

# BLACK WILLOW

When traveling along a stream or in any other wetland, one might observe trees or shrubs with dark-colored bark. If so, those woody plants might be the Black Willow (*Salix nigra* Marshall).

The Black Willow is a member of the Orders *Malpighiales* or *Salicales* and of the Family *Salicaceae*. The generic name, *Salix*, is an old Latin word for “willows”. *Salix* may also be Celtic for “near water”. *Sal* is “near” and *lis* is “water”. The specific epithet, *nigra*, is Latin for “black”.

Some other scientific synonyms for this tree species have been *Salix ambigua* Pursh, non Ehrhart, *S. denudata* Rafinesque, *S. dubia* Trautvetter, *S. falcata* Pursh, *S. flavovirens* Hornemann, *S. ligustrina* F. Michaux, *S. ludoviciana* Rafinesque, and *S. purshiana* Sprengel. Other common names for this tree are Crack Willow, Dudley Willow, Goodding Willow, Southwest Black Willow, Swamp Willow, and Willow. However, some of these other common names are also given to other willow species.

## DESCRIPTION OF THE BLACK WILLOW

**Size:** Black Willows are the largest and the tallest native willows in North America. Their largest sizes are found in the lower Mississippi Valley.

**Height:** Their height ranges from 10-140 feet. The shorter ones may be shrubs.

**Diameter** (at 4½ feet high): Their diameter varies from 1½-8 feet.

**Trunk:** Their trunks are usually straight or twisted and may be leaning low over water. The trunk may be single or it may be forked at its base, with up to 4 trunks.

**Crown:** Their crowns are often broad, open, spreading, irregular, and round-topped. It is heavily branched with many shoots and sprouts. This species makes an ideal shade tree.

**Branches:** The larger branches and shoots are pointed upright. The smaller branches are drooping and sagging. These branches are brittle and can break easily.

If placed in moist soil, these branches will take root. This commonly occurs along the concave or the inner-meander of streams and rivers where the broken branches may drift to their new location

**Twigs:** The twigs are slim, rounded, and flexible. However, they are brittle at their base.

Each twig is red-brown, light orange, orange-green, olive, yellow-green, or golden yellow and is hairless. However, the younger twigs may be slightly hairy. The older twigs may become darker and grayer.

These twigs have alternate U-shaped leaf scars. Each leaf scar has 3 bundle scars and a longitudinal ridge running downward.

Several species of mammals eat these twigs. Some of them are the various Rodents (Order *Rodentia*), Eastern Cottontail Rabbits (*Silvilagus floridanus* J.A. Allen), Muskrats (*Ondatra zibethicus* L.), North American Beavers (*Castor canadensis* Kuhl), and White-tailed Deer (*Odocoileus virginianus* Zimmermann).

**Buds:** There are no terminal buds. The lateral buds are about 1/8 inch long, narrow, conical, smooth, shiny, pointed, and brown to red- or yellow-brown. They are appressed and are flat upon the side next to the twig and are rounded upon the opposite side. Each bud has only 1 cap-like scale. Many species of birds eat these buds.

**Leaves:** Their leaves are simple, alternate, and deciduous. Each leaf is linear and lanceolate. They have rounded or wedged bases, long tapered tips that are curved to 1 side, and finely serrated margins with 15-30 teeth per inch. They are about 1-8 inches long and about 1/8-3/4 inches wide. They are pinnately veined. They are also hairless, shiny dark green above, and lighter green below. Their leaf petioles are short, hairy, and glandless.

The leaves upon the fast-growing shoots have stipules that often encircle the shoot. These stipules are large, paired, green, ovoid or semi-cordate, dentate, and persistent.

The leaves provide food for the White-tailed Deer, the Eastern Cottontail Rabbits, and for the larva of some of our native butterfly species. Two such species are the Mourning Cloak (*Nymphalis antiopa* L.) and the Viceroy (*Limnitis archippus* Cramer).

In the fall, these leaves turn yellow. They are one of the last trees to lose their leaves in the fall.

**Flowers:** The flowers are dioecious. Both the male and the female flowers are borne upon 1-3 inch long catkins. There are no calyx or corolla. The bracts are blunt-tipped, yellow, and hairy. These catkins are located atop the young shoots.

The male flowers are borne in yellow, hairy, crowded, slender, erect catkins. They have 2 basal glands, 3-7 stamens with long, arching, and bearded-based filaments, and yellow anthers.

The female flowers are green, urn-shaped, and are borne upon shorter catkins. They have 1 basal gland, 1 stalked, glabrous, and ovoid, conical pistil with 1-celled ovaries, and 2 sessile and thick stigmas.

These flowers produce nectar, which attracts Bees (Superfamily *Apoidea*) and other insects. These flowers can either be insect-pollinated or wind-pollinated. However, wind-pollination can cause hybridization between the various willow species. The pollen can also cause allergies. Flowering season is usually April-May, which is about the same time as the leafing season.

**Fruit:** The fruits are 1/8-1/4 inch long, short-stalked, smooth, light red-brown to green, conic or ovoid, 1-celled, and bivalved pods or capsules. They are arranged in 3-6 inch long clusters. This species produces fruit every year. They mature in May-July and split open along their 2 sutures into 2 halves to release their numerous seeds.

**Seeds:** The seeds are small, light, and fluffy. About 2-3 million seeds make 1lb. These seeds are densely covered with long, white, basal, haired tufts. These seeds are carried by wind or by water.

These seeds travel to open, sunny sites with moist, bare mineral soil to germinate. To survive, the wind-carried seeds, which have no food reserves and which dry out quickly, must germinate within 24 hours after exiting the fruit. The water-carried seeds can survive for longer periods of time.

Once these seeds reach their soil, they may sprout within a few hours. Within 2-3 days, these sprouts will produce their dicotyledon seed leaves.

**Bark:** The bark is yellow or light brown with an orange tinge to dark gray-brown or black. It is deeply divided or furrowed with broad, flat, scaly, shaggy, stringy, platy, forked, interlacing ridges. The bark on the young trees is purple-gray. Yellow-bellied Sapsuckers (*Sphyrapicus varius* L.) may feed upon the inner bark.

**Wood:** The wood is soft, light, weak, brittle, flexible, straight-grained, and close-grained. It is both odorless and tasteless. The heartwood is a light red-brown to gray-brown and

the sapwood is thin and white to light tan. This wood is eaten by the North American Beaver. The wood is durable in water but not in soil.

**Roots:** The roots are shallow, dense, fibrous, and widespread. They can sometimes clog drainage pipes.

**Habitat:** Black Willows inhabit wetlands and other areas with wet soils. They are found along rivers and streams and by lakes, ponds, swamps, and marshes. They are shade intolerant and need much sunlight. They may be found in either pure stands or with other wetland trees, such as Eastern Cottonwoods (*Populus deltoides* W. Bartram ex Marshall), American Sycamores (*Platanus occidentalis* L.), Red Maples (*Acer rubrum* L.), Silver Maples (*Acer saccharinum* L.), and Boxelders (*Acer negundo* L.).

**Range:** Black Willows are found in most of the eastern and central U.S., as far west as the Great Plains. However, they are not found in the northern Great Lakes area and in southern Florida. They have the largest and the most extensive range of all willow species. It is the most common willow species in the eastern U.S.

### **Weaknesses:**

Black Willows have many weaknesses. Although they are fast growing trees, they are also short-lived (about 70-85 years) trees. They are susceptible to both droughts and fires.

Black Willows are susceptible to both diseases and insect pests. They are susceptible to certain infections, such as crown Gall, Witches Broom, and Willow Blight (Willow Scab and Black Canker). Some of the insect pests include Forest Tent Caterpillar (*Malacosoma disstria* Hubner), Gypsy Moth (*Lymantria dispar* L.), Japanese Beetle (*Popilla japonica* Newman), Cottonwood Leaf Beetle (*Chrysomela scripta* Fabricus), Willow Sawfly (*Nematus ventralis* Say), Willow Leaf Beetle (*Chrysomela interrupta* Fabricus), Imported Willow Leaf Beetle (*Plagioderia versicolora* Laicharting), Spotted Leaf beetle (*Lina interrupta* Fabricus), Cottonwood Borer (*Petrodera scalator* Fabricus), and Willow Branch Borer (*Oberea ferruginea* Thunberg).

### **Uses:**

Despite the wood's weaknesses, it does serve some purposes. It is the only willow species that is used for lumber. The wood resists splitting and holds nails very well. It won't check, crack, splinter, or warp. However, this wood is not used for structural framing.

The wood is also used for making artificial limbs, barn flooring, barrels, boat keels, bows, boxes, cabinetry, crates, doors, fuel, furniture, millwork, polo balls, pulpwood, toys, and veneer.

Both the wood and the twigs are highly flexible. They are used for weaving baskets and wicker furniture.

The wood is also used for making charcoal. This charcoal was ground and was used for making black gunpowder, especially during the American Revolution.

Black Willow Wood makes poor firewood. It gives off little heat and only lasts for a short time.

The bark also has some uses. This bark contains tannin. The inner bark was woven into cordage, bags, fabrics, and fishnets. Shaved bark was used as a substitute for tobacco.

Black Willow roots had a few uses. They are ideal for flood control, soil erosion control, and pollution control. These roots are able to form mats and to bind the soil. The

trees' branches are often planted into the ground to take root quickly and easily. These branches require no pre-treatment. They roots also contain a scarlet red dye.

### **Medicinal Uses:**

Black Willow had many medicinal uses. Both the Native Americans and the early European settlers used this tree for medicinal purposes.

The bark and/or root bark decoction was made into a bitter spring tonic and was used for treating dysentery, spastic colon, fevers, hoarseness, laryngitis, bleeding, kidney stones, fainting, anemia and headaches. The bark and the roots were also used as a quinine substitute. The bark was made into a tea for treating dyspepsia, debility, fevers, gangrene, indigestion, intestinal ailments, lumbago, and ulcers. A bark infusion was used for treating asthma, common colds, and as a diaphoretic. The bark was also made into a wash that was used externally as an astringent and for treating acne, eczema, psoriasis, burns, cuts, skin ulcers, and other skin ailments. The bud resin was used for treating scurvy, sunburns, scalds, scratches, wounds, and as a spring tonic. The leaves were used for treating fevers. The catkins were used as an aphrodisiac.

Their greatest medicinal use comes from the bitter crystalline glucoside salicin, which is found in the young bark. From 1882 to 1926, Salicin was listed in the *U.S. Pharmacopoeia*. In 1827, French chemist Henri Leroux first extracted salicin but found it to be unusable. In 1838, Italian chemist Raffaele Pria converted salicin to salicylic acid but found it to be hard on stomachs. In 1853, French chemist Charles Frederic Gerhardt buffered salicylic acid into acetylsalicylic acid but never marked his discovery. In 1899, German chemist Felix Hoffman, using Gerhardt's discovery, convinced his employer, Friedrich Bayer and Company (founded in 1863), to market acetylsalicylic acid. On February 27, 1900, acetylsalicylic acid was patented in the U.S. as Aspirin. Bayer, a German company, held the patent until it was forced to surrender it after the 1919 Treaty of Versailles. However, aspirin is now synthesized by modern chemical technologies.

### **Edible Uses:**

Black Willows only have a few edible uses. Its inner bark is edible but is also very bitter. The inner bark should be boiled in several changes of water before consuming it.

The leaves are also edible. They contain vitamin C.

### **Cultural History:**

Black Willows played a small role in our cultural history. There have been a few poems written about willows. However, some of these poems may have been written about other willow species.

In 1921, American poet William Carlos Williams wrote a collection of poems in his book, *Sour Grapes*. One of those poems was about a willow that was probably the Black Willow.

#### ***Willow Poem***

*It is a willow when summer is over,  
a willow by the river  
from which no leaf has fallen nor*

*bitten by the sun  
turned orange or crimson.  
The leaves cling and grow paler,  
swing and grow paler  
over the swirling waters of the river  
as if loath to let go,  
they are so cool, so drunk with  
the swirl of the winds and of the river—  
oblivious to winter,  
the last to let go and fall  
into the water and on the ground.*

Willow trees have also been mentioned in stories. However, many of these were also about other species. The character of *Grandma Willow*, shown in Disney's *Pocahontas*, may have been a Black Willow.

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