

***SELENIA AUREA* NUTTALL (BRASSICACEAE) IN TEXAS: A REVIEW**

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ABSTRACT

The occurrence of *Selenia aurea* in Texas is fully documented. The species is thus considered a part of the flora of Texas, at least in a historical sense. Photographs of documenting specimens, circumstances involving the time and place of collection, and commentary on the history of the species in the state are included.

KEY WORDS: Brassicaceae, Cruciferae, *Selenia*, Texas, San Augustine County, San Augustine, Ayish [Irish] Bayou Settlement, Weches Formation, glades and outcrops, Melines C. Leavenworth.

Selenia is a genus of five species, four occurring in the southwestern USA and one in northeast Mexico (Al-Shehbaz 2010). Four species are recorded in Texas, two being endemic to the state, another also occurring in New Mexico, and the fourth species, *S. aurea* Nuttall, mainly distributed in the Ozark and Ouachita highlands of the southcentral USA, is considered to be of questionable occurrence in Texas. The later species was cited by Torrey and Gray (1838) and Watson (1895) as occurring in Texas and, more recently by Martin (1940), Correll and Johnston (1970), Rollins (1993), and Al-Shehbaz (2010) as probably occurring in Texas. Turner et al. (2003) excluded the species from the state. The purpose of the study is to determine if *S. aurea* can be documented in Texas and thus clarify the southwestern distribution of the species.

The major references, with commentary, concerning *Selenia aurea* in Texas include the following.

The first mention of the occurrence of *Selenia aurea* in Texas was by Torrey and Gray (1838), where it is treated as *S. aurea* var. β . The following specimen is cited: “Near St. (sic) Augustine, Texas, Dr. Leavenworth.” There are irregularities associated with the citation. Martin (1940), in citing the specimen, writes that “No sheet has been seen that corresponds to these data. There is in the herbarium of the New York Botanical Garden (from the Torrey Herbarium) a collection labeled “*Selenia aurea*. —(?) Prairies, Texas.” The question mark is in place for a word unreadable by Martin. No specific location is

given. Additionally, the St. (English or French, saint) should be San (Spanish, San, masculine of saint), as there is a San Augustine but no St. Augustine in Texas. These items will be addressed further in the discussion of the herbarium specimens cited below.

In 1895, Sereno Watson (in Gray 1895) cited the above specimen in proposing the name *Selenia aurea* var. *aperta* for var. β of Torrey and Gray. He also cited the specimen data as “Near St. Augustine, Texas, Leavenworth,” indicating that the transaction was based solely on literature.

Martin (1940) presents an excellent account of the species, which includes a summary of the circumstances of the Leavenworth specimen mentioned above. He concludes with saying that the species is “probably in Texas.” This disposition is likely the result of the inconsistencies of the Leavenworth specimen.

By inclusion in their manual, Correll and Johnston (1970) treated *Selenia aurea* as part of the flora of Texas. The distribution was given as “probably n.e. Tex.” This distribution may be taken in two ways. A northeast Texas distribution would be contiguous with the distribution (which included eastern Oklahoma and in particular, Choctaw County, which borders Texas) mapped by Martin (1940). Or possibly it may only be an expression of uncertainty, since the Texas record may not be supported by a specimen. Thus the species was included in the flora in deference to the citations by Torrey and Gray (1838), Watson (1895), and possibly Martin (1940).

Rollins (1993) questioned the exact southwest limits of the species, having not seen specimens from Texas or Louisiana. [Rollins’ mention of Louisiana has nothing to do with the present paper and was dismissed as extraterritorial (not from present day Louisiana, but from the Louisiana Purchase territory).]

The species was included as part of the flora of Texas in various checklists of the vascular flora of the state. Included here are the works of Cory and Parks (1937), Gould (1962), Johnston (1990), Hatch et al (1990), and Jones et al. (1997). There are presumably based upon literature reports, hence specimens are not cited.

Turner et al. (2003) did not map the species as part of the flora of the state in the Atlas of the Vascular Plants of Texas (Vol. 1), thereby excluding the species as part of the Texas flora.

Al-Shehbaz (2010) mentioned that “Although R.C. Rollins (1993) and R.F. Martin (1940) suggested that *Selenia aurea* probably occurs in southeastern Texas, I have not seen any material from that state.”

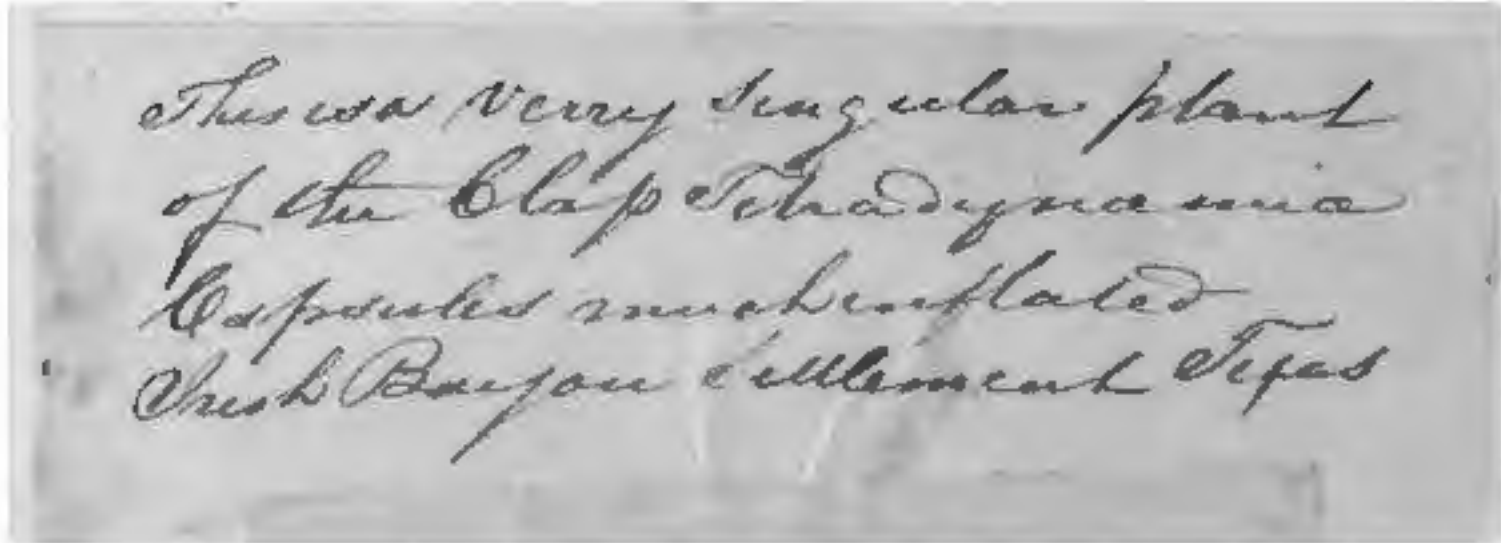
In summary, the question still remains. Only one specimen of *Selenia aurea* has been cited from the state, but the record cannot be verified because there is no specimen that corresponds to the data given (see Torrey and Gray 1838, above). In essence, the location cited by Torrey and Gray does not accompany the specimen. A specimen from Texas cited by Martin (1940) appears to be the same sheet mentioned by Torrey and Gray (1838) but with accurate label data that does not give a specific location.

The purpose of this paper is to determine if *Selenia aurea* should be considered part of the flora of Texas and thus resolve the question of the southwestern limit of distribution of the species. The research included field searches for the species in two areas of the state. This included San Augustine and Sabine counties of east central Texas, the area collected by M.L. Leavenworth in the 1830s. The second area was northeast Texas (particularly Lamar and Fannin counties), which is continuous with the distribution cited by Martin (1940) and cited as the part of the state where the species is most likely to be expected. The species was not relocated. The second part of the study was to locate and study herbarium specimens of *S. aurea* from Texas. Four specimens were located and accessed via ultra definition digital

photographs (eloans). Two of these photographs provided information important to resolving the issue and are included in this paper. The other two specimens are fragments lacking original label data.

Figure 1, from the Academy of Natural Science at Philadelphia (PH), provided the most important information. The specimen had the most plant material and a label written in the hand of the collector, Melines C. Leavenworth. There are several annotations confirming the determination as *Selenia aurea* and a label in the lower right corner stating that the specimen, originally a part of the herbarium of C.W. Short, was presented to the Academy of Natural Sciences by Short's estate in 1864.

Following is an enlarged digital copy of the label (see Fig 1).



The label, in the hand of Leavenworth, reads:

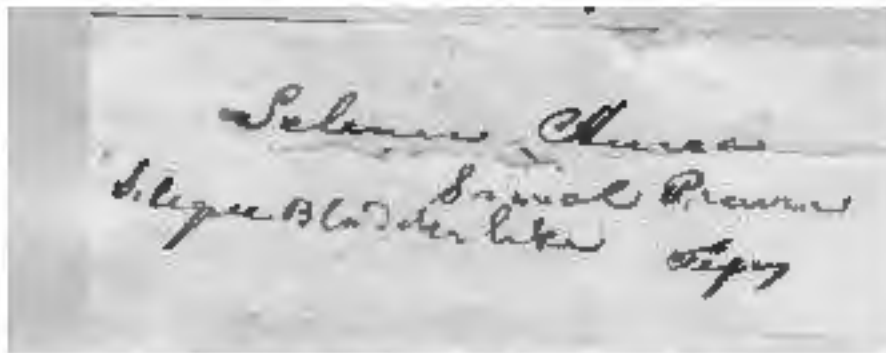
"This is a verry (sic) singular plant
of the class Tetradymania
Capsules much inflated
Irish Bayou Settlement Texas"

It is not known what is meant by "*verry singular plant* of the class Tetradymania." It probably refers to the inability to place the genus in any known "tribe" so it was given a place by itself (from Torrey and Gray 1838). Contrarily, it may only refer to the rarity of the species in Texas or that only one plant was present (but the presence of numerous individual roots makes this unlikely). Class Tetradymania was used at that time as the name of what is the Brassicaceae today. This is also the only label among the four specimens that gives a "precise" location of the collection site, Irish Bayou Settlement. Unfortunately, there is no such named place in Texas. This is, however, Leavenworth's rendering of the place named Ayish Bayou Settlement. The word Ayish seems to be the English adaptation of the name of the aboriginal people variously known as the Ais, Ayis, or Eyeish (as in Mission de Nuestra Señora de los Dolores de los Ais founded in 1716 near what is now San Augustine, [Gains & Caldwell 1995], as to the name and founding date, but not the translation of Ais). Ayish Bayou is named after the Ayish Indians, who lived next to the waterway so named. The stream originates in Shelby County, Texas, and flows south through San Augustine County (and the town of San Augustine). It is [originally] a tributary of the Angelina River, but now empties into Sam Rayburn Reservoir. Finally, the word Texas in script, with its distinctive bold slash through the x, was used in identifying the writing of Leavenworth.

A collection date is not given, but the approximate date of collection can be determined. Texas, prior to 1836, was part of Mexico. Prior to 1834, the area (now San Augustine) was known as Ayish Bayou Settlement. In 1834, the municipality of San Augustine was established by Mexican law, the name

being chosen by the Mexican government to honor San Augustine of Hippo (McCroskey 2012). If Leavenworth collected the plant before 1834, he would have cited the location as Ayish Bayou Settlement, but as San Augustine if in 1834 or later. From October 1831 to 1833, Leavenworth, a surgeon in the United States Army, was stationed at Camp Jessup (later Fort Jessup), Sabine Parish, Louisiana (McVaugh 1947). A road, [the] El Camino Real (King's Highway) connected Natchitoches, Louisiana, to the Presidio de Nuestra Señora del Pilar de los Adaes (capital of Texas from 1721 to 1763, Goins & Caldwell 1995), Camp Jessup, Ayish Bayou Settlement (San Augustine), Nacogdoches, San Antonio, then to Mexico. The distance between Camp Jessup and Ayish Bayou Settlement (San Augustine) is approximately 80 km, as measured on today's highways, Louisiana Highway 6 and Texas Highway 21. These basically follow the path of the original El Camino Real. McVaugh (1947) mentioned that nothing is known about Leavenworth's botanical activities during this tour of duty at Camp Jessup, but it certainly does not preclude that he could have traveled to Ayish Bayou Settlement. When considered in view of the renaming of the settlement as San Augustine, a collection date of 1831-1833 is probable.

The second specimen (Figure 2) of note is from the Torrey Herbarium of the New York Botanical Garden (NY Specimen ID: 1477274). It is not known how NY obtained this specimen, but most likely it was sent to Torrey by Short and is a duplicate of the Leavenworth specimen discussed above. Following is a digital copy of the label (see Fig. 2).



The label does not give a specific location, collector, or date. The handwritten Texas, with the boldly slashed x, clearly reveals the handwriting of Leavenworth, thus the collector. The first line of the label gives the plant name. The second line, not understandable by Martin (1940) and is referenced in his paper as "(?) Prairies" is translated here to "gravel." Thus the complete phrase is "Gravel (sic) Prairies," which does not refer to a place name, but to the gravelly nature of the surfaces of rock glades/outcrops of the Weches Formation in this part of Texas, the habitat of the species. The rock glades, consisting of glauconite, sandstone, and/or ironstone, were (and are) devoid of trees and appeared as "prairies" in the virgin forest of the time. The surfaces are strewn with gravel. [Indications are that Leavenworth has some peculiarities of spelling, as in "verry" above and now "gravel."] On the third line, prior to Texas, is written "Silique Bladder like."

Apparently, this is the specimen cited by Torrey and Gray (1838) as "Near St. (sic) Augustine, Texas, Dr. Leavenworth," as it appears to be the only specimen that they had access to. Obviously, since the specimen does not give a specific location, the location cited in Torrey and Gray (1838) was obtained from another source. In doing so, Torrey and Gray (1838) erred in citing the name as St. Augustine rather than San Augustine. The addition of the word "near" possibly reflects uncertainty as to if Ayish Bayou Settlement was incorporated into San Augustine in 1834. The failure to transcribe the label data accurately without giving indication of such in the manuscript and/or failure to enter this on the herbarium sheet maybe the root cause of the uncertainty concerning the occurrence of the species in Texas.



Figure 1. *Selenia aurea* (M.C. Leavenworth s.n.). Photo from Herbarium PH, Botany Department, Academy of Natural Sciences, Philadelphia. Information provided with the permission of The Academy of Natural Sciences.



Figure. 2. *Selenia aurea* (M. C. Leavenworth s.n. Courtesy of the C.V. Starr Virtual Herbarium of The New York Botanical Garden

There are two additional specimens at the New York Botanical Garden (NY Specimen ID 1477275 and 1477276). These sheets, both containing fragments of a fruiting branch, have "C.W. Short M. D." labels identifying the specimens as being from Texas. This may be in the hand of C.W. Short, but is definitely not in the hand of Leavenworth. This seems to support that these fragments were part of the original Leavenworth collection and were distributed as follows. New York Specimen ID: 1477275 was originally given to Princeton University and incorporated into NY in 1945 while NY Specimen No. 1477276 was given to Wesleyan University and deposited in NY in 1981.

In summarizing the findings obtained through study of the digital photographs, we consider the following to be important.

1. Four specimens were located, two having original data important to the study, while the other two had no original information.
2. In our opinion, all specimens are duplicates of the same collection (unicate) made between 1831 and 1833. The specimens were sent to C.W. Short, who distributed fragments to other herbaria.
3. The collection was made at or near Ayish Bayou Settlement (now San Augustine, San Augustine County), Texas. The collection was split as noted.
4. The specific habitat was a rock outcrop/glade of the Weches Formation.

The one specimen from the Academy of Natural Sciences (PH), which has been historically documented in this paper, verifies the historical occurrence of *Selenia aurea* in Texas. The Torrey specimen (NY Specimen ID: 1477274) provides corroborative information. Thus, the southwestern limits of the species include central deep east Texas.

Finally, comments on the possibility of rediscovery of the species in Texas are appropriate. In short, this is highly unlikely, largely because of habitat loss, the rock outcrops/glades of this part of Texas having been mined for rock used on local roads. Those remaining intact are in less than pristine condition, largely due to invasion by non-native woody plants such as *Rosa bracteata* (Rosaceae), *Ligustrum sinense* (Oleaceae), and *Lonicera japonica* (Caprifoliaceae) or are privately held, thus have limited or no access. However, the hope remains that the species may still be found in the state, probably in northeast Texas.

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