

**A NOTABLE RANGE EXTENSION FOR *SHINNERSIA RIVULARIS*
(ASTERACEAE, EUPATORIEAE) IN TEXAS**

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ABSTRACT

Previously known in Texas from only a few spring systems in Kinney, Uvalde, and Val Verde counties, the aquatic angiosperm *Shinnersia rivularis* is here reported from several sites in Kimble County, Texas, where it occurs in both submersed and emergent stands in and along the Llano and South Llano rivers. This report documents a range extension of ca. 140 km and the first known occurrence of the species in a river system of the Edwards Plateau natural region of Texas.

Despite estimates that put the total number of flowering plant species as high as 352,000 (Paton et al. 2008), surprisingly few of these species are well-adapted to the aquatic habitat. In Texas, the Rio Grande bugheal, *Shinnersia rivularis* (A. Gray) R.M. King & H. Rob., is the sole member of the large and diverse family Asteraceae that is a true hydrophyte, occurring as both submersed and emergent individuals in several spring systems in the southwestern part of the state. The species is easily recognized in the field by its distinctive growth habit and its abundantly produced, characteristic inflorescences (Fig. 1).



Figure 1. Capitula of *Shinnersia rivularis* from the South Llano River, Kimble Co., Texas (photo by D.E. Lemke).

Shinnersia rivularis was originally described (as *Trichocoronis rivularis*) by Asa Gray from specimens collected in northern Mexico by Lewis Edwards and Josiah Gregg (Gray 1849) and placed in his newly erected genus *Trichocoronis*, along with *T. wrightii*, a species of the Texas coastal plain (Turner et al. 2003). The species remained in *Trichocoronis* until segregated as a monotypic genus by King and Robinson (1970) on the basis of differences in inflorescence and corolla morphology, size of the involucre, and characteristics of the fruit and the pappus. Although many workers have continued to place the species in *Trichocoronis* (e.g., Correll & Correll 1975; Turner et al. 2003; Poole et al. 2007), Nesom recognized the genera as morphologically distinct in his Flora of North America treatments (Nesom 2006a, 2006b), and a recent molecular study (Tippery et al. 2014) also has provided data supporting the recognition of *Shinnersia* as distinct from *Trichocoronis*.

The first published record of *Shinnersia rivularis* (as *T. rivularis*) from Texas is in Asa Gray's *Plantae Wrightianae*, where the species was described as occurring "in the outlet of a spring tributary to the San Felipe; blooming profusely both above and beneath the surface of the water" in what is now Val Verde County (Gray 1852). Since that time, *S. rivularis* has also been collected from springruns in Uvalde and Kinney counties, Texas (Poole et al. 2007). The species is particularly abundant in the upper portion of San Felipe Creek below San Felipe Springs in the city of Del Rio (documented by numerous collections at TEX-LL) and at Soldiers Camp Springs along the Nueces River in western Uvalde County (Brune 1981), where it has been observed by the first author and collected by W.R. Carr (*Carr 18821*, TEX). The present report, based upon the specimens cited below, documents a range extension of approximately 140 km and the first report of the species from a river system, as opposed to a springrun, in the Edwards Plateau natural region of the state.

Voucher specimens. Texas. Kimble Co.: South Llano River State Park, near the day use area, 0.4 mi N of headquarters building, 11 Apr 2009, *Hansen 6388* (TEX); Junction City Park along the N bank of the South Llano River, ca. 150 yards downstream of dam spillway with *Salix*, *Melia*, *Platanus*, *Juglans*, *Justicia*, *Andropogon*, grasses, weeds, 30°29'25.58" N, 99°45'33.57" W, 7 Apr 2011, *Reed 3410* (TAMU); Junction City Park along the N bank of the South Llano River, ca. 150 yards downstream of dam spillway with *Bacopa*, *Ludwigia*, *Hydrocotyle*, *Eleocharis*, *Myriophyllum*, *Veronica*, 30°29'25.58" N, 99°45'33.57" W, 8 Apr 2011, *Reed 3411* with Lemke (TAMU).

In addition to the collections cited above from the South Llano River, *Shinnersia rivularis* has been observed and photographed downstream in the Llano River, a short distance below the confluence of the North and South Llano rivers.

In both the South Llano and Llano rivers, *Shinnersia rivularis* forms extensive mats of submersed and emergent plants (Figs. 2–4). As an emergent, the species has been found growing in association with *Justicia americana*, *Bacopa monnieri*, *Hydrocotyle umbellata*, *Ludwigia peploides*, *Veronica anagallis-aquatica*, and *Eleocharis* spp. When growing submersed, *S. rivularis* typically forms dense, tangled mats that are only sporadically punctuated by other submersed macrophytes, such as *Potamogeton illinoensis* or *Myriophyllum heterophyllum* (Fig. 5). In the Llano and South Llano rivers, flowering has only been observed in emergent individuals, in contrast to the situation at San Felipe Creek, where capitula are commonly produced beneath the water surface.



Figure 2. Habitat of *Shinnersia rivularis* in the Llano River, Kimble Co., Texas, below the confluence of the South Llano and North Llano rivers. Emergent plants can be seen in the left foreground and submersed plants in the right foreground (photo by D.E. Lemke).



Figure 3. Flowering individual of *Shinnersia rivularis* in the Llano River, Kimble Co., Texas. Only emergent plants were seen to flower at this locality (photo by D.E. Lemke).



Figure 4. Dense submersed mat of *Shinnersia rivularis* in shallow water of the Llano River, Kimble Co., Texas (photo by D.E. Lemke).



Figure 5. Closeup of submersed mat of *Shinnersia rivularis* growing with *Potamogeton illinoensis* in the Llano River, Kimble Co., Texas.

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