The seasonal release of pollen from a diverse group of trees, shrubs, grasses and weeds is a significant cause of allergic reactions in children and adults. Although the identities of specific allergenic plants are well known in many geographic regions, few sources of information are readily available to help physicians and allergy sufferers recognize these plants in their immediate environments or assess their importance to total allergen exposures.

To provide allergy professionals and their patients with such resources, a comprehensive series of botanical information sheets has been created that covers the major allergenic plants found in the United States. Each one-page sheet describes a different plant and includes general botanical information (common name, genus and species, geographic distribution), specific or distinguishing characteristics (habitat, means of identification, allergenic relationships), and numerous color photographs of the plant and its distinct structural elements (*e.g.*, leaves, flowers, fruit). To date, a total of 121 plant sheets have been completed: 80 trees, 27 weeds, 9 grasses, 3 flowers and 2 cultivated plants. Examples of plant sheets from each category are demonstrated. The images are modified or updated as better photographs are obtained.

All botanical information sheets are archived as Adobe Portable Document Format (PDF) files and can be obtained at no charge from the Greer website (www.greerlabs.com) or on CD from the authors by request. Printed materials are easily compiled and organized into prevalent allergenic plant binders for clinic waiting rooms or libraries, and can be customized to provide allergic patients and their families with a pictorial guide to the specific sources of their pollen allergen sensitivities.

Images

All images reproduced on Greer's Botanical Information Sheets are digital photographs taken by one of the authors (RSJ). Some images were produced from photographic prints from the author's personal collection.

Trees

Plant sheets are available for the following 80 trees.
White ash and Box elder sheets are shown below.

Acacia	Alder: Tag/Smooth, White
Aspen	Ash: Arizona, Green/Red, White
Bayberry/Wax Myrtle	Beech, American
Beefwood/Aust. Pine	Birch: Black/Sweet, Red/River, White
Box Elder	Cedar: Eastern Red, Mountain, Salt/Tamarisk
Eucalyptus	Cottonwood: Eastern, Fremont
Hackberry	Cypress: Arizona, Bald
Locust, Black	Elm: American, Cedar/Fallblooming, Siberian
Eucalyptus	Hickory: Shagbark, Shellbark, White
Mango	Juniper: Oneseed, Pinchot, Rocky Mountain, Utah, Western
Melaleuca	Maple: Coast, Red, Soft/Silver, Sugar/Hard
Mesquite	Mulberry: Red, White
Olive	Oak: Arizona/Gambel, Black, Bur, California Black
Orange Blossom	Oak: California Live, California White, Post, Red, Scrub
Pecan	Oak: Virginia Live, Water, Western White, White
Pepper Tree	Pine: Eastern White, Loblolly, Longleaf, Ponderosa
Poplar, White	Pine: Slash, Virginia/Scrub, Western White, Yellow
Privet, Common	Sycamore: Eastern, Western
Russian Olive	Walnut: Black, California Black, English
Sweet Gum	Willow, Arroyo + Black

White Ash

Genus/species	<i>Fraxinus americana</i>
Family	Oleaceae
Distribution	Eastern and Central US

White Ash is a very widespread species typically found in moist areas near streams or on slopes. It becomes a medium-sized tree. The compound leaves, each composed of five to nine pointed leaflets, are borne in pairs (opposite) on the twigs and are lighter underneath than on top. The male and female flowers are produced on separate trees in the spring. Pollen is spread by the wind, and the female flowers develop into paddle-shaped fruit, each containing one seed, that ripen in the autumn.



Box Elder

Genus/species	<i>Acer negundo</i>
Family	Aceraceae
Distribution	Most of Eastern US, scattered in Western US

Box Elder is a small tree that is widespread in the east, but has a discontinuous distribution along watercourses in several western states. Box elder may get as tall as 65 feet but is usually much smaller; it typically has a short trunk that branches close to the base, and the tree becomes rounded in shape. The flowers and fruit are typical of maples, with the latter having the characteristic "wing" and being arranged in pairs. Allergenicity, Box elder pollen cross-reacts with that from other maples.



Grasses

Plant sheets are completed for the following 9 grasses.
Bermuda and Timothy sheets are shown below.

Bahia	Bermuda
Johnson	Kentucky Blue/June
Orchard	Reed Canary
Sweet Vernal	Timothy

Bermuda Grass

Genus/species	<i>Cynodon dactylon</i>
Family	Poaceae (includes all the grasses, including grains)
Distribution	Southern half of US

This grass, native to the savannas of eastern Africa, has been introduced and established in much of the world, including Bermuda from where it is thought to have been brought to the United States. It is commonly grown in warm areas of the US for use in lawns and pastures, but may become an invasive pest. Bermuda grass is a perennial species spreading by roots, nodes of runners where they touch the ground, and by seed. Although it develops best in warm humid areas, it can tolerate drought by becoming dormant. Bermuda grass has short narrow bluish-green leaves that turn brown during cold weather, being a "warm season" grass. The purplish flowering stems can grow over a foot tall, but are typically much shorter, and usually have about 4 to 5 fingerlike seedheads. Allergenicity, it is considered one of three "Southern grasses" and while it is moderately cross-reactive with salt grass, it demonstrates low cross-reactivity with most other grasses.



Timothy Grass

Genus/species	<i>Phleum pratense</i>
Family	Poaceae (includes all the grasses, including grains)
Distribution	Throughout US; more development in Northern US

Timothy grass, a clump-forming perennial grass, is a rather tall species sometimes reaching more than five feet in height. Leaves may approach a foot in length and are about 1/4" in width. The flower head resembles a small green "cat tail" about 2 to 6 inches in length, with purplish stamens often visible hanging along the sides. Blooming is typically in late spring or early summer. Timothy grass is prized for both pastures and for hay, and attains its best development in cool regions as it does not tolerate heat and drought. Reproduction is strictly by seed. This grass is one of the important "pasture grasses" from the standpoint of allergy.



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Weeds

Plant sheets are available for the following 27 weeds. Lambs quarter and Short ragweed sheets are shown below.

Baccharis	Cocklebur	Dock, Yellow/Curly
Dog Fennel	Firebush/Kochia	Goldenrod
Lambs Quarter	Marsh Elder, Burweed	Marsh Elder, True/Rough
Mugwort, Common	Mugwort, Darkleafed	Nettle
Pigweed, Rough/Redroot	Pigweed, Spiny	Plantain, English
Ragweed, Desert	Ragweed, False	Ragweed, Giant
Ragweed, Short	Ragweed, Western	Russian Thistle
Sagebrush, Coast	Sagebrush, Common	Sagebrush, Pasture
Sorrel, Sheep/Red	Wingscale	Wormwood, Annual

Lambs Quarter

Genus/species	<i>Chenopodium album</i>
Family	Chenopodiaceae
Distribution	Throughout the US, including Alaska and Hawaii

This annual plant thrives in disturbed rich moist soils. It is often a weed of farms and gardens around temperate areas of the world and may grow to be some 4 feet tall. The alternate rather triangular leaves have a bluish cast to them, especially when immature. Stems often have purplish stripes. The tiny green wind-pollinated flowers, which are found at in clusters at the ends of branches and growing from the bases of leaves, bloom from May to October. Reproduction is by seed.



Short Ragweed

Genus/species	<i>Ambrosia artemisiifolia</i>
Family	Asteraceae
Distribution	Most of US

This species is the "king" of allergenic plants, being the most important for allergy in America and the most widespread among several species of ragweed. Sometimes called "common" ragweed, it is a native species that aggressively flourishes along roadsides and in disturbed soil. It produces enormous numbers of pollen grains that stay airborne. The leaves are bipinnately lobed (lobes on the lobes). They are opposite on young plants but leaves produced later are alternate. The plant blooms in late summer and early autumn. On each branch of the mature plant, the numerous greenish-yellow male flowers, which open downward to release their pollen, are arranged in clusters along the sides of the spikes above the inconspicuous female flowers. The plant may grow to be four feet tall but is usually smaller. It is an annual, developing each spring from seed that has matured the previous autumn.



Cultivated Plants

Plant sheets are completed for the following 5 cultivated plants or flowers.

Castor bean and Ox-eye daisy sheets are shown below.

Castor Bean	Ox-Eye Daisy
Red Clover	Dandelion
	Sunflower

Castor Bean

Genus/species	<i>Ricinus communis</i>
Family	Euphorbiaceae
Distribution	Cultivated in many areas of US An invasive weed in CA, FL and tropical islands

In tropical regions, a castor bean plant may reach 30 feet in height, but in temperate areas where it is less than half that height, it is used as an ornamental annual because of its large star-shaped leaves that often exceed a foot in diameter. Some cultivars have a reddish coloration to the entire plant. Flowers form at the tops of stems, with the female at the top (having conspicuous red stigmas) and the male underneath (with conspicuous yellow anthers). The female flowers develop into egg-shaped capsules about an inch long covered by soft, flexible spines, and each capsule contains three seeds bearing a strong resemblance to engorged ticks. The seeds contain ricin, a toxic protein that has been used as a chemical weapon.



Ox-Eye Daisy

Genus/Species	<i>Chrysanthemum leucanthemum</i>
Family	Asteraceae
Distribution	Most of US, especially northern half

Ox-eye Daisy has been introduced as an ornamental and has become, for the most part, an invasive weed. A climate having cold winters is required for flower formation. Leaves, particularly those at the base of the plant, are 2 to 6 inches in length, and narrow (about a fourth of an inch wide) with lobes on each side; leaves along the stem tend to get progressively smaller and clasp the stem. The mature plant is about 1 to over 2 feet in height; each flower head, from between 1 and 2 inches in diameter, consists of some 15 to 35 white ray flowers (the "petals") surrounding hundreds of yellow disk flowers. Blooming is from late May through August, and flower heads are visited by bees seeking their pollen. Ox-Eye Daisy may cause both contact and inhalant allergy.



Availability

All Greer botanical information sheets are available at no charge via the Greer website, www.greerlabs.com.

To view and download these documents to your computer:

- Log on to www.greerlabs.com
- Click on "Corporate Information"
- Point to "News & Press", click on "Media Downloads"
- Scroll down to "Botanical Information Sheets"
- Click to view available plant sheets in PDF format
- Link to free download of Adobe PDF reader
- Open and save individual files to your hard drive

Web archives will be updated to include new plant sheets or photographs as they are completed.

Plant sheet files are also available on CD from the authors or from your Greer sales representative by request.

Applications

Individual plant sheets are useful educational tools for patients who express clinical sensitivities to specific plant pollens, or are on immunotherapy to these pollens. Patients and their families can use these sheets to identify the locations of specific plants in their home, school, work or play environments that may contribute to their allergic symptoms, and may help to control or minimize exposures.

Bound collections of plant sheets define the allergenic plants found in a given geographic location or the specific testing and treatment allergens selected by each clinic, and serve as convenient reading materials for clinic waiting rooms. Prevalent allergenic plant binders are also commonly used as reference materials in physicians' offices, clinic libraries or reading rooms.

