

***Euonymus alatus* (Thunb.) Sieb.**
CELASTRACEAE

winged burning bush

Synonyms: *Celastrus alatus* Thunb.
Celastrus striatus Thunb.
Euonymus arakianus Koidz.
Euonymus sacrosanctus Koidz.
Euonymus striatus (Thunb.) Loes.
Euonymus subtriflorus Blume
Euonymus thunbergianus Blume

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Illustration source: Ma, J.S. 2001

General Description.—This species is commonly known as winged burning bush or winged spindle tree because of its stems, which have two to four conspicuous brown, corky ridges or wings, 2 to 3.5 mm wide and 1.0 to 1.2 mm thick. It is the only species of *Euonymus* L. in North America to have such prominent wings on its twigs. It is also occasionally called Asian spindle tree because it is native to Asia. Winged burning bush is a low-growing shrub, usually up to 2 m tall, never more than 4 m. The plant does spread well horizontally, sending out stems in many directions. Its buds are axillary (two per axil), ovoid or obovate, scattered along the stem. The leaves are opposite, two per node, and are spaced somewhat evenly along the stem. The leaf petioles are short, round in cross section, glabrous, 2 to 3.5 mm long (rarely shorter

than 2 mm., the leaves then appearing subsessile). The leaf blades are glabrous, lanceolate to obovate, 4.5 to 7.3 (rarely to 10) by 1.2 to 2.3 (rarely to 4.5) cm, leathery to papery, with cuneate or attenuate bases, crenate to serrate margins and acuminate to cuspidate apices. The five to seven pairs of ascending lateral veins disappear before reaching the leaf margin. The flowers develop on the current season's growth and are bisexual (rarely functionally unisexual). They are in small axillary clusters (cymes), the clusters on slender peduncles, 2.0-2.5 cm long, usually with one dichotomous branch and three or fewer flowers. Each flower is on a pedicel 4 to 7 mm long. The flowers are about 9 mm in diameter with the parts in fours, and the sepals and petals readily distinguishable from one another. The petals are yellowish green. The fruits are ovoid, four-lobed capsules, 8 to 14 by 10 to 16 mm. At maturity the capsules are red to brown-purple and they split open along the lobes (often one or more lobe is abortive), exposing the one to four seeds, each enclosed in a fleshy orange aril. The seeds (sans aril) are glabrous, light brown to black, ellipsoid, 6 to 12 by 4.0 to 5.5 mm. Some spell the specific epithet "alata" instead of "alatus" used here. This is because botanists disagree as to whether the genus name *Euonymus* should be treated as feminine ("alata") or masculine ("alatus") (Paclt 1998). In classical Greek, the generic name was treated as feminine; however, Linnaeus treated the genus as masculine. The spelling "*Euonymus*" has formally been conserved over Linnaeus's originally spelling "*Evonymus*," which has also occasionally been used (Gilstra 1991).

Range.—Winged burning bush is native to east Asia being distributed in far eastern Russia (Far East), Japan, Korea, and China. In its native range, it occurs in areas with annual precipitation of 400

mm or more and in elevations ranging from 40 to 2,700 m (Ma 2001). It was first introduced into the United States about 1860 (Rehder 1940), as an ornamental plant, and it eventually became naturalized in the Eastern United States (Ebinger 1996, Gleason and Cronquist 1991, J. Ma in personal observation). Currently winged burning bush is known from 21 Eastern and Mid-Western States (Connecticut, Illinois, Indiana, Iowa, Kentucky, Maryland, Massachusetts, Michigan, Minnesota, Missouri, North Carolina, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, South Carolina, Virginia, Vermont, West Virginia), as well as Montana (USDA 2003). It can be expected to be found elsewhere with the continued spread of naturalized populations and additional material escaping from cultivation.

Ecology.—It is not as aggressive an invader as the related Oriental bittersweet (*Celastrus orbiculatus* Thunb). It is found in disturbed habitats, such as roadsides, forest margins and woodlands that are in early stages of succession (Ma, personal observation).

Reproduction.—Hymenopterous and dipterous insects, especially bees and flies, appear to be the main pollinators, and the attractive arillate seeds are widely dispersed by birds and small mammals (Brizicky 1964). The flowers bloom in the spring and the fruit mature in the fall. The species can be asexually propagated through stem cuttings and root separation.

Growth and Management.—Winged burning bush grows in a variety of soil conditions. It is not a fast growing plant, reaching perhaps up to 1 m of growth in a single growing season. Propagation can be effected by layering or seed (Chittenden and Synge 1956). However, there is concern about the continued use of this plant in ornamental plantings, since it can be invasive in some areas (Martin 2002)

Benefit.—The foliage of winged burning bush turns bright scarlet in autumn, giving the plant its common name burning bush. The purplish capsules and seeds with orange arils add to the “burning” effect of the plant late in the year. This effect of the plant has made it a popular ornamental and horticultural species. Some specimens can be shaped into bonsai (Smith 2003)

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