



Post Oak & Prairie Journal

A Regional Journal of the Cross Timbers and Prairies

Fall, 2022

Blue Funnel-Lily Pollination and Seed Dispersal Hypotheses As Well As Growing Them for Reintroduction

Allan D. Nelson

Overview

Androstephium coeruleum (Scheele) Greene, commonly called blue funnel-lily, occurs in Kansas, Oklahoma, and Texas (Figure 1). Blue funnel-lilies occur in the Central Great Plains and frequently grow on rocky prairies and grassy slopes (Pires and Reveal 2022). In Texas, it occurs on the Blackland Prairie extending south and east into the Edwards Plateau and Rolling Plains (Diggs et al 1999).

Blue funnel-lily leaves, much longer than the plant is tall, give the plant an unusual appearance and the leaves are often hidden among prairie grasses. The flowers have six tepals (term used for sepals and petals that look alike), which may be white, bluish, or lavender. The tepals become partly joined to form a tube called the corona (Figure 2), which may have resulted in “funnel” being in the common name. Its scientific name, from the Greek *andros* meaning “male” and *stephanos* meaning “crown,” was derived from the shape of the vertical corona above the tepals, which hold the stamens (Figure 2; this

image as well as others captured by grower and a prairie restoration advocate that wishes to remain anonymous).

Ovaries within the flowers mature into nearly spherical to egg-shaped fruits called capsules that split into three carpels revealing flattened, slightly wrinkled, black seeds. An above ground stem bears the long, slender leaves and roots are attached to a corm, which is a dry, bulb-like structure. Both corms and bulbs form from underground stems that can be distinguished by their succulence. Corms, found in the blue funnel-lily have dry, papery leaves or other tissue while bulbs have

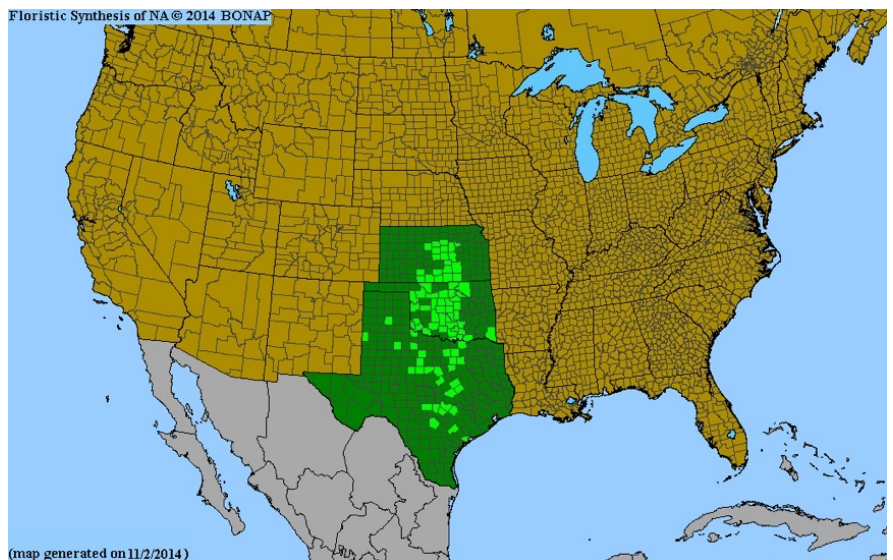


Figure 1. Map (Kartesz 2015) showing the distribution of blue funnel-lily in Kansas, Oklahoma, and Texas.

succulent leaves. Corms of blue funnel-lily were eaten by native people, which migrated as hunter-gatherers in West Texas and beyond (Kindscher 1987).



Figure 2. Flower of blue funnel-lily showing stamens inside corona

Taxonomy

Androstephium, native to central and western areas of the continental U.S.A., has been circumscribed into *A. coeruleum* and *A. breviflorum* S. Watson in the most recent treatment in the Flora of North America (Pires and Reveal 2022). The latter species occurs from eastern California to western Colorado. It has pale purplish to whitish flowers and a common name of pink funnel flower. There has been debate as to what

family the genus occurs in, but today, most taxonomists place it in the Liliaceae (Utech 2022). This family has been expanded over recent years, due to mainly molecular data, to include more variable species but most flowers have six tepals and stamens as well as a three chambered ovary (Utech 2022), as seen in the two species of *Androstephium* (Pires and Reveal 2022).

Pollination

Plants produce flowers from February to May (Pires and Reveal 2022). No information on pollination of *A. coeruleum* was located in the literature but in the course of fieldwork and growing the plants, insects including ants, beetles and bees have been observed on the flowers. In one instance a bumblebee (*Bombus* spp.) was observed harvesting pollen from inside the corona (Figure 3) and most recently a white-lined sphinx moth (*Hyles lineata*) was observed visiting flowers.



Figure 3. Bumblebee visiting blue funnel-lily flower

Seed Dispersal

Loughmiller *et al.* (2018) says the seeds are dispersed by wind, which seems like a reasonable hypothesis, supported by photographs prior to high winds and after those winds in Taylor County, Texas (Figures 4-5). Seed set in fruits is high for populations observed in the field in northern Taylor County as one can observe in the capsules

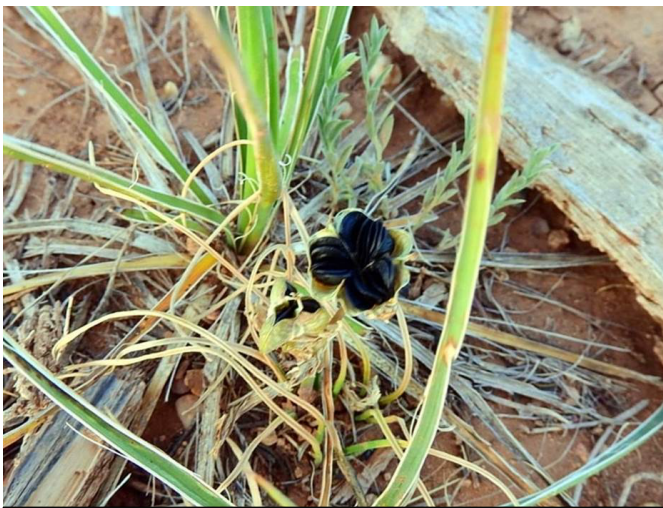


Figure 4. Open capsule of a blue funnel-lily

packed with seeds (Figure 4), making them unlikely, at least in Taylor County, Texas, to have problems with reproductive success as a conservation concern.

Growing Blue Funnel-Lily

The following information on growing blue funnel-lily is provided by a person that wants to remain anonymous and has sent me seeds and bulbs to grow in pots at my home. Sustainable harvest of relatively common plants like blue funnel-lily is 5% of a population of at least 20 individuals (Simpson 1997).

Seeds or bulbs, from rescue sites along an area where a highway was expanded, have been collected sustainably. Seeds are collected from open capsules to insure their maturity and are placed in wet paper towel to undergo moist, refrigerated stratification. Temperatures were regulated from about 36-39 degrees Fahrenheit. They are stored this way until the following growing season, which may be longer than needed but was the duration used by the grower in this case.

Seeds were planted in moist potting soil (bought from a nursery) and watered with about 5.0% kelp-infused, distilled water (95 ml water with 5 ml liquid kelp (available at nurseries) and placed onto a heated, seed-starting mat (an electric heating pad that goes under seed flats available at nurseries) in light. If mold developed in the pots or on paper towel in the refrigerator, it was physically removed and a light dusting of cinnamon was applied as an anti-fungicide. Other fungicides like cloves could be used but cinnamon was used in this case. Seeds germinated and

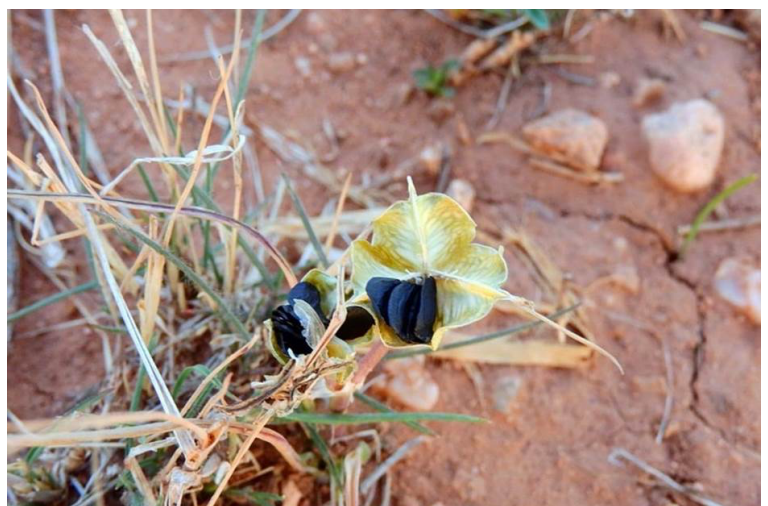


Figure 5. Capsule of a blue funnel-lily after winds

seedlings were allowed to grow in pots for one season and then planted outdoors. Plants require a well-drained, rich, sandy loam or clay in a sunny location and these areas were selected in plantings in Erath and Taylor counties in Texas by the author and anonymous grower.

In rescue events, which occurred along highway rights-of-way in Abilene, Texas before road construction began, corms were dug with long bladed shovels. Intact corms were then transferred to pots for planting once leaves emerged in the growing season (Figure 6) and propagated as described for seedlings in the above paragraph.



Figure 6. Leaves of blue funnel-lily in pots to be transplanted during re-introduction of the species

Literature Cited

Kartesz, J.T., The Biota of North America Program (BONAP). 2015. North American Plant Atlas. (<http://bonap.net/napa>). Chapel Hill, N.C. [maps generated from Kartesz, J.T. 2015. Floristic Synthesis of North America, Version 1.0. Biota of North America Program (BONAP). (in press)].

Kindscher, K. 1987. Edible Wild Plants of the Prairie. Lawrence, University Press of Kansas.

Loughmiller, C., L. Loughmiller, and J. Marcus. 2018. Texas Wildflowers: A Field Guide. Austin, University of Texas Press.

Pires, J. C. and J. L. Reveal. 2022. *Androstephium coeruleum* (Scheele) Greene. In: Flora of North America. Accessed November 28, 2022 at http://floranorthamerica.org/Androstephium_coeruleum

Simpson, M. G. 1997. Plant collecting and documentation field notebook. San Diego State University Press, San Diego, California.

Utech, F. H. 2022. Liliaceae Jussieu. In: Flora of North America. Accessed November 28, 2022 at <http://floranorthamerica.org/Liliaceae>.

Allan Nelson is a Professor of Biological Sciences and Herbarium Curator at Tarleton State University. He teaches Plant Taxonomy, Terrestrial Field Ecology, and Conservation Biology.

Post Oak & Prairie Journal ❖ Rob Denkhaus & Michael Smith, Editors

The Post Oak & Prairie Journal is published by the Editors and available as a pdf file without charge on Facebook at <https://www.facebook.com/groups/PostOakPrairie/files/> It is not currently available as a print publication.

The journal is © 2022 by Rob Denkhaus and Michael Smith. Ownership of all material including photographs remains with the author/photographer.

Submitting articles to the journal

We encourage you to contribute to the journal. Articles may contain natural history research and data pertaining to the region, as well as information pertaining to wildlife, plant communities, conservation, and land management within these areas. Occasionally we publish brief notes such as an observation of wildlife behavior or a species' occurrence that will be of interest to readers. Articles are peer-edited prior to acceptance, meaning that we ask other biologists and naturalists to offer their thoughts regarding clarity and content. The style we prefer for the journal is fairly informal. We want each issue to be engaging for anyone with a little natural history background, from amateur naturalists to biologists. Complete submission guidelines on the Facebook page or on request by email.