

A NEW SPECIES OF *ERIOGONUM* (POLYGONACEAE) FROM SOUTH TEXAS

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ABSTRACT

Eriogonum riograndis, sp. nov., is segregated from plants previously identified as *E. multiflorum* Benth. The new species is known from 17 counties of the Rio Grande plains in south-central Texas. *Eriogonum riograndis* differs from *E. multiflorum* in its broader leaves with auriculate-subclasping bases (vs. attenuate, non-clasping leaf bases) and its involucre with more numerous flowers (22–28(–36) vs. 6–12(–15) flowers). The two taxa are primarily allopatric and sharply discontinuous in morphology. Putative intermediates have been observed in three counties. Both species are distinct from the apparently closely related *E. annuum* Nutt. in their longer peduncles, sparsely tomentose and glabrescent involucre, and cordate perianth lobes.

RESUMEN

Eriogonum riograndis, sp. nov., se segrega de las plantas identificadas previamente como *E. multiflorum* Benth. La nueva especie se conoce de 17 condados de las llanuras de Río Grande en el sur-centro de Texas. *Eriogonum riograndis* difiere de *E. multiflorum* en sus hojas más anchas con bases auriculado-semiabrasadoras (en vez bases de las hojas atenuadas, no abrazantes) y sus involucros con flores más numerosas (22–28(–36) vs. 6–12(–15) flores). Los dos taxa son primariamente alopátricos y fuertemente discontinuos en su morfología. Se han observado intermedios putativos en tres condados. Ambas especies son distintas del aparentemente muy relacionado *E. annuum* Nutt. Por sus pedúnculos más largos, involucros esparsamente tomentosos y lóbulos del perianto glabrescentes, y cordados.

The Texas species of *Eriogonum* Michx. were treated in detail by Reveal (1968, 1970), who observed (1968, p. 203) that *E. multiflorum* Benth. and *E. annuum* Nutt. “are the most frequently collected species in the state and collectively the most widely distributed species.” Together, they constitute subg. *Micrantha* (Benth.) Reveal (Reveal 1969). Reveal provided a set of detailed morphological contrasts to distinguish these two taxa, noting that their difference in perianth lobe shape allows easy identification. He did not call attention to significant infra-specific variation in either species.

The present study finds that plants previously identified as *Eriogonum multiflorum* can be separated into two, morphologically distinct sets of populations. Those occupying the largest part of the range in Texas, along with those from peripheral localities in northwestern Louisiana, southwestern Arkansas, and south-central Oklahoma (Fig. 2), are identified here as typical *E. multiflorum*. The type collection of *E. multiflorum* (Bentham, Trans. Linn. Soc. London 17:413. 1837) was made in 1833 by Thomas Drummond (Drummond

“between Brazoria and San Felipe de Austin,” perhaps in what is now Austin County (from where a modern collection of *E. multiflorum* also has been made). An illustration based on the Drummond type material, presumably at K (Hook. Icon. Pl. 3, t. 250. 1840) shows leaves with non-clasping bases and the description notes “Involucres with about 6–9 flowers”—these features (see below) along with the general habit unambiguously establish the identity of the species. Observation of additional type material of *E. multiflorum* (GH photocopies; isotype and syntypes fide annotations by J. Reveal in 1967) corroborate this. Plants identified as *E. multiflorum* in the Rio Grande plains of southern Texas represent a previously undescribed species.

Eriogonum riograndis Nesom, sp. nov. (Figs. 1, 2). TYPE: U.S.A. TEXAS. SAN PATRICIO CO.: 9 mi E of Sinton, Welder Foundation Research Area, near headquarters buildings, grassy field along swale and in swale, 28 Oct 1958, F.W. Gould 8510 (HOLOTYPE: BRIT-SMU; ISOTYPES: TAESI, UC).

Eriogono multifloro Benth. similis duratione annua, caulibus foliosis tomentosus, periantho stipitato, et lobis externis perianthii oblongi-cordatis; differt foliis majoribus ad basim auriculati-subamplectentibus et involucris floribus plus numerosis.

Annual or biennial herbs from a taproot, eglandular. **Stems** erect, 2.5–6(–11, –20 fide Reveal 1970, Richardson 1995) dm tall, usually unbranched until the inflorescence, closely but loosely gray-white and persistently woolly-tomentose. **Leaves** mostly on the lower 3/4–4/5 of the stem, basal not persistent, alternate, oblong-obovate to oblong-elliptic or oblong, epetiolate and shallowly auriculate-subclasping, apex rounded to obtuse, 15–40(–45) mm long, 10–22(–25) mm wide, margins flat or narrowly revolute, entire but often closely undulate, upper surface lightly but persistently woolly-tomentose, lower surface densely and persistently white- to tawny-tomentose. **Inflorescences** cymoid, usually relatively compact. **Involucres** on peduncles 2–5 mm long, turbinate to turbinate-campanulate, 2–2.8 mm high, 2–3 mm wide, 5(–6)-lobed, externally sparsely but persistently tomentose to glabrate, internally densely tomentose. **Flowers** 22–28(–36) per involucre, exerted from the involucre on filiform pedicels. **Perianth** bright white to pinkish, maturing or drying orangish, externally glabrous, internally sparsely tomentose; perianth lobes dissimilar, outer lobes basally cordate and broadly oblong to oblong-elliptic, 2–2.7 mm long, 1.5–2.2 mm wide, midrib thick from base to apex, inner lobes linear, 0.1–0.2 mm wide. **Fruits** dark brown to red-brown, 1.9–2.2 mm long, not winged, glabrous.

Habitat and phenology.—Fields, pastures, roadsides, mesquite prairies, oak woodlands, and other open habitats, sandy soil; (Aug–)Sep–Nov(–Dec).

Distribution.—The distribution of *Eriogonum riograndis* (Fig. 2) corresponds to phytogeographic pattern #17 of Sorrie and Weakley (2001): South Texas-Northeast Mexico Mesquital. They note that “The northern portion is commonly denoted as the South Texas Plains, but ecologically the whole area



FIG. 1. Habit and details of *Eriogonum riograndis* (from holotype, BRIT).

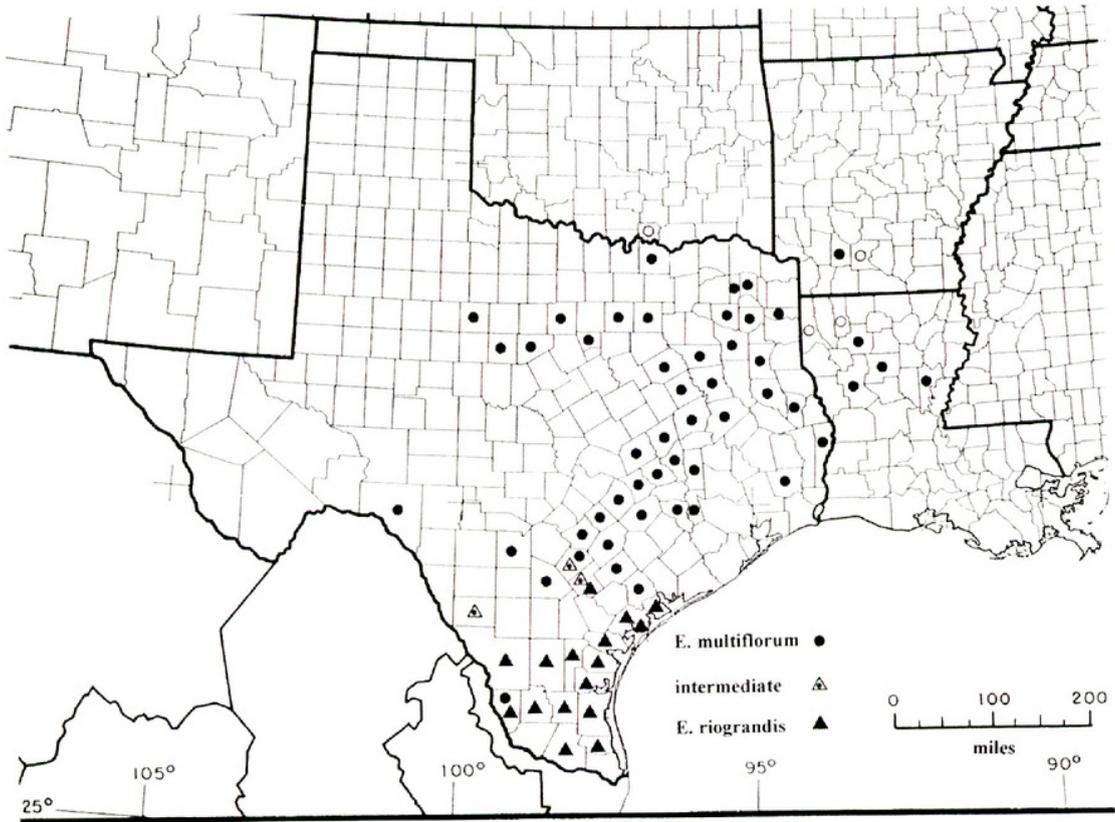


FIG. 2. Geographic distribution of *Eriogonum riograndis* and *E. multiflorum*. Records are from BRIT-SMU, CAMU, OKLA, TAES, TEX-LL, and VDB. Open symbols represent records from collections not seen in this study but added from Smith (1988) and MacRoberts (1989) and from photocopies of Oklahoma specimens from OKLA.

is more properly termed the Tamaulipan Scrub region, or Tamaulipan Mesquital, due to the dominant shrubby vegetation, especially *Prosopis glandulosa* Torr. ..." (Sorrie & Weakley 2001, p. 61). The distribution of the recently described *Pseudognaphalium austrotexanum* Nesom (Nesom 2001) also fits the same phytogeographic pattern. Reveal (1970) noted that *E. multiflorum* occurs in Mexico; presumably this would be *E. riograndis* in the interpretation here, but a specimen documenting the Mexican distribution has not been seen in the present study.

Etymology.—The appositive epithet refers to the central geographic feature in the range of the new species, the Rio Grande (river).

Additional collections examined. **U.S.A. Texas. Aransas Co.:** 4.7 mi E of Rockport, 19 Sep 1936, *Parks and Cory* 20336 (TAES); Aransas Refuge, 30 Sep 1944, *Cory* 45936 (TAES); St. Joseph Island, irregular dunes beyond back beach, 7 Nov 1964, *Andrews* 72 (TEX); Aransas Wildlife Refuge, sandy soil at Equipment Shed, 18 Sep 1968, *Fleetwood* 9317 (LL); sandy soil along Hwy 35 ca 5 mi N of Rockport, 26 Sep 1981, *Brown* 5421 (TAES); 1/2 mi N of Goose Island State Park on Park Road 13, common in clearing in oak woodland, 29 Dec 1982, *Fryxell* 3836 (BRIT, TEX). **Brooks Co.:** 3 mi E of Encino, 6 Jul 1935 [sterile], *Parks and Cory* 141421 (TAES); 14 mi S of Falfurrias, sandy oak region, 15 Sep 1942, *Lundell* 11941 (LL); a few mi E of Jim Hogg Co. line on Rd 755, loose sand prairie, 13 Sep 1954, *Johnston* 541455

(TEX); 4 mi SE of King Ranch, Encino Division Headquarters, in deep, loose sand blow-out area, 18 Nov 1954, *Gould and Morrow 6705* (SMU, TAES, TEX); 15 mi E of Hebbronville on State Hwy 285, in Pleistocene gravel, 25 Nov 1962, *Dohnke 6* (SMU, TEX); 12 mi E of Hebbronville, Hwy 285, 10 Nov 1962, *Solis 48* (TAES, TEX); 4.6 mi S of FR 2191 (extension) from its jct with TX 285, Mariposa ranch gate, SE of Falfurias, open hillside to edge of oak mott with deep sandy soil, 31 Oct 1990, *S. & G. Jones 6081* (VDB). **Calhoun Co.:** Matagorda Island, 1955, *Ball s.n.* (TAES); Matagorda Island, access road from air base HQ to beach at end of island, ca 2 mi E of base, 22 Jul 1973 [not flowering], *Hartman 3722* (TEX). **Duval Co.:** Benavitas, 340 ft, 12 Aug 1941, *Fisher 41101* (TEX). **Hidalgo Co.:** N of Edinburg, 11 Nov 1942, *Walker 126* (LL); ca. 30 mi N of Edinburg, in sand, 23 Aug 1944, *Whitehouse 44,276* (SMU); Bentsen Ranch, 10 mi N of Edinburg, in sand, 2 Nov 1973, *Everitt s.n.* (SMU); La Reforma Training Area (Texas National Guard), N end of Sector C, openings in mixed mesquite-blackbrush shrubland on dry level upland, 6 Oct 1993, *Carr 13177* (TEX); La Reforma Training Area (Texas National Guard), along main N-S road, 1.4 road mi N of gate 24, grazed grassland on gently rolling upland with scattered mesquite, 255 ft, 25 Oct 1994, *Carr 14302* (TEX). **Jim Hogg Co.:** State Hwy 285 E of Thompsonville, in light brown loose sand, 11 Nov 1962, *Ramirez, Alva, and McCart 8708* (SMU, TAES, TEX); 10 mi N of La Gloria on Texas Farm Rd 1017, 15 Oct 1990, *Miller, Brant, & Noyes 5811* (VDB); E side of FM 1017, 3.0 road mi S of jct with smaller road at Agua Nueva, ca. 450 ft, occasionally mown grassland in deep loose sandy soil, roadside, 7 Oct 1993, *Carr 13208* (TEX). **Jim Wells Co.:** sandy loam in dry lake, Romarsid Ranch, 1 Nov 1943, *Freeborn 142* (TEX). **Karnes Co.:** 2 mi S of Karnes City, frequent in dry, deep sandy soil, fallow field, 27 Oct 1952, *Johnson 1010* (LL, SMU, TAES); 3 mi NE of Kenedy, dry Escondido Creek, infrequent in dry sandy loam soil, 25 Jul 1954 [very early bud], *Johnson 1618* (SMU). **Kenedy Co.:** 18.7 mi N of Raymondville, frequent along road in sandy soil, 2 Dec 1945, *Cory 51495* (SMU); Norias Division of King Ranch, Saltillo Pasture, 14 Sep 1953, *Johnston s.n.* (TAES, TEX), 17 Sep 1953, *Johnston s.n.* (TAES, TEX), 24 Nov 1953, *Johnston s.n.* (SMU, TAES, TEX); 18 mi S of Riviera, dune area, 12 Oct 1952, *Morrow and Nord 19* (TAES); Norias Division of King Ranch, SE corner of ranch, open sandy coastal plain, 23 Sep 1958, *Lundell and Correll 15155* (BRIT, LL); 3.4 mi N of Armstrong, fine gray sand, 6 Nov 1953, *Shinners 17082* (SMU). **Kleberg Co.:** Padre Island, 17 Nov 1940, *Cory 36795* (SMU), *Cory 36796* (TAES), *Cory 36797* (TAES), *Cory 36798* (SMU), *Cory 36799* (TEX); Kingsville, summer 1940, *Sinclair s.n.* (TEX); Laureles Division of King Ranch, loose sand, 15 Sep 1953, *Johnston s.n.* (TEX), 29 Nov 1953, *Johnston s.n.* (TEX); Brooks County line on Road No. 285, loose sand mesquite prairie, 14 Sep 1954, *Johnston 541513* (SMU, TEX); Padre Island National Seashore, end of service road to dump area, small stabilized dunes near margin on brackish back island pond, 14 Oct 1989, *Lemke 3009* (TEX). **Nueces Co.:** Copano Bay, 5 Oct 1922, *Tharp 1552* (TEX); Corpus Christi, 18 Dec 1935 [past fruit], *Parks 17437* (TAES), *17438* (TAES); Mustang Island, loose sand, 26 Oct 1954, *Hildebrand 82* (TEX); Mustang Island, sand dunes 300 yds from Gulf, 11 Nov 1965, *Crutchfield 1027* (LL); Mustang Island cemetery, Port Aransas, sandy soil near fence, 14 Oct 1967, *Gillespie 110* (TEX); Mustang Island, Shamrock Bay area, west side of island, 29 Jul 1967, *Gillespie 200* (TEX); Mustang Island State Park, NW of Park Rd 53, 500 ft SW of Corpus Christi Pass, dry sand along elevated margin in tidal flat, 500 ft, 20 Oct 1989, *Carr 10158* (TEX). **Refugio Co.:** Black Jacks below Austell, 4 Dec 1928, *Phipps s.n.* (TEX). **San Patricio Co.:** 1.8 mi SW of Aransas Pass, 19 Sep 1936, *Parks and Cory 20338* (TAES); 4 mi SW of Ingleside, 19 Sep 1936, *Parks and Cory 20339* (TAES); 2 mi SE of Ingleside in deep fine sand, 2 Oct 1950, *Jones 383* (SMU); 1 mi S of Ingleside in deep fine sand, 8 Jun 1951 [pre-flowering], *Jones 565* (SMU); Welder Wildlife Refuge ca. 13 mi E of Sinton, high banks above Aransas River in Mare Trap Pasture, occasional in tight sandy loam, 29 Sep 1956, *Rowell 5212* (SMU). **Webb Co.:** 3 mi S of Mirando City at Los Ojuelos, in grayish black loose sand, 10 Oct 1961, *Magnon and Rodriguez 14* (SMU). **Willacy Co.:** Yturria, 50 ft, 6 Aug 1924 [not in flower], *Runyon 665* (TEX); along hwy from Yturria Station north, 24 Sep 1937, *Runyon 1808* (TEX); Yturria, open dry sandy ground, 10 m, 22 Sep 1939, *Runyon 4237* (TEX); Raymondville, 5 Jul 1941, *Shiller 759* (TAES, TEX); Sauz Ranch, sand, 23 Nov 1953, *Johnston and Davis s.n.* (SMU, TAES, TEX). **Zapata Co.:** 7 mi N of Zapata, US Hwy 83, 15 Nov 1961, *Munoz, McCart, and Cabrera 39* (SMU, TEX).

Eriogonum multiflorum and *E. riograndis* can be distinguished by a simple visual inspection relying primarily on leaf morphology. A count of flowers per involucre, usually requiring low magnification, confirms their distinction. Morphological differences between the two are summarized in the following contrast.

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|---|------------------------------|
| 1. Leaves oblong-obovate to oblong-elliptic or oblong, 1.5–4(–4.5) cm long, 10–22(–25) mm wide, auriculate-subclasping at the base, upper surfaces persistently tomentose to weakly glabrescent, usually grayish; flowers 22–28(–36) per involucre | Eriogonum riograndis |
| 1. Leaves mostly narrowly elliptic-lanceolate to narrowly lanceolate, 2–5(–8) cm long, 3–9(–15) mm wide, attenuate at the base, rarely rounded, but not auriculate-subclasping, upper surfaces glabrescent to glabrate, commonly reddish; flowers (6–)9–12(–16) per involucre | Eriogonum multiflorum |

These two taxa are similar in habit and overall morphology, and they apparently have a sister relationship. *Eriogonum riograndis* is similar to *E. multiflorum* in its annual duration, leafy and tomentose stems, cymose inflorescence with pedunculate involucre, stipitate perianth internally pubescent but externally glabrous, and dissimilar perianth lobes (outer oblong-cordate, inner linear). They have similar phenologies and both occur in sandy habitats. As a pair, these taxa differ from *E. annuum* in their oblong-cordate outer perianth lobes (vs. obovate and basally attenuate) and sparsely tomentose, commonly glabrescent involucre (vs. densely and persistently tomentose). The involucre of *E. annuum* also are on shorter peduncles (sessile to 1–3 mm long), often giving the inflorescence branches a somewhat secund appearance, and each involucre produces 25 or more flowers (similar to those of *E. riograndis*).

Eriogonum riograndis and *E. multiflorum* are primarily allopatric in geographic range (Fig. 2), but *E. multiflorum* has been documented within the range of *E. riograndis*.

Zapata Co. *E. riograndis* and *E. multiflorum* both have been collected here. Plants of the latter (*Hamby 1711*, TEX) are typical in leaf morphology and flower number, as are plants of *E. riograndis* (citation above).

A few plants with apparently intermediate features have been collected (Fig. 2).

Dimmit Co. (18 mi E of El Indio, *Miller et al. 5775*, TAES): leaves narrow, sessile but flowers 36 per involucre. This plant has leaves of *E. multiflorum* but a high number of flowers like *E. riograndis*. *Hoglund s.n.* (Carrizo Springs, TEX) has narrow, sessile leaves but 20–21 flowers per involucre.

Karnes Co. (2 mi S of Karnes City, *Johnson 1010*, LL, SMU, TAES): leaves relatively narrow and strongly glabrescent but those on the upper 2/3 of the stem basally truncate to subauriculate and subclasping; involucre 18–27-flowered (tending toward intermediate in flower number). These plants are identified here as *E. riograndis*. Another from Karnes Co. (*Johnson 1618*, SMU) is florally

immature but similar in leaf morphology to *Johnson 1010*, but the tendency for smaller number of flowers and the sessile lower leaves indicate that genes from *E. multiflorum* may be present.

Wilson Co. (Kicaster, *Parks Rx 3016*, TEX): upper leaves clasping to subclasping, flowers ca. 18–22. This plant is similar to those of *Johnson 1010* in Karnes Co., apparently intermediate. *Parks* and *Cory 11800* (E of Floresville, TAES) has narrow sessile leaves but 24 flowers. *Parks 5355* (Kicaster school, TAES) is typical *E. multiflorum*.

Choice of rank.—Conspicuous morphological and geographic discontinuity between *Eriogonum multiflorum* and *E. riograndis* is the predominant feature of their contrast. Putative morphological intermediates suggest that hybridization may occur where they come into geographically close contact, but no zone of intergradation exists to suggest that significant gene flow occurs between the two taxa. It might be argued that their apparent sister relationship should be recognized by treating them as varieties within a single species, but the degree of morphological differentiation between species in any given genus (including *Eriogonum*) is variable, and the discontinuity documented here (with inference of genetic isolation) provides justification for treating *E. multiflorum* and *E. riograndis* at specific rank, consistent with species concepts in many other genera.

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