Nyssa sylvatica

Marshall

Nyssaceae

LOCAL NAMES
English (swamp blackgum,yellow gum,tupelo-gum,tupelo,swamp tupelo,pepperidge,sour gum,black gum,black tupelo)

BOTANIC DESCRIPTION
N. sylvatica is a medium to large-sized deciduous tree, growing 18-30 m tall with dense foliage, pyramidal in youth maturing to a flat-topped crown on an erect trunk of up to 90 cm diameter with branches at a stiff 90° angle and sometimes pendulous. The base of the tree may be enlarged when it is growing in water.

Bark dark gray-brown and shallowly, irregularly furrowed, on old stems it can become quite blocky, about 2.5 cm or thicker resembling alligator hide.

Leaves alternate, simple, 7-15 cm long and 3-8 cm wide, ovate to elliptic, pinnately veined; leaf margin serrated.

Flower polygamo-dioecious, small, greenish-white, not showy, clusters hang from slender stalks, appearing with the leaves.

Fruit a dark, purplish blue oblong drupe, often profusely borne when present, 2-3 per stalk; 1.3 cm long, each single-seeded fruit with a fleshy coating surrounding a ribbed pit.

Twig moderately stout, red-brown to gray, diaphragmed pith; 2.5-5cm curved spur shoots often present; buds ovate, pointed, green and light brown, but darkening to brown in the winter.

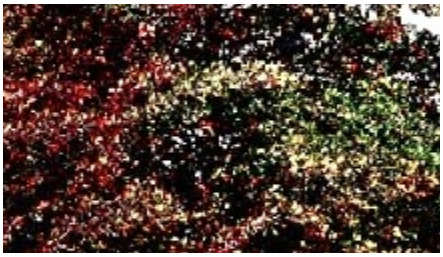
Nyssa sylvatica (Tupelo) is divided into two commonly recognized varieties differentiated by habitat, Nyssa sylvatica var. biflora, a tree of swamps, heavy organic or clay soils of wet bottomlands, and Nyssa sylvatica var. sylvatica, (black or sour gum) occurs on light-textured soils of uplands and stream bottoms.

The generic name Nyssa comes from the name of the beautiful water nymph (submerged aquatic plant; of fresh or brackish water) in Greek mythology. Sylvatica is Latin for "of the forest."

BIOLOGY
Flowers appear in spring (April-June) with the foliage. The bee-pollinated flowers are hermaphrodite. Fruits develop over the spring and summer (September-October) and ripen early to late fall (Sept-Nov). The fruits are not persistent and fall shortly after ripening. Seeds not dispersed by animals generally fall to the ground near the tree and remain dormant in the litter or are water dispersed.

Young tree (©Larry Allain. USGS NWRC.)

Bark (Brian Lockhart, Louisiana State University, www.forestryimages.org)



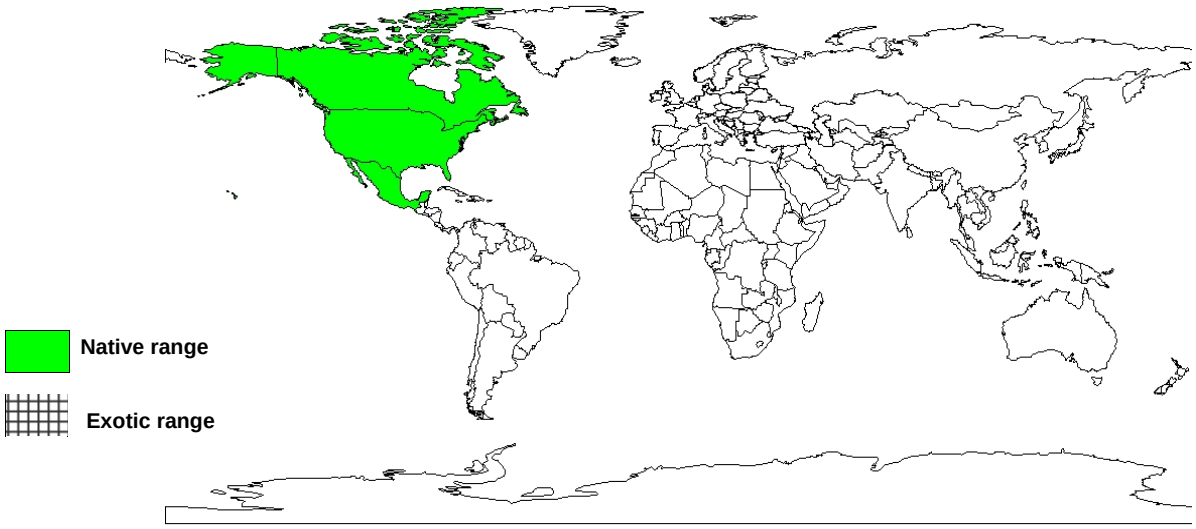
Flowers (Charles T. Bryson, USDA Agricultural Research Service, www.forestryimages.org)

ECOLOGY
N. sylvatica is a lowland tree of low wet woods, bottomlands and pond peripheries, also found on dry rocky wooded slopes and ravines, in sun to partial shade, moist to well drained soils. Common tree associates include black cherry (Prunus serotina), dogwood (Cornus florida), hickory (Carya spp.), oak (Quercus spp.), eastern hophornbeam (Ostrya virginiana), yaupon (Ilex vomitoria), swamp cyrilla (Cyrilla racemiflora), and redbay (Persea borbonia). In New England it is associated with Black Ash (Fraxinus nigra), American Elm (Ulmus americana), and Red Maple (Acer rubrum).

BIOPHYSICAL LIMITS
Altitude: 0-915 m
Temperature: 2 -26° C
Rainfall: average 1270 mm/year.
Soil type: Prefers an acid soil with adequate moisture, well-drained, light-textured and silty alluvium. In the uplands it grows best on the loams and clay loams of lower slopes and coves.

DOCUMENTED SPECIES DISTRIBUTION

Native: Canada, Mexico, US
Exotic: New Zealand



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

PRODUCTS
Food: the fruit can be eaten raw or cooked. It has a thin sharply acid pulp that is pleasant to roll in the mouth as a masticator; it is also used in preserves. It is pleasantly acidulous.

Timber: Black tupelo wood is uniform textured, heavy, strong and soft, very difficult to split and is used mainly for lumber, veneer, paper pulp, and to some extent for railroad ties. The veneer is used mainly for boxes, soles of shoes, wooden pipes, wheel hubs, crates, baskets, furniture, and interior woodwork. Because of its toughness, black tupelo is also used for flooring, rollers in glass factories, blocks, gunstocks, and pistol grips. It also used for making crossties and pallets and for durable handles of hand tools.

Medicine: The bark is emetic, ophthalmic and vermifuge. An infusion has been used as a bath and also given to children with worms. A strong decoction is used to cause vomiting when unable to retain food. Strong ooze from the roots is used as eye drops.

Fodder: The fruits are high in crude fat, fiber, and phosphorus and constitute an important food source for variety animals, including black bear and over 30 species of song and game birds. Young sprouts are relished by white-tailed deer but lose palatability with age.

Apiculture: Although flowers are not showy, they are an excellent nectar source for bees. Bee keepers seek out the tupelos while in bloom, because people in the southern United States consider tupelo honey particularly flavorful.

SERVICES
Ornamental: Due to its clean attractive foliage, straight bole, shapely crown, and consistently spectacular and attractive fall color, black tupelo is often planted as an ornamental.

Shade or shelter: Black tupelo makes an excellent shade tree. Its habit lends it to use as a specimen tree and can be grown in groves quite nicely as well. It also has numerous cavities that serve as nesting and den spaces for a variety of animals. It can be used as a street tree if a fair amount of branches are removed to get good clearance.

TREE MANAGEMENT
The deep taproot system makes tupelo transplanting somewhat difficult especially in autumn except on very young trees, therefore container-grown seedlings are recommended and care should be taken to amend the soil, fertilize, water thoroughly, mulch adequately and avoid winter salt spray to enhance survival chances during the first winter. Young trees require irrigation until well established but tolerate average dry conditions thereafter.

Seedling establishment is best accomplished by the shelterwood method. Regeneration can also be accomplished by clearcutting if it follows a good seed fall or if advanced regeneration is already established.

Fall pruning is recommended but light trimming may be done anytime. Trees generally do not require much pruning, but the removal of broken or low branches may be necessary.

Trees should be trained to a single dominant leader by removing competing leaders, especially those that form narrow crotch angles which develop into weak and potentially dangerous branches.

GERMPLASM MANAGEMENT
The fruit pulp should be removed by maceration and the seeds recovered by floating in water. The depulped seed should be stratified by placing in plastic bags with moist sand and refrigerated for a minimum of 30 days. Following removal from stratification, seeds germinate under warm and moist conditions in about 3 weeks.

Once seedlings are large enough to handle, they should be pricked out into individual pots and grown in the greenhouse for at least their first winter. Planting out should be in late spring or early summer, after the last expected frosts. Protection from the cold for their first winter outdoors is necessary.

PESTS AND DISEASES
No serious insect or disease problems. The two most important insects are the tupelo leaf miner (Antispila nyssaefoliella) and the forest tent caterpillar (Malacosoma disstria). Their infestation may cause growth loss and occasional mortality. Black tupelo is also susceptibility to leaf spots, canker, rust and scale. Animal damage on seedlings and sprouts could be experienced when deer populations are high.

FURTHER READNG

Bailey LH and Bailey EZ. 1976. Hortus. 3rd ed. Macmillan General Reference, NY.

Bean W. 1981. Trees and Shrubs Hardy in Great Britain. Vol 1 - 4 and Supplement. Murray

Bonner FT. 1974. Nyssa L. Tupelo. In Seeds of woody plants in the United States. C. S. Schopmeyer, tech. coord. U.S. Department of Agriculture, Agriculture Handbook 450. Washington, DC.

Britton NL & Brown A. 1970. An Illustrated Flora of the Northern United States and Canada Dover Publications. New York.

Chittendon F.1951. RHS Dictionary of Plants plus Supplement. 1956 Oxford University Press.

Dirr MA. & Heuser MW. 1987. The Reference Manual of Woody Plant Propagation. Athens Ga. Varsity Press.

Duncan WH.; Duncan MB. 1988. Trees of the southeastern United States. Athens, GA: The University of Georgia Press.

Elias T. 1980. The Complete Trees of N. America. Field Guide and Natural History. Van Nostrand Reinhold Co. New York.

Eyre FH (ed.). 1980. Forest cover types of the United States and Canada. Society of American Foresters. Washington, DC.

Facciola S. 1990. Cornucopia - A Source Book of Edible Plants. Kampong Publications. Vista, CA.

Godfrey RK. 1988. Trees, shrubs, and woody vines of northern Florida and adjacent Georgia and Alabama. Athens, GA: The University of Georgia Press.

Griffiths M. 1994. The Index of Garden Plants. Timber Press, Portland.

Hedrick UP. 1972. Sturtevant's Edible Plants of the World. Dover Publications Inc. New York.

Hightshoe GL. 1988. Native Trees, Shrubs, and Vines for Urban and Rural America. Van Nostrand Reinhold, New York.

Huxley A. 1992. The New RHS Dictionary of Gardening. 1992. MacMillan Press. London.

Johnson WT & Howard HL. 1994. Insects That Feed on Trees and Shrubs. Cornell University, Ithica.

Kunkel G. 1984. Plants for Human Consumption. Koeltz Scientific Books. Rosendahl, CO 1955.

Little EL. Jr. 1979. Checklist of United States trees (native and naturalized). U.S. Department of Agriculture, Agriculture Handbook 541. Washington, DC.

Moerman D. 1998. Native American Ethnobotany Timber Press. Oregon.

Peattie DC. 1991. A Natural History of Trees of Eastern and Central North America. Houghton Mifflin. Boston.

Poor JM & Nancy PB. 1984. Plants That Merit Attention, Vol. I: Trees. Timber Press, Portland.

Sargent CS. 1965. Manual of the Trees of N. America. Dover Publications Inc. New York.

Sheat WG. 1948. Propagation of Trees, Shrubs and Conifers. MacMillan and Co. USDA Forest Service 2001.

Sinclair WA et al. 1993. Diseases of Trees and Shrubs. Cornell University, Ithica.

Stiles EW. 1980. Patterns of fruit presentation and seed dispersal in bird-disseminated woody plants in the eastern deciduous forest. The American Naturalist.

Uphof JC. Th. 1959. Dictionary of Economic Plants. Weinheim, Germany. Hafner Publishing Co., New York.

Usher G. 1974. A Dictionary of Plants Used by Man. Constable, London.

Vines RA. 1960. Trees, shrubs, and woody vines of the Southwest. Austin, TX: University of Texas Press.

Wyman D.1986. Wyman's Gardening Encyclopedia. MacMillan, New York.

SUGGESTED CITATION

Orwa C, Mutua A , Kindt R , Jamnadass R, Simons A. 2009. Agroforestree Database:a tree reference and selection guide version 4.0 (http://www.worldagroforestry.org/af/treedb/)