ERIGERON BISTIENSIS (ASTERACEAE: ASTEREAE): A NEW SPECIES FROM NORTHWESTERN NEW MEXICO

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ABSTRACT

Erigeron bistiensis Nesom & Hevron is described and illustrated. It is presently known from a single population in San Juan County, New Mexico. The new species is a member of the *E. compactus* group of sect. *Wyomingia* and is very similar to *E. untermannii* from northeastern Utah. The concept of *E. untermannii* is broadened to include *E. carringtoniae.*

Recent intensive collecting in northwestern New Mexico continues to bring new taxa to light. The species of *Erigeron* described here is among the rarest in New Mexico.

Erigeron bistiensis Nesom & Hevron, sp. nov. (Fig. 1).—TYPE: USA, New Mexico, San Juan Co., Navajo Indian Reservation, San Juan Basin NE of Bisti Trading Post, 4.2 mi E of New Mexico Hwy 371, ca. ¼ mi S of San Juan Co. Rd. 7250, ridge tops and slopes of Hunter Wash drainage in desert shrub–grassland, T25N, R12W, S31 NE ¼, NE ¼ [New Mexico 7.5′ USGS quadrangle = Alamo Mesa West], 6340 ft, most plants past flowering or with withered rays, 5 June 1993, *Bill Hevron 1975* with J. Merz (holotype: UNM; isotypes: ARIZ, ASC, ASU, BRY, COLO, NMC, NY, TEX, UC, US, UT, UTC).

A *Erigeronti compacto* Blake et speciebus affinibus similis habitu pulvinato radice palari, ramis caudicibus numerosis crassis ascendentibusque, vestimento albi-strigilloso, foliis angustis, floribus radii ligulis circinnatis, et acheniis complanatis 2-nervatis; inter has species *E. untermannii* Welsh & Goodrich maxime similis sed caulibus 2–3 cm altis, foliis dense strigillosi-cinereis linearibus vel anguste oblanceolatis non redactisque in dimidio inferiore caulium, capitulis minoribus, et acheniis faciebus dense sericeis nervis aurantiaci-resinaceis dignoscenda.

Caespitose, perennial herbs arising from a thick taproot with numerous, short (1–4 cm long), ascending-erect caudex branches, forming clumps up to 30 cm in diameter. Stems erect, 7–15 cm tall,

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FIG. 1. Habit of *Erigeron bistiensis* (from TEX isotype).

unbranched, gray-green, moderately to densely strigose with white, stiff, appressed hairs 0.1–0.5 mm long, eglandular. Leaves gray-green, similar in vestiture to the stems, in dense basal clusters from the caudex apices, mostly erect, linear to linear-oblanceolate, entire, 10–25 mm long, 1–2 mm wide, slightly broadened at the very base, the cauline sessile, ascending and continuing relatively unreduced in size ½–¾ up the stems. Heads solitary, terminal, cupulate, 11–16 mm wide (pressed); phyllaries in 2–3 (–4) subequal series, 5–7 mm long, narrowly oblong-lanceolate, evenly loosely short-pilose, minutely but prominently granular-glandular. Ray flowers 30–40 in a single series, the corollas 8–13 mm long, ligules 1.5–2.0 mm wide, white, drying white or pinkish to bluish, distinctly coiling from the apices with maturity. Disc corollas 3.8–4.5 mm long, narrowly funnelform, not strongly indurated or inflated, glabrate; style branch collecting appendages deltate to shallowly triangular, 0.2–0.3 mm long. Achenes with 2, orange-resinous nerves, oblong-obovate, 2.5–3.0 mm long, 0.6–1.0 mm wide, the faces and margins densely

strigose-sericeous; pappus of 32–39 barbellate bristles ca. ⅔ the disc corolla height, with a few outer setose bristles 0.5–1.0 mm long. Known only from the type locality, the epithet is in reference to the immediately adjacent BLM Bisti–De Nazin Wilderness Area.

Additional collection examined: New Mexico, San Juan Co., type locality, heads immature, just beginning to flower, 3 May 1991, *Hevron 1145* (TEX, UNM).

Distribution and Habitat

Erigeron bistiensis is locally abundant on the highly dissected, south-trending slopes in the upper stratigraphic portion of the Hunter Wash drainage (Fig. 2). The substrate is a white to tan, fine-textured sand immediately derived from the Cretaceous Ojo Alamo Sandstone formation (Dane and Bachman 1965). This formation is located between the brown-red sand of the upland grassland and the gray clay badlands of the Kirtland formation at lower elevations. The new species is restricted to ridge tops and slopes of the Ojo Alamo but was not observed in arroyo bottoms. Plants were noted from all aspects on slopes of 0–30 degrees. At the type locality, about 200–250 plants of *Erigeron bistiensis* are scattered over 3–4 acres along the Ojo Alamo formation, which extends for approximately 100 yards into the Hunter Wash drainage.

The Ojo Alamo formation extends northwestward from the Hunter Wash area for about 30 miles in a narrow (mostly 1–3 km wide), continuous arc roughly paralleling the Chaco River to the San Juan River in the vicinity of Farmington, New Mexico. This city lies on the most sizable expanse of exposed Ojo Alamo Sandstone and urban development may have eradicated the largest amount of suitable habitat potentially available for *Erigeron bistiensis.* North of the San Juan River, the Ojo Alamo occurs sporadically for a short distance. Eastward from the Hunter Wash area, the Ojo Alamo continues in a narrow band for approximately 90 miles, extending into northwestern Sandoval County to the vicinity of Cuba.

The desert shrub-grassland of the type locality is characterized by the following species: *Ephedra torreyana* S. Wats., *Oryzopsis hymenoides* (R. & S.) Ricker, *Bouteloua gracilis* (Willd. ex Kunth) Lag. ex Steud., *Leptodactylon pungens* Nutt., *Hilaria jamesii* (Torr.) Benth., *Stipa comata* Trin. & Rupr., *Yucca angustissima* Engelm. & Torr., *Astragalus praelongus* Sheldon, *Astragalus ceramicus* Sheldon, *Dalea candida* (Michx.) Willd., *Ericameria nauseosa* (Pallas ex Pursh) Nesom & Baird, *Machaeranthera grindelioides* (Nutt.) Cronq., *Hymenopappus filifolius* Hook., and *Tetradymia canescens* DC.

There were no signs of predation, herbivory, or disease on *Erigeron bistiensis.* Grazing is intense in the area of the type locality, but livestock do not appear to pose a threat to the continued existence

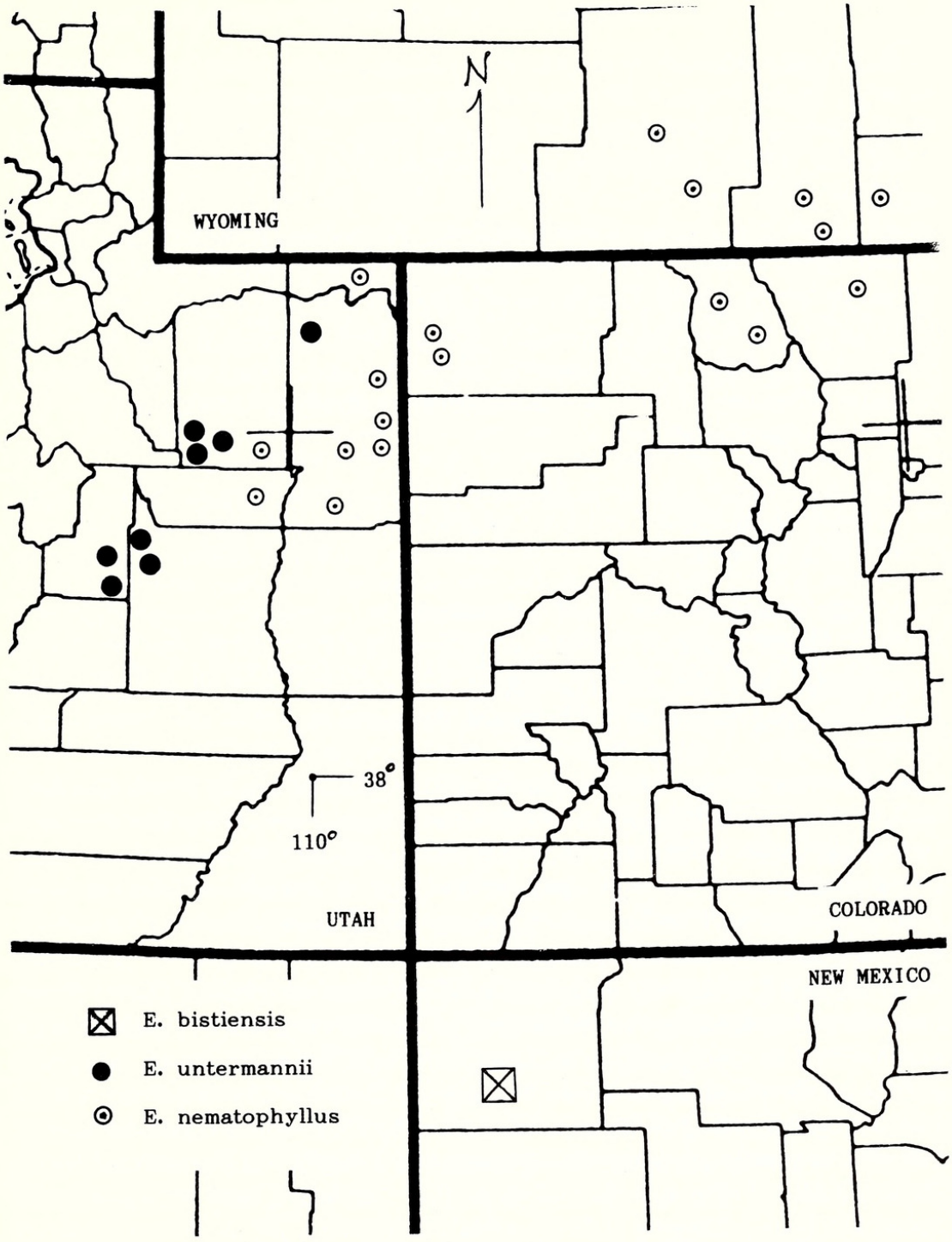

FIG. 2. Distribution of *Erigeron bistiensis* and the similar species *E. untermannii* and *E. nematophyllus* (see comments in text).

of the species, which appears to be relatively unpalatable. Oil and gas extraction, with associated road construction, represents the other major land use and may pose a significant threat. Based on its small population size and current threats, *E. bistiensis* will be proposed as a candidate for listing under the Endangered Species Act.

Infrageneric Position

Erigeron bistiensis is a member of the *E. compactus* Blake group of sect. *Wyomingia* (A. Nelson) Cronq. (sensu Nesom 1989) in its taprooted, pulvinate habit with numerous, thick, ascending caudex branches, white-strigillose vestiture, narrow leaves, coiling ligules, and flattened, 2-nerved achenes. The discovery of this species further emphasizes the distinctiveness of the *E. pulcherrimus* Heller group within sect. *Wyomingia,* which differs in its multi-nerved achenes from the *E. compactus* group as well as the rest of the genus. *Erigeron bistiensis* is the second recently discovered species of the *E. compactus* group from northwestern New Mexico. The first, *E. sivinskii* Nesom (Nesom 1991), is distinguished from *E. bistiensis* by the following contrasts:

1. Stems and leaves grayish, moderately to densely short-strigose; leaves mostly narrowly oblanceolate, 1–2 mm wide at widest point; phyllaries canescent with ascending-appressed hairs, midvein relatively broad and orange-resinous; disc corollas 3.8–4.5 mm long; achenes oblong-obovate, the faces densely strigose-sericeus; pappus of 32–39 bristles; San Juan Co. ..... *E. bistiensis*
1. Stems and leaves greenish, sparsely short-strigose; leaves linear, 0.6–0.8 wide at widest point; phyllaries sparsely pilose-hispid with spreading hairs, midvein relatively thin and yellowish; disc corollas 3.0–3.8 mm long; achenes oblong, the faces glabrous; pappus of 21–27 bristles; McKinley Co. ..... *E. sivinskii*

Within the *Erigeron compactus* group, *E. sivinskii, E. compactus,* and *E. consimilis* Cronq. constitute a group marked by the production of achenes with completely glabrous faces but strigose or sericeous margins (Nesom 1991), a distinctive feature otherwise rare within the genus. The remaining members of the *E. compactus* group, *E. bistiensis, E. untermannii* Welsh & Goodrich, and *E. nematophyllus* Rydb. (Fig. 1), produce achenes with markedly hairy faces and margins. Among these species, *E. bistiensis* and *E. untermannii* are similar to each other in their strongly foreshortened, densely pulvinate habit and grayish vestiture, but the new species is separated from the closest populations of *E. untermannii* by a distance of about 450 kilometers, and the two species are clearly distinguished morphologically. They are included in the following key (adapted and extended from Nesom 1991), which separates all of the species of the *E. compactus* group.

1. Leaves mostly (2–) 4–8 cm long, the lower margins ciliate, persistent portion of old basal leaves relatively long and slender-fibrous; sw Wyoming, w Colorado, ne Utah ..... *E. nematophyllus*
1. Leaves mostly 1–3 cm long, margins eciliate, persistent portion of old basal leaves short and broad (2)
   2. Achenial faces and margins strigose or strigose-sericeous (5)
   2. Achenial faces glabrous, the margins sparsely to densely ciliate (3)
      3. Stems, leaves, and phyllaries green, sparsely short-strigose; stems with relatively unreduced leaves on at least the lower half; phyllaries relatively

thin-herbaceous; achene margins sparsely ciliate; nw New Mexico ..... *E. sivinskii*

3. Stems, leaves, and phyllaries gray-green, densely short-strigose; stems essentially scapose, sometimes with a few, small, scattered bracts; phyllaries distinctly thickened along the margins; achene margins densely ciliate (4)
   4. Phyllaries spreading-hispidulous with thick-based trichomes; heads 15–20 mm wide; rays 30–55; w Colorado, e Utah, ne Arizona ..... *E. consimilis*
   4. Phyllaries strigose with thin-based trichomes; heads 8–15 mm wide; rays 15–32; e California, Nevada, w Utah ..... *E. compactus*
      5. Leaves mostly narrowly oblanceolate, the blades 1–2 mm wide, cauline leaves essentially unreduced ½–¾ of the distance up the stem; heads 11–16 mm wide; rays 30–40, the ligules 8–13 mm long; achenes densely sericeous, with orange-resinous nerves; pappus bristles 32–39; nw New Mexico ..... *E. bistiensis*
      5. Leaves oblanceolate to spatulate, the blades 2–7 mm wide, cauline leaves absent or few and restricted to the lower ¼ of the stem; heads 7–12 mm wide; rays 18–30, the ligules 5–10 mm long; achenes moderately strigose, with light-colored nerves; pappus bristles 18–26; nw Utah ..... *E. untermannii*

Erigeron untermannii is considered here to include *E. carringtoniae* Welsh. In the original description of the former, Welsh (1983a) compared it with *E. compactus,* observing that his new species differed from the latter in broader leaves with ascending to spreading hairs and in shorter ray corollas. He noted that *E. carringtoniae* differed from *E. untermannii* in its involucral bracts with longer, thinner hairs and longer ray corollas. The same differences were also used to distinguish the latter two taxa in his key to Utah *Erigeron* (Welsh 1983b). With a broader selection of collections at hand (20 of *E. untermannii,* 9 of *E. carringtoniae,* as identified at BRY, representing a total of ca. 68 plants; the majority of these collections made since 1989), we cannot find any morphological feature that would separate the two taxa. The populations in Sanpete and Emery counties occur on the Wasatch Plateau at elevations of 3000–3300 meters, compared to those in Duchesne and Uintah counties, which are along the margin of the Uintah Basin at 2175–2835 meters, but all of them occur in relatively exposed habitats on substrates of shale, limestone, or marly gravel.

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