

# NYBG

## New York City EcoFlora

### Lauraceae

Laurel Wilt is transmitted by the Red Bay Ambrosia Beetle, *Xyleborus glabratus*, introduced from Asia. The beetle transmits the fungus, *Raffaelea lauricola*. The beetle and its fungal symbiont are described as an invasive disease complex with potential impacts as great as the Chestnut Blight and Dutch Elm Disease (Global Invasive Species Database, 2018). The disease has already caused widespread mortality in Red Bay (*Persea borbonia*) in Florida, Georgia and South Carolina (Man, 2010).

**References:** Global Invasive Species Database. 2018. *Xyleborus glabratus* (insect). <http://www.issg.org/database/species/ecology.asp?si=1536&fr=1&sts=&lang=EN> (1 June 2018). Man, G. 2010. Major Forest Insect and Disease Conditions in the United States: 2009 Update. FS 952. July 2010.



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### *Lindera benzoin* (L.) Blume Spicebush

**Description:** Shrub or small tree to 5 m tall, often colonial from root sprouts; dioecious (or polygamodioecious?); bark smooth, dark brown with prominent lenticels; whole plant aromatic. Leaves alternate, petiolate, simple, elliptic or obovate, chartaceous, acute at both ends, glabrous to sparsely pubescent, margins entire, the largest leaves produced toward the branch tips, reduced toward the trunk. Flower buds produced on current season's wood, flowering the following spring before the leaves, in small clusters about 3 cm diameter, yellow, sweetly fragrant; sepals 6; petals absent; staminate flowers with 9 fertile stamens; ovulate flowers with fertile ovary and 12–18 infertile stamens. Fruit drupes, short stalked, ellipsoid, 6–10 mm long, shiny red at maturity. Seeds solitary. Flowers in early spring (one of the earliest flowering plants in our area).

**Where Found:** Southern Canada to Texas, Oklahoma and Kansas; understory in moist woods, often in floodplains. Common throughout New York City; the plants are abundant in the coves at Inwood Hill Park.

**Conservation Status:** The species is ranked 6 out of 10 in habitat specificity (0 being the least specific) and ranked S5 in rarity (5 being the least rare) by the New York Natural Heritage Program. The species is of Special Concern in Maine.

**Natural History:** Various species of Diptera (Flies) and Hymenoptera (Sawflies, Wasps and Bees) pollinate the flowers. Bobwhite (*Colinus virginianus*), Ring-Necked Pheasant (*Phasianus colchicus*), Great Crested Flycatcher (*Myiarchus crinitus*), Eastern Kingbird (*Tyrannus tyrannus*), Veery (*Catharus fuscescens*), Hermit Thrush (*Catharus guttatus*), Gray-Cheked Thrush (*Catharus minimus*), Swainson's Thrush (*Catharus ustulatus*), Wood Thrush (*Hylocichla mustelina*), White-Eyed Vireo (*Vireo griseus*), Red-Eyed Vireo (*Vireo olivaceus*), Catbird (*Dumetella carolinensis*), Robin (*Turdus migratorius*) and White-Throated Sparrow (*Zonotrichia albicollis*) feed on the ripe fruit (Martin et al., 2011). Wood Thrushes are reported to be especially fond of them (Nesom, 2000). The fruits have a high lipid content, making them important for migrating birds with high energy requirements. Capture rates for Swainson's Thrushes and Gray Catbirds were 20% and 250% higher (respectively) in native-dominated shrublands that contained Spicebush than they were in exotic-dominated shrublands (Oguchi et al., 2018). The Spicebush Swallowtail Butterfly lay eggs exclusively on Spicebush and other members of the Lauraceae family and the larvae feed on the leaves. Prometheus Moths (*Callosamia promethea*) and the Tulip Tree Beauty (*Epimecis hortaria*) may also feed on the foliage. The Sassafras borer (*Oberea ruficollis*) bore into the branches and roots. Azure Butterflies have been observed nectaring on the flowers (botanygirl, [iNaturalist observation](#)).

**Cultural History:** Early land surveyors used Spicebush as an indicator of fertile soil (Nesom, 2000).

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**Name Notes:** Spicebush is named for the spicy odor produced by terpenes and other compounds released when any part of the plant is bruised. The genus name *Lindera* commemorates the early Swedish botanist and physician, Johann Linder (1676–1723). Benzoic acid is an aromatic compound from various species of the *Styrax* genus native to Java, Sumatra and Thailand.

**Species Notes:** A form of the species with pubescent leaves and twigs occurs primarily in the southeast and has been named *Lindera benzoin* var. *pubescens* (Palmer & Steyererm.) Rehder. A form with orange-yellow ripe fruits was named forma *xanthocarpa* (G.S. Torr.) Rehder and was recently found on Staten Island (Lynch, 2012). Two other species are rare shrubs in the southeastern US: *Lindera melissifolia* (Walt.) Blume, Pondberry or Southern Spicebush, and *Lindera subcoriacea* B.E. Wofford, Bog Spicebush. Spicebush is one of the first plants to bloom in spring, forming conspicuous drifts of yellow among the bare trees and shrubs. The Cornelian Cherry (*Cornus mas*) produce masses of small yellow flowers around the same time as Spicebush, but can be distinguished by the rough yellowish bark and opposite branching. Cornelian Cherry have not been found in the wild. Spicebush leaves turn a brilliant yellow color in the fall.

**Links:** iNaturalist [observations](#) from New York City. [Specimens](#) from the Mid-Atlantic Herbaria Consortium. Global biotic [interactions](#) from GloBI.

**References:** Nesom, G. 2000. *Lindera benzoin* (L.) Blume. Plant Guide. USDA NRCS National Plant Data Center & the Biota of North America Program. [https://plants.usda.gov/plantguide/pdf/pg\\_libe3.pdf](https://plants.usda.gov/plantguide/pdf/pg_libe3.pdf). Oguchi, Y., Z. Pohlen, R.J. Smith and J.C. Owen. 2018. Exotic and native-dominated shrubland habitat use by fall migrating Swainson's Thrushes and Gray Catbirds in Michigan, USA. *The Condor* 120: 81–93. Lynch, R. 2012. A Rare Find: Yellow-Fruited Spicebush (*Lindera benzoin* forma *xanthocarpum*). *Arnoldia* 69(3): 24–28. Martin, A.C., H.S. Zim and A.L. Nelson. 2011. *American Wildlife and Plants: A Guide to Wildlife Food Habits*. Dover Publications. 512 pp.



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***Sassafras albidum*** (Nutt.) Nees  
Sassafras

**Description:** Trees to 20 m tall, the trunk sometimes becoming 1 m in diameter; often colonial from rootstock; dioecious; bark cinnamon-colored, with thick braided ridges; twigs yellowish green with prominent lenticels; terminal buds ovoid, ca 1 cm diameter, yellow-green; whole plant aromatic. Leaves alternate, simple, polymorphic, sometimes un-lobed and elliptic, bi-lobed (mitten) or tri-lobed, coriaceous, tapered to the base, the margins entire, dark green above, paler beneath. Flowers usually before the leaves, in racemes, fragrant, greenish-yellow, the pedicels elongating in fruit, turning bright red; sepals 6; petals absent. Fruit fleshy, ellipsoid drupes, about 1 cm long, turning shiny, blue-black.

**Where found:** Southern Canada to Florida, Texas, Oklahoma and Kansas; light-gaps in woods, fields and roadsides, usually in sandy, well-drained soil; intolerant of shade.

**Conservation Status:** The species is ranked 4 out of 10 in habitat specificity (0 being the least specific) and is ranked S5 in rarity (5 being the least rare) by the New York Natural Heritage Program.

**Natural History:** Sassafras are often found in large colonies, particularly after fire. The Sassafras borer (*Oberea ruficollis*), Spicebush Swallowtail (*Papilio troilus*), Tiger Swallowtail (*Papilio glaucus*), Io Moth (*Automeris io*), Prometheus Moth (*Callosamia promethea*), Drexel's Datana (*Datana drexelii*), Imperial Moth (*Eacles imperialis*), Tulip Tree Beauty (*Epimecis hortaria*), Cecropia Moth (*Hyalophora cecropia*), Small Necklace Moth (*Hypsoropha hormos*), Crinkled Flannel Moth (*Lagoa crispata*), Common Metarranthis (*Metarranthis hypocharia*), Pale Metarranthis (*Metarranthis indeclinata*), Woodgrain Leafroller (*Pandemis lamprosana*), Sassafras Leafroller Moth (*Phaecasiophora niveiguttana*), Tortricid Moth sp. (*Sparganothis saracana*) feed on leaves (Hilty, 2018). White-tailed Deer and Rabbits will browse the leaves and Beaver will gnaw on the bark. Bobwhite, Wild Turkey and many songbirds eat the fruit. The flowers are pollinated by small Halictid and Adrenid bees and a variety

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of flies, including Syrphid Flies, March Flies, Dance Flies, Tachinid Flies, Flesh Flies, Blow Flies, and Muscid Flies as well as Sawflies, Ichneumonid Wasps, and Beetles (Hilty, 2018).

**Cultural History:** The wood was used for a variety of products. Oil of Sassafras is extracted from the roots and has been used in perfumes, teas and other beverages. Large quantities of the oil are reported to be carcinogenic.

**Name Notes:** The genus name is derived from the name used by early French and Spanish settlers and probably derived from a Native American name. The specific epithet, *albidum*, refers to the whitish undersides of the leaves.

**Species Notes:** The leaves turn brilliant orange and red in the fall. There are three extant species in the genus, one in North America and two in Asia.

**Links:** iNaturalist [observations](#) from New York City. [Specimens](#) from the Mid-Atlantic Herbaria Consortium. Global biotic [interactions](#) from GloBI.

**References:** Hilty, J. 2018. Illinois Wildflowers. <http://www.illinoiswildflowers.info/trees/plants/sassafras.htm>, accessed 1 June 2018.

## Papilionidae



### *Papilio troilus* L.

#### Spicebush Swallowtail Butterfly

Throughout its lifecycle, the Spicebush Swallowtail Butterfly displays an exquisite array of morphological and behavioral adaptations, making it one of our most beautiful and interesting Butterflies. It is native to the eastern half of the United States from southern Canada to Florida, Texas and Kansas. Caterpillars feed exclusively on species of the small and restricted Laurel family (Lauraceae) and yet it is one of the most commonly observed butterflies in North America-- even breeding in Central Park.

Spicebush Swallowtails are in the large, mostly tropical Swallowtail family (Papilionidae). The family numbers over 500 species, including the largest of all butterflies, the Queen Alexandra's Birdwing of Papua New Guinea whose wing span may exceed 30 cm. Adult butterflies are mostly large and attractive while the caterpillars are slow moving and colorful. Many Swallowtails co-evolved with particular host plants and are dependent on them, especially as caterpillars. Black Swallowtail feed primarily on members of the Carrot family (Apiaceae) especially

Dill and Fennel. Caterpillars of our Eastern Tiger Swallowtails are less particular, feeding on members of the Magnolia (Magnoliaceae), Rose (Rosaceae), Olive (Oleaceae) and others. All three may be commonly seen in New York City. The less common Pipevine Swallowtail feed exclusively on members of the Pipevine family (Aristolochiaceae) which are rare in our area.

Adult females use chemoreceptors in their forelegs to select young Spicebush and Sassafras leaves upon which to lay their eggs. The relatively large, smooth spherical eggs are oviposited under the leaf. The hatched larvae chew through the leaf from the edge to the midrib on the upper surface. Early instars of the larvae are brown and slimy, resembling bird droppings and when disturbed emit a foul odor.



As the caterpillars pass through later stages of development (instars), they lay down a layer of silk along the midrib of the upper leaf surface. The drying silk contracts and rolls the leaf upward, sheltering the larvae during the day. They emerge from their protective leaf at night to feed and when disturbed extend their osmeterium--a reddish, antennae-like structure resembling the forked tongue of a snake. In their final stage, the caterpillar turns yellow-green and develops the characteristic eye-spots and coloration that resemble snake eyes. The mimicry is so evolved the eye-spots even have white patches within a dark "pupil" giving the "eyes" a moist and more authentic appearance. These are probably the best snake mimics of all North American insects.

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Ansel Oommen, Bugwood.org

The final instars pupate just off the ground, emitting a line of silk while turning around to create a harness holding them fast. Summer pupae are green like the surrounding vegetation. Winter pupae are brown and will enter diapause to "hibernate" until spring. The entire process from egg to adult lasts about one month. The adults live from two days to two weeks, relying on a variety of plants for nectar while searching for mates. The adults also display a highly evolved form of mimicry. Their size, shape and coloring resembles those of the foul-tasting and poisonous Pipevine Swallowtail (*Battus philenor*) which birds soon learn to avoid.

In our region, Spicebush Swallowtail (top map) feed exclusively (as caterpillars) on Spicebush (center map) and Sassafras (bottom map), while those further south also utilize Bay Laurel (*Persea barbonia*), Swamp Bay (*Persea palustris*), Southern Spicebush (*Lindera melissifolia*) and the introduced Camphor Tree (*Cinnamomum camphora*).

