

## **PYRACANTHA (ROSACEAE) IN THE ARKANSAS FLORA**

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### **ABSTRACT**

*Pyracantha fortuneana* is reported here as new to the Arkansas flora. A single, escaped plant of *P. fortuneana* was discovered growing on a steep slope of a narrow, urban greenbelt in Clark County. Photographs of both species of *Pyracantha* that occur in the state's flora, including the escaped *P. fortuneana* plant, along with notes on the genus *Pyracantha* in Arkansas, are provided.

In 2017, a single, escaped individual of *Pyracantha fortuneana* (Maxim.) H.L. Li (Chinese firethorn) was documented from a highly disturbed, urban greenbelt in Clark County (Fig. 1). The escaped plant was growing on a steep, rocky slope within the greenbelt. Two cultivated, reproductively mature plants of *P. fortuneana* were present in the vicinity of the escaped plant and are presumed to be the source of it via bird-mediated seed dispersal.

Voucher specimen of *P. fortuneana*: **Arkansas**. Clark Co.: Arkadelphia, steep slope of narrow, urban greenbelt, SW of the intersection of 10<sup>th</sup> St. and University Ave., off 10<sup>th</sup> St., one escaped plant less than 2 m tall, two cultivated plants of the species in the vicinity, 27 Nov 2017, Serviss 8611 (HEND).

*Pyracantha fortuneana* is an evergreen, thorny shrub to 3 meters tall, native to China (Gu & Spongberg 2003). It is cultivated in Arkansas, and spontaneous seedlings in the immediate vicinity of cultivated *P. fortuneana* plants were observed previously (Serviss, unpublished data; Fig. 2A–C). Lance and Zika (2014) note that seedlings of naturalized *Pyracantha* most frequently occur in ruderal habitats, roadsides, edges, thickets, and in the vicinity of plantings. *Pyracantha fortuneana* has been documented outside of cultivation in a number of other southern states (Nesom 2010; Wunderlin & Hansen 2011; Lance & Zika 2014; Kartesz 2015; Weakley 2015; Keener et al. 2017; USDA, NRCS 2017).

The genus *Pyracantha* was first documented for the Arkansas flora by Serviss (2009—Fig. 3A), based on a Garland County specimen of naturalized *P. koidzumii* (Hayata) Rehd. (Formosa firethorn). Additional naturalized plants of *P. koidzumii* were subsequently documented from Arkansas in 2012 and 2016 from locations in Clark and Garland counties (Serviss et al. 2016). Our record of *P. fortuneana* marks the second species of *Pyracantha* documented from Arkansas, outside of cultivation.



Figure 1. Escaped plant of *Pyracantha fortuneana* from Clark County, Arkansas. A. Plant in habitat. B–C. Close-up of stems and leaves. Plant was less than 2 m tall and growing on a steep slope of a highly disturbed, narrow greenbelt, with a number of other naturalized exotic species, including *Ligustrum lucidum* (glossy privet), *Lonicera fragrantissima* (fragrant shrub honeysuckle), *L. japonica* (Japanese honeysuckle), and *Nandina domestica* (nandina), among others. Two cultivated, reproductively mature plants of *P. fortuneana* occur in the vicinity of the escaped plant and are the presumed source of it.

Also in 2017, a population of 11 naturalized plants of *P. koidzumii* was documented within and immediately adjacent to an area of disturbed, upland woods in Hot Springs National Park in Garland County (Figs. 3B, 4). This discovery represents the largest naturalized population of any species of *Pyracantha* documented to date in Arkansas. Naturalized plants of *P. koidzumii* from this location ranged in size from small individuals less than 2 m tall, to larger, reproductively mature individuals that were ca. 3–4 m with nearly mature fruits. Plants were distributed between the woods, edge, and into an adjacent open area. One plant also was disjunct from the main population by several meters and occurred along the edge of a dense thicket. The site of the naturalized *P. koidzumii* plants borders and partially encompasses the remnant of an old residential area, where the homes are no longer present. Two larger plants of the species, in addition to the 11 naturalized plants, also were present at the location and could represent plants persistent from cultivation.



An additional record of *P. koidzumii* from Clark County also was documented in 2017, providing a second occurrence of this species from that county. It consisted of a single, escaped plant growing at the edge of a highly disturbed, semi-wooded, urban greenbelt (Fig. 5A). Several reproductively mature plants of *P. koidzumii* were present in an adjacent residential area and are the presumed source of the escaped *P. koidzumii* plant.



Figure 2. Spontaneous plants of *Pyracantha fortuneana* from Clark County. A–C. Spontaneous, juvenile plants documented from 2005 — Fig. A shows one of those plants 12 years later (in 2017) with mature fruits. A few spontaneous juveniles of *P. fortuneana* were present at this site in 2005, and were presumably generated from a reproductively mature plant of *P. fortuneana* that was cultivated at the location. D. Close-up view of leaves of the naturalized plant discovered in 2017, for comparison.

Voucher specimens of *Pyracantha koidzumii*: **Arkansas. Clark Co.:** One spontaneous/escaped plant, less than 1 m tall, at edge of disturbed, semi-wooded greenbelt, adjacent to residential area, off Walnut St., just S of intersection of Walnut St. and 29<sup>th</sup> St., Arkadelphia, 3 Nov 2017, *Serviss 8603* (HEND); one plant on well-drained, upper slope of hill, disturbed woods, clayey-rocky soil, off Mt. Zion Rd., off AR Hwy 8, about 3 mi W of I-30, 34.1137 N, 93.1268 W, 28 Jan 2016, *Tumlison 22* (HEND). **Garland Co.:** Eleven naturalized plants scattered in upland, rocky soils of open, mixed-pine hardwood, edge, and adjacent open area, Hot Springs National Park, off Sleepy Valley Rd., immediately E of intersection of Sleepy Valley Rd. and Gulpha Gorge Rd, 15 Sep 2017, *Serviss 8594* (HEND); one plant growing near fencerow, disturbed, open roadside, plant with mature fruits, off Hwy 270, just N of exit 5B (W side of 270), Hot Springs, 13 Dec 2012, *Serviss 7767* (HEND); one large, multi-trunked, arborescent plant growing on steep, rocky, semi-wooded slope of hillside, off Central Ave., 4500 block, Hot Springs, 15 Nov 2008, *Serviss 7398* (HEND).



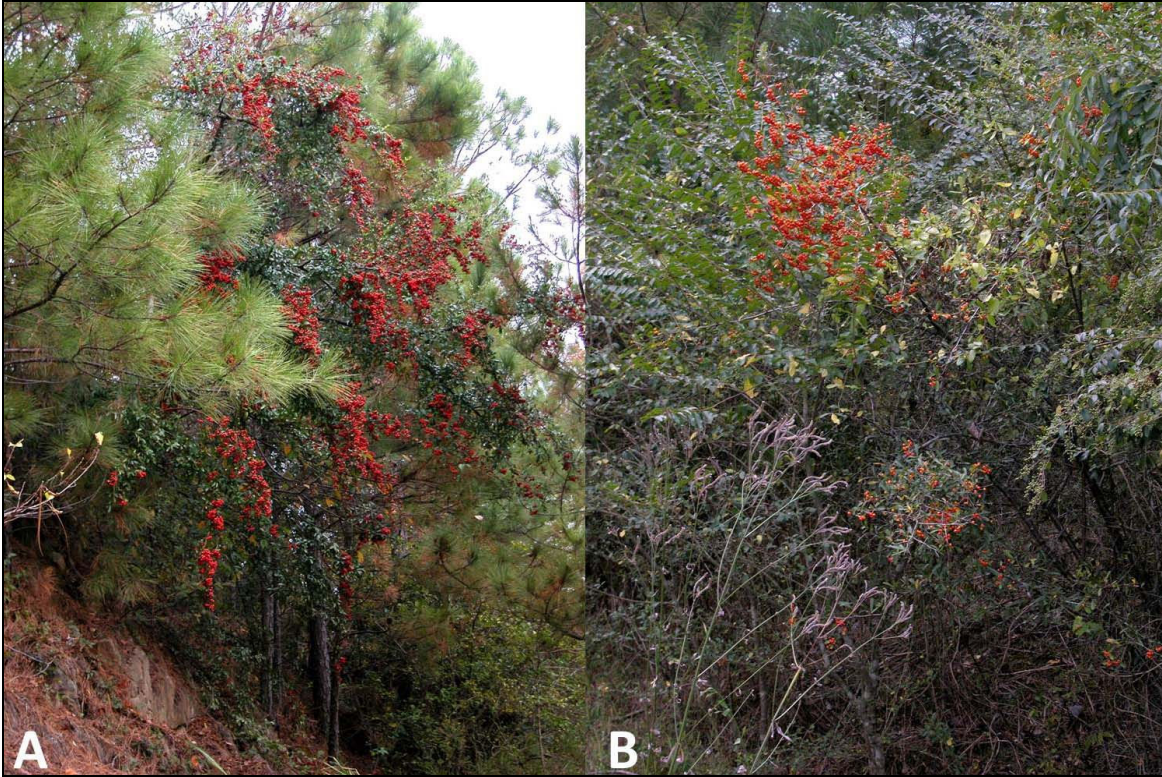


Figure 3. Naturalized plants of *Pyracantha koidzumii* in Garland County. A. Large, arborescent plant on steep, semi-wooded, rocky bluff in Hot Springs. B. Naturalized plant about 3 m tall growing at edge of thicket in rocky, upland soils in Hot Springs National Park. Ten other *P. koidzumii* plants were present at this location; several had nearly mature fruits similar to those shown here.

In Arkansas, *Pyracantha* species appear to favor well-drained, rocky soils of bluffs, slopes, and hillsides, but sometimes plants also are present in areas with little to no gradient. Naturalized plants have been documented within wooded and open habitats. The presence of escaped/naturalized individuals appears often to correlate with the presence of cultivated *Pyracantha* plants in proximity, although this is not always the case, as one *P. koidzumii* plant documented from Clark County in 2016 (Fig. 5B) apparently was not near to any cultivated plants of the species (Serviss et al. 2016). Bird-mediated dispersal is the presumed mode of spread and establishment, as the fruits are fed on by at least a few native bird species (Lance & Zika 2014). Both *P. fortuneana* and *P. koidzumii* should be expected elsewhere in the state's flora, especially in disturbed sites, waste places, greenbelts, and other urban/suburban natural areas that occur in proximity to where plants of these species are cultivated.

*Pyracantha fortuneana* and *P. koidzumii* are morphologically similar and sometimes easily confused (see Figs. 6–7 for a comparison of the two species). Nesom (2010) and Lance and Zika (2014) have provided keys and descriptions adequate for separation of the *Pyracantha* species naturalized and/or regularly cultivated in the southeastern USA. In Arkansas, *P. fortuneana* may typically be distinguished from *P. koidzumii* by its leaves with serrulate or crenulate-serrate margins (the leaves of *P. koidzumii* generally have entire to mostly entire margins). However, distinguishing the two species may at times be more difficult, especially among juvenile plants. Some individuals of *P. koidzumii* will produce some leaves with teeth toward the apex (generally five or fewer per margin), and occasionally plants of *P. fortuneana* will have at least some leaves that are sparsely toothed. Additionally, juvenile plants of *P. fortuneana*, and apparently *P. koidzumii*, both have toothed leaf margins (Figs. 2B–D, 7D).



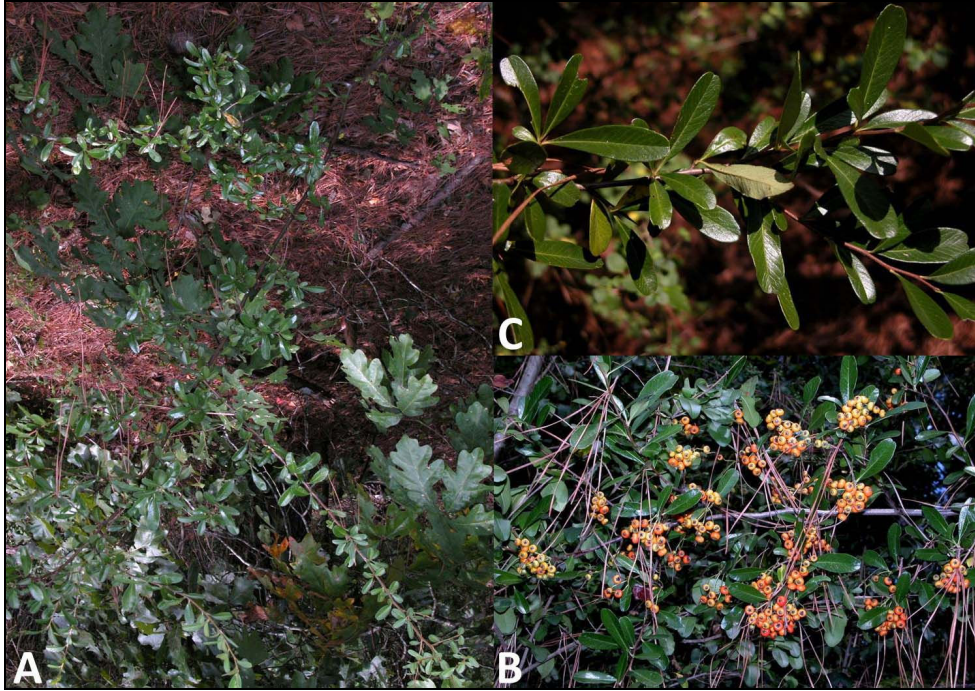


Figure 4. *Pyracantha koidzumii* naturalized in Garland County. A. Small plant, ca. 2 m tall, growing at the edge of a disturbed, upland, mixed-pine hardwood; a few similar-sized juveniles, along with several larger, reproductive-age plants, were naturalized at this site. B–C. Leaves, stems, and nearly mature fruits from one of the larger *P. koidzumii* plants. Plants at this location have some leaves with a few widely spaced teeth and others with completely entire margins.



Figure 5. *Pyracantha koidzumii* naturalized in Clark County. A. Small plant, less than 2 m tall, growing at the edge of a disturbed, semi-wooded greenbelt. Cultivated plants of the species were present in an adjacent residential area. B. Another naturalized *P. koidzumii* plant from a rocky woods west of Arkadelphia (photo credit: Renn Tumblison, Henderson State University). No cultivated plants were observed in the vicinity of this plant. Bird-mediated dispersal of seeds is the presumed method that led to the presence of both plants.



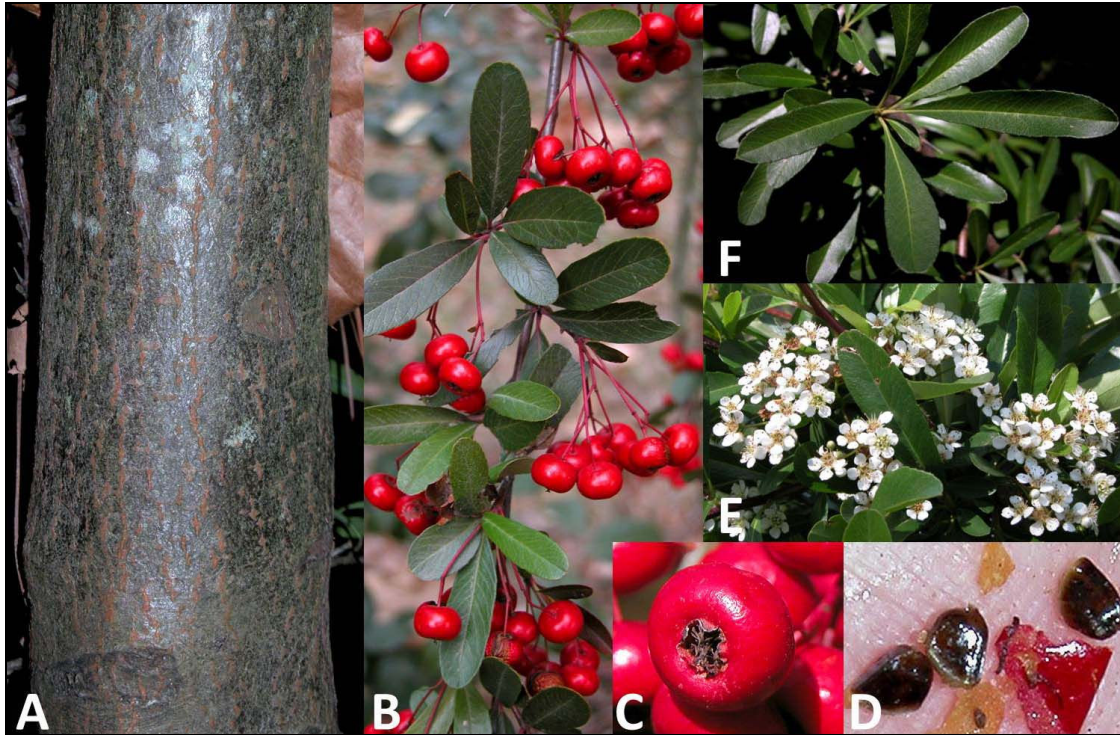


Figure 6. *Pyracantha fortuneana* plant and habit. A. Bark. B. Plant with mature fruits. C. Close-up of mature fruit. D. Seeds. E. Flowers. F. Leaves.

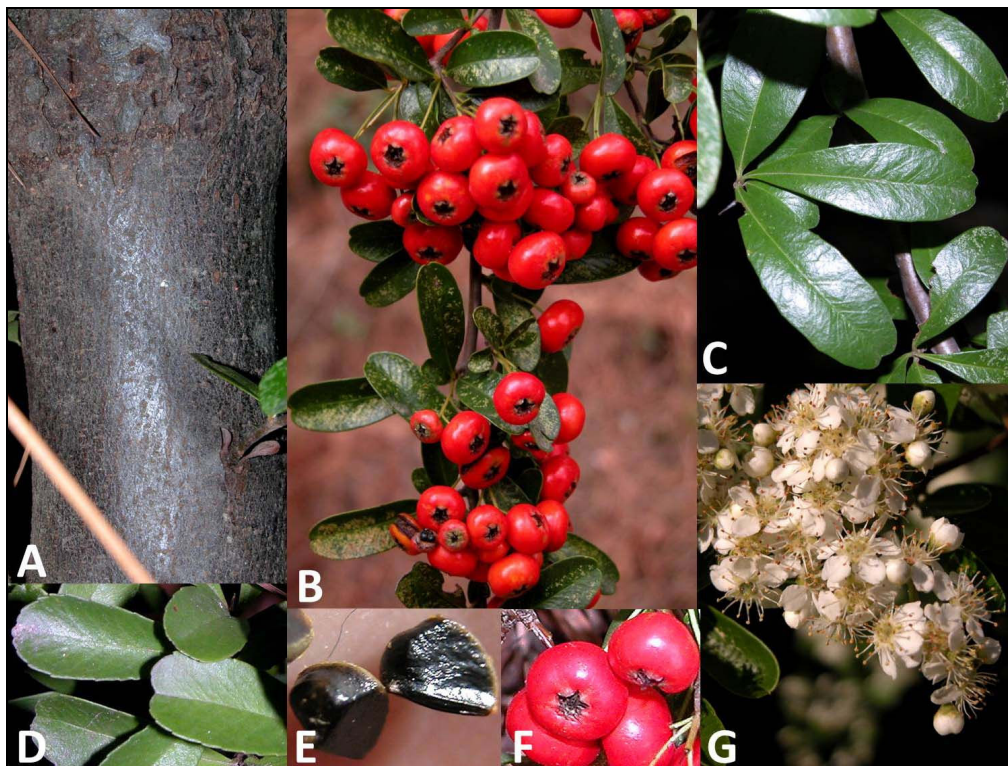


Figure 7. *Pyracantha koidzumii* plant and habit. A. Bark. B. Plant with mature fruits. C. Leaves (notice the margins are entire). D. Leaves from a naturalized juvenile plant from Clark County to show teeth. E. Seeds. F. Close-up of fruits. G. Flowers.

Difficulty in determining species identifications with escaped and naturalized *Pyracantha* plants also may arise from the fact that numerous cultivars and hybrids of both species exist, many of which are cultivated in the southeastern USA (Bailey 1949; Bailey & Bailey 1976; Krüssmann 1978; Meyer et al. 1994; Egolf & Andrick 1995; Nesom 2010). Additionally, spontaneous intermediates occasionally are encountered where cultivated species or hybrids are grown in proximity; no barrier to hybridization is apparent (Lance & Zika 2014).

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