Penstemon albidus (Plantaginaceae) in the Lampasas Cut Plain Ecoregion of Texas

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ABSTRACT

We analyzed the distribution of *Penstemon albidus* Nutt. (Plantaginaceae) and found it did not occur in the Lampasas Cut Plain of Texas (LCP) as reported by The Biota of North America (BONAP) based on herbarium specimens from the LCP. Herbarium specimens from the Texas Oklahoma Regional Consortia of Herbaria (TORCH) and fieldwork on the plant were used to show that specimens were misidentified. Because of its similarity to the Central Texas endemic *P. guadalupensis,* we have observed many misidentifications based on images on the Internet, especially when leaf pubescence and/or corolla and leaf sizes cannot be closely examined or measured. Our work confirms *P. albidus* does not occur in the Lampasas Cut Plain. *Published online* ***www.phytologia.org*** *Phytologia 105(2): 25-28 (June 21, 2023). ISSN 030319430.*

KEY WORDS: *Penstemon albidus*, Lampasas Cut Plain, White penstemon, Floristics

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The type specimen of *Penstemon albidus* was collected in 1811 by Thomas Nuttall and described in 1817 (Nuttall 1818). Until 1828, plants in *Penstemon* were sometimes classified as *Chelone,* which occurred here, but was resolved by Keck (1938) when he transferred the species from *Chelone* to *Penstemon*. *Penstemon* is a large genus that has been divided into subgenera and sections. Based on pollen sac characteristics, it has been placed in the subgenus Penstemon and the section Cristati by (Freeman 2019). Within the section Cristati, it has white petal lobes or white, rarely tinged with pink to lavender petal lobes, funnelform corollas subtended by a fused calyx with lobes that are glandular-pubescent (Freeman 2019). Flowers are in inflorescences with axes that are densely glandular-pubescent (Freeman 2019). The androecium has included stamens with opposite, explanate pollen sacs and the gynoecium has a glabrous pistil (Freeman 2019). Leaves are glabrate or puberulent to scabrous with basal and proximal leaves that are mostly 7-18 mm wide with rare extremes of 4-20 mm width (Freeman 2019). Blades are oblanceolate or obovate to lanceolate (Freeman 2019).

Penstemon albidus is commonly known as white-flower beardtongue and is a widespread prairie species occurring in Canada and the USA (Freeman 2019). In the USA it occurs in Colorado, Iowa, Kansas, Minnesota, Montana, Nebraska, New Mexico, Oklahoma, North Dakota, South Dakota, Texas, and Wyoming. Freeman (2019) noted that *P. albidus* is remarkably uniform in its vegetative and floral characters throughout its range. In the southern portion of its range in Texas, it becomes difficult to distinguish from *P. guadalupensis* (Stanford 1976) and often only differs by a few mm in leaf length or scabrous pubescence. Another white-flowered specimen, *P. cobaea* has also been erroneously identified as *P. albidus,* but has much larger corollas and wider leaves (Correll and Johnston 1970; Stanford, 1976; Diggs et al. 1999; Freeman 2019). The plants bloom from April through July and rarely into September and are commonly found growing in silty, sandy loam, or gravelly soils from 300 to 1800 m in elevation (Freeman 2019). In Texas, its distribution was thought to be restricted to the Great Plains and northern

Texas (Correll and Johnston 1970) but was reported further south into the Lampasas Cut Plain in Comanche and Lampasas counties by The Biota of North America Program (BONAP; Figure 1).

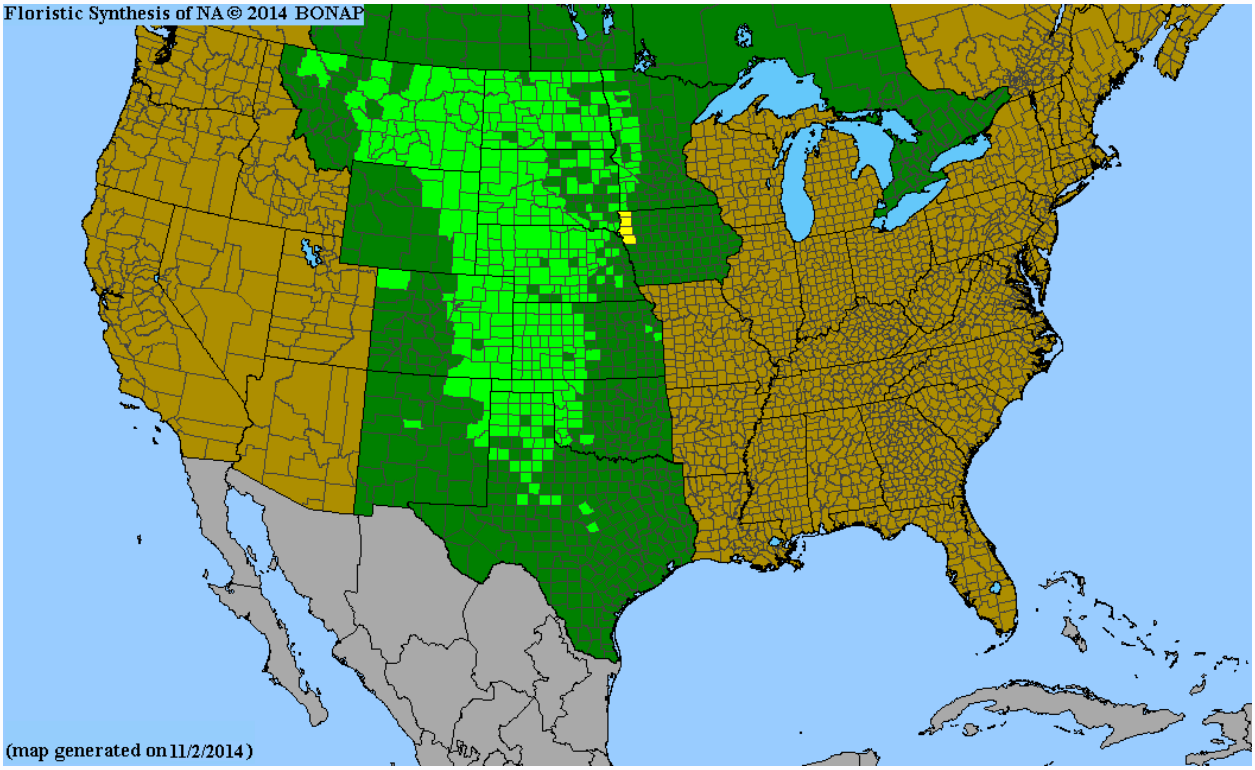

Figure 1. Map created in 2014 by The Biota of North America Program (BONAP) showing the state and county distribution of *Penstemon albidus*.

MATERIALS AND METHODS

Specimens from the Lampasas Cut Plain were examined in the field and located by a search of the Texas Oklahoma Regional Consortia of Herbaria (TORCH; Table 1). Specimens from TORCH that included digital images from the study region were examined to see that the basal leaves were less than 7.0 mm in width and that the corolla was 12-20 mm, which are important characters for identifying *P. albidus* to the species-level (Freeman 2019).

RESULTS AND DISCUSSION

We located five specimens at three herbaria in our search of the TORCH portal for counties in the LCP. Specimens from Burnet and Lampasas counties had corollas greater than 20 mm and should be annotated to *P. cobaea.* Specimens from Comanche County had basal leaves less than 7.0 mm and should be annotated to *P. guadalupensis.*

Though originally thought to occur in north Texas (Correll and Johnson 1970), Kartez (2015) mapped it further south in the Lampasas Cut Plain Ecoregion in Comanche and Lampasas counties. Our annotations of these herbarium specimens (Table 1) indicate that it does not occur in the LCP. Specimens from our search were likely used to make the BONAP map (Kartez 2015), which has resulted in confusion in identification, especially on Internet sites such as iNaturalist.

Table 1. Herbarium records from the Texas Oklahoma Regional Consortium of Herbaria for *P albidus*

Herbarium, Acronym, and Number	**Collector**	**Location**	**Date**
San Angelo State University ASU-49346	B. Nelson	Texas, Burnet County, Road to Narun	5/10/1970
Texas A&M University, S.M. Tracy TAES-46591193	B. C. Tharp	Texas, Comanche County, Comanche	4/4/1928
Texas A&M University, S.M. Tracy TAES-183926	S. & G. Jones	Texas, Lampasas County, Lampasas	4/20/1988
University of Texas TEX-00025065	B. C. Tharp	Texas, Comanche County, Comanche	4/28/1934
University of Texas TEX=00351352	Mrs. J. F. Phipps	Texas, Comanche County, C[a]omyn, Texas	1/1/1931

Data from electronic sources on the Internet like iNaturalist that use images to identify taxa and then consider them research grade determinations, once at least two identifiers agree using those images, are likely to be mistaken, unless the image quality is sufficient for the many vegetative and reproductive microcharacters used in plant taxonomy. The algorithm used by iNaturalist for all identified taxa includes scoring each identification and using the ratio between the number of cumulative identifications for that taxon over the sum of the cumulative identifications (iNaturalist contributors, iNaturalist 2023). Then, for the identified taxa that have a score over 2/3 and at least 2 identifications, the iNaturalist algorithm uses the lowest ranked taxon as the name with the caveat that an observation can lose research grade status if the community votes it down from research grade using additional identifications and associated discussion (iNaturalist contributors, iNaturalist 2023). Many plant name determinations are not conducive to image searches and we predict that generic, species, and intraspecific taxa misidentifications are high in many cases. Naming by comparison using field guides, often arranged by flower color and of limited scope rarely provide research quality determinations. Unless images show characteristics used in dichotomous keys, Internet identification is just a rapid form of photographic comparisons and corolla color matching for photogenic species, which may have a place for an amateur, but should not be used in botany classes or research projects. Relying on community science websites for proper identification for various flora and fauna would not be academically sound for peer reviewed papers or research questions. Some of those sites do provide valuable data (Merrill et al. 2021), but using them as a sole mechanism for identifications or data sets may increase errors on research questions.

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