

A NEW SPECIES OF *ERIGERON* (COMPOSITAE) FROM COAHUILA

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ERIGERON **chiangii** Nesom, sp. nov. (Fig. 1)

Ab affini *E. folioso* Nutt. acheniis discique flosculis brevioribus, pappi setis minus numerosis, foliisque basalibus spatulato-obovatis margine integris dentatisve incrassatis vel revolutis diversa.

Perennial herbs from a few, slender, woody roots, with a cluster of basal leaves and a single erect stem borne at the ends of short (1–4 cm), ascending, leafless, more or less woody, caudex branches, basal leaves usually deciduous by mid-summer. Erect stems 11–40 cm high, often reddish at the base, simple or usually with 1 to numerous branches, mostly branching from the upper 1/2 of the stem; at least the upper part of the stem (sometimes only under the heads) conspicuously and densely stipitate-glandular with dark orange-tipped, capitate, Type C trichomes,¹ otherwise completely glabrous if not glandular, rarely with tiny, viscid-appearing Type B trichomes and a very few, spreading Type A trichomes. Basal leaves hirsute or rarely pilose with fine Type A trichomes, pubescence of margins not different from that of the lamina, except longer at base of the petioles; lower cauline leaves moderately strigose-hirsute, eglandular, losing Type A trichomes and usually becoming densely stipitate-glandular higher on the stem, basal leaves spatulate to obovate or oblanceolate, subcoriaceous, margins slightly thickened or revolute, entire or with 1 or 2 pairs of pinnate teeth or lobes, apex rounded or barely mucronulate, usually about 3 cm long and 7 mm wide but up to 7.5 cm long and 14 mm wide, petiole when present about 1/3–1/2 as long as the leaf; cauline leaves numerous, alternate, sessile, markedly different in shape from the basal leaves or sometimes changing gradually on the lower 1/3 of the stem, usually narrowly linear but sometimes oblong-oblanceolate, 7–55 mm long, 0.7–4.0 (6.0) mm wide, apex acute to rounded-mucronulate, entire, sometimes with reduced axillary clusters of smaller linear leaves.

¹ Illustrations of trichomes referred to as Types A, B, and C can be found in earlier studies of *Erigeron* (Nesom, 1976, 1978.).



Heads at ends of erect stems or branches, not clustered, or stipitate-glandular penduncles 1–4 cm long; involucre narrowly campanulate-hemispheric, about 6–12 mm wide, composed of 30–46 imbricated phyllaries in about 3 series, reflexing sharply after maturation and release of achenes; phyllaries lanceolate or oblanceolate, long acuminate, up to 0.8 mm wide, the innermost up to 6 mm long, the outermost about half as long, brownish-green with stramineous margins, sometimes purplish on the upper half, the innermost with narrow midribs and chartaceous margins, densely glandular with long Type C trichomes, without other vestiture; receptacles 1.5–3.0 mm wide, very shallowly convex, slightly tuberculate with raised carpopodial attachments points. Ray flowers, pistillate, fertile, 16–40 (50) in number, in 1–2 series, corollas mostly white, without a definite midstripe but often tinged with lavender, pink, or blue, 3–4 (5) veined, apex rounded, acute, or slightly notched, 5.0–9.5 mm long, remaining straight with wilting or age, the tubular portion about $\frac{1}{3}$ of the total length, sparsely pubescent with long Type C trichomes, 0.9–1.5 mm long. Disc flowers perfect, fertile, about 30–100 in number, corollas yellowish, tubular to narrowly funnellform, glabrous or sparsely pubescent with Type C trichomes, sometimes slightly constricted in the lower $\frac{1}{3}$, slightly indurated in the midregion, 2.6–4.0 mm high, 0.5–0.8 wide, the lobes 0.4–0.6 mm long and sometimes purple; anthers with thecae 1.2–1.5 mm long, with lanceolate apical appendages 0.2–0.3 mm long; style with branches 0.6–0.8 mm long, including the triangular to deltate collecting appendages 0.17–0.26 mm long. Achenes oblong, laterally compressed, 1.3–1.8 mm long, 0.3–0.5 mm wide, tan, with 2 thin, orangish ribs, sparsely strigose with duplex trichomes; carpopodium a narrow, cartilaginous ring; pappus of ray and disc achenes similar, simple, of 16–20 tawny, barbellate bristles, equalling or slightly shorter than the height of the disc corollas, sometimes with a few short, outer setae or bristles. Chromosome number known from one collection (*Powell, Patterson, and Ittner 1602*) $n=18$.

TYPE: MEXICO. COAHUILA: Cañón de la Madera, Sierra de la Madera, 29 Mar 1975, *Wendt and Lott 842* (HOLOTYPE:LL!).

ADDITIONAL COLLECTIONS EXAMINED: MEXICO. COAHUILA: Mina El Popo, ca. 2 km S of Cañón El Diablo on dissected E slope of Sierra del Carmen, 29 Jul 1973, *Johnston, Chiang, Wendt and Riskind 11922* (LL); higher elevations in the Sierra Jardín (in the Sierra del Carmen), 1 Sep 1966, *Flyr 1210* (SMU); canyon descending E from high pass N of Sierra Jardín, 6 mi E of Rancho El Jardín, 23 May 1968, *Powell, Patterson, and Ittner 1602*—voucher for chromosome count of $n=18$ (TEX); middle and upper reaches of Cañón de la Hacienda, Sierra de la Madera, 10 May 1973, *Johnston, Wendt, and Chiang 10956* (LL); *ibid.*, 6 Aug

Fig. 1. *Erigeron chiangii* Nesom, ca. 0.5X.

1973, *Henrickson 12000* with *Wendt* (LL- 2 sheets); *ibid.*, 5 Aug 1973, *Henrickson 11950* with *Wendt* (LL); *ibid.*, 21 Sep 1973, *Chiang, Wendt, and Johnston 9451E* (LL); higher part and N slope of Sierra de la Madera, SE and SSE of Rancho Cerro de la Madera, 20 Sep 1972, *Chiang, Wendt, and Johnston 9430A* (LL); about 10 km SW of R. San Miguel at Ejido Santa Eulalia in Cañón de los Burros, NE side of Serranías del Burro, 750 m alt., 2 Jun 1972, *Chiang, Wendt, and Johnston 7519C* (LL); along small, rocky canyon, about 1 mi N of "La Laguna," Cañón del Mulato, Serranías del Burro, alt. ca. 3500 ft, 8 Sep 1963, *Gould 10596* (TAES); Rancho Agua Dulce, E slope of the Sierra de San Manuel, 30 Jun 1936, *Wynd and Mueller 387* (MO, ARIZ, US, GH); Cañón de la Gavia, S of Rancho de la Gavia (Sierra de la Gavia), 2–3 Aug 1973, *Johnston, Wendt, Chiang, and Riskind 12035B* (LL); Mina El Aguirreno, N side of Sierra de la Paila, 5 Jul 1973, *Johnston, Wendt, and Chiang 11700* (LL); Canon El Cono, Sierra de la Gloria, 6 Sep 1976, *Wendt and Riskind 1621* (LL); Cañón de Milagro, E side of the Sierra de los Guajes, about 12 km W of Hacienda de la Encantada, 10 Sep 1941, *Stewart 1513* (GH); Sierra de San Marcos, opposite Los Fresnos, NE-facing slope, 4–5 Apr 1969, *Keil, Meyer, Lewis and Pinkava P6071* (ASU—several branches of *E. chiangii*, 1 plant and a branch of *E. sp.*); Sierra de San Marcos, opposite Los Fresnos, NE-facing slope, 4–5 Apr 1969, *Keil, Meyer, Lewis, and Pinkava 6120* (NY –1 plant of *E. chiangii*, 3 plants of *E. sp.*).

Dr. B. L. Turner first recognized that these plants deserved specific distinction and suggested the epithet. This commemorates Fernando Chiang, a recent graduate student at the University of Texas who was part of the group, with Dr. Marshall C. Johnston, which made several of the first collections of this taxon during their reconnaissance of the Chihuahuan Desert region. *Erigeron chiangii* is endemic to mountains and canyons of east-central Coahuila within a radius about 120 kilometers of Monclova. Most commonly it has been collected in calcareous gravel or limestone cliff crevices at about 750–2500 meters elevation. It grows in chaparral, izotal, or on limestone outcrops in oak-pine-fir forests at about 2700 meters.

The new species is very distinctive and easily recognized by the following characters: in most plants, a growth habit of clusters of hirsute, basal leaves at the ends of slender, leafless, ascending, caudex branches; basal leaves subcoriaceous with slightly thickened or revolute margins; cauline leaves mostly linear; 3 series of imbricate phyllaries; conspicuous, stipitate, orange-tipped glands on otherwise glabrous phyllaries and upper stems and leaves; relatively few, broad, white to bluish or pinkish ligules; and an essentially simple pappus of 16–20 bristles. The holotype (*Wendt & Lott 842*, from the Sierra de la Madera, Fig. 1) was chosen because it shows with relative completeness the nature of the roots, ascending caudex branches, basal leaves, and erect stems. Most of the plants of *Erigeron chiangii* on other sheets examined are broken off from the root system with only a portion of the caudex, and on other sheets collected later in the season, the basal leaves have been lost. The cauline leaves on the illustrated plant are more or less intermediate in shape for the species—leaves from other collections are either more narrowly linear or more broadly oblanceolate. All but one of the extremely linear-leaved collections of *E. chiangii* are from northwest

of Muzquiz in the Sierra del Carmen and Serranías del Burro. In that area the plants grow at elevations between the low and high extremes for the species. The single chromosome count for *E. chiangii* is tetraploid ($n=18$ from the Sierra del Carmen; Powell and Powell, 1978), and checks of pollen size and stainability suggest that plants over its whole range are probably also tetraploid.

Plants of *Erigeron chiangii* from the two collections cited from the Sierra de San Marcos (Keil, Meyer, Lewis, & Pinkava 6071 and 6120) are slightly atypical. The lower stems and leaves have moderately dense, spreading or retrorse pubescence in contrast to the normal glabrous condition. These plants are mounted on the same sheets with another species of *Erigeron*, yet unnamed, which is similar in general appearance to *E. chiangii*, at least at this locality. Other sheets from the same location have only plants of the other species. It seems likely that some gene flow is occurring between these taxa in the Sierra de San Marcos, but the plants of *E. chiangii* show little other evidence of hybridization. In characters of pappus, ligule width and coloration, glandularity, involucre pubescence and imbrication, and leaf texture and margin, they are typical.

Although limited hybridization may be occurring between plants of *Erigeron chiangii* and the unnamed taxon mentioned above, the closest relatives of *E. chiangii* appear to be in the *Erigeron foliosus-breweri* complex of California, Oregon, and Washington. At least some plants of this complex are strikingly similar in growth habit to *E. chiangii*, as well as in their linear to narrowly lanceolate or oblanceolate, often crowded, cauline leaves, their few ray flowers with broad ligules, and their strongly imbricated phyllaries. All of these taxa grow in dry, rocky habitats. The pubescence and glandularity characteristic of *E. chiangii* may also be found in plants of *E. foliosus* Nuttall, particularly in var. *confinis* (Howell) Jepson and in var. *hartwegii* (Greene) Jepson, but no single plant of these taxa has been observed in which the whole combination of *E. chiangii* characters occurs. According to Cronquist (1947) polymorphy and intergradation make taxonomic segregation among members of the *E. foliosus-breweri* complex one of the most difficult problems in the genus. However, plants of *E. chiangii* are not highly variable in morphology over the range of the species. Furthermore, the basal cluster of relatively broad basal leaves of *E. chiangii* apparently never occurs in *E. foliosus*. The pappus bristles of *E. chiangii* are fewer in number, and the achenes and disc flowers average considerably shorter in length. The range of *E. chiangii* is separated by a gap of over 1600 kilometers from the nearest populations of its putative relatives. Thus, despite a close similarity to some plants of *E. foliosus*, the distinctive combination of characters in *E. chiangii* which are rather consistent over the range of the species, the several characters distinct from those of *E. foliosus*, and the wide geographic disjunction of these two taxa, support the recognition of *E. chiangii* as a distinctive species.

In the genus *Erigeron* there are at present few known species with relatively wide geographic ranges which lack diploids somewhere within their range. If *E. chiangii* is composed only of tetraploid plants, as it seems, an allochthonous origin for this species is strongly implied. Diploids have been reported for *E. foliosus* and *E. breweri*, and despite the wide disjunction, the remarkable similarity of *E. chiangii* to forms of these species strongly suggests that they represent the primitive stock from which *E. chiangii* had its origin.

Evolutionary convergence might account for the similarities between these disjunct population systems. However, if *Erigeron chiangii* and *Erigeron foliosus* do not share a relatively recent common ancestry, the origin of *E. chiangii* is obscure since there is apparently no species in north central Mexico which is sufficiently phenotypically similar to *E. chiangii* to warrant its consideration as an ancestor.

Plants of *Erigeron bigelovii* A. Gray from Texas and northern Mexico have strongly imbricated, glandular phyllaries and relatively few ray flowers and might be mistaken for *Erigeron chiangii*. However, the former species has a woody base without caudex branches, highly branched and wiry stems, and spreading pubescence on the stems and leaves. The glands of *E. bigelovii* are uncolored, not conspicuously stipitate, and smaller than those of *E. chiangii*. No intergradation has been observed between these species, and they probably are not closely related.

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