

NEW DISTRIBUTIONAL RECORDS OF LIRIOPOGONS (*LIRIOPE* AND *OPHIPOGON*, RUSCACEAE) IN ARKANSAS

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ABSTRACT

Previous naturalized records of four species of liriopogons — *Liriope graminifolia*, *Liriope muscari*, *Liriope spicata*, and *Ophiopogon japonicus* in Arkansas were restricted to only a few south central counties, with the widest distribution exhibited by *L. spicata*, encompassing six counties. Additional county occurrences for all four species are documented here, with widely disjunct occurrences of *L. spicata* from Crawford, Phillips, and Sebastian counties. Ecological attributes, including potential for invasiveness, key characteristics for species identification, and photographs of each species *in situ* are provided.

The monkey grasses and mondo grasses are nonnative, mostly Asiatic species belonging to the genera *Liriope* and *Ophiopogon*, which collectively often are referred to as “liriopogons” (Skinner 1971; Bailey & Bailey 1976; Chen & Tamura 2000a, 2000b; Fantz 2008a, 2008b, 2009; Nesom 2010; Lattier et al. 2014). Many liriopogons are important ornamentals in the USA and elsewhere because of their wide availability, diverse array of cultivars, evergreen habit, and ease of cultivation and propagation (Bailey 1949; Bailey & Bailey 1976; Fantz 1993, 2008b, 2009; Nesom 2010; Lattier et al. 2014).

In the Arkansas flora, the Ruscaceae family is represented by five genera and nine species, with four species or nearly one-half as liriopogons (Serviss et al. 2019) — sometimes these taxa are included within the larger Asparagaceae. Prior to 2016, the only liriopogon species known for the state was *L. spicata* (Smith 1988; Gentry et al. 2013; Serviss et al. 2016b). Since 2016, *L. graminifolia*, *L. muscari*, and *Ophiopogon japonicus* have been documented for naturalized occurrences in multiple counties (Serviss et al. 2016a, 2016b, 2020; Figs. 7–8). In Arkansas, all four species typically are encountered in highly disturbed urban habitats, specifically ditch and stream banks, riparian zones, greenbelts, floodplain forests, and low, disturbed woods with moist, alluvial soils, where cultivated source pools of these species exist in proximity (Serviss et al. 2016a, 2016b). They are not restricted to the aforementioned habitat types and also can occur in mesic or upland woods, open sites, and highly disturbed areas, such as old home sites, lawns, pastures, and roadsides, adjacent to where cultivated. These four species are found in similar habitats in other states where naturalized (Thomas & Allen 1993; Diggs et al. 1999; Nesom 2010; Spaulding et al. 2010; Roling et al. 2011; Wunderlin & Hansen 2011; Miller et al. 2015; Spaulding et al. 2021; Texas Invasives 2023; Weakley 2024).

Liriopogons are frequent in cultivation in the southeastern USA, including Arkansas. They are highly adaptable and flexible regarding tolerance to different light regimes, from full sun to full shade, along with soil moisture levels, including dry soils for prolonged periods – these attributes facilitate their abundant use as ornamentals. Their frequency in cultivation and ability to reproduce successfully provides a widespread and abundant source pool for propagule entry into the flora, allowing regular and recurring establishment. These same traits also contribute to their invasive tendencies.



Figure 1. A–H. Species of liriopogons naturalized in the Arkansas flora. A. *Liriope graminifolia* (*L. exiliflora*) — notice the similarity to *L. muscari* (1B–C); everything shown in 1A is a stoloniferous offset. B–C. *Liriope muscari* — notice the variation in flower color; also, weakly stoloniferous and non-stoloniferous forms occur in the flora. D–E. *Liriope spicata* — 1E shows fruits which are typical for *Liriope* spp. F. Mature fruits from the weakly stoloniferous form of *L. muscari*, for comparison with those of *L. spicata*. G–H. *Ophiopogon japonicus* — notice the color and morphology of the fruits and inflorescence differ from those of *Liriope*.

The liriopogon species that occur in Arkansas morphologically are similar and easily confused, particularly the three *Liriope* species when reproductive structures are absent (Fig. 1). For this reason, careful observation must be made when attempting to identify live or preserved specimens. For detailed

information on the ecologies and attributes of each species, along with identification keys and photographs, see Fantz (2008b, 2009), Nesom (2010), and Serviss et al. (2016b). The four species can reliably be distinguished using the following key (modified from Nesom 2010; Fantz et al. 2015; Serviss et al. 2016a, 2016b).

1. Pedicels of flowers recurved (flowers drooping); flowers perigynous or epigynous; anthers connate; fruits (sarcotestae) blue **Ophiopogon japonicus**
1. Pedicels of flowers straight (flowers held erect); flowers hypogynous; anthers free; fruits (sarcotestae) black or dark blackish-blue.
 2. Plants caespitose or sometimes weakly stoloniferous but clump-forming and not spreading aggressively via stoloniferous offsets, or plants stoloniferous but initially slow to produce offsets and/or producing offsets from short, abbreviated stolons and appearing caespitose for 2-5 years; leaves 6–12(–23) mm wide.
 3. Length of peduncle (basal stalk of the scape/inflorescence) 1.5–2 times longer than the length of the rachis of the inflorescence; scape length 2–3 times longer than peduncle; bracts lanceolate; growth form caespitose, even with weakly stoloniferous forms **Liriope muscari**
 3. Length of peduncle (basal stalk of the scape/inflorescence) 2–3 times longer than the length of the rachis of the inflorescence; scape length subequal to or 1.5 times longer than peduncle; bracts ovate; growth form stoloniferous, even if only minimal at first, with stolons 0.5–5 cm long (older plants often with longer stolons) **Liriope graminifolia**
 2. Plants highly stoloniferous, forming large, extensive colonies via stoloniferous offsets; leaves (2–)3–8(–12) mm wide.
 4. Scares mostly equal to or taller than the leaves, (15–)20–44(–53) cm long, inflorescences conspicuous and often positioned well above the leaves, rachis of inflorescence (4–)5–13 cm long, flowers purple, lilac, or lavender, but flowers and rachis sometimes fading with age to pale lavender or pinkish-white; leaves variable in width, (2–)3–8(–12) mm wide **Liriope graminifolia**
 4. Scares and inflorescences mostly shorter than the leaves and often obscured by them, scapes 12–29 cm long, rachis of inflorescence 2–5(–8) cm long, flowers white to pale pink or pale violet; leaves 3–6(–8) mm wide **Liriope spicata**

Liriope graminifolia is less common than the other liriopogon taxa in the state's flora, possibly owed to its slightly less aggressive habit and more limited use in cultivation, at least in southern portions of the state; however, all species demonstrate invasive tendencies in Arkansas (Serviss et al. 2016a, 2016b, 2020), with *L. spicata* being the most invasive and widespread species. Their ecologies and reproductive habits in the flora overall are similar, with localized establishment through a combination of stoloniferous offsets and seeds, and long-distance dispersal of propagules facilitated by water and birds, or humans via unwanted plants as horticultural discards (Spaulding et al. 2010; Serviss et al. 2016b). Based on our observations, appropriate habitats in urban environments possess a high likelihood of having one or more liriopogon species present, and their distributions in Arkansas are undoubtedly greater than what is presented here.

For this study, urban habitats in multiple counties in southwestern and central Arkansas (Columbia, Crawford, Faulkner, Grant, Hempstead, Hot Spring, Miller, Ouachita, Saline, and Sebastian) were surveyed for the presence of naturalized liriopogons. Additional county occurrences reported (Howard, Jackson, and Phillips) are based on voucher specimens of naturalized plants accessed through SERNEC (2024). Voucher specimens cited within this paper currently are housed at Henderson State University; however, they eventually will be transferred to ANHC.

LIRIOPE GRAMINIFOLIA (L.) Baker – Grass Lilyturf; Creeping Lilyturf (Figs. 9–13). [including *L. exiliflora* (L.H. Bailey) H.H. Hume (see Fantz 2008b; Fantz et al. 2015)]

Liriope graminifolia is a stoloniferous, colony-forming perennial that is native to China and Japan (Griffiths 1992; Chen & Tamura 2000a). It previously was documented in Arkansas from Clark and Pulaski counties (Serviss et al. 2016a, 2020). New county occurrences are recorded for Faulkner, Hempstead, Hot Spring, Jackson, and Miller counties (Fig. 7). In the Arkansas flora, *L. graminifolia* is infrequent to occasional in appropriate habitats; however, sometimes larger numbers of plants are encountered, particularly if cultivated plants of the species are present nearby. Localized spread and establishment of *L. graminifolia* probably is through a combination of stoloniferous offsets and seeds. Flowering May–August. Fruiting June–October or November.

The growth form of *Liriope graminifolia* with older, established plants generally is similar to *L. spicata*, where in time large colonies of plants/ramets may be formed via stoloniferous offsets. However, its longer inflorescences on elongate peduncles at or above the height of the leaves, usually darker, lavender-purple flowers, slightly earlier flowering time, slightly wider leaves, and generally less aggressive stoloniferous habit aid in distinguishing it from *L. spicata* (compare Figs. 1A, 9C, 10, 11, 13 with Figs. 1D, 21, 24). Our observations, in conjunction with Fantz et al. (2015), are that young plants of *L. graminifolia* (less than 2–5 years of age) often have a compact growth form, with limited production of stolons and offsets and production of very short stolons, from 0.5 to 5 cm in length. Plants of *L. graminifolia* at this stage appear caespitose and are very easily confused with *L. muscari*. With age, *L. graminifolia* produces longer stolons and more offsets, with a growth form more reminiscent of *L. spicata*, where even more recently produced stoloniferous offsets produce larger, more elongate stolons (Fig. 11).

Voucher specimens. Arkansas. Faulkner Co.: Conway, off Clifton St. near Huntington Apts., about two blocks W of Hendrix College, 35.100821° N, 92.445526° W, a few escaped plants/ramets growing in unkempt, overgrown city lot, no residence, likely seeded in via birds from cultivated plants a few blocks away, 28 Jun 2024, *Serviss* 8791. **Hempstead Co.:** Hope, off S Texas St., S/SW of the intersection of S Texas St. and Mack St., 33.65583830° N, 93.59793930° W, 1–2 small groups of escaped plants, spreading and establishing by stoloniferous offsets, growing at base of large tree at edge of highly disturbed greenbelt and riparian zone bordering residential area, cultivated plants of the species nearby, 20 Aug 2024, *Serviss* 8834. **Hot Spring Co.:** Malvern, near Riggins Rd., 34.283945° N, 92.790072° W, private residence, numerous plants spreading and escaping locally from plants in cultivation via stoloniferous offsets and possibly also seeds (several places), 25 Jun 2024, *Serviss* 8787. **Jackson Co.:** Mississippi Alluvial Plain, Western Lowlands Pleistocene Valley Trains Ecoregion, USGS Swifton East 7.5' Quad, Swifton Sand Ponds Natural Area, S of Jackson Co. Rd. 72, about 0.5 rd. mi. E of US Hwy 67 between Swifton and Alicia, 35.85481° N -91.10077° W, T14N R1W S16 NW4, upper edge of forested sand pond at edge of sandy ridge previously deforested and cultivated and since recently planted with oak species, single dense colony ca. 2 m in diameter, 5 Oct 2016, *Baker* 16-0106 (ANHC). **Miller Co.:** Texarkana, ca. 50 meters south of Lawndale Dr., edge of Pinson Park, 33.467164° N, 94.015799° W, several small groups of plants/ramets, some establishing directly from horticultural discards, others possibly via seed dispersal from cultivated plants of the species in the vicinity, 9 Jul 2024, *Serviss* 8796.

There is disagreement as to whether the plants cultivated in the USA and established in the flora, including Arkansas, with the aforementioned characteristics, should be considered as *Liriope graminifolia* or *L. exiliflora* (L.H. Bailey) H.H. Hume. Fantz (2008b), Lattier et al. (2014), and Fantz et al. (2015) treat *L. exiliflora* as a distinct species, and Fantz (2008b) considers *L. graminifolia* to be synonymous with *L. spicata*. Nesom (2010), however, considers the name *L. exiliflora* synonymous with *L. muscari*, and treats *L. graminifolia* and *L. spicata* as distinct species. Chen and Tamura (2000a) also treat *L. graminifolia* and *L. spicata* as distinct. Nesom (2010) noted that the application of the name *Liriope exiliflora* to plants commonly cultivated in the USA that match the characteristics of *L. graminifolia* apparently stems in part from a misinterpretation by Hume (1961) of a photograph of

Convallaria spicata Thunb., which Bailey (1929) had renamed as *L. muscari* var. *exiliflora*. After further study of Hume's descriptions of *L. exiliflora* and *L. graminifolia*, species descriptions provided by Bailey (1949), Bailey and Bailey (1976), and Chen and Tamura (2000a), and the fact that no distinct species identified as *L. exiliflora* ever has been recognized in Japan, Nesom concluded that the plants identified by Hume as *L. exiliflora* are forms of *L. graminifolia*, and that the USA material ascribed as *L. exiliflora* should, in fact, be included within *L. graminifolia*. Arkansas plants correspond to *L. graminifolia* (Nesom 2010) and *L. exiliflora* (Fantz 2008b), which by comparison appear to be the same species.

Fantz et al. (2015) agree with Nesom (2010) that Hume may have misinterpreted Thunberg's species; however, they disagree with Nesom that *Liriope graminifolia* as delineated by Nesom and the species described by Hume as *L. exiliflora* represent the same species, citing numerous morphological distinctions between the two, including leaf size dimensions, peduncle (scape) length relative to the rachis, bract and pedicel lengths, flower color, and abundance of fruit set. The following key has been constructed from the distinguishing characteristics provided by Fantz et al. (2015) for the two taxa.

1. Leaves long and narrow, to 63 cm long and 1–6 mm wide, veins 5–11; scapes elongated at maturity (33–62 cm); peduncles 3–4 times the length of the rachis; bracts 2–3 mm long and pedicels typically shorter (1–3 mm); flower color lighter, lavender to paler; fruit set uncommon in cultivation
..... **Liriope graminifolia**
1. Leaves shorter and broader, to 30 cm long and 6–12 mm wide, veins 9–15; scapes shorter at maturity (17–29 cm); peduncles 2–2.5 times the length of the rachis; bracts 3–5 mm long and pedicels longer (3–5 mm); flower color darker, bluish-purple to lavender; fruit set abundant in cultivation
..... **Liriope exiliflora**

Fantz et al. (2015) asked the question whether or not *Liriope exiliflora* as Hume described should be renamed, if Nesom's proposed synonymy with *L. muscari* is followed, but argue that currently, only the name *L. exiliflora* is available for the taxon described by Hume, which in their opinion, is distinct from all other *Liriope* species, including *L. graminifolia* as defined by Nesom (2010). In this paper, we have followed the classification by Nesom (2010); however, we also have included within the keys characters provided by Fantz et al. (2015) to distinguish *L. exiliflora*.

LIRIOPE MUSCARI (Dcne.) L.H. Bailey – Blue Lilyturf; Big Blue Liriope; Monkey Grass (Figs. 14–19).

Liriope muscari is a caespitose, sometimes weakly stoloniferous perennial that is native to China, Japan, Korea, Taiwan, and Vietnam (Griffiths 1992; Chen & Tamura 2000a). It previously was documented in Arkansas from Clark, Garland, Hot Spring, Pulaski, and Union counties (Serviss et al. 2016b, 2020). New county occurrences are recorded for Columbia, Grant, Miller, and Saline counties (Fig. 7). *Liriope muscari* generally is infrequent to occasional in appropriate habitats, although sometimes it is locally abundant, with populations consisting of many plants. Flowering May–August. Fruiting June–November.

In Arkansas, *Liriope muscari*, in at least some of its forms (observed with weakly stoloniferous plants), is capable of prolific establishment via seeds (Fig. 16). Some forms of *L. muscari* do not produce large numbers of seeds (Fantz 2008b; Nesom 2010). In Arkansas, both stoloniferous and nonstoloniferous forms occur naturalized (Fig. 2). Stoloniferous plants produce short, abbreviated stolons but are nevertheless still caespitose, and only form large clumps rather than expansive colonies, as compared with *L. graminifolia* and *L. spicata*. Careful examination is necessary for proper species determination with stoloniferous *L. muscari* and small or newly formed plants of *L. graminifolia* that have yet to show extensive development of stolons and offsets (see discussion under *L. graminifolia*).

Voucher specimens. Arkansas. Columbia Co.: Magnolia, immediately E of intersection of Sue St. and Dogwood St., 33.2853747° N, 93.2275716° W, several young plants growing in accumulated soil in small area atop cement culvert at street edge, seeded in from older reproductive age plants also present that possibly were persistent from cultivation (even older plants could be escapes), 19 Jul 2024, *Serviss* 8818. **Grant Co.:** Sheridan, immediately NW of intersection of N Arch St. and W Church St., 34.3092520° N, 92.4041400° W, one escaped clump growing in moist soil on bank of small, highly disturbed roadside drainage in residential area, likely seeded in by birds from cultivated plants of the species in the vicinity, 30 Jul 2024, *Serviss* 8821. **Miller Co.:** Texarkana, E end of Markwood Dr., edge of Pinson Park (W side), 33.467215° N, 94.016123° W, several small and young plants (presumably from seeds) and also somewhat older clumps of plants, in highly disturbed edge area directly adjacent to residential area, 9 Jul 2024, *Serviss* 8794. **Saline Co.:** Benton, immediately W/NW from McCright St. and Narroway St., 34.569349° N, 92.595603° W, many naturalized plants as isolated individual clumps and small populations of numerous groups of plants growing along bank and terrace of highly disturbed, semi-wooded, urban riparian zone, adjacent to large residential area, 25 Jun 2024, *Serviss* 8781.

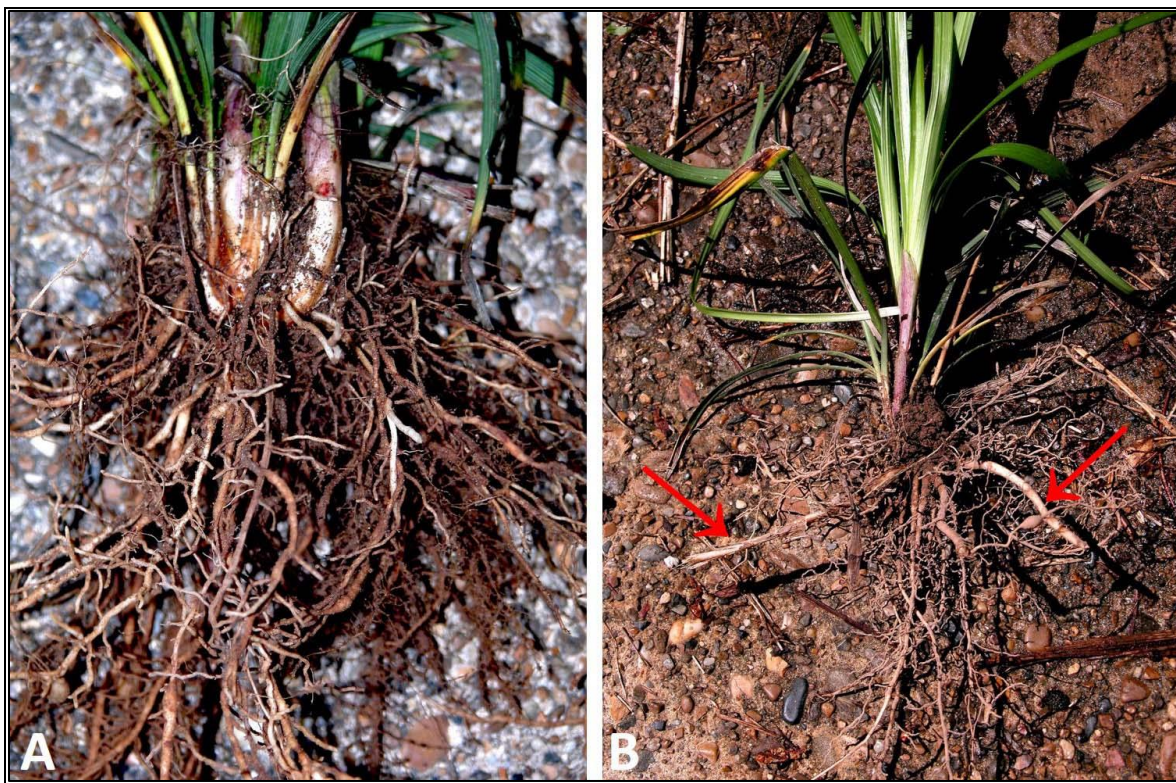


Figure 2. A–B. *Liriope muscari* nonstoloniferous and stoloniferous forms. A. Nonstoloniferous form; the larger, thicker structures are cordlike roots, not stolons. B. Stoloniferous form — two stolons are designated by red arrows. Both forms are naturalized in the Arkansas flora.

Liriope muscari is a variable species regarding both its vegetative and reproductive morphology (Fantz 2008b; Nesom 2010). One notable variant/form that sometimes is considered a distinct species is *L. muscari* f. *latifolia* (Makino) H. Hara = *L. platyphylla* F.T. Wang and Tang. This taxon occasionally is cultivated and could be encountered in the flora. It is recognizable from “typical” *L. muscari* by its taller inflorescences with longer scapes, more flowers, and persistent perianth. Chinese and Japanese taxonomists classify *L. platyphylla* as a variety of *L. muscari* (Chen & Tamura 2000a; Nesom 2010), whereas Fantz (2008b) and Fantz et al. (2015) treat it as a distinct species. Regardless of taxonomic status, *L. muscari* and *L. platyphylla* may be distinguished using the following key (modified from Fantz 2008b; Nesom 2010).

1. Entire inflorescence, rachis and peduncle (scape) 20–30 cm long, equal to or somewhat exceeding the leaves, less than twice the height of the leaves; rachis of inflorescence 5–12 cm long, loose, about 1/3 to 1/2 peduncle length; fascicles 35–50 in number **Liriope muscari**
1. Entire inflorescence, rachis and peduncle (scape) (50–)55–62 cm long, overtopping the leaves to about twice leaf height; rachis of inflorescence 18–24 cm long, crowded, about 3/4 to 4/5 peduncle length; fascicles 60–80 in number **Liriope platyphylla**

LIRIOPE SPICATA Lour. – Creeping Lilyturf; Creeping Liriope; Monkey Grass (Figs. 20–30).

Liriope spicata is a stoloniferous, colony-forming perennial that is native to China (Griffiths 1992; Chen & Tamura 2000a). It previously was documented in Arkansas from Clark, Garland, Hot Spring, Pulaski, Saline, and Jefferson counties (Gentry et al. 2013; Serviss et al. 2016b). New county occurrences are recorded for Columbia, Crawford, Faulkner, Grant, Hempstead, Howard, Miller, Phillips, Ouachita, and Sebastian counties (Fig. 7). *Liriope spicata* is occasional to locally abundant and invasive in the appropriate habitats, although it also sometimes is encountered in remote areas away from urban environments (Figs. 20–23). Flowering May–August. Fruiting June–November.

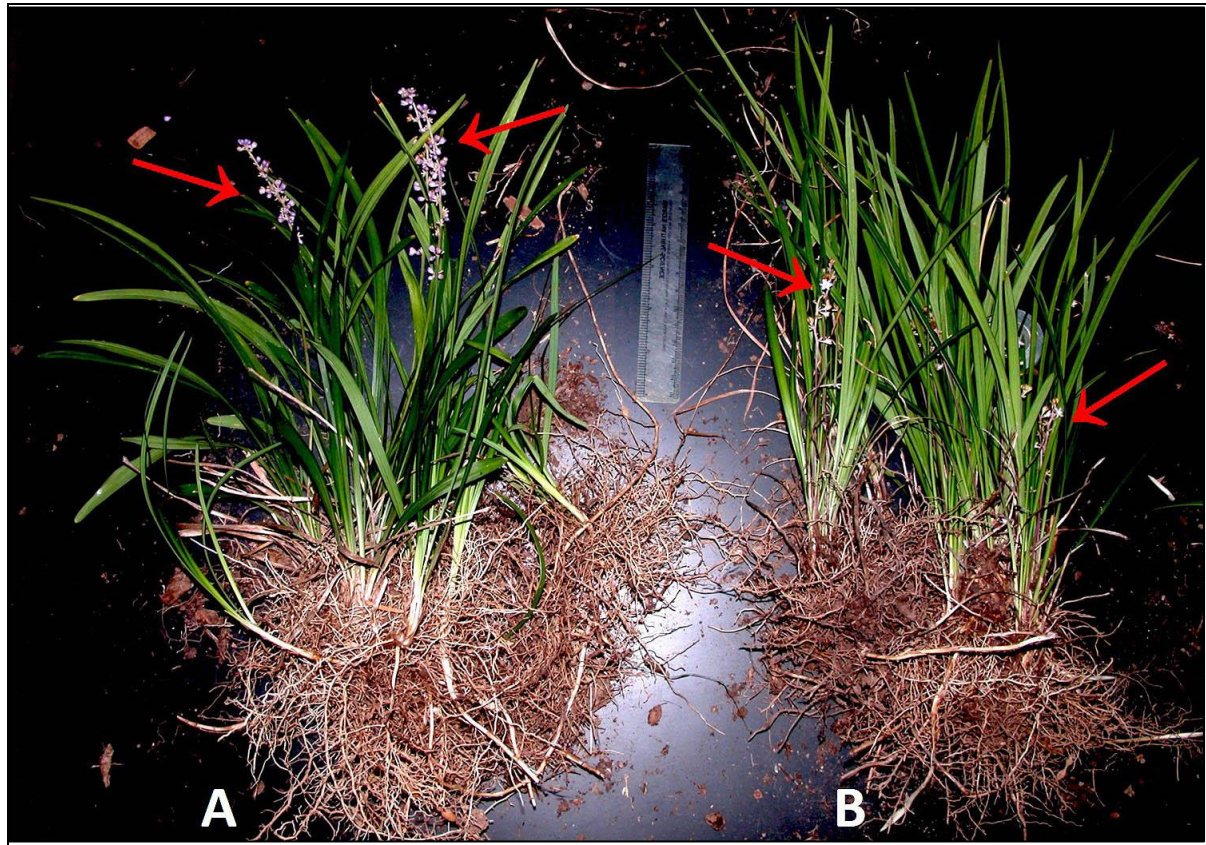


Figure 4. A–B. Comparison of *Liriope graminifolia* (*L. exiliflora*) and *Liriope spicata* (plants are from the same location). A. *Liriope graminifolia*. B. *Liriope spicata*. Although the two species are similar in growth form and habit, the differences in inflorescence size and position relative to leaf height, along with flower color, is apparent (red arrows indicate inflorescences). Notice also that the leaves of *L. graminifolia* are slightly wider. Both plants have well-developed stolons and are producing offsets.

Liriope spicata is an aggressive and highly invasive species that regularly is encountered in urban environments, especially adjacent to where currently or previously cultivated, spreading and establishing via a combination of offsets and seeds. The combination of its highly stoloniferous habit, short inflorescences that are partially or wholly obscured by the leaves, and usually white (sometimes

pale violet or lavender) flowers distinguish *L. spicata* from most other liriopogon species in the state, although when sterile, it easily can be confused with *L. graminifolia* (Fig. 4).

Naturalized *Liriope spicata* plants (in Arkansas) show variability with regard to flower color, inflorescence size (length and width), inflorescence position — length of inflorescences relative to height of the leaves, and leaf width (Fig. 5). How much of this variation is owed to genetics versus environment affects is uncertain, but is nonetheless an aspect of this species, at least in Arkansas. *Liriope spicata* can be used to help prevent soil erosion, especially on banks (Fantz 2008b; Spaulding et al. 2021).

Voucher specimens. Arkansas. Columbia Co.: Magnolia, immediately N of intersection of Sue St. and Dogwood St., 33.2853747° N, 93.2275716° W, several escaped plants in narrow greenbelt area between two residences, flowers violet, 19 Jul 2024, *Serviss 8817*; off N Washington St., 33.284050° N, 93.238631° W, several small but separate colonies of plants established in sandy, alluvial soil on bank of small stream, a few plants also in streambed at edge, 19 Jul 2024, *Serviss 8811*. **Crawford Co.:** Alma, Lake Alma Park area, NW of N Mountain Grove Rd., 35.504932° N, 94.216214° W, two small colonies consisting of several plants/ramets in open, woods and also along walking trail, not planted, colonies separated from one another by ca. 0.4 km, 20 Jul 2024, *Fuller 07–20–2024–04*. **Faulkner Co.:** Conway, adjacent to intersection of Tyler St. and Davis St., 35.102462° N, 92.446714° W, several small, escaped groups of plants distributed along disturbed drainage and greenbelt, likely seeded in from cultivated plants of the species in the vicinity, 28 Jun 2024, *Serviss 8790*. **Grant Co.:** Sheridan, off E Bell St., 34.306938° N, 92.397352° W, relatively small colony of probably a few hundred plants/ramets growing on moist, overgrown bank of small drainage, 30 Jul 2024, *Serviss 8825*. **Hempstead Co.:** Hope, off S Texas St., S/SW of the intersection of S Texas St. and Mack St., 33.65511360° N, 93.59642320° W, large, naturalized colony and many isolated small groups of plants and individuals (from seeds), growing at edge and scattered throughout highly disturbed greenbelt and riparian zone bordering residential area, 20 Aug 2024, *Serviss 8833*. **Hot Spring Co.:** Malvern, off Dyer St., 34.358634° N, 92.810555° W, extensive population of thousands of plants/ramets consisting of several large and small colonies and individual plants growing on banks and terrace of small, intermittent stream in urban greenbelt, inflorescences wide, a few plants growing in streambed in wet substrate, 30 Jul 2024, *Serviss 8827*. **Howard Co.:** Ouachita Mountains, Athens Plateau Ecoregion, USGS Baker Springs 7.5' Quad, Cossatot River State Park, E of Cossatot River, NE across from Cow Creek confluence, along access road to former private campsite and proposed future State Park group camping facility, road bank and drainage where access road crosses wet-weather drainage, T5S R30W S21 S2S2NW4, 14 Oct 2015, *Baker 15-0097* (ANHC). **Miller Co.:** Texarkana, S end of Markwood Dr., edge of Pinson Park (N side), 33.467215° N, 94.016123° W, very small, escaped colony of plants at edge of disturbed, low, urban woods, 9 Jul 2024, *Serviss 8795*. **Ouachita Co.:** Camden, off Jackson Ave. and directly E of Four Seasons Nursery, 33.58387100° N, 92.8441923° W, large, naturalized population consisting of thousands of plants/ramets spread over several large and small sub groups/colonies of plants and single individuals, disturbed urban greenbelt between nursery and old home site, weedy and invasive, 19 Jul 2024, *Serviss 8806*; off Sax Ave., W/SW of Memorial Cemetery, 33.594078° N, 92.8422105° W, a few colonies consisting of multiple plants each growing in moist soil of overgrown bank of roadside drainage ditch, 19 Jul 2024, *Serviss 8803*. **Phillips Co.:** Buck Island, outside of Helena-West Helena, NE portion Center E portion, accessed from the Helena River Park, River Walk boat ramp, River mile: 664-668., 34.554548° N -90.55963° W, 20 Jul 2020, *Baker CMS165* (ANHC). **Sebastian Co.:** Fort Smith, off Wells Lake Rd, Janet Huckabee Arkansas River Valley Nature Center, 35.306° N, 94.340° W, several scattered colonies of plants present in disturbed, semi-wooded habitat, naturalized, some in flower, spreading and establishing via stoloniferous offsets, 2 Sep 2024, *Fuller 09–2–2024–05*; Fort Smith, off Wells Lake Rd, Janet Huckabee Arkansas River Valley Nature Center, 35.306° N, 94.340° W, one fairly small colony consisting of dozens of plants/ramets, possible remnant from prior cultivation but clearly spreading and establishing via stoloniferous offsets, 20 Jun 2024, *Fuller 06–20–2024–03*.

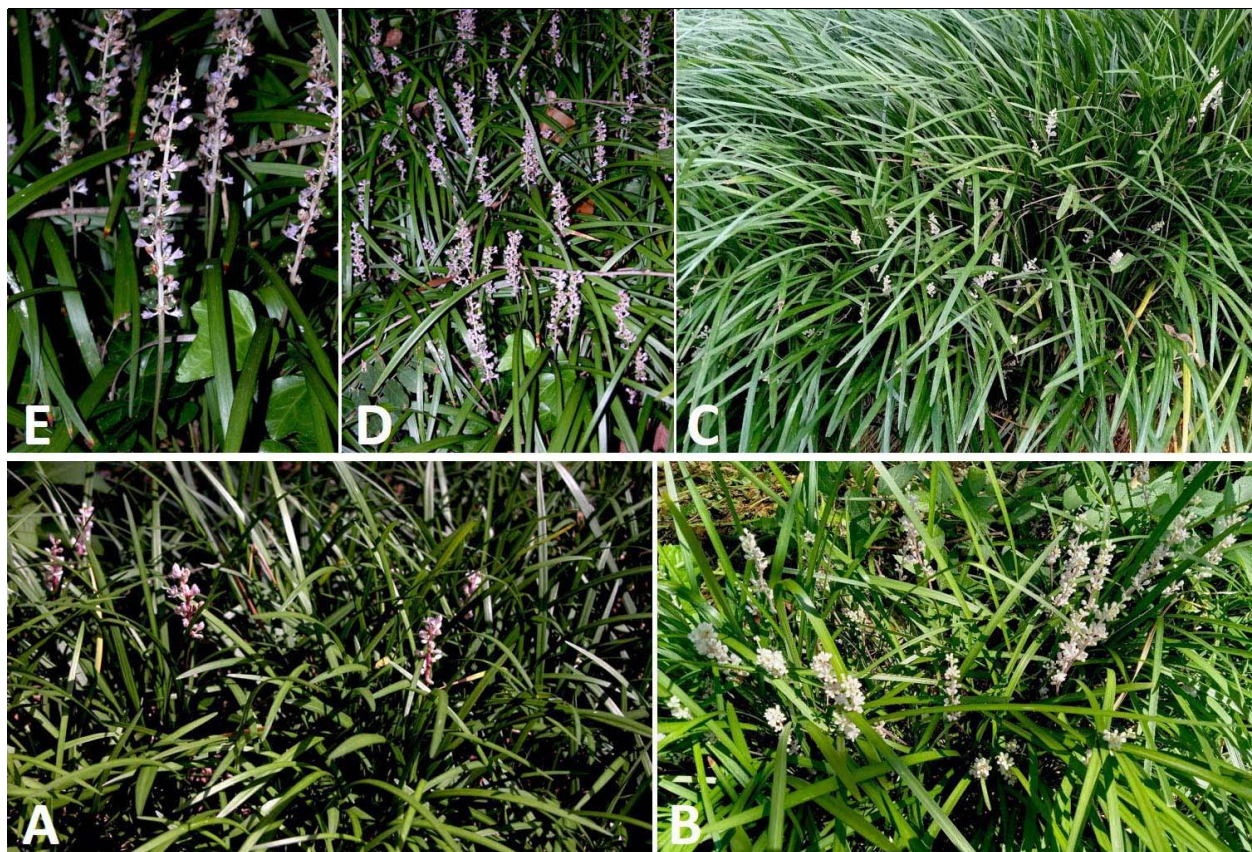


Figure 5. A–E. *Liriopogon spicata* showing variation in flower color, inflorescence height, and leaf width. A. Plants with relatively small inflorescences held near the top of the leaves and pinkish-white flowers. B. Plants with slightly larger, wider inflorescences held near the tops of the leaves and nearly white flowers slightly tinged with violet. The leaves also are relatively wide (compare to plants in Figure 5C — both sets of plants (5A and B) are relatively young; older, more established plants seem to produce narrower leaves). C. Older plants with small, short inflorescences much obscured by the leaves, white flowers, and narrow leaves. D–E. Plants with taller, longer inflorescences with pinkish-violet flowers and wide leaves. These plants superficially are reminiscent of *L. graminifolia* and potentially could be confused with it. The shorter inflorescences and rachises, and less intense (paler) color of the flowers, help to distinguish it.

OPHIPOGON JAPONICUS (Thunb.) Ker–Gawl. – Japanese Mondo Grass; Dwarf Mondo Grass (Figs. 31–35).

Ophiopogon japonicus is a stoloniferous, colony-forming perennial that is native to China, Japan, and Korea (Griffiths 1992; Chen & Tamura 2000b). It previously was documented in Arkansas from Clark, Garland, Pulaski, and Union counties (Serviss et al. 2016b, 2020). New county occurrences are recorded for Miller, Montgomery, Ouachita, and Saline counties (Fig. 7). *Ophiopogon japonicus* is occasional to locally abundant in the appropriate habitats, although in similar fashion to *L. spicata*, it also sometimes is encountered in more remote areas (Fig. 35). Flowering late April–July; Fruiting May–October.

Ophiopogon japonicus over time typically forms dense stands of plants/offsets. Though it prefers moist soils with good drainage, it can tolerate wet soils for at least some duration and also prolonged periods in dry soil, especially if in at least partial shade. Its smaller body size, generally narrower and smaller leaves, open inflorescences with downward oriented flowers and curved pedicels, and bright blue mature fruits distinguish *O. japonicus* from the three species of *Liriopogon*. Some forms

of *O. japonicus* have pale blue fruits rather than the darker, more intense shade of blue that is typical. With young, sterile plants, the two genera are more difficult to distinguish (Fig. 6). As with *Liriope* spp., the principal vectors for seed dispersal (in Arkansas) of *O. japonicus* likely are birds. Spontaneous *O. japonicus* plants, along with other species of liriopogons, regularly are encountered (in appropriate habitats) in places where birds roost and generate large numbers of droppings.



Figure 6. A–B. Comparison between juvenile stages of *Ophiopogon japonicus* (A) and *Liriope spicata* (B). Although similar and easily confused, the leaves of *O. japonicus* are narrower and slightly more coriaceous than those of *L. spicata*. Seedling plants or small, sterile offsets of the three *Liriope* species are extremely difficult to distinguish.

Voucher specimens. Arkansas. Miller Co.: Texarkana, off Water Oak Dr., 33.49139700° N, 93.99940330° W, growing in a wash on slight slope in disturbed, semi-wooded greenbelt, near a residential area, two small, young plants/ramets, probably seeded in via birds, no cultivated plants of the species observed in the vicinity, 9 Jul 2024, *Serviss* 8797. Montgomery Co.: Ouachita National Forest area, off Ragweed Valley Rd., 34.4751866667° N, 93.4414633333° W, about three large colonies consisting of hundreds of plants/ramets, along with several smaller groups and individual plants naturalized along stream edge and adjacent overflow area of an intermittent drainage, source of plants likely seeds dispersed by birds, no cultivated plants observed in the vicinity, 16 Jul 2024, *Serviss* 8802. Ouachita Co.: Camden, off Jackson Ave. and directly E of Four Seasons Nursery, 33.58387100° N, 92.8441923° W, small population consisting of a few dozen plants/ramets growing in moist soil along shallow drainage, deep shade probably limiting spread, plants probably persisting from prior cultivation but spreading via stoloniferous offsets, disturbed urban greenbelt at/near old home site, 19 Jul 2024, *Serviss* 8808. Saline Co.: Benton, immediately W/NW from McCright St. and Narrowway St., 34.569349° N, 92.595603° W, many naturalized plants as isolated individuals, small groups, and a large population of many hundreds of plants/ramets growing along bank and terrace of highly disturbed, semi-wooded, urban riparian zone, weedy and invasive, residential area in the vicinity, 25 Jun 2024, *Serviss* 8783.

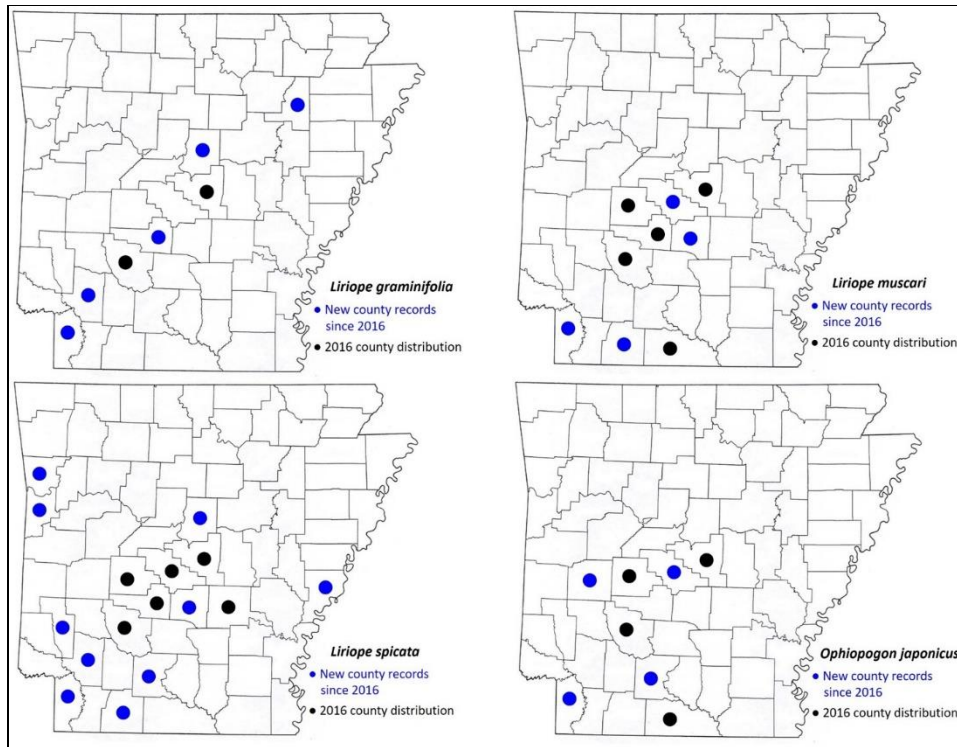


Figure 7. Arkansas county distributions of the four currently known species of liriopogons in the flora: *L. graminifolia* (*L. exiliflora*), *L. muscari*, *L. spicata*, and *O. japonicus*, from 2016–2024. Distribution maps are arranged clockwise in alphabetical order by genus and species beginning at the upper-left. Black circles indicate county records from 2016–2020. Blue circles indicate newly documented (2024) county records. Additional voucher specimens from 2021–2023, not presented here nor cited in Serviss et al. 2016a, 2016b, or 2020, also are from counties designated by black circles and are housed with the HEND collection at ANHC.

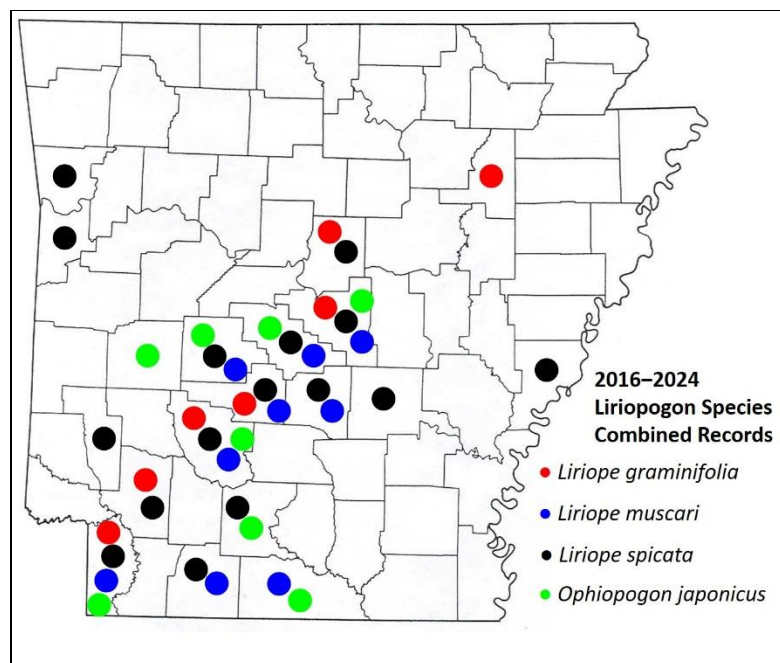


Figure 8. Comparative distributions of all known liriopogon taxa and county occurrences in Arkansas.

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LITERATURE CITED

- Bailey, L.H. 1929. The case of *Ophiopogon* and *Liriope*. *Gentes Herb.* 2: 1–37.
- Bailey, L.H. 1949. *Manual of Cultivated Plants* (rev. ed.). Macmillan Co., New York.
- Bailey, L.H. and E.Z. Bailey. 1976. *Hortus Third. A Concise Dictionary of Plants Cultivated in the United States and Canada. Vol. 2.* MacMillan.
- Chen, X. and M.N. Tamura. 2000a. *Liriope*. Pp. 250–251, *in* Z.Y. Wu and P.H. Raven (eds.). *Flora of China. Vol. 24 (Flagellariaceae through Marantaceae).* Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.
- Chen, X. and M.N. Tamura. 2000b. *Ophiopogon*. Pp. 252–261, *in* Z.Y. Wu and P.H. Raven (eds.). *Flora of China. Vol. 24 (Flagellariaceae through Marantaceae).* Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.
- Diggs, G.M., Jr., B.L. Lipscomb, and R.J. O’Kennon. 1999. *Shinners and Mahler’s Illustrated Flora of North Central Texas.* Sida, Bot. Misc. 16.
- Fantz, P.R. 1993. Taxonomic problems in cultivated liriopogons. *Horttechnology* 3: 141–150.
- Fantz, P.R. 2008a. Macrophytography of cultivated liriopogons and genera delimitation. *Horttechnol.* 18: 334–342.
- Fantz, P.R. 2008b. Species of *Liriope* cultivated in the southeastern United States. *Horttechnology* 18: 33–348.
- Fantz, P.R. 2009. Names and species of *Ophiopogon* cultivated in the southeastern United States. *Horttechnol.* 19: 385–394.
- Fantz, P.R., D. Carey, T. Avent, and J. Lattier. 2015. Inventory, Descriptions, and Keys to Segregation and Identification of Liriopogons Cultivated in the Southeastern United States. *Hortscience* 50: 957–993.
- Gentry, J.L., G.P. Johnson, B.T. Baker, C.T. Witsell, and J.D. Ogle (eds.). 2013. *Atlas of the Vascular Plants of Arkansas.* Univ. of Arkansas Herbarium, Fayetteville.
- Griffiths, M. 1992. *Index of Garden Plants.* Royal Horticultural Society. Timber Press, Portland.
- Hume, H.H. 1961. The *Ophiopogon–Liriope* complex. *Baileya* 9: 135–158.
- Lattier, J.D., T.G. Ranney, P.R. Fantz, and T. Avent. 2014. Identification, nomenclature, genome sizes, and ploidy levels of *Liriope* and *Ophiopogon* taxa. *Hortscience* 49: 145–151.
- Miller, J.H., E.B. Chambliss, and N.J. Loewenstein. 2015. *A Field Guide for the Identification of Invasive Plants in Southern Forests.* Slightly Revised Edition. USDA Dept. of Agriculture and US Forest Service, Southern Research Station.
- Nesom, G.L. 2010. Overview of *Liriope* and *Ophiopogon* (Ruscaceae) naturalized and commonly cultivated in the USA. *Phytoneuron* 2010-56: 1–31.
- Roling, P.V., A. Howlett, and L.E. Brown. 2011. *Liriope muscari* and *Ophiopogon japonicus* (Ruscaceae) naturalized in Texas. *Phytoneuron* 2011-5: 1–5.
- SERNEC Data Portal. 2024. <<https://sernecportal.org/portal/index.php>> Accessed October 2024.
- Serviss, B.E., J.W. Hardage, F.C. Ward, R.T. Fulmer, L.I. Serviss, and J.H. Peck. 2019. *Aspidistra elatior* (Ruscaceae) new for the Arkansas flora. *Phytoneuron* 2019-37: 1–4.
- Serviss, B.E., M.A. Stone, B.L. Olsen, K.B. Serviss, and J.H. Peck. 2016a. *Liriope graminifolia* (Ruscaceae) new to the Arkansas flora, second record for the USA. *Phytoneuron* 2016–62: 1–8.
- Serviss, B.E., C.A. Fuller, K.B. Serviss, B.L. Olsen, M.A. Stone, and J.H. Peck. 2016b. *Liriope* and *Ophiopogon*: Overview of two genera of Ruscaceae naturalized in the Arkansas flora. *Phytoneuron* 2016-50: 1–20.

- Serviss, B.E., J.W. Hardage, B.L. Olsen, L.M. Hunter, F.C. Ward, K.B. Serviss, and J.H. Peck. 2020. *Alocasia macrorrhizos* (Araceae), *Buxus sempervirens* (Buxaceae), and *Nothoscordum gracile* (Alliaceae) new in the Arkansas flora, with additional noteworthy records of angiosperms for the state. *Phytoneuron* 2020-13: 1–14.
- Skinner, H.T. 1971. Some liriopogon comments. *J. Royal Hortic. Soc.* 96: 345–350.
- Smith, E.B. 1988. An Atlas and Annotated List of the Vascular Plants of Arkansas (ed. 2). Published by the author, Fayetteville, Arkansas.
- Spaulding, D., W. Barger, and G.L. Nesom. 2010. *Liriope* and *Ophiopogon* (Ruscaceae) naturalized in Alabama. *Phytoneuron* 2010-55: 1–10.
- Spaulding, D.D., J.T. Kartesz, H.E. Horne, B.J. Finzel, and J.K. England. 2021. Flora of Northern Alabama, part 5. Liliaceous Families. *Phytoneuron* 2021-30: 1–262.
- Texas Invasives. 2023. A Citizen Science Program to Detect and Report Invasive Species. [TexasInvasives.org](https://www.texasinvasives.org/). <<https://www.texasinvasives.org/invaders/>> Accessed October 2023.
- Thomas, R.D. and C.M. Allen. 1993. Atlas of the Vascular Flora of Louisiana. Vol. I: Ferns & Fern Allies, Conifers, and Monocotyledons. Louisiana Dept. of Wildlife and Fisheries. Natural Heritage Program, Baton Rouge.
- Wunderlin, R.P. and B.F. Hansen. 2011. Guide to the Vascular Plants of Florida (ed. 3). Univ. Press of Florida, Gainesville.
- Weakley, A.S. 2024. Flora of the Southeastern United States. Edition of 14 April 2023. Univ. of North Carolina Herbarium (NCU), Chapel Hill. <<http://www.herbarium.unc.edu/flora.htm>> Accessed July 2024.

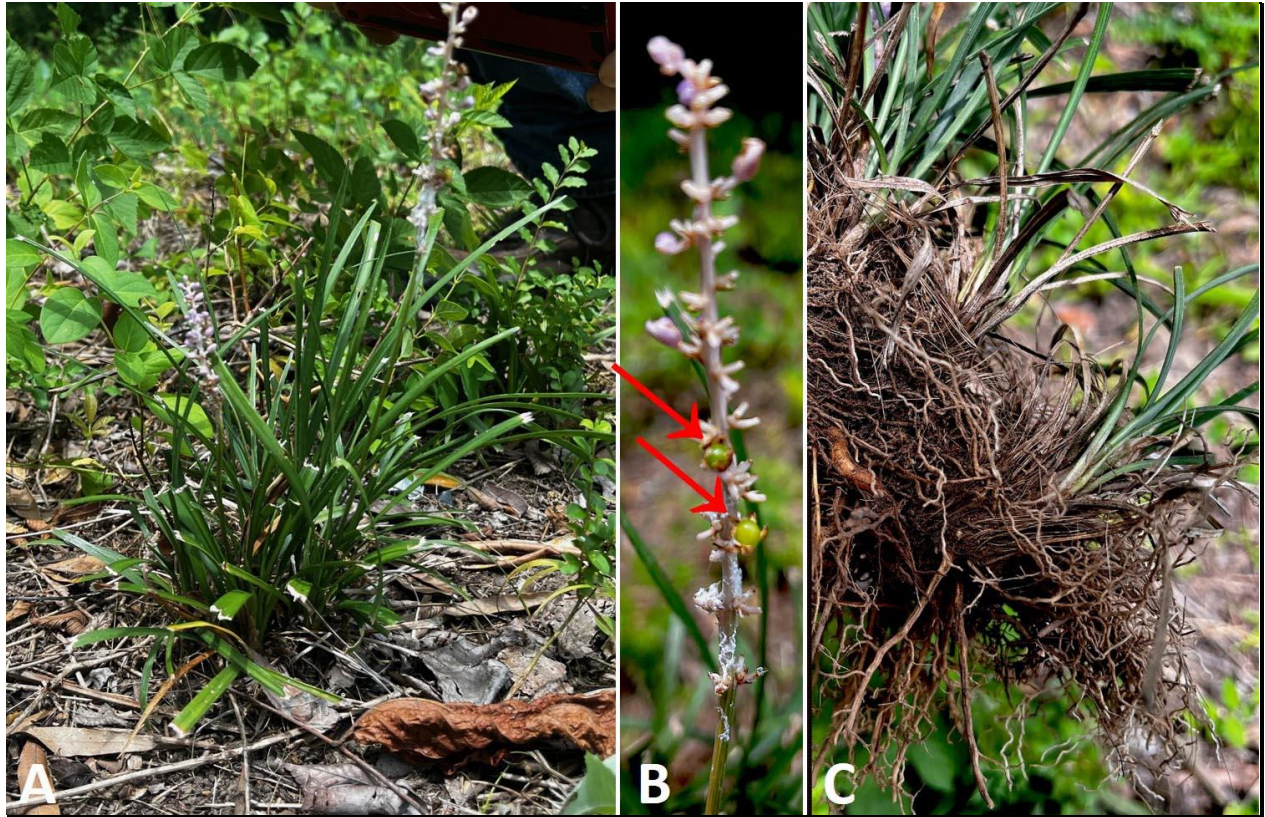


Figure 9. A–C. Escaped plants of *Liriope graminifolia* in Faulkner Co. (30 Jun 2024). A. Young plant with inflorescences and flowers — notice the essentially caespitose appearance, which will disappear with age as stolon length and production increases. B. Close-up of inflorescence with two developing seeds with sarcotestas (indicated by red arrows). C. Same plant from Figure 9A showing stoloniferous offsets and stolon segment — three offsets can be seen. Plants occur in a highly disturbed and overgrown city lot, with cultivated *L. graminifolia* about two blocks away, which is presumed to be the source for establishment. The lavender-purple flowers and long inflorescences that extended to the tops or above the leaves help distinguish it from the morphologically similar *L. spicata*, which also was present at this site.



Figure 10. Naturalizing plants of *Liriope graminifolia* in Hot Spring Co. (27 Jun 2024). These plants were spreading into a highly disturbed area via stoloniferous offsets and possibly seeds from plants in cultivation. The youngest offsets are present toward the bottom. Numerous offsets and larger plants/ramets can be seen in the photograph, with many more present beyond what is shown. Other places of spontaneous establishment also occur at the site.

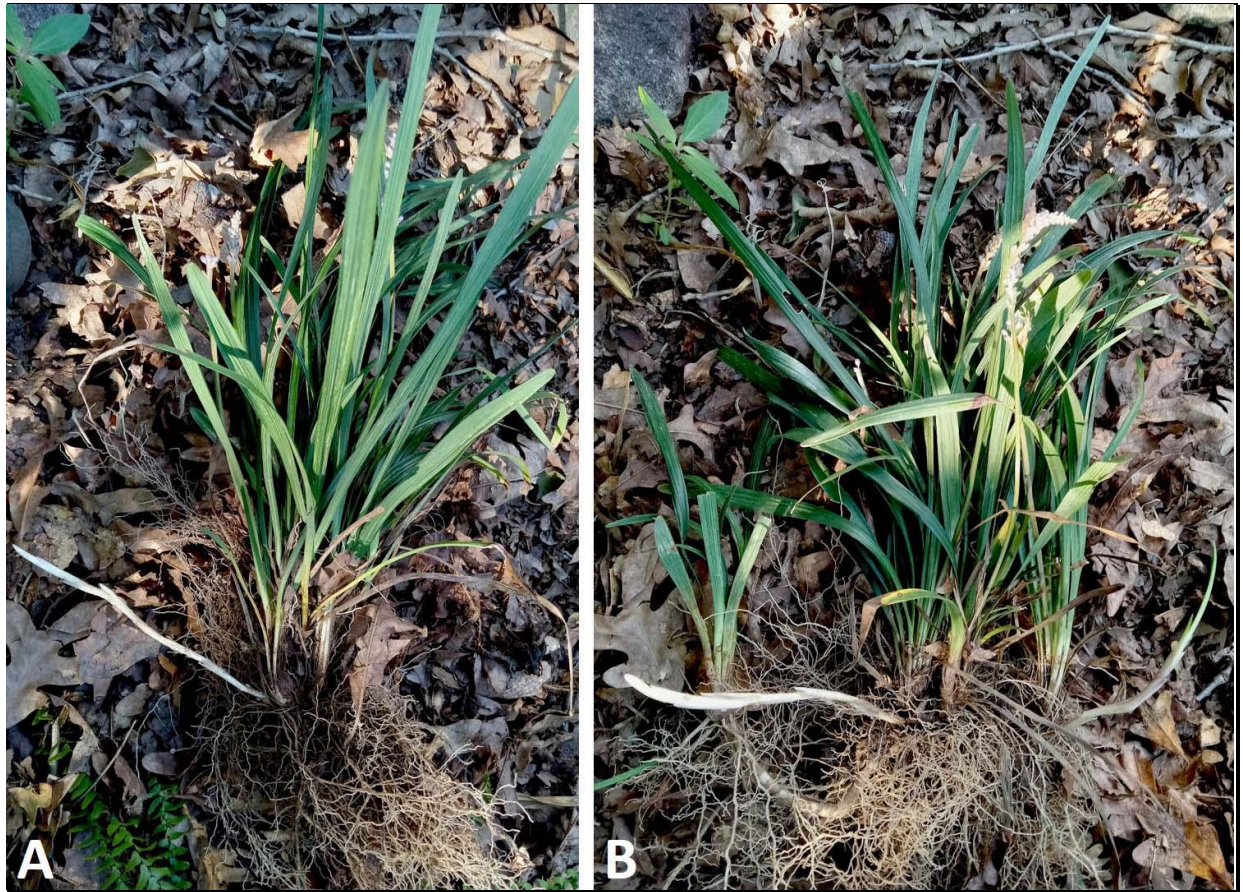


Figure 11. A–B. Naturalizing plants of *Liriope graminifolia* in Hot Spring Co. (27 Jun 2024). From the same site as the plants in Figure 10 but a different location. A. Plant/ramet showing young inflorescences almost as tall as the leaves, which will lengthen as they mature, wider leaves (relative to most *L. spicata*), elongate, slender stolon (white), and fibrous, tuberous roots). B. Different plant/ramet with several stolons (new and older), the older ones bearing connected stoloniferous offsets — at least three offsets can be seen. In this regard, *L. graminifolia* and *L. spicata* are similar, although it is our observation that *L. spicata* produces stoloniferous offsets, with associated colonization, more aggressively than *L. graminifolia* (compare with Figure 24 for *L. spicata*).



Figure 12. Naturalized plants of *Liriope graminifolia* in Hempstead Co. (20 Aug 2024). These plants were growing with *L. spicata*, at the base of a large loblolly pine, *Pinus taeda*, at the edge of a highly disturbed greenbelt and riparian zone within the city of Hope. Cultivated plants of the species were in the vicinity and bird-mediated dispersal of seeds from those likely is the source of the naturalized plants. Some of the plants shown were removed from the site and consisted of a series of stoloniferous offsets interconnected by short stolons — see Figure 13.



Figure 13. Naturalized plants of *Liriope graminifolia* in Hempstead Co. (20 Aug 2024). Same plants from Figure 12. Notice the multiple stoloniferous offsets interconnected by short stolons and the swollen, knotty portions at the base of the offset where it is connected to the stolon — these traits regularly are observed with *L. graminifolia*. The inflorescence also has the ovate-shaped bracts characteristic of this species.



Figure 14. Naturalizing plants of *Liriope muscari* in Saline Co. (25 Jun 2024). Many *L. muscari* plants occur irregularly distributed on the bank and overflow areas of a small stream of a riparian zone in Benton, Arkansas — the plants in the photograph are present on the terrace above the streambank in disturbed, semi-wooded habitat. Several clumps of plants can be seen but isolated plants also were present. The plants in the clump on the far right are in flower. The site is extensive and occurs at the base of a large residential area, where *L. muscari* is cultivated in abundance. Bird-mediated dispersal of seeds from cultivated plants likely is the mode of establishment for these plants.



Figure 15. Naturalized plants of *Liriope muscari* in Saline Co. (25 Jun 2024). These plants are present in sandy alluvial soil just above the waterline, along the edge of a small stream of a disturbed, wooded riparian zone in the city of Benton.



Figure 16. Two young naturalized plants of *Liriope muscari* in Saline Co. (25 Jun 2024). These plants are present on the bank of a small drainage at the edge of a moist greenbelt bordering a residential area. The smaller of the two plants is partially obscured by leaves but is present at the lower right of the photograph. Numerous young plants of *L. muscari* were present throughout the area.



Figure 17. Escaped plant of *Liriope muscari* via seed production in Grant Co. (30 Jul 2024). This lone plant was growing in moist, alluvial soil at the edge of a highly disturbed intermittent drainage in the city of Sheridan. In close proximity at an adjacent residence, *L. muscari* is cultivated and bird-mediated dispersal of seeds from that location is the likely source of this plant. This plant is the nonstoloniferous form of the species.



Figure 18. Escaped plant of *Liriope muscari* via seed production in Clark Co. (11 Sep 2024). This plant was growing in moist, alluvial soil along a wash in highly disturbed, semi-wooded urban habitat within the city of Arkadelphia. Bird-mediated dispersal of seeds from cultivated plants of the species is the likely source of this plant. This plant is the stoloniferous form of the species — a few, small offsets can be seen to the far right of the clump. Both *L. graminifolia* and *L. spicata* also are naturalized at this site (the *L. graminifolia* had nearly finished flowering and had abundant fruits at the time this photograph was taken) — all three species are cultivated in the rough vicinity.



Figure 19. Spontaneous plants of *Liriope muscari* via seed production in Clark Co. (7 Jul 2024). Several spontaneous, now reproductive-age plants are shown in the photograph; many smaller, younger plants also are present (not shown). Although the stoloniferous form of *L. muscari*, these plants were produced via seeding in from cultivated plants of *L. muscari* in the vicinity. Movement of seeds likely was via a combination of bird-mediated and water/gravity-mediated dispersal. The process of seedling recruitment and establishment at this site has been ongoing for several years. A plant of the native *Wisteria frutescens* is present growing through the *L. muscari* plants.



Figure 20. Naturalized *Liriope spicata* in Sebastian Co. (2 Sep 2024). Several scattered colonies of plants/ramets are present in a disturbed, semi-wooded habitat within the city of Fort Smith. Spread and establishment via stoloniferous offsets is apparent. Some plants also are in flower and the combination of seeds and offsets likely has given rise to the colonies at the site. The origin of these plants is unknown. Photo credit: Cynthia Fuller, Arkansas Colleges of Health Education.



Figure 21. Close-up view of naturalized plants/ramets of *Liriope spicata* in Sebastian Co. (20 Jun 2024). Even though in the sterile condition, the narrow leaves and numerous, widely-spaced offsets aid in distinguishing the species from *L. graminifolia*. Photo credit: Cynthia Fuller, Arkansas Colleges of Health Education.

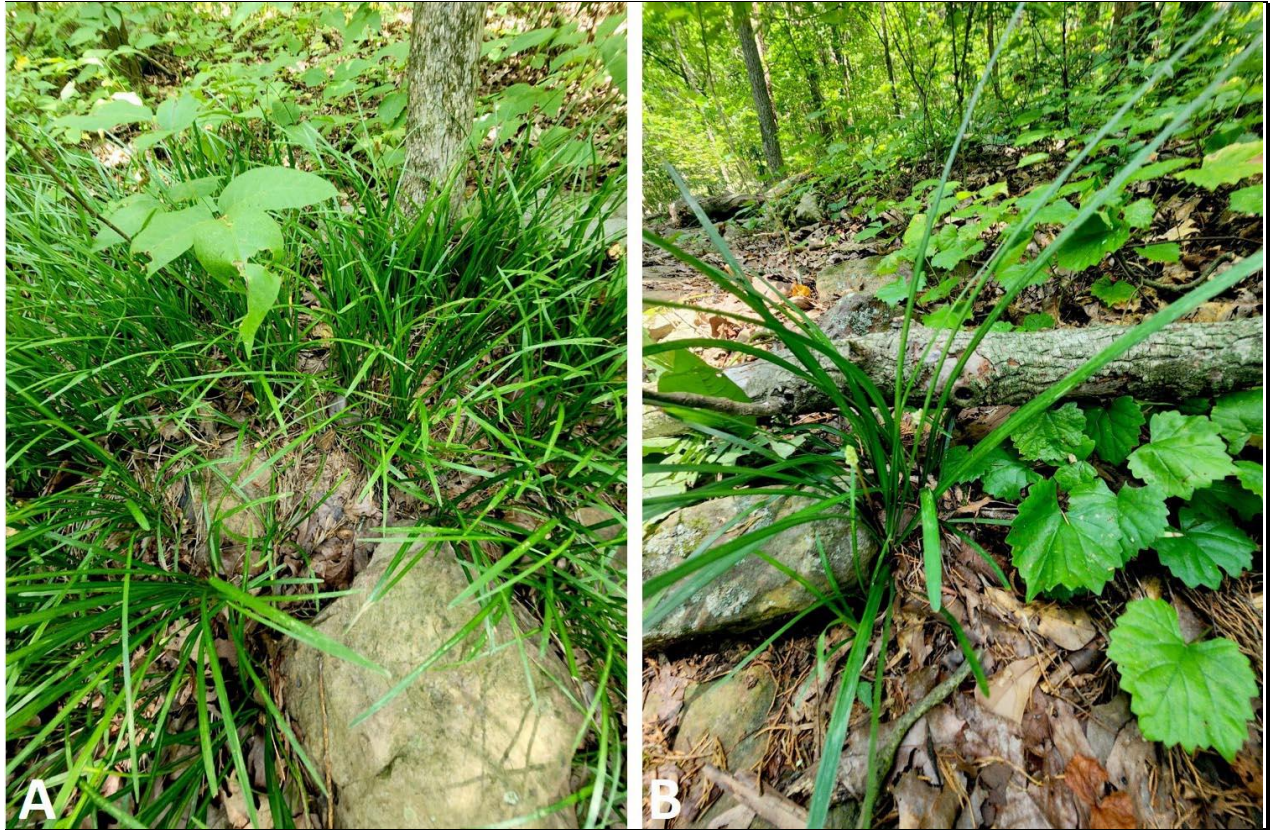


Figure 22. A–B. Naturalized plants of *Liriope spicata* in Crawford Co. (21 Jul 2024). A. One of two small populations of plants present along a trail in open woods. B. Somewhat isolated plant with developing inflorescences. Two widely separated groups of plants, increasing via stoloniferous offsets, were present in woods at Alma Lake. The origin of these plants is unknown and no other *L. spicata* plants were observed at the site. This record represents the northernmost naturalized occurrence of any liriopogon species in the state. Photo credit: Cynthia Fuller, Arkansas Colleges of Health Education.



Figure 23. Naturalized plants of *Liriope spicata* in Crawford Co. (21 Jul 2024). Shown is a small section of a large population of *L. spicata* that consists of several colonies and plants scattered over a ca. 460 m² area in open, upland woods near Lake Alma. At least four groups of plants can be seen in the photograph (one bottom right, two closely separated at upper-middle, and one large group at upper-left, adjacent to a trail). It is important to note that upland woods are not typical habitat for *Liriope* spp. in Arkansas, based on our observations; however, this instance does provide some idea of the inherent ecological flexibility of *L. spicata*. Photo credit: Cynthia Fuller, Arkansas Colleges of Health Education.

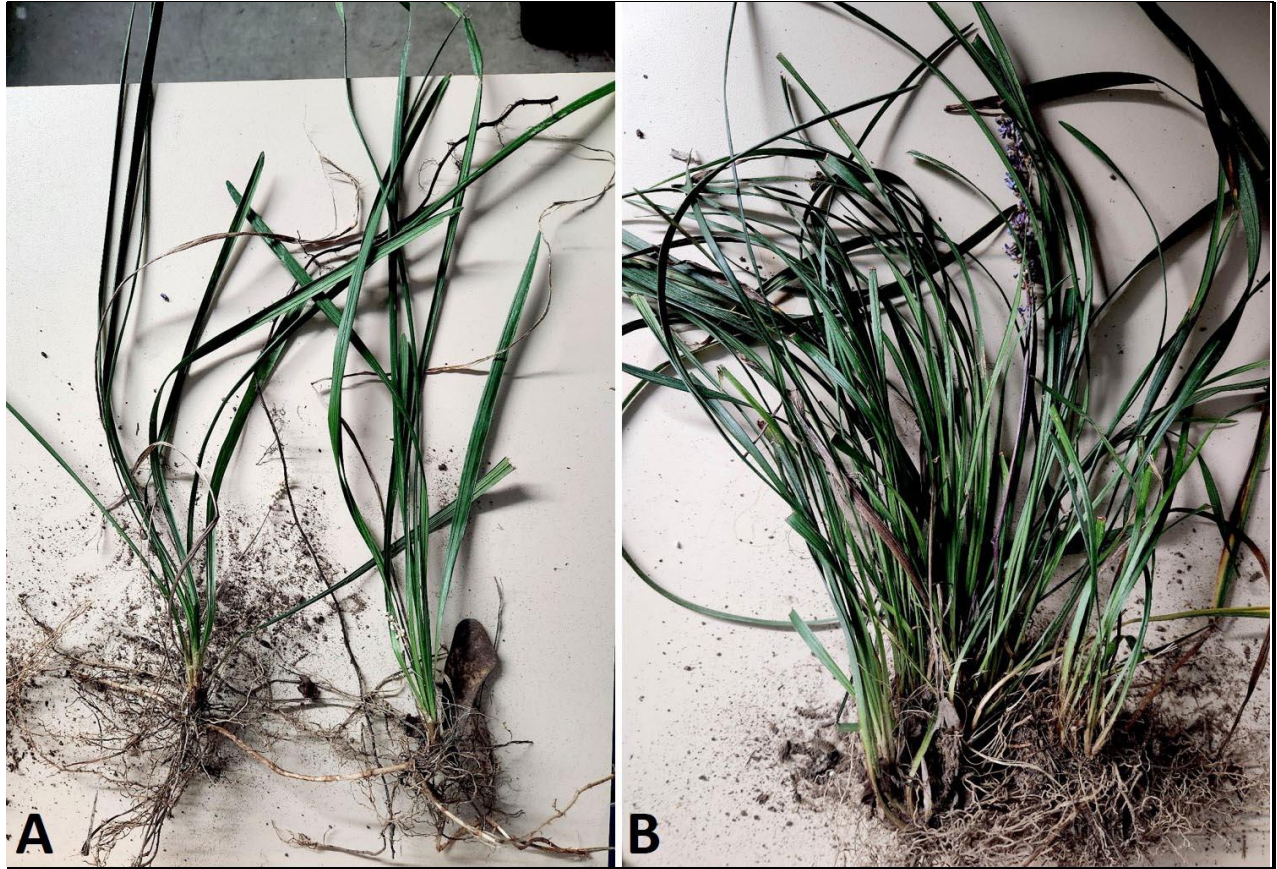


Figure 24. A–B. Naturalized plants/ramets of *Liriope spicata* in Crawford Co. (21 Jul 2024). A. Two ramets connected via a stolon, each of which also is bearing additional stolons (left and right of plants) that themselves were connected to other offsets. B. Different cluster of plants/ramets, with one bearing a mature inflorescence — notice that it is partially obscured by the leaves. Although in the photograph the flowers are a darker violet-purple than typically observed with *L. spicata*, the flowers were considerably paler in color when the plant was fresh and in the field (compare with Figure 11 for *L. graminifolia*).



Figure 25. Naturalized plants of *Liriope spicata* in Ouachita Co. (19 Jul 2024). Shown is a small portion of a very extensive population of literally thousands of plants/ramets of *L. spicata* naturalized within a highly disturbed urban greenbelt in the city of Camden. In addition to a few larger colonies as shown here, numerous smaller groups and individual plants occur. Plants were distributed over open and densely shaded areas, although plants and colonies in dense shade were sparse.



Figure 26. Naturalized plants of *Liriope spicata* in Columbia Co. (19 Jul 2024). Shown is a nascent colony of *L. spicata* establishing along a semi-wooded, sandy stream bank within the city of Magnolia. Most, if not all, of the plants shown likely are stoloniferous offsets; a few are in flower. A few other colonies were scattered along this drainage.



Figure 27. Young, naturalized plants of *Liriope spicata* in Hot Spring Co. (30 Jul 2024). Two different plants at the same site growing at the waterline in wet, waterlogged soil of an intermittent stream within the city of Malvern. The larger plant in Figure A has produced a stoloniferous offset. While liriopogons, including *L. spicata*, prefer moist (not wet) sites, it is not out of the question to occasionally find them growing near standing water in very wet soils.



Figure 28. Naturalized plants of *Liriope spicata* in Hempstead Co. (20 Aug 2024). This colony extends beyond what is shown in the photograph. Notice the recently formed stoloniferous offsets (right and bottom edges of colony). Several similar colonies, along with many smaller ones, were scattered throughout an extensive, highly disturbed greenbelt and riparian zone within a residential area in the city of Hope. In addition to stoloniferous offsets, plants also were establishing via seeds, as many isolated, very young plants occurred throughout the area — see Figure 29.



Figure 29. A–B. Naturalized plants of *Liriope spicata* in Hempstead Co. (20 Aug 2024). A. Nascent colony of a few offsets that was separated from any other *L. spicata* plants by at least a few meters. B. Very young plant, from seed, as it also is not close enough to any other *L. spicata* plants to have been produced as an offset. Several such small groups and isolated plants occurred scattered throughout a large, highly disturbed greenbelt within the city of Hope. Spread and establishment of *L. spicata* at this site is via a combination of stoloniferous offsets and seeds.



Figure 30. Large, very extensive naturalized population of *Liriope spicata* in Clark County (July 2021). Literally, many thousands of plants/ramets are present in low wet woods above a small intermittent stream within the city of Arkadelphia, far in excess of what is seen in the photograph — nearly everything of what is shown in the understory is *L. spicata*. Many colonies of *Ophiopogon japonicus* also were present and scattered irregularly with the *L. spicata*. *Liriope spicata* is invasive in Arkansas, particularly in moist habitats along streams, wet woods, and floodplain forests in urban environments.



Figure 31. Large, extensive naturalized population of *Ophiopogon japonicus* in Saline County (25 Jun 2024). Literally hundreds of plants/offsets occur on the bank of a small stream within the city of Benton. The populations shown here extends from just above the waterline, up the bank, and into the wooded overflow area above. Small, isolated plants also were present in the vicinity. Similar occurrences are known from other counties in the state (Serviss et al. 2016b).



Figure 32. Small, very young plants of *Ophiopogon japonicus* in Saline County (25 Jun 2024). These plants were separate from the larger population shown in Figure 31 and are growing sandy alluvial soil near the stream bed.



Figure 33. Large, extensive naturalized population of *Ophiopogon japonicus* in Clark County (Oct 2016). What is interesting about these plants is that rather than occurring along a stream in a riparian habitat, which is typical, they are present within and at the edge of disturbed mesic woods — essentially all the grasslike groundcover is *O. japonicus*. A residential area borders this site and this population likely started out as escapes from cultivated *O. japonicus* plants.



Figure 34. Escaped *Ophiopogon japonicus* in Miller Co. (9 Jul 2024). Two, very young plants of *O. japonicus* growing in a shallow, moist draw on a mild slope in highly disturbed urban woods within the city of Texarkana. No other *O. japonicus* plants were present. Bird-mediated dispersal of seeds is the presumed source of these plants.



Figure 35. Naturalized *Ophiopogon japonicus* in Montgomery Co. (15 Jul 2024). About three larger colonies, along with several smaller ones and numerous individual plants are growing along an intermittent stream drainage and surrounding low area in the Ouachita National Forest. Plants are present on the bank, in the stream bed (shown in photograph), and scattered irregularly in the drainage area where the stream empties. Bird-mediated dispersal of seed is the likely source of these plants, as the area appears to be a frequently used roost site; the seed source is unknown and no cultivated plants of the species were observed in the area.