

ILEX CRENATA (AQUIFOLIACEAE), *SYRINGA VULGARIS* (OLEACEAE),
AND *ULMUS PARVIFOLIA* (ULMACEAE) NEW TO THE
ARKANSAS (U.S.A.) FLORA, WITH A SECOND RECORD OF
PYRACANTHA KOIDZUMII (ROSACEAE) FOR THE STATE

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ABSTRACT

Three species of woody, eudicot angiosperms—*Ilex crenata* Thunb., *Syringa vulgaris* L., and *Ulmus parvifolia* Jacq.—are reported as new for Arkansas, and one species of woody eudicot angiosperm, *Pyracantha koidzumii* (Hayata) Rehd., is documented for only its second occurrence in the state. The *P. koidzumii* record also marks only the second occurrence of the genus *Pyracantha* outside of cultivation in Arkansas.

RESUMEN

Se citan nuevas para Arkansas tres especies de angiospermas leñosas, eudicotiledóneas—*Ilex crenata* Thunb., *Syringa vulgaris* L., y *Ulmus parvifolia* Jacq.—y una especie de angiosperma leñosa eudicotiledónea, *Pyracantha koidzumii* (Hayata) Rehd., se documenta para su segunda ocurrencia en el estado. La cita de *P. koidzumii* también marca la segunda ocurrencia del género *Pyracantha* fuera de cultivo en Arkansas.

INTRODUCTION

Field and herbarium investigations continue to yield a number of new additions to the woody flora of Arkansas. Over the past 15 years, field work by the authors has focused primarily on urban environments and has resulted in two families, 12 genera, and numerous species of woody plants, most of which were non-native, as newly documented or documented for only a second occurrence outside of cultivation in the state (Peck 2003; Serviss et al. 2006; Serviss et al. 2007a, 2007b; Serviss & Peck 2008; Serviss 2009; Peck & Serviss 2011; Serviss et al. 2012; Serviss & Peck 2013; Serviss et al. 2014; Serviss et al. 2015; Peck & Serviss 2016; Serviss & Peck 2016a, 2016b; Serviss et al. 2016). During that same period, a number of additional new and noteworthy records of non-native woody species also were contributed by other botanists (Sundell et al. 2002; Arkansas Vascular Flora Committee 2006; Nesom 2009; Gentry et al. 2013). Many of these relatively recently documented non-native woody species are of Asiatic origin and readily available (or have been in times past) via the horticultural trade, with many also common in cultivation across the state.

Both *Ilex crenata* (Japanese holly) and *Ulmus parvifolia* (Chinese elm) fall into this category—both Asiatic and much-planted, hardy, and easily grown ornamental species that are valued for their attractive vegetative forms. *Ilex crenata* is not widespread outside of cultivation in the U.S. and only has been documented in a few states as sparingly naturalized in urban woods and green belts (Pittillo & Brown 1988; McAvoy & Bennett 2001; Haines 2011; Weakley 2015). Based on its frequent cultivation in Arkansas, however, the occurrence of *I. crenata* outside of cultivation is not surprising. In contrast, *U. parvifolia* is not as frequently cultivated in the

state as *I. crenata*, but is naturalized in a number of states across the southern U.S. and a few northeastern states (Sherman-Broyles 1997); thus its presence in the Arkansas flora is similarly not unexpected.

Syringa vulgaris (common lilac) is of European origin and represents an unusual discovery. While this species is commonly cultivated and regularly naturalized and/or persistent from cultivation in the northern U.S., its cultivation and naturalization is far less common in the south. *Syringa vulgaris* apparently is not well-adapted to the hot, humid climate and often calcium-deficient soils that characterize much of the Southeast. The southern-most records of this species outside of cultivation occur from Missouri, South Carolina, and Tennessee. It is regularly encountered in cultivation in the northern one-half of Arkansas, but considerably less so in the southern portion of the state. Interestingly, *S. vulgaris* previously has been attributed to the Arkansas flora (Thompson 1977); however, it was excluded from Smith (1988) and Gentry et al. (2013) because the voucher specimen was determined to be from cultivated material.

ADDITIONS TO THE ARKANSAS FLORA

Ilex crenata Thunb. (Aquifoliaceae), Japanese holly, box-leaved holly (Fig. 1). *Ilex crenata* is an evergreen, multi-stemmed shrub or rarely a small tree to 10 meters tall that is native to China, Japan, and Korea (Bailey & Bailey 1976; Krüssmann 1978; Chen et al. 2008). It is sparingly naturalized in a few northeastern states, along with North Carolina and Louisiana (Pittillo & Brown 1988; McAvoy & Bennett 2001; Wilder & McCombs 2002; Haines 2011; Vincent et al. 2011; Weakley 2015).

This species is frequently cultivated as a hedge and border plant for its evergreen habit, compact growth form, dense foliage, and shade tolerance and numerous horticultural forms exist (Krüssmann 1978). It is commonly cultivated in Arkansas, and while presently only documented in the state from Garland County, it should be expected elsewhere as escaped or persisting from cultivation.

In Arkansas, *I. crenata* very closely resembles *I. vomitoria* (yaupon holly) and is easily confused with it, particularly when examining sterile plants or specimens. Both species have similar foliage and growth forms, although *I. vomitoria* generally displays a less tightly branched growth form and reaches a larger size at maturity. The two species may reliably be distinguished by the following key (modified from Weakley 2015):

1. Leaf undersurface with scattered punctate glands (glands sometimes sparse or pale in color), apex of lamina obtuse to acute with a short, sharp tooth; fruits black _____ ***I. crenata***
1. Leaf undersurface without scattered punctate glands, apex of blade retuse (notched) with a short mucronate projection; fruits red or yellow _____ ***I. vomitoria***

Voucher specimen: **ARKANSAS. Garland Co.:** a few plants growing within urban green belt along Hot Springs Creek, wooded stream with many exotics, Hot Springs, 22 Jul 2006, Peck 06-016 (HEND).

Syringa vulgaris L. (Oleaceae), common lilac. *Syringa vulgaris* is a large, deciduous shrub or small tree to ca. 7 meters tall that is native to southeastern Europe (Bailey & Bailey 1976; Krüssmann 1978). It is naturalized and also long-persistent from cultivation in several eastern states (Mitchell 1986; Wofford & Kral 1993; Chester et al. 1997; Haines 2011; Weakley 2015; USDA, NRCS 2016), including Missouri and Tennessee, both of which border Arkansas. Plants of *S. vulgaris* often produce root suckers, sometimes forming thickets; this habit may contribute to its ability to persist from cultivation and/or establish localized populations. In the U.S. flora, *S. vulgaris* generally occurs as an escaped species along woodland edges, thickets, fields, and roadsides and is persistent on abandoned homesteads (Haines 2011; Weakley 2015).

Syringa vulgaris has been cultivated for centuries, and over 800 varieties and horticultural forms currently exist (Krüssmann 1978). It is prized as an ornamental for its sweet, lilac-scented flowers, the fragrant oil of which is extracted and used to scent perfumes, soaps, body washes, and household cleaning products. *Syringa vulgaris* also is valued for its hardiness and ease of cultivation, and the flowers are attractive to bees and butterflies.

Our record is from Pulaski County in central Arkansas, and although the origin of that *S. vulgaris* plant is unknown, no apparent evidence of cultivation was present at the site, nor were any source plants observed that potentially could have produced the spontaneous individual. It also is important to note that, although the

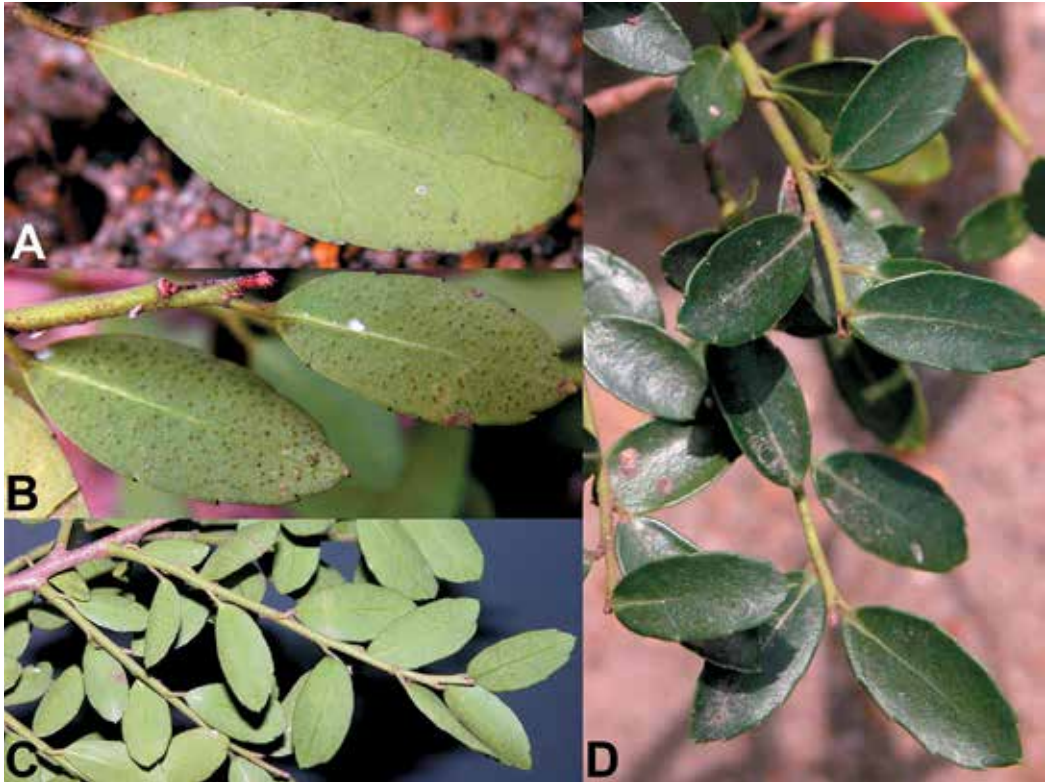


FIG. 1. Photographs of leaves of *Ilex crenata* and *I. vomitoria* for comparison (from cultivated plants). A. *Ilex vomitoria*: Close-up of leaf lower surface for absence of punctate glands. B–D. *Ilex crenata*: B. Close-up of leaf lower surface for punctate glands. C–D. Branches with leaves.

cited voucher specimen (Cox 1043) for the spontaneous *S. vulgaris* plant is a student collection, one of the authors [JHP] was with the student on site when the specimen was collected. The Pulaski County record of *S. vulgaris* remains the only example of this species observed by the authors outside of cultivation in the Arkansas flora over the past 30 years.

It was one individual, persistent, and obviously derived in some unknown manner from cultivated sources at some time. As no others were evident, this plant is best called a “waif” using the classification of Nesom (2000). It does show some potential for naturalization in other states, but a combination of soil and weather conditions probably constrains it in Arkansas. While looking for additional examples across Arkansas, this specimen became misplaced and overlooked in the herbarium until reviewed by one of us [BES].

In Arkansas, *S. vulgaris* may potentially be confused with a few of the large-leaved privet species, such as *Ligustrum japonicum* (Japanese privet) and *L. lucidum* (glossy privet); however, *S. vulgaris* may be distinguished from *Ligustrum* by its cordate (heart-shaped) leaves, capsule-type fruits, and lavender, blue, or purple-colored flowers. In contrast, *Ligustrum* species have leaves that are not cordate, but instead with tapered bases, drupe-type fruits, and flowers that are white to whitish-cream in color. A few forms of *S. vulgaris* have white-colored flowers, but may still be distinguished from *Ligustrum* by the leaves.

Voucher specimen: **ARKANSAS. Pulaski Co.:** one plant along disturbed roadside, lakeshore-young pine forest area, silty-sandy soils, SE¼ Sec27 T3N R15W, 7 Sep 1986, Cox 1043 (HEND).

Ulmus parvifolia Jacq. (Ulmaceae), Chinese elm, lacebark elm (Fig. 2). *Ulmus parvifolia* is a large, deciduous tree to 25 meters tall that is native to China, Japan, Korea, and Vietnam (Fu et al. 2003). It is naturalized in

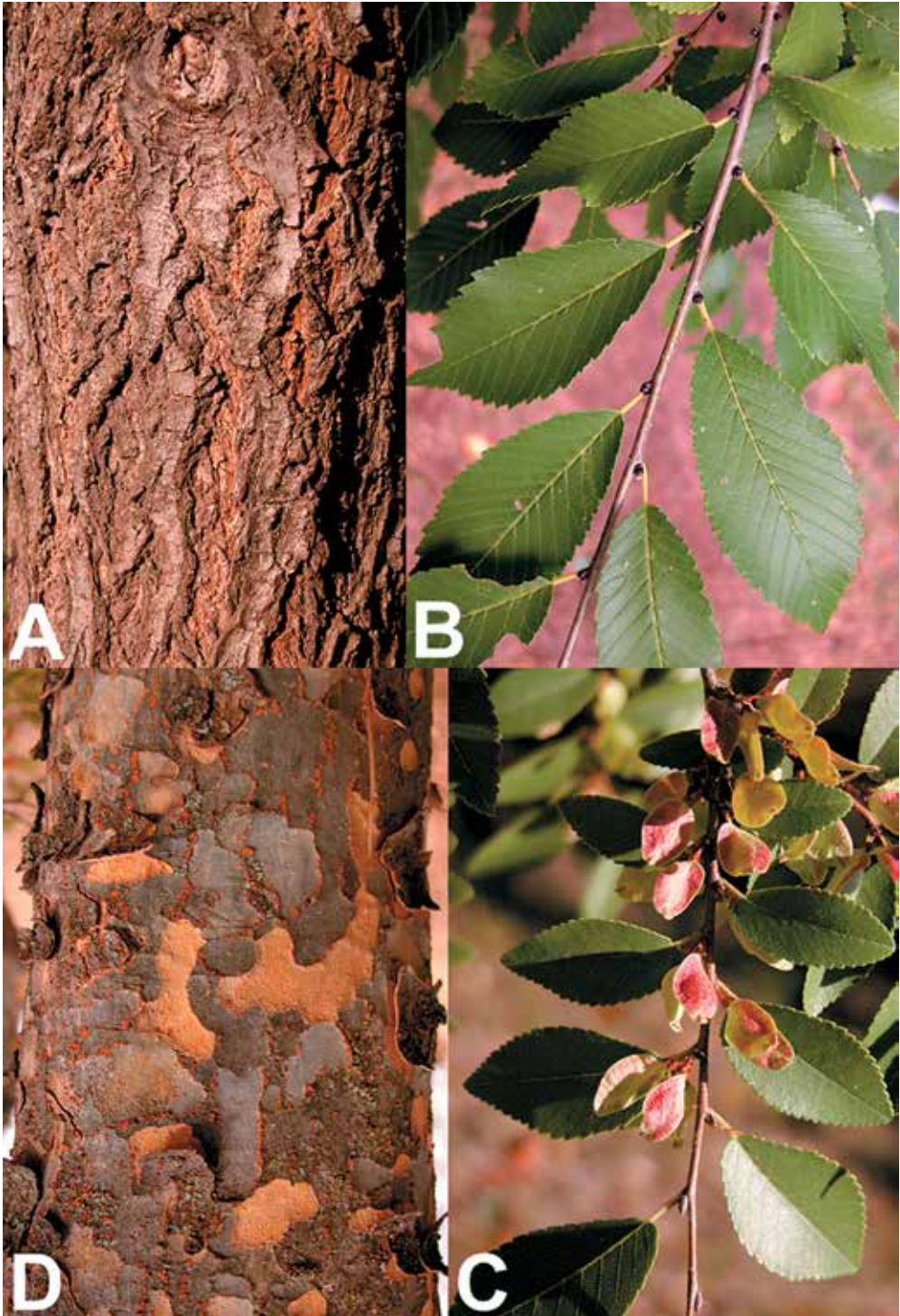


FIG. 2. Photographs of *Ulmus parvifolia* and *U. pumila* for comparison. A–B. *Ulmus pumila*: A. Bark. B. Leaves and flower buds. C–D. *Ulmus parvifolia*: C. Leaves and fruits. D. Bark.

several states in the southern U.S., but also ranges as far north as Maine along the east coast (Sherman-Broyles 1997; Thomas & Allen 1998; Wunderlin & Hansen 2011; Weakley 2015).

Ulmus parvifolia is an important ornamental species for its attractive growth form and ornamental bark. In the U.S., it occurs outside of cultivation as a ruderal of disturbed woods, woodland edges, roadsides, fence-rows, fields, and waste places (Sherman-Broyles 1997; Weakley 2015).

In Arkansas, the smooth, platy, exfoliating bark with conspicuous orange-brown-colored lenticels and glabrous leaves, fruits, and calyces distinguish it from the native species of *Ulmus*. Vegetatively, however, *U. parvifolia* somewhat resembles the non-native *U. pumila* (Siberian elm), which also is naturalized in the state. The two species may reliably be distinguished by the following key:

1. Flowers and fruits produced in late winter to early spring; leaves 2 cm wide or wider; older bark deeply ridged and furrowed with deep furrows and interlocking ridges; bark without large, conspicuous, rusty-orange-colored lenticels _____ **U. pumila**
1. Flowers and fruits produced in late summer to early fall; leaves usually 2 cm or less wide (may be up to 2.5 cm wide); bark irregularly platy with smooth, flattened plates, exfoliating to reveal lighter-colored areas beneath plates; bark with numerous, large, conspicuous rusty-orange-colored lenticels _____ **U. parvifolia**

Voucher specimen: **ARKANSAS. Garland Co.:** one plant in pine-oak forest on ridge, N side of Spanish Mountain, T2S R17W S34, 5 Aug 2006, Peck 06-117 (HEND).

SECOND OCCURRENCE IN THE ARKANSAS FLORA

Pyracantha koidzumii (Hayata) Rehd. (Rosaceae), Formosa firethorn. *Pyracantha koidzumii* is a large, thorny, evergreen shrub or small tree to about 4 m in height that is native to Taiwan (Gu & Spongberg 2003). It has been documented outside of cultivation in the U.S. from Arkansas, Oklahoma, and Texas eastward to the Carolinas and Florida (Serviss 2009; Nesom 2010; Lance & Zika 2014).

This species is regularly cultivated for its attractive red to reddish-orange fruits, showy flowers, and evergreen habit, and from it and the genus as a whole, well over 100 cultivars and hybrids have been developed (Bailey & Bailey 1976; Egolf & Andrick 1995).

Serviss (2009) provided the first documentation of naturalized *P. koidzumii* in Arkansas, based on a 2008 voucher specimen from Garland County collected by B. Serviss and A. Serviss (Serviss 7396, HEND). The Garland County record consisted of a single, arborescent, reproductive-age plant (with mature fruits) present on a steep, rocky, semi-wooded bluff. This record also represented the first occurrence of the genus *Pyracantha* outside of cultivation in the state. Two additional collections of naturalized *P. koidzumii* plants were made by R. Tumilson (2016) from Clark County and B. Serviss (2012) from Garland County. The 2012 Serviss Garland County record is from a different location than the *P. koidzumii* specimen collected by Serviss in 2008.

Naturalization of *Pyracantha koidzumii* is almost assuredly via bird dispersal of the seeds, as the fruits are readily fed on by at least a few bird species. Based on its relative frequency of cultivation and bird-mediated mode of dispersal, *P. koidzumii* should be expected elsewhere in the Arkansas flora, especially in the vicinity of where plants of the species are cultivated.

Voucher specimens: **ARKANSAS. Clark Co.:** one plant on well-drained upper slope of a hill, clayey-rocky soil, found in woods associated with *Diospyros virginiana*, *Pinus taeda*, *Quercus pagoda*, *Rhus copallina*, and *Ulmus alata*, not planted, numerous fruits seen earlier but had been all taken by birds at time of collection, Mt. Zion Road off AR State Hwy 8, ca. 3 mi W of I-30, GPS 34.1137N, 93.1268W, W side of Arkadelphia, 28 Jan 2016, Tumilson 22 (HEND). **Garland Co.:** one plant growing along fencerow in thicket along roadside, Hwy 270 (W side), just N of exit 58, Hot Springs, 13 Dec 2012, Serviss 7767 (HEND).

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