# RED BUTTE GARDEN
UTAH'S BOTANICAL GARDEN

*Garden Plant Collections*

# *Ethnobotany*

*Solanum jamesii*

Ethnobotanists explore the entwined, ongoing coevolution of people and plants. Their studies focus on the intersection of botanical life and human ingenuity in both past and present cultural practices. Plants used for medicine, tools, art, ceremonies, shelter, and food can give us clues to hone our understanding of the past, extending into our present, and informing our future.

There is a vast amount of ethnobotanical plants all around the world. They cover a wide range of habit types and include trees, shrubs, forbs, and herbs, with perennial, biennial, and annual lifecycles.
Many plants comprise a multitude of uses, as well as different uses between cultures. What might be useful to one culture, might not be useful to another, or may be used in a completely different way.

At Red Butte Garden, our Ethnobotany Collection emphasizes medicinal plants, plants for food and beverages, and those with cultural importance and noteworthy local stories.

## DESIGNING WITH AND SELECTING ETHNOBOTANICAL PLANTS

If you are interested in a garden that does more than please your senses, consider adding useful plants to your landscape, thereby creating a multifunctional garden where you can harvest materials for food, medicine, natural fibers and dyes, and much more.

You might not realize you already have an ethnobotanical garden. If you grow native plants in your yard, they were likely used by certain Native American groups who have been skilled at using what they need from the natural world around them for millennia. Take for example wild blue flax (*Linum lewisii*), whose nutritious seeds are used in both traditional and modern cooking. Another popular Utah native is oregon grape (*Mahonia repens*), whose roots are used to make a yellow dye, and the roots and fruit are used as medicine for an assortment of ailments such as headaches, colds, and stomach illness. Also, the fruit is edible raw or cooked, and can be made into a porridge or jam. You may even have some 'weeds' that are useful. A fine example is the common and tenacious dandelion (*Taraxacum officinale*). Dandelion leaves are not only nutritious, but have medicinal use as well. While you may not intentionally plant dandelion, if it happens to appear, consider using the leaves in a salad. A little research on the plants you already have, might reveal some uses you can benefit from right away. Garden plants from other parts of the world may surprise you with their uses as well.

When selecting plants for an ethnobotanical garden, think about your own needs and ask yourself some questions. Are there any craft or art projects you need materials for? Have you ever wanted to make your own medicine? Or essential oils? Would you like to learn to dye your own fiber? What herbs and spices do you like to cook with? Would you like to grow


*Asclepias speciosa*

wild food? Would you like to grow the same plants Native Americans or other peoples have used for centuries? A little homework on plants you would like to benefit from will go a long way towards ethnobotanical garden success.

If it's health benefits you seek, consider talking with an herbalist to decide which plants might be best for you. You will also need to make sure the plants you wish to acquire are well suited for the climate, and that you can provide the proper growth requirements. Once you have researched and chosen plants that will perform well at your site, you can be on your way to growing your ethnobotanical garden.

## CARE AND MAINTENANCE

How you intend to use a plant will influence how you care for and maintain it. For example, when harvesting branches for fiber, proper pruning techniques are important to get the most out of your plant in the future. Therefore, it is important to research each plant species before you perform any maintenance or harvesting. You will need to find out which plant parts you want to use and plan accordingly. For instance, don't remove spent blooms if you want to harvest seeds. If it's the roots you need, make sure the plant is growing vigorously and only harvest part of the roots, so the plant will have a chance to recover. It is also crucial to harvest at the proper time of the year, not only to prevent damage to the plant, but also because some plants may only be edible or useful at certain points in their life cycles, such as blue elderberry (*Sambucus cerulea*), which is not safe to eat raw until the fruit is fully ripe.

## MEDICINAL PLANTS

Many medicinal plants are also poisonous and vice versa. Poisonous/medicinal plants produce secondary metabolites such as alkaloids and terpenoids in order to defend themselves against herbivores, and damage from other plants and microbes. These secondary metabolites can have physiological effects on humans and animals. Some alkaloids you may have heard of are caffeine, morphine, and cocaine. Some well-known terpenoids are digoxin (famously used as a heart medicine) and tetrahydrocannabinol (THC) (used to treat chronic pain and rare forms of epilepsy). Whether a substance is medicinal or poisonous often depends on the dose. For example, digoxin, which is produced by foxglove (*Digitalis lanata*), is lethal at high doses. However, at the correct dosage, digoxin is used in modern medicine to treat congestive heart failure.

When using plants medicinally, in addition to determining proper dosage, it is important to know which part of the plant is used. While one part of a plant may be medicinal or edible, another part of the plant may be poisonous. Using the example of blue elderberry (*Sambucus cerulea*)— while the mature raw fruit flesh is very nutritious, the raw seeds, stems and other plant parts are toxic. Additionally, pay attention to proper preparation as sometimes a plant is poisonous raw but is no longer poisonous when cooked. Take for example showy milkweed (*Asclepias speciosa*)—all parts of the plant are poisonous raw, but when cooked, the young shoots, leaves, and seedpods become safe to eat. You also have to be careful with combinations of medicines, as a substance may be harmless taken alone, but when taken alongside another medicinal substance, may become detrimental. It is important to note that not all closely related

species have the same properties. For instance, the fruit of blue elderberry (*Sambucus cerulea*) is edible raw but only when the fruit is mature, while the fruit of its close relative, the red elderberry (*Sambucus racemosa*) is never safe to eat raw, only cooked, as cooking breaks down the toxins. Both species contain hydrocyanic acid, a compound that can lead to diarrhea and nausea if consumed in large quantities; however, the red elderberry contains much higher concentrations. This is why proper identification is the number one rule when using plants, especially if using them internally or externally. If you do not know what a plant is, it is best to leave it alone. To learn to identify plants, consider going on botanist-led tours, taking a plant identification class, and getting your own plant identification books. Learning to identify plants can be very rewarding and beneficial.

## DID YOU KNOW

In collaboration with relatives of ancestral tribes, our Conservation Research Department is investigating sites in Southern Utah to discover what plants grew near Puebloan villages dating back 7,000 years. Some of the plants found to be important resources to those villages are showcased in the Children's Garden, including the four-corners potato (*Solanum jamesii*), which is an important staple food that indigenous tribes have used for over 10,000 years. It is thought to be the first cultivated plant in the intermountain west.

Many common native plants you see every day have a rich history of use amongst Native American groups. Some local examples include:

- Woods's rose (*Rosa woodsii*): used for its edible fruit as well as green wood for arrows and fish spears.
- Cattail (*Typha latifolia*): fluff used as a temper for pottery. Roots, stems, flowers, and pollen are all edible and medicinal. It also has a plethora of fiber uses— from bed stuffing and rugs, to home building materials.
- Big sagebrush (*Artemisia tridentata*): used medicinally as a disinfectant, stomach aid, cold, cough, and respiratory aid. The leaves are used as a tea or as a seasoning, the shoots for roof thatching, and bark to weave bags and clothing.
- Yarrow (*Achillea millefolium*): All parts of plant are used as a general cure-all for sickness and skin conditions such as stings, bites, and bruises.
- Skunkbush sumac (*Rhus trilobata*): all parts of this plant are useful in some way—roots as a deodorant, stems for basketry, fruit for mordant (fixes dyes to fabrics), leaves and twigs for dyes, and all parts are medicinal.
- Utah Juniper (*Juniperus osteosperma*): Green branches are used for colds, seeds eaten for headaches, and twigs and berries for cough. The fruit is eaten fresh or after boiling and used to make beverages.
- Piñon pine (*Pinus edulis*): used for its edible nuts. The needles are burned and the resulting smoke inhaled for colds. The pitch is used on wounds and sores due to its antibacterial properties.

Dyes made from plants have been used to enhance people's lives through decoration of animal skins, fabrics, crafts, hair, and even human bodies. Up until the mid-19$^{th}$ century, natural plant dyes were the only source of dye available. As scientific techniques have advanced for creating durable artificial dyes, creating dyes from plants has become somewhat of a lost art. Today, there is a resurgence of people wanting to make their own dye from plants, and there are a lot of resources available for help. There are many plants and plant parts that can be used for dying, including roots, nuts, flowers, bark, seeds, fruit skins, and even onion skins.

The use of herbs has been important to all cultures since long before history was recorded. Carbon dating has revealed the use of herbs as far back as 13,000–25,000 B.C. Herbs are plants with savory or aromatic properties used to flavor and garnish food and beverages, aid medicinal needs, or produce fragrances.

In culinary use, there is a difference between herbs and spices. Herbs generally refer to the leafy green or flowering parts of the plant, while spices are usually produced from other plant parts such as seeds, bark, roots, and fruits. If you like to cook, herbs and spices can bring lots of flavor and fragrance to your dishes. Why not grow them at home in your garden or even in your windowsill?

Fiber is another popular useful product that plants provide. Fiber from plants can be used for many things from making rope, paper, fishing twine, clothing, baskets, crafts, and much more. There are different types of fibers based on the part of the plant the fiber comes from. Seed fibers come from the seed, as is the case for cotton, which comes from the seed of the cotton plant (*Gossypium hirsutum*). Bast fibers are collected from inner bark or 'bast,' surrounding the stem of the plant, which are more durable and processed for textiles and cordage. The commercially useful plants flax (*Linum usitatissimum*), jute (*Corchorus* species), and hemp (*Cannabis sativa*) fall into this category. Hard fibers come from fruit or leaves, such as the fruit of coconut (*Cocos nucifera*) and the leaves of agave (*Agave sisilana*), banana (*Musa* species), and raffia palm (*Raphia farinifera)*. Today raffia has many uses from weaving baskets, hats, and mats, to tying up plants that need support, as well as being made into a native cloth that is exported as rabanna. The raffia palm is crowned with enormous leaves that can be as long as 65 ft. and composed of 80-100 leaflets. The fiber is soft, pliable, strong, and does not shrink when wet. It is made by tearing the leaflets into thin strips and then drying them in the sun. It dries a yellowish-tan color, but is usually dyed into other colors. Many commercial fiber plants are native to temperate regions, however some local examples include dogbane (*Apocynum cannabinum*), showy milkweed (*Asclepias speciosa*), and banana yucca (*Yucca baccata*)—all of which are used by many Native Americans for cordage, clothing, and sewing material.

## WHERE TO SEE THIS COLLECTION

- Our ethnobotanical collection can be seen throughout the Garden, particularly in the Natural Area, Terrace Gardens, Children's Garden, and Desert Harvest of the Water Conservation Garden.
- Within the Terrace Gardens, our Herb Garden showcases a variety of herbs and spices used in cooking, and the Medicinal Garden showcases a variety of medicinal plants and features a themed exhibit every year.
- The Ethnobotanic Garden in our Children's Garden highlights the research of our Conservation Research Department, and the ethnobotanical plants found to be significant within their research study area.
- The Desert Harvest Garden is a food garden, designed with higher water use near the bottom of the basins and drier plants on the basin rims, and includes a symbiosis theme of plants that provide nitrogen or encourage pollinators.

RED BUTTE GARDEN
THE UNIVERSITY OF UTAH

300 Wakara Way, Salt Lake City, UT 84108 • 801-585-0556 • redbuttegarden.org