

CANNA X GENERALIS (CANNACEAE), A SECOND CANNA NATURALIZED IN ARKANSAS

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ABSTRACT

Canna X generalis is reported here for the first occurrence outside of cultivation in Arkansas. Escaped plants of *C. X generalis* are documented from Clark Co., Arkansas, and were present as two distinct colonies of plants growing as escapes in highly disturbed habitats. It is the second member of the genus documented as naturalized in Arkansas. Photographs of *C. X generalis* in habitat and a key to identification of the *Canna* species currently known from the Arkansas flora are provided.

In 2021, two colonies of escaped plants of *Canna X generalis* Bailey (common garden canna) were documented from two, separate locations in Clark County in Arkansas (Figs. 1–2). *Canna X generalis* previously has not been documented in Arkansas outside of cultivation (Smith 1994; Arkansas Vascular Flora Committee 2006; Gentry et al. 2013; Serviss et al. 2014; Peck & Serviss 2016). One of the two escaped colonies of *C. X generalis* occurred along a stream bank in a highly disturbed urban greenbelt and riparian zone (Fig. 1), and the other at the edge of disturbed, urban woods (Fig. 2); both are within the city of Arkadelphia. Each colony consisted of multiple plants/rhizomatous offsets. Both sites are bordered by residential areas and cultivated plants of *C. X generalis*, either directly or indirectly, probably gave rise to the colonies. The plants shown in Figure 1 appeared to have spread directly via rhizomes from cultivated plants — several cultivated plants of *C. X generalis* were present at a residence that bordered the riparian zone adjacent to the location of the escaped individuals. At the second site, shown in Figure 2, evidence of dumping of horticultural waste is present and those plants may have originated from such. Establishment and spread of plants within the colonies at both sites appeared to be via rhizomatous offsets.

Voucher specimens. Arkansas. Clark Co.: Colony consisting of multiple escaped plants growing near top of stream bank in highly disturbed, urban greenbelt and riparian zone, spreading from cultivated plants of the species, off Elaine Circle, S and E of intersection of Elaine Circle and 21st St., Arkadelphia, 19 Jun 2021, *Serviss 8747* (HEND); small, escaped colony consisting of about 14 plants growing at edge of disturbed, urban woods, presumably initially established from dumped horticultural waste, adjacent to Pinewood Dr., immediately W of the Reddie Athletic Center, Arkadelphia, 1 Sep 2021, *Serviss 8753* (HEND). **Union Co.:** Small colony and one semi-isolated plant, persistent and possibly escaped, growing on top of stream bank at edge of highly disturbed greenbelt and riparian zone, directly behind residence, N/NW of intersection of Briarwood Dr. and Crestwood Dr., El Dorado, 31 Aug 2019, *Serviss 8707* (HEND).



Figure 2. *Canna x generalis* escaped in Clark Co., Arkansas (from a different location than the plants shown in Fig. 1). Plants were present at the edge of highly disturbed woods. The origin of the plants likely was from dumping of horticultural waste. About 14 plants/offsets of *C. x generalis* can be seen in the photograph. Although sterile and not unequivocally identifiable to species, an identity of *C. x generalis* was assigned to these plants, as their growth form and habit seems somewhat distinct from that observed with Arkansas material of *C. indica*. In addition, *C. x generalis* commonly is cultivated in the Arkadelphia area, and unwanted plants (of both species) from cultivation sometimes are discarded in waste areas.

An additional occurrence of *C. x generalis* in Arkansas also is worthy of mention — shown in Figure 3 is a portion of a colony consisting of several plants that appears to be present based on persistence from prior cultivation or establishment from horticultural discards. These plants occur at the edge of a disturbed greenbelt and riparian zone directly behind a residence that borders the site. While the origin of the plants is uncertain, they clearly were spreading via rhizomatous offsets, and with a single plant present that was separated from the rest by ca. 1–2 meters. While these plants cannot unequivocally be regarded as escaped, given enough time, they presumably might spread into the greenbelt, providing opportunity for dispersal of propagules via runoff or stream water to new locations.

Canna x generalis is a rhizomatous perennial of horticultural origin (Bailey & Bailey 1976; Griffiths 1992). Historically, it has been considered or interpreted as an interspecific hybrid between *C. indica* and *C. glauca* or *C. iridiflora* (Bailey & Bailey 1976; Griffiths 1992; Kress & Prince 2000), although as a taxon it likely represents a complex group or series of hybrids among multiple species and with numerous forms and cultivars, to include hybrids of *C. x generalis* and *C. flaccida*, known

as *C. X orchioides* (Rogers 1984; Griffiths 1992; Maas-van de Kamer & Maas 2008). These hybrids, apparently, consist of fertile or sterile diploids and sterile triploid forms (Rogers 1984; Kress & Prince 2000; Maas-van de Kamer & Maas 2008). Maas-van de Kamer and Maas (2008) include *C. X generalis* and *C. X orchioides* under their treatment of a highly variable *C. indica*-complex, stating that it was impossible to find differences in characters that are invariable enough to create different species within the *C. indica*-complex. However, the plants presented here differ morphologically in their flowers, particularly the size and shape of the staminodes, from “typical,” at least as observed in Arkansas, *C. indica* (Fig. 4); hence, the name of *C. X generalis* is maintained for the plants reported in this paper. *Canna X generalis* frequently is cultivated in the USA and elsewhere for its showy flowers, large leaves, and ease of cultivation, and has been documented in the USA as escaped or persisting from cultivation from the floras of several eastern states (Godfrey & Wooten 1979; Rogers 1984; Wunderlin & Hansen 2011; Kartesz 2015; Weakley 2020; Keener et al. 2021; Wunderlin et al. 2021).

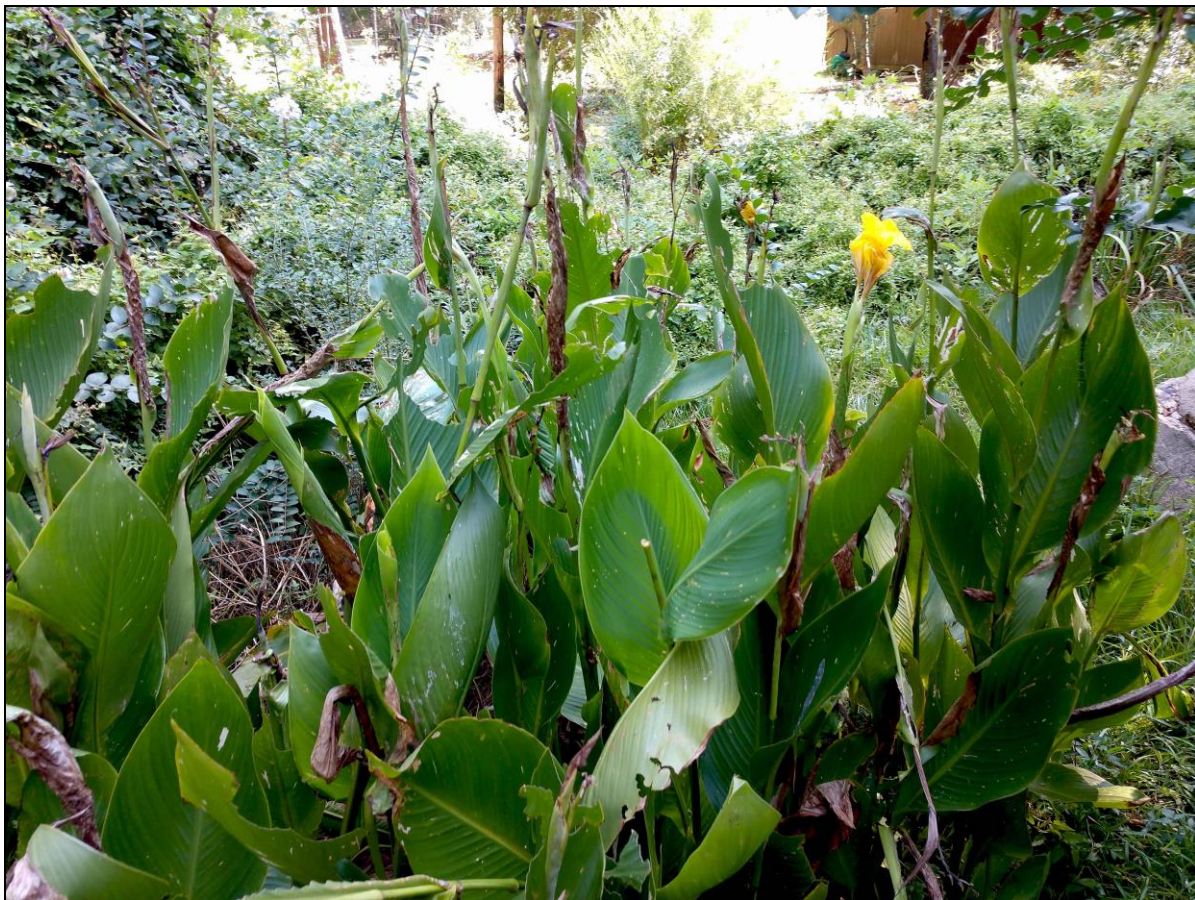


Figure 3. *Canna X generalis* persisting and spreading, presumably from prior cultivation or horticultural discards, in Union Co., Arkansas. These plants were present at the edge of a highly disturbed riparian zone and also at the edge of a residence, just behind a property fence. The precise origin of the plants is uncertain; however, vegetative spread and expansion of the colony via rhizomatous offsets clearly is evident. Their presence at this site offers the possibility of dispersal of propagules via stream water (or other means) and potential establishment elsewhere.

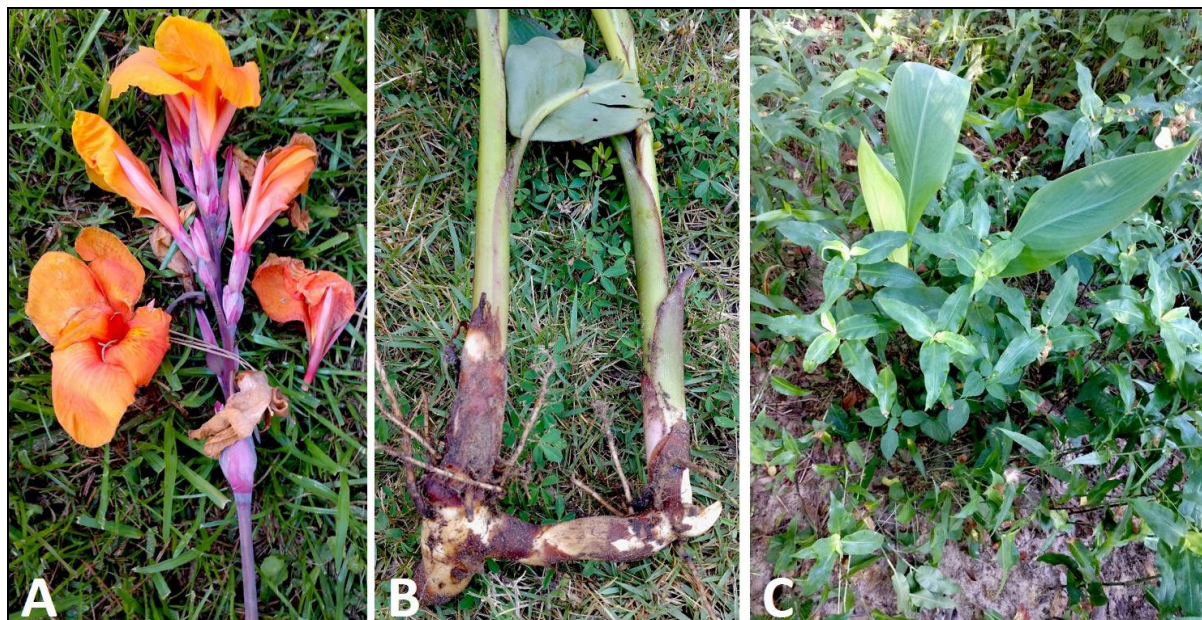


Figure 1. (A–C) *Canna* \times *generalis* escaped in Clark Co., Arkansas. (A) Flowers and inflorescence; flowers were obtained from a cultivated plant at the site. Notice the extremely wide staminodes, to 5.5 cm, as compared to those of *C. indica* (Fig. 4). (B) Plants for close-up of above ground stems and rhizome. (C) Escaped plants in habitat — these plants were present along a stream in a highly disturbed riparian zone of an urban greenbelt. Plants were growing on the stream bank, a few meters above the water line, where they had spread via rhizomatous offsets from cultivated *C. x generalis* plants at the site. Three small, closely spaced groups of escaped plants were present.

Canna species reproduce by seed and/or via vegetative/clonal reproduction from an extensive rhizome system. Vegetative reproduction can generate entire colonies of plants, allowing rapid establishment of populations, persistence long after cessation of cultivation practices, and potential spread and naturalization from areas of cultivation. Additionally, seeds or rhizome fragments also can be dispersed through natural or anthropogenic means, potentially resulting in the establishment of remote escaped populations — one or both of the aforementioned undoubtedly have contributed to the occurrence of *Canna* in the Arkansas flora (Serviss et al. 2014; Peck & Serviss 2016). In addition, at least some hybrids and species, such as *C. x generalis* and *C. indica*, are quite resilient, where rhizomes and/or offsets can tolerate removal from soil or substrate and remain viable for days or weeks, depending on conditions. This attribute increases the likelihood of establishment from horticultural discards or transport and deposition of propagules by water or dredging.

The Cannaceae currently is represented by two taxa in the state — *C. x generalis* and the previously documented *C. indica* (Serviss et al. 2014; Peck & Serviss 2016). The family was first documented for the state's flora by Serviss et al. (2014). The two species/taxa of *Canna* can be distinguished using the following key.

1. Flowers red to reddish-orange or red and yellow, staminodes relatively narrow, the free portion (0.3–)0.5–1.5(–2) cm wide ***Canna indica***
1. Flowers red, orange, yellow, pink, or combinations of two of these colors, staminodes wide, the free portion (1.5–)2.5–5.5(–6) cm wide ***Canna x generalis***

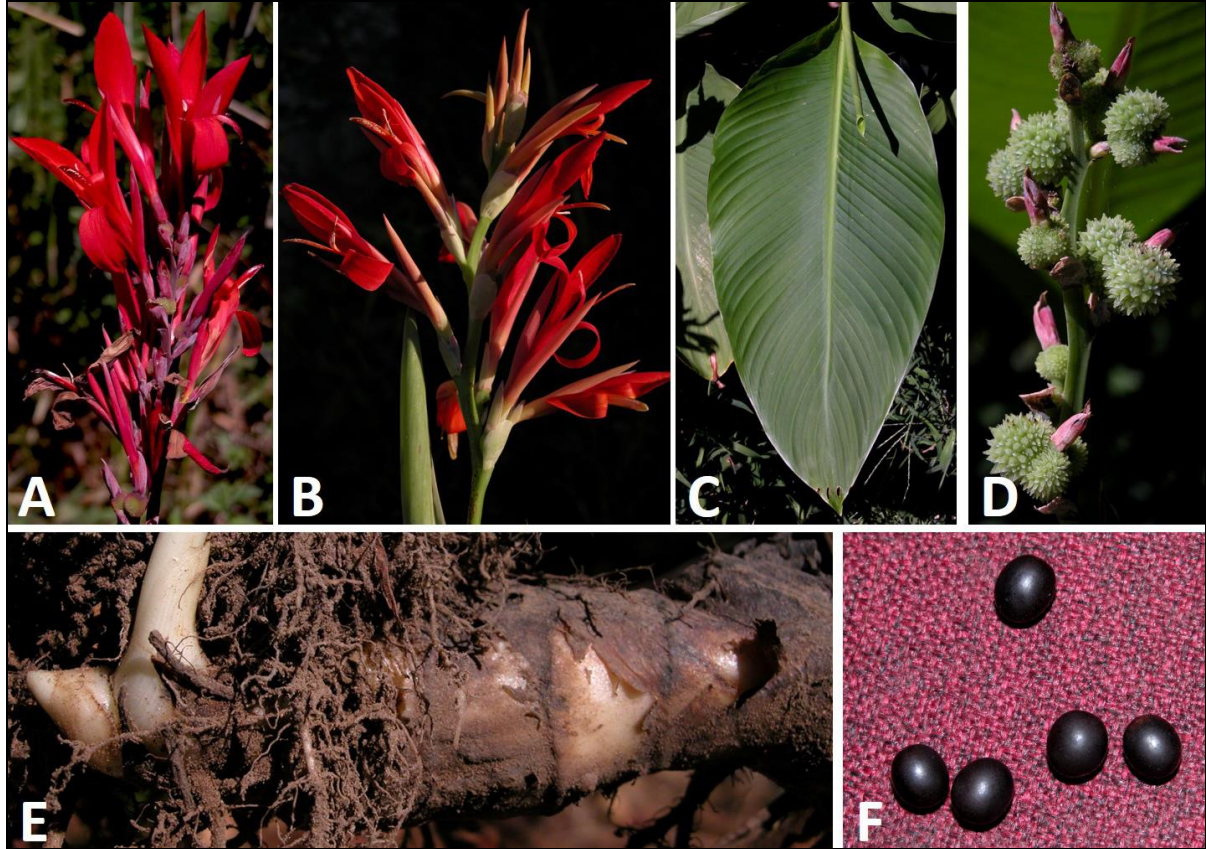


Figure 4. (A–F) *Canna indica* for comparison with *C. x generalis* (Fig. A is from a cultivated *C. indica* plant; Figs. B–F are from plants of *C. indica* naturalized in Arkansas). (A–B) Flowers and inflorescences (notice the narrow staminodes). (C) Leaf. (D) Fruits. (E) Rhizome. (F) Seeds.

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LITERATURE CITED

- Arkansas Vascular Flora Committee. 2006. Checklist of the Vascular Plants of Arkansas. Arkansas Vascular Flora Committee, Fayetteville.
- 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, New York.
- Gentry, J.L., G.P. Johnson, B.T. Baker, C.T. Witsell, and J.D. Ogle. 2013. Atlas of the Vascular Plants of Arkansas. Vascular Flora Project, Univ. of Arkansas, Fayetteville.
- Godfrey, R.K. and J.W. Wooten. 1979. Aquatic and Wetland Plants of the Southeastern United States. Monocotyledons. Univ. of Georgia Press, Athens.
- Griffiths, M. 1992. Index of Garden Plants. Royal Horticultural Society. Timber Press, Portland.
- Kartesz, J.T. 2015. Taxonomic Data Center. The Biota of North America Program (BONAP). Chapel Hill, North Carolina. <<http://www.bonap.org/index.html>> Accessed June 2021.

- Keener, B.R., A.R. Diamond, L.J. Davenport, P.G. Davison, S.L. Ginzburg, C.J. Hansen, C.S. Major, D.D. Spaulding, J.K. Triplett, and M. Woods. 2021. Alabama Plant Atlas. [S.M. Landry and K.N. Campbell (original application development), Florida Center for Community Design and Research. Univ. of South Florida]. Univ. of West Alabama, Livingston.
- Kress, W.J. and L.M. Prince. 2000. *Canna* (Cannaceae). Pp. 310–314, in Flora of North America Editorial Committee (eds.). Flora of North America North of Mexico, Vol. 9. Oxford Univ. Press, New York and London.
- Maas-van de Kamer and P.J.M. Maas. 2008. The Cannaceae of the world. *Blumea* 53: 247–318.
- Peck, J.H. and B.E. Serviss. 2016. *Ficus carica* (Moraceae) and *Kerria japonica* (Rosaceae) new to the Arkansas flora (U.S.A.), with a second record of *Canna indica* (Cannaceae) and the reinstatement of *Nerium oleander* (Apocynaceae) for the state. *J. Bot. Res. Inst. Texas* 10: 169–174.
- Rogers, G.K. 1984. The Zingiberales (Cannaceae, Marantaceae, and Zingiberaceae) in the southeastern United States. *J. Arnold. Arbor.* 65: 5–55.
- Serviss, B.E., J.H. Peck, and T.A. Roeser. 2014. The first naturalized occurrence of the Cannaceae family in the Arkansas (U.S.A.) flora, with additional new and noteworthy angiosperm records for the state. *J. Bot. Res. Inst. Texas* 8: 637–639.
- Smith, E.B. 1994. Keys to the Flora of Arkansas. Univ. of Arkansas Press, Fayetteville.
- Weakley, A.S. 2020. Flora of the Southeastern United States. Edition as of 20 October 2020. Univ. of North Carolina Herbarium (NCU), Chapel Hill. <<http://www.herbarium.unc.edu/flora.htm>> Accessed June 2021.
- Wu, D. and W.J. Kress. 2000. *Canna*. P. 378, in Z.Y. Wu and P.H. Raven (eds.). Flora of China, Vol. 10 (Fabaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.
- Wunderlin, R.P. and B.F. Hansen. 2011. Guide to the Vascular Plants of Florida. Third Edition. Univ. Press of Florida, Gainesville.
- Wunderlin, R.P., B.F. Hansen, A.R. Franck, and F.B. Essig. 2021. Atlas of Florida Plants. [S.M. Landry and K.N. Campbell (application development), USF Water Institute.] Institute for Systematic Botany, Univ. of South Florida, Tampa. <<https://florida.plantatlas.usf.edu/>> Accessed September 2021.