

FIRST RECORD OF *EUONYMUS MAACKII* (CELASTRACEAE) FROM THE ARKANSAS (U.S.A.) FLORA

Brett E. Serviss

Natural Sciences
College of Aviation, Science, and Nursing
Henderson State University
Arkadelphia, Arkansas 71999, U.S.A.
servisb@hsu.edu

Jonathan R. Kratz

Natural Sciences
College of Aviation, Science, and Nursing
Henderson State University
Arkadelphia, Arkansas 71999, U.S.A.

ABSTRACT

The first naturalized occurrence of *Euonymus maackii* (Celastraceae) in the Arkansas flora is reported here from Garland County. In 2025, a small, naturalized population of 9–10 plants of *E. maackii* was discovered in highly disturbed roadside habitat along a small drainage and adjacent to a residential area, within the city of Hot Springs. Larger individuals were fertile, with well-developed but immature fruits. Smaller, sterile individuals are presumed established from seeds produced from the larger, reproductive-age plants. The precise origin of the naturalized plants is unknown, although initial escape and establishment from cultivated plants of the species is probable.

RESUMEN

Se informa aquí de la primera aparición naturalizada de *Euonymus maackii* (Celastraceae) en la flora de Arkansas, en el condado de Garland. En 2025, se descubrió una pequeña población naturalizada de 9–10 plantas de *E. maackii* en un hábitat muy alterado junto a una carretera, a lo largo de un pequeño drenaje y adyacente a una zona residencial, dentro de la ciudad de Hot Springs. Los individuos más grandes eran fértiles, con frutos bien desarrollados pero inmaduros. Se presume que los ejemplares más pequeños y estériles se establecieron a partir de semillas producidas por las plantas más grandes en edad reproductiva. Se desconoce el origen exacto de las plantas naturalizadas, aunque es probable que se hayan escapado y establecido a partir de plantas cultivadas de la especie.

KEY WORDS: Celastraceae, winterberry euonymus, Arkansas, Garland County, invasive, *Euonymus*

INTRODUCTION

Euonymus maackii is a deciduous or tardily deciduous shrub or small tree to about 5 m tall that is native to China (Ma & Funston 2008). This species previously was not documented for the Arkansas flora (Smith 1994; Gentry et al. 2013; Ma & Levin 2016; Ogle et al. 2020; Serviss & Tumlison 2021). Serviss and Tumlison (2021) did include *E. maackii* in their treatment of Arkansas exotic woody plants, because it is cultivated in the state, produces seeds that are bird-dispersed, and can spread vegetatively through air layering of stems and production of root suckers; offering plausibility for its naturalized occurrence in the state. Additionally, other introduced Asiatic *Euonymus* species, such as *E. alatus* (Thunb.) Siebold and *E. fortunei* (Turcz.) Handel-Mazzetti, are invasive in Arkansas. *Euonymus maackii* is known from the naturalized floras of a few other states, mostly in the eastern USA, including Colorado, Florida, Georgia, Illinois, Oklahoma, and South Carolina (Kuhn et al. 2011; Ma & Levin 2016; Weakley and Southeastern Flora Team 2025; Wunderlin et al. 2025). *Euonymus maackii* should be expected elsewhere in Arkansas, especially in the vicinity of where the species is cultivated.

ADDITIONS TO THE ARKANSAS FLORA

Euonymus maackii Ruprecht (winterberry euonymus; Syn.: *Euonymus bungeanus* Maxim.) is reported here from Garland County for the first naturalized occurrence in the Arkansas flora (Figs. 1, 4, 5). In 2025, a small, naturalized population of 9–10 plants of *E. maackii* was discovered growing along a small drainage and adjacent highly disturbed roadside habitat, within the city of Hot Springs (Figs. 2, 3). Naturalized plants ranged in size from less than 1 m to ca. 2.5–3.5 m in height. Some individuals were fertile with well-developed but immature fruits (Fig. 3). Spread and establishment from seeds is suspected, with some possible establishment



FIG. 1. Naturalized plants of *Euonymus maackii* in Garland Co., Arkansas. One of the larger plants, ca. 2.5–3 m tall, can be seen at the center of the photograph, above the waterline. This individual was fertile, with nearly mature fruits. Several additional plants of *E. maackii* occur at the edge and within the greenbelt that extends behind this plant. The larger, arborescent plant somewhat behind and to the right of it is an older individual of *E. maackii*—this plant likely is the initial source of the naturalized plants at the site; its origin is uncertain but possibly from cultivation practices, as the location of the naturalized plants directly borders a residential area and a golf course.

also via suckering. The origin of the naturalized plants is unknown and no obviously cultivated plants of the species were observed; however, establishment from cultivated plants is possible, as the location is bordered by a residential area and a golf course.

Some of the smaller *E. maackii* plants were distributed irregularly in a narrow roadside greenbelt, where other naturalized exotic species, including *Ailanthes altissima* (Mill.) Swingle, *Albizia julibrissin* Durazz., *Ilex cornuta* Lindl. & Paxton, *Ligustrum sinense* Lour., *Liriope spicata* Lour., *Nandina domestica* Thunb., and *Wisteria sinensis* (Sims) DC. occurred (Figs. 1, 2). Many of the *I. cornuta* plants were juveniles, anecdotally indicating that bird-mediated dispersal of seeds from foraging and/or roosting birds likely contributed to the establishment of some of the *E. maackii* plants, in addition to *I. cornuta* and *N. domestica*.

Plants of *E. maackii* mature reproductively at only a few years of age, and small individuals less than one meter tall can produce flowers and fruits (Serviss & Tumlison 2021). *Euonymus maackii* also is adaptable to a wide range of edaphic conditions and was observed at the site growing in both moist and mesic soils.

Voucher specimen. U.S.A. ARKANSAS. Garland Co.: Hot Springs, Golf Links Rd., 163 m E of the intersection of Golf Links Rd. and Shady Grove Rd., 34.472422, -93.035243, small population of 9–10 plants present along small drainage and adjacent fence row and narrow greenbelt, along highly disturbed roadside, some plants fertile, with well-developed fruits, 2 Aug 2025, Serviss 8843 (ANHC, HEND).

Eight species of *Euonymus*, including *E. maackii*, currently are known from the Arkansas flora (Serviss et al. 2017; Ogle et al. 2020; Serviss & Tumlison 2021). Of these, only the native *E. atropurpureus* Jacq., along with



Fig. 2. Close-up of four (three in the foreground and a fourth, larger individual deeper into the greenbelt) of the smaller naturalized plants of *Euonymus maackii* in Garland Co.—plants with large, broadly elliptic, lighter green leaves. About seven plants, ranging from less than 1 m to ca. 2.5–3 m tall were distributed along several meters of the greenbelt. At least some, if not all, of these plants likely were seeded in by one or more of the larger *E. maackii* plants at the site.



Fig. 3. A–C. Leaves, fruits, and bark of naturalized *Euonymus maackii* plants from the Garland Co. site. A. Close-up of leaves and stem. B. Leaves and nearly mature fruits—note that the fruits are yellowish-white in color, which aids in distinguishing this species from the morphologically similar *E. atropurpureus* and *E. europaeus*, both of which occur in the Arkansas flora. C. Bark—notice the prominent interlocking ridged and furrowed pattern, which further distinguishes *E. maackii* from *E. atropurpureus*, which has smooth bark (older individuals can develop shallow, longitudinal, furrow-like lines but bark is not ridged and furrowed with pattern like *E. maackii*). Many nonnative species were naturalized at the site, and three juvenile plants of *Ilex cornuta* (dark green; one of them lower left) and one small plant of *Liriope spicata* (right, slightly above bottom) can be seen in the photograph.



FIG. 4. County distribution of naturalized *Euonymus maackii* in Arkansas.

the introduced *E. europaeus* L., easily could be confused with *E. maackii*; however, the following key can be used to distinguish the eight *Euonymus* species [modified from Ogle et al. (2020) and Serviss and Tumlison (2021)].

1. Plants deciduous; young stems quadrangular in cross section, the angles often with corky wings *E. alatus*
1. Plants deciduous or evergreen (sometimes partially evergreen in *E. fortunei*); stems terete or subterete in cross section, or at least not winged.
 2. Plants evergreen and liana-like or erect to ascending shrubs; leaves thickly chartaceous, often glossy.
 3. Plant liana-like *E. fortunei*
 3. Plant a shrub.
 4. Growth form with branches procumbent, sprawling, or ascending (*E. kiautschovicus* included here) *E. fortunei*
 4. Growth form erect *E. japonicus*
 2. Plants deciduous and shrubs or small trees, leaves chartaceous to membranous, not generally glossy
 5. Plants spreading or trailing small shrubs, to 0.5 m tall *E. obovatus*
 5. Plants erect to upright shrubs or small trees, 1–5 (or more) m tall.
 6. Plant a small shrub to ca. 2 m tall; petioles of leaves to 0.5 cm long *E. americanus*
 6. Plant a large shrub or small tree to 5 m (or more) tall; petioles of leaves 0.6–2.5 cm long.
 7. Flowers dark reddish-purple; lower surface of leaves pubescent, sometimes sparsely so; mature bark smooth or sometimes fracturing into thin, flattened plates separated by narrow, longitudinal fissures *E. atropurpureus*
 7. Flowers pale greenish-white to yellowish-white; leaves glabrous; mature bark ridged and furrowed with interlocking ridges.
 8. Leaves generally long-acuminate or caudate at the apex, sometimes acute, petioles (1.25–2.5 cm); anthers purple; fruits pale yellowish-white, occasionally tinged with pink coloration *E. maackii*
 8. Leaves acute to short-acuminate at the apex, petioles (0.6–1.25 cm); anthers white to cream; fruits pink to red *E. europaeus*



Henderson State University Herbarium
Family: Celastraceae

Species: *Euonymus maackii* Ruprecht

Loc.: Garland Co.: Hot Springs, Golf Links Rd., 163 m east of the intersection of Golf Links Rd. and Shady Grove Rd., 34.472422, -93.035243

Hab.: small population of 9-10 plants present along small drainage and adjacent fence row and narrow greenbelt, along highly disturbed roadside, some plants fertile, with well-developed fruits

Coll.: Serviss, B.E. with J.R. Kratz No.: 8843
Date: August 2, 2025

Fig. 5. Garland County specimen of *Euonymus maackii*; notice the caudate apices on some leaves.

Other woody taxa in the Arkansas flora that potentially could be confused with *E. maackii* include *Prunus mahaleb* L., young plants of both *Pyrus calleryana* Decne. and *P. communis* L., and *Triadica sebifera* (L.) Small, mostly because of its similarity in leaf shape and overall growth form to these species. *Euonymus maackii* can be distinguished from them, however, by its opposite leaves and distinctly ridged and furrowed bark, with interlocked ridges (Fig. 3). The aforementioned species have alternately arranged leaves and either smooth bark or bark consisting of narrow and elongate, or at least flattened, sometimes semi-exfoliating plates. In addition, the leaves of *T. sebifera* have entire margins, whereas those of *E. maackii* are toothed.

ACKNOWLEDGMENTS

We are grateful to Jennifer Ogle, Virginia McDaniel, and Renn Tumlison for their very helpful insights and editorial suggestions regarding this paper.

REFERENCES

GENTRY, J.L., G.P. JOHNSON, B.T. BAKER, C.T. WITSELL, & J.D. OGLE. 2013. *Atlas of the vascular plants of Arkansas*. Vascular Flora Project, University of Arkansas, Fayetteville, U.S.A.

KUHN, B., B.E. NELSON, & R.L. HARTMAN. 2011. A floristic inventory of the Cimarron National Grassland (Kansas) and the Comanche National Grassland (Colorado). *J. Bot. Res. Inst. Texas* 5:753–772.

MA, J. & M. FUNSTON. 2008. *Euonymus* (Celastraceae). In: Z.Y. Wu and P.H. Raven, eds. *Flora of China*. Vol. 11 (Oxalidaceae through Aceraceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis, U.S.A. Pp. 440–460.

MA, J. & G.A. LEVIN. 2016. *Euonymus* (Celastraceae). In: *Flora of North America* Editorial Committee, eds. *Flora of North America North of Mexico*, Vol. 12. Oxford Univ. Press, New York, U.S.A. and London, UK. Pp. 122–125.

OGLE, J., T. WITSELL, & J. GENTRY. 2020. *Trees, shrubs, and woody vines of Arkansas*. Ozark Society Foundation, Little Rock, Arkansas, U.S.A.

SERVISS, B.E. & R. TUMLISON. 2021. Guide to the naturalized, escaped, and adventive woody flora of Arkansas. *Phytoneuron* 2021-29:1–193.

SERVISS, B.E., J.W. HARDAGE, B.L. OLSEN, & J.H. PECK. 2017. *Euonymus japonicus* (Celastraceae) new to the Arkansas flora. *Phytoneuron* 2017-80:1–3.

SMITH, E.B. 1994. *Keys to the flora of Arkansas*. University of Arkansas Press. Fayetteville, Arkansas, U.S.A.

WEAKLEY, A.S. AND SOUTHEASTERN FLORA TEAM. 2025. *Flora of the southeastern United States Web App*. University of North Carolina Herbarium, North Carolina Botanical Garden, Chapel Hill, U.S.A. Available at <http://fsus.ncbg.unc.edu>. Accessed August 2025.

WUNDERLIN, R.P., B.F. HANSEN, A.R. FRANCK, & F.B. ESSIG. 2025. *Atlas of Florida plants*. [S.M. Landry and K.N. Campbell (application development), USF Water Institute]. Institute for Systematic Botany, University of South Florida, Tampa, U.S.A. Available at <http://florida.plantatlas.usf.edu/>. Accessed August 2025.