A NEW SPECIES OF CARDAMINE (BRASSICACEAE) FROM SOUTH-CENTRAL TEXAS

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ABSTRACT
A novel taxon, Cardamine carrii B.L. Turner, sp. nov., is described from the Edwards Plateau of south-central Texas (Uvalde and Kinney counties). It appears to belong to the C. auriculata complex (sensu Rollins 1940, 1993), having the fractiflex capitul escences of that assemblage, within which it most resembles C. macrocarpa, a species of trans-Pecos Texas and Coahuila.

KEY WORDS: Cardamine macrocarpa, Brassicaceae, Texas, Kinney County, Uvalde County, Kickapoo Cavern State Park

Identification of new collections of various taxa, especially in attempts to keep up-to-date my Atlas of Texas Plants (Turner et al. 2003), has occasioned the present paper.

CARDAMINE CARRII B.L. Turner, sp. nov. Fig 1. TYPE: USA. Texas. Kinney Co.: Kickapoo Cavern State Park, ca. 400 ft NW of BM 1822, ca. 1700 ft SE of windmill at BM 1717, SW ¼ of park, 29º 35’ 48” N, 100º 27’ 25” W, clay loam and duff over rock rubble on slope at shaded base of NW-facing limestone bluff, 1700-1720 ft, 20 Apr 1990, W.R. Carr 10,458 (holotype: TEX; isotype TEX).

Annual herbs, glabrous, 10–20 cm high. Taproots slender, delicate. Basal leaves glabrous, mostly 3–6 cm long, not persisting; petioles 2–4 cm long; segments broadly ovate in outline, the terminal segment mostly 1.5–2.0 cm long, and as wide, 3-nerved from the very base, their margins irregularly lobate. Cauline leaves mostly 3–8, 5–8-foliate, 6–10 cm long, 4–5 cm wide; petioles 3–4 cm long. Inflorescence mostly a weakly ebracteate, divaricately branched, terminal raceme 6–10 cm long. Sepals 4, lanceolate, glabrous, ca 2 mm long, 0.5 mm wide. Petals 4, white, linear, ca 2 mm long, 0.5 mm wide. Stamens 6 (4 long, 2 short); filaments (longer) ca 2 mm long, their anthers ca 0.75 mm long. Capsules glabrous, 3–4 cm long, 1.0–1.5 mm wide; pedicels 3–5 mm long. Seeds 20–25 per capsule, ovoid, tan, minutely rugose, ca 1.5 mm long, 1.0 mm wide.

Additional specimens examined. USA. Texas. Kinney Co.: Kickapoo Cavern State Park, E facing limestone slope in Pine Canyon, ca 2800 ft E of BM 1914 near S boundary of park, locally common, with Poa bigelovii and Parietaria obtusa in shallow clay loam and leaf litter under guajillo and pinyon pine, ca 1840 ft, 19 Apr 1990, Carr 10,445 (TEX). Uvalde Co.: ca. 1.7 airmiles W of FM 2690 bridge, on the Annandale Ranch, 29º 26’ 49” N, 99º 41’ 33” W, 1260-1270 ft, 9 Apr 1997, Carr 16050 (TEX); 3.4 airmiles S of low water crossing at Concan, 2.2 airmiles W to WSW of jct. FM 2759 and State Rte. 127, 29º 26’ 48.4” N, 99º 41’ 57.2” W, 1260 ft, 11 Apr 2007, Carr 25737 (TEX); 0.2 mi past the entrance to the Wittig Ranch on the left side of road, 2 Feb 1987, Wittig 7509 (TEX).

The species is named for the exceptional Texas botanist, William [Bill] R. Carr, well known for his carefully assembled specimens from throughout the state, including four of the five known collections of the new species.
Figure 1. *Cardamine carrii* (isotype, TEX).
Figure 2. Distribution of the Cardamine auriculata complex.

Figure 3. Distribution of Cardamine carrii and C. macrocarpa in Texas.
Cardamine carrii presumably belongs to the C. auriculata complex of species (Fig. 3), all of which have fractiflex branching (sensu Rollins 1940). The following key to the complex should serve to identify the novelty:

1. Terminal leaflet much larger than the lateral leaflets; stems hirsute with trichomes 1–2 mm long ................................................................. Cardamine mexicana

1. Terminal leaflet about equal to the lateral leaflets; stems glabrous, or nearly so.

2. Petals emarginate; pedicels 1–2 cm long ........................................... Cardamine longipedicellata

2. Petals entire, not emarginate; pedicels less than 1 cm long.

3. Petals strap-shaped, 5–8 mm long, ca 1 mm wide; siliques ca 1.5 mm wide; pedicels 5–8 mm long ................................................................. Cardamine macrocarpa

3. Petals linear, ca 2 mm long, 0.5 mm wide; siliques 1.0–1.4 mm wide; pedicels 3–5 mm long ................................................................. Cardamine carrii

Previous botanists, including Rollins (1993) and Turner et al. (2003), have identified Cardamine carrii as C. macrocarpa Brandegee var. texana Rollins (the type from Brewster Co., Texas). Al-Shehbaz et al. (2010) noted that “The characters by which var. texana is said to differ from var. macrocarpa are artificially drawn, and the style length, presence or absence of indumentum on the pedicels, and degree of flexuosity of the raceme rachises do not correlate and can vary within a given area. For these reasons, we do not recognize infraspecific taxa in Cardamine macrocarpa.”

Al-Shehbaz et al. (2010) also noted that in the USA “Cardamine macrocarpa is known from the Chisos Mountains, Brewster County.” A recent collection of the taxon, however, presumably not examined by the authors, has been collected from eastern Jeff Davis County, as indicated in Figure 2.

Jeff Davis Co.: on Nations Ranch, ca. 0.8–1.0 airmiles SSW of summit of Bear Cave Mountain, rare in gravel and on rock outcrops … rhyolite canyon at NE tip of Bear Mountain, ca. 5600-6000 ft, 31 Aug 1997, Carr 1492 (TEX).

Branching of the inflorescence of Cardamine carrii in early flower is not as fractiflex as occurs in C. macrocarpa, but more aged racemes are often considerably so (e.g., Carr 10445, 10458). At least one reviewer of the present paper suggested that the novelty might best be treated as but a variety of C. macrocarpa, but the distinctions of C. carrii from the latter are as distinct as those of yet other specific taxa of the C. auriculata complex, and I find no suggestion that the two taxa intergrade, much less grow together. In short, C. carrii is easily recognized by its distinctive foliage (larger leaves with fewer broader segments), fruits (slender, on short pedicels) and flowers (very small, the petals ca 2 mm long), and the distinctive soil and habitat of the Edwards Plateau.

So far as known, Al-Shehbaz et al. (2010) did not examine material of Cardamine carrii, none of the sheets on file at TEX having been annotated by the workers concerned.

Cardamine carrii is unlikely to be a weedy or introduced taxon (as the possibility occurred to me in my ignorance of the genus as a whole), since it occurs in natural habitats in association with the rare pine tree, Pinus remota (Little) Bailey & Hawksworth [Texas pinyon]. As noted by Little (1966), “the pinyons of Edwards Plateau [Edwards and Kinney counties] are relics of a more widespread pinyon-juniper woodland” dating back to Pleistocene times, and perhaps earlier. In the company of Jana Kos, I attempted to locate the novelty anew, but was unable to, largely because of its apparent rarity and my inability to negotiate the terrain sampled by Carr. Nevertheless, it was obvious from our field observations that C. carrii was nearly always associated with Pinus remota or its habitat.
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LITERATURE CITED