FIRST OBSERVATIONS OF *PALAFOXIA CALLOSA* IN WASHITA COUNTY, OKLAHOMA

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ABSTRACT

Palafoxia callosa (Nutt.) Torr. & A. Gray is a critically imperiled plant that has an extremely restricted distribution in Oklahoma with all previous observations recorded from Caddo and Pontotoc Counties. Here we report the first observations of *P. callosa* in Washita County, Oklahoma. Considering the restricted distribution and limited information available on *P. callosa* in Oklahoma, additional surveys are needed to assess the population status and current threats to the conservation of this species.

Keywords: Asteraceae, **Palafoxia***, biogeography, rare species*

INTRODUCTION

Palafoxia callosa (Nutt.) Torr. & A. Gray was observed on five occasions at the same research site in Washita County, Oklahoma. The authors observed a population of individuals at the Klemme Range Research Station in Washita County, Oklahoma in September 2019 (Figure 1). Additional observations occurred in September 2016, September 2017, and July 2018 at the same site (Figure 2). A voucher specimen was collected in August 2015. These observations were the first on record for this species in Washita County, Oklahoma (Hoagland et al. 2020).

MATERIALS AND METHODS

The observations were made during routine field sampling work at a terrestrial National Ecological Observatory Network (NEON) site at the Klemme Range Research Station (35.41059, -99.05879) near the town of Burns Flat in Washita County, Oklahoma (NEON 2020b).

The voucher specimen was collected as part of standardized sampling efforts to support identification of unknown species. The voucher specimen is currently being stored in the herbarium at NEON's Southern Plains domain support facility in Denton, Texas. The conservation status of *P. callosa* was not known at the time of collection.

DISCUSSION

Palafoxia callosa is a member of the Asteraceae family. The species is an annual herb with glandular stems that reach 20-60 cm tall at maturity. The inflorescence is discoid, with pink disk flowers. Anthers are maroon to reddish purple. Leaves are linear, measuring 20-70 x 1 mm, with glandular-based hairs. The phyllaries are 3-5 x 1.4 mm. The fruit is a pappus-bearing achene (Diggs Jr. et al. 1999).

Palafoxia callosa is very similar to *Palafoxia rosea* and the two species may be confused where their distributions overlap. The main

distinctions are the width and length of the phyllaries, and the shape and length of the pappus scales. The phyllaries of *P. rosea* are longer and wider than those of *P. callosa*, and generally measure 1-2.5 x 5-10 mm long (Figure 3). The pappus scales of *P. rosea* are usually longer (1.5-8 mm long) than those of *P. callosa* (0.3-2 mm long) (Figure 4) (Strother 2020).

Palafoxia callosa has been documented in the south-central United States, occurring in Missouri, Arkansas, Louisiana, Mississippi, Oklahoma, and Texas. This species has also been documented in the state of Coahuila, Mexico (USDA 2020).

In Oklahoma, there are only two previous records of this species. There is one specimen recorded in Caddo County from 1985 and one specimen recorded in Pontotoc County in 1951 (Hoagland et al. 2020). According to NatureServe (2020) the species' global status is G4 (Apparently Secure), but for Oklahoma it has been listed as SH (Possibly Extirpated).

In September of 2020, the Oklahoma Natural Heritage Program (ONHP) confirmed that the heritage status rank for *P. callosa* was updated to S1 (critically imperiled), but the Oklahoma Natural Heritage Tracking List has not been updated to reflect this change. Additionally, ONHP stated that even though the *Flora of North America* does not include Oklahoma in the distribution description of *P. callosa*, the ONHP has decided to include this species in the next revision of *Flora of Oklahoma* (Amy Buthod, Oklahoma Biological Survey/Oklahoma Natural Heritage Inventory/Bebb Herbarium, personal correspondence 2020).

Habitat types for *P. callosa* include gravelly stream edges, rocky limestone glades and prairies (NPIN 2013). The habitat for *P. callosa* at the Klemme Range Research Station consists of short and mixed grass prairie, gravelly stream edges, and rocky outcrops (Figure 5). The site is dominated by soils in the Cordell series (USDA 2019). The Cordell soil series is characterized by gravelly, calcareous loamy soils. The soil is typically shallow and underlain by reddish sandstone and siltstone that supports vegetation adapted to arid, well-drained conditions (USDA 2019). At the Klemme Range Research Station, the associated species include *Sporobolus compositus* (Poir.) Merr., *Thelesperma filifolium* (Hook.) A. Gray, *Ratibida columnifera* (Nutt.) Woot. & Standl., *Bouteloua curtipendula* (Michx.) Torr., and *Ophioglossum engelmannii* Prantl (NEON 2020a). The population size of this taxon is estimated to be several hundred individuals at Klemme Range Research Station.

Figure 1 *Palafoxia callosa* observed in situ in September of 2019 in Washita County, Oklahoma

Figure 2 *Palafoxia callosa* observed in situ in September 2017 in Washita County, Oklahoma

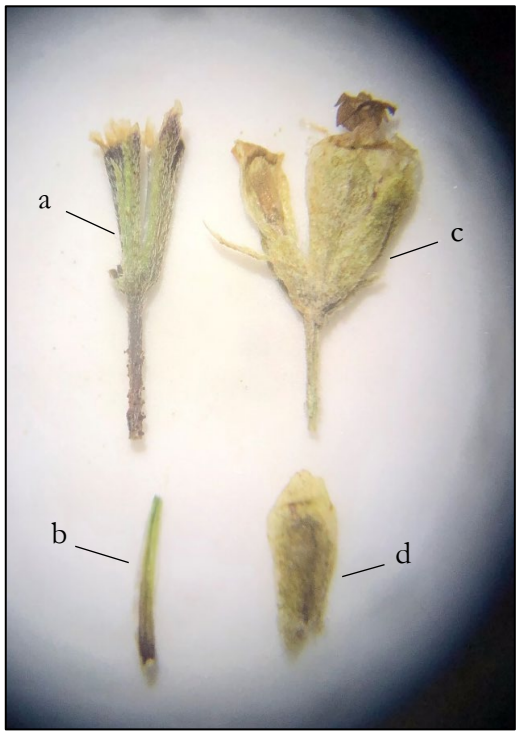

Figure 3 *Palafoxia callosa* a) phyllaries; b) a single phyllary; *Palafoxia rosea* c) phyllaries; d) a single phyllary. Voucher specimens collected in Washita County, Oklahoma in summer of 2015.

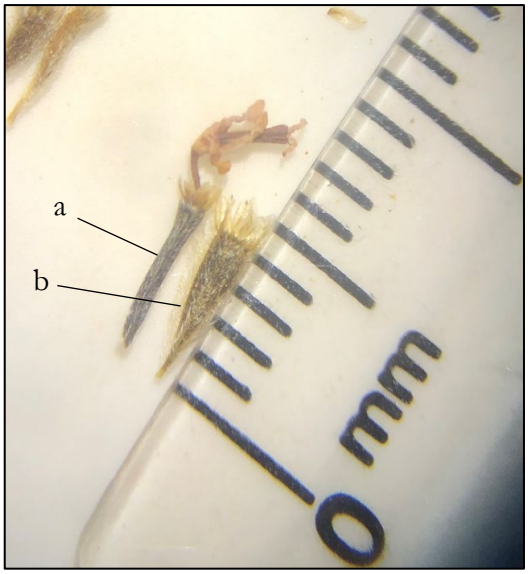

Figure 4 a) *Palafoxia callosa* achene with pappus and b) *Palafoxia rosea* achene with pappus. Voucher specimens collected in Washita County, Oklahoma in summer of 2015.

Figure 5 An example of *Palafoxia callosa* habitat during October of 2018 at Klemme Range Research Station

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