

***Gaillardia candelaria* var. *mikemoorei* (Asteraceae: Helenieae),  
A novel gypsophile from Coahuila, Mexico**

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**ABSTRACT**

A novel gypsophile, *Gaillardia candelaria* var. **mikemoorei** B.L. Turner, **var. nov.** is described from Coahuila, Mexico. According to DNA data it is most closely related to the recently described *G. candelaria* B.L. Turner. Morphological differences between the two taxa are discussed and photographs of the types of both taxa are provided, along with a map showing the distribution of gypsophilic *Gaillardias* in the area concerned. . Published on-line [www.phytologia.org](http://www.phytologia.org) *Phytologia* 95(3): 252-257 (August 1, 2013).

**KEY WORDS:** Asteraceae, Helenieae, *Gaillardia*, *G. candelaria*, *G. c.* var. *mikemoorei*, gypsophiles, Mexico, Coahuila

Preparation of a treatment of the Tribe Helenieae of Mexico (Turner 2013) occasioned the present contribution; unfortunately the plants concerned were forwarded to me for identification after the appearance of my tribal treatment. I reckoned these to belong to a novel taxon, closely related to *G. candelaria*, and describe it accordingly.

**GAILLARDIA CANDELARIA** var. **MIKEMOOREI** B.L. Turner, **var. nov.** **Fig. 1**

Resembling ***Gaillardia candelaria*** B.L. Turner, but the leaves predominantly basal (vs cauline); peduncles 6-10 cm long (vs 10-20 cm); outer involucral bracts linear-lanceolate, 9-10 mm long (vs lanceolate, 6-8 mm long); receptacles beset with sclerotic, persistent, conical, prickles ca 0.5 mm high (vs elongate-conical, 1.0-1.5 mm high); pappus scales 8 (vs ca 12) and lobes of the ray ligules 4-6 mm long (vs ca 2 mm).

**Perennial, mostly scapose, herbs** to 20 cm high, arising from well-developed, branched rhizomes. **Leaves** linear, mostly 4-8 cm long, 1-3 mm wide, possessing a single prominent mid-rib, sparsely pubescent above and below, not atomiferous glandular or punctate; base of leaves enlarged and clasping. **Peduncles**, 6-10 cm long, moderately pubescent with spreading white hairs ca 0.5 mm long. **Heads** single, 10-13 mm wide (the rays excluded), ca 1 cm high. **Involucral bracts (outer)**, 10-11, linear-lanceolate, 9-10 mm long, ca 1.5 mm wide, longer than the inner bracts, reflexed with age, white-pubescent, like the peduncles. **Receptacles** convex, 4-5 mm across, beset with 30-40, mostly markedly indurate, cone-shaped, enations ca 0.5 mm high. **Ray florets** ca 11, neuter, sterile; ligules yellow, 1.2-1.5 cm long, mostly 3-lobed, the lobes 3-nerved, 4-6 mm long, 2-3 mm wide. **Disc florets** 30-40; corollas 3.5-4.0 mm long; tubes ca 0.5 mm long; throats ca 4 mm long, 5-lobed, the apices pubescent with purplish trichomes. Stamens 5; anthers purplish, the appendages lanceolate, ca 1 mm long, glandless. **Style branches**, linear, purple, ca 2 mm long. **Achenes** (immature) ca 2 mm long, densely white-pubescent, mainly near the base; pappus of 8, linear-lanceolate, scales 5-6 mm long, their apices awned for 2-3 mm.

**TYPE: MEXICO. COAHUILA: Mpio, Francisco 1 Madero**, "West side of Valle de Buenavista Francisco 1. Madero" 1835 m. Gypsum hillside, 20 Sep 2012, 26 34 18 N, 103 02 17.6 W, *Hinton et al.* 29346 (Holotype: MEXU; isotypes: GBH, TEX).

According to the collector of the Type (G.S. Hinton, pers. comm.), var. **mikemoorei** was “the dominant species on the gyp” at the locality concerned.

**ADDITIONAL SPECIMEN EXAMINED: COAHUILA:** “On gypsum slopes on the W side of the Valle de Buenavista (E slopes of Sierra de los Remedios/Acatita.” 5831 ft, 26 36 43.1 N, 103 02 23.9 W, 22 Aug 2012, *Moore et al. 2000* (TEX).

The collector of the above specimen (pers. comm.) noted that “One of the outstanding things about this species is that it braches underground, which I have never seen before in *Gaillardia*.” Moore also studied the DNA of both infraspecific taxa concluding “According to nuclear internal transcribed spacer (ITS) sequence data, *G. mikemoorei* [my delineation] forms a clade with *G. candelaria*, with little sequence variation among individuals of the two taxa.” Never the less, I had intended to describe the taxon as a new species, but its collector took a humbler attitude, my bowing to his wishes.

In the revisionary treatment of **Gaillardia** by Turner and Watson (2007), this novelty will key to or near **G. suavis**, differing from the latter in having simple, linear- lanceolate, leaves (vs pinnatifid), shorter peduncles, and receptacles with persistent, rigid, conical bristles (vs. mostly deciduous or absent). Actually, I misidentified two of the sheets cited above, taking these to be atypical, linear-leafed, forms of **G. pinnatifida**, one of these to have served as the type of a projected novelty, this illustrated (TEX), but not published; reexamination of the sheets concerned shows these to be the recently described **G. candelaria**.

According to Moore’s DNA data (pers. comm), **G. candelaria**, **G. powellii** and **G. henricksonii** form a well-supported gypsum endemic clade, this also apparent from morphological data.

The novelty is named for Prof. Mike [Michael] J. Moore, currently at Oberlin College, Ohio, and Academic son of Bob Jansen at the Univ. of Texas, Austin. Prof. Moore is an exceptional student of gypsophily among plants (cf. Moore and Jansen, 2007).

Initially, having examined the type, I proposed a tentative name honoring its collector, George Hinton. But George demurred, pointing out that Mr. Moore had called the type locality to his attention, and that he went to the gyp site largely at the latter’s urging. Such is honor among gentlemen, or should be.

It should be noted that at the time of my description of **G. candelaria**, I did not possess material of **G. mikemoorei**, nor was I able to provide an adequate description of the material on hand, the type of the former disappearing from my fold by the wile of yet another worker. Because of this, I have, below, modified the description of **G. candelaria**.

**GAILLARDIA CANDELARIA** B.L. Turner, var. **CANDELARIA** *Phytologia* Memoirs 13: 55. 2007.

**Perennial herbs**, 20-30 cm high. **Stems** suffruticose 10-15 cm long, their apices each producing a single head on softly tomentose peduncles, the latter 10-15 cm long. **Leaves** alternate, linear-lanceolate, sparsely puberulent to nearly glabrate, mostly 4-9 cm long, 2-3 mm wide, gradually reduced upwards and much-overlapping, their lower surfaces with a single pronounced midrib, their margins entire and somewhat enrolled. **Heads** 3.5-4.2 cm across the extended rays (as determined from label data). **Receptacles** hemispheric, variously endowed with semi-persistent, slender, conical enations mostly 0.1-1.5 mm high. **Invulcres** 2-3 seriate, composed of subequal lanceolate bracts 6-8 mm long, ca. 2 mm wide, the outer series pubescent like the peduncles. **Ray florets**, ca 11, neuter; ligules yellow. 10-15 mm long, mostly 3-lobed at their apices, the sinuses 2-3 mm deep. **Disc florets** 30-50 (estimated); corollas yellow, 5-6 mm long; tubes short (ca. 0.5 mm long), glabrous; throats 4.5-5.5 mm long, ca. 3 mm wide,

markedly pubescent above with septate, yellowish, or less often, purplish, hairs. **Stamens**, 5, their appendages ovate-lanceolate, eglandular. **Style branches** linear, purple, their appendages linear-lanceolate, the latter ca. 2 mm long. **Achenes** ca 1.5 mm long, densely white-pubescent with stiffly ascending hairs, the pappus of ca. 12, white-membranous, lanceolate scales ca. 5 mm long, their midveins extended into awns, 1-2 mm long.

**TYPE: MEXICO. COAHUILA:** 82 road mi SW of Cuatro Cienegas, ca. “7 mi S of turnoff for Los Delicias [sic], south of pass between Sa. Delicias and Sa. de Candelaria in pure gypsum w-facing slopes of Sierra la Candelaria at base camp of a Strontium mine ... 1.4 mi NE of Hwy 30,” 4040 ft, 12 Nov 2002, *James Henrickson 23199* (Holotype: TEX).

**ADDITIONAL SPECIMENS EXAMINED: COAHUILA:** “12 km NNE of Las Margaritas on the easternmost ridge of the Sierra de las Margaritas,” 1300-1400 m, 26 33 30 N, 102 51 30 W, 24 Sep 1972, *Chiang et al. 9508* (LL); “ca 32 (air) miles NE of Tlahualilo, in the NW portion of the Sierra de las Delicias, in the First Canyon S of the Puerto de las Sardines; on limestone [sic, presumably gypsum]; frequent perennial,” 4400 ft, 26 20 N, 103 06 W, 9 Aug 1973, *Henrickson 12208* (LL); (same locality and date as the type): *Henrickson 23199B* (TEX); *Henrickson 23200* (TEX).

All of the above specimens are very similar; however, Henrickson noted on the label of his collection *23199B* (presumably an isotype) that “of 42 plants, one small cluster of plants had red at tip of disk corolla lobes,” this observation presumably due to the purplish hairs alluded to in the above description.

**Gaillardia candelaria** superficially resembles **G. multiceps** of the southwestern U.S.A. It is immediately distinguished from that taxon by its elongate peduncles and subscapose habit (which superficially resemble that of the widespread, common *Tetraneuris scaposa*) and narrower, more enrolled, leaves. It also possesses longer, more linear, style-branch appendages.

Apparently, Henrickson originally intended to treat **G. candelaria** as a new variety (*G. multiceps* var. *candelaria*), to judge from his tentative identifications on the labels concerned. My examination of the material suggests specific status, although I concede that one’s species concept can be expanded to exceptional limits, often depending upon whim and circumstance.

The distributions of **Gaillardia** gypsophiles in north central Mexico are shown in Fig. 2.

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Fig. 1. *Gaillardia c. var. mikemoorei* (Holotype: MEXU; isotypes: GBH, TEX).

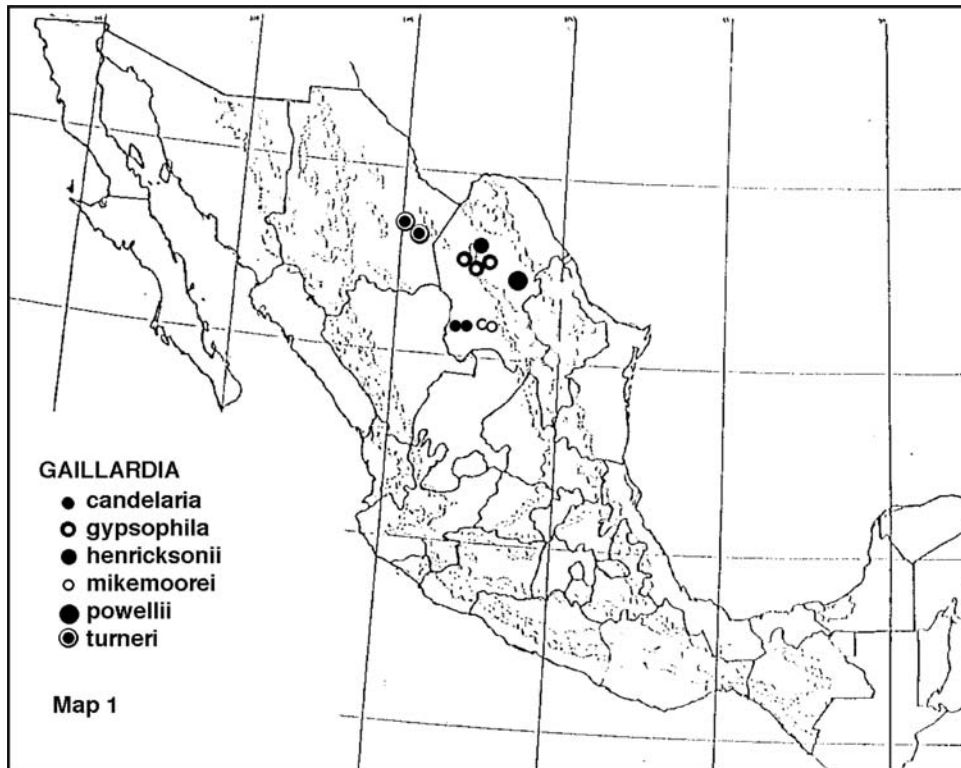


Fig. 2. Distribution of *Gaillardia gypsophiles* in Mexico.



Fig. 3. *Gaillardia c. mikemoorei* in the field.



Fig. 4. Type locality of *G. c. mikemoorei*.



Fig. 5. Mike Moore, gyp site, with Guadalupe Mts. of Texas in background.