

TAXONOMIC REVIEW OF *GRINDELIA* (ASTERACEAE: ASTEREAE) IN COLORADO

GUY L. NESOM

Research Associate

Academy of Natural Sciences of Drexel University

Philadelphia, Pennsylvania

guynesom@sbcglobal.net

ABSTRACT

A taxonomic review of *Grindelia* in Colorado recognizes twelve species: *G. aphanactis*, *G. ciliata*, *G. decumbens*, *G. fastigiata*, *G. inornata*, *G. laciniata*, *G. nuda*, *G. revoluta* (including *G. acutifolia*), ***G. stenophylla*** (Steierm.) Nesom, **comb. et stat. nov.**, *G. squarrosa*, *G. subalpina*, and *G. subincisa*. A distribution map is provided for each taxon, including the complete range if it includes Utah or New Mexico. A key to the species and detailed maps are provided. All collections examined are cited for most of the species.

Taxonomy of *Grindelia* in the USA is unsettled. Since Steyermark's seminal revision (1934), the conservative FNA treatment by Strother and Wetter (2006) seems a mostly implicit statement that formal recognition of uncertainly defined species was unjustified — they did provide informal diagnostic characterizations of many potential segregates within their broadly encompassing concept of *G. hirsutula*. Bartoli and Tortosa (2012) attempted to provide an overview of the North American taxa, but problems and errors and the lack of maps do not recommend it for practical use. A recent interpretation of Californian taxa is from the dissertation study of Moore (2010, 2025) — her treatment also might be considered conservative in that she acknowledged that narrower species concepts may be justified in some cases. Calflora (2025) provides maps of the Californian taxa and *in situ* photos, based on Moore's concepts.

Much of the taxonomic confusion in USA *Grindelia* is centered in Colorado. The treatment by Harrington (1954) is the closest in interpretation to the present study and it also is the closest to Steyermark's concepts. Extensive collections of *Grindelia* in Colorado and the southwestern USA by Mark Wetter in 1979-80 and 1984-86 (see Acknowledgements) were not accompanied by a publication but his itinerary was influenced by type localities and by Steyermark's concepts and the identifications here are mostly similar to his. Weber and Wittman (2012) followed the 2006 FNA treatment, noting that "Hybridization and trivial variation are rife." Like Weber and Wittman (and following FNA), Ackerfield (2022) adopted the use of Californian "*Grindelia hirsutula*" as the name for a group of Colorado taxa, and heterogeneous map ranges indicate that concepts need clarification.

Results of present study indicate that evolution of *Grindelia* in the Colorado area has produced patterns similar to most other genera of North American Astereae — species have discrete morphological and geographic boundaries. With recognition of the spatial boundaries, the range and extent of infraspecific variability can be better understood.

Natural hybrids are often formed, especially as documented by collections and observations of Mark Wetter, but there is no indication that gene flow blurs species boundaries. Most of the hybrids involve *Grindelia squarrosa*, which is widespread and sympatric with most or all of the other species, although Wetter's observations note that it often occurs in close sympatry without hybridization. *Grindelia aphanactis* and *G. inornata* also overlap in range with other species and sometimes hybridize.

Many of the *Grindelia* species in this account occur over a wide range in elevation and most are commonly encountered on dry prairies, roadsides, and other disturbed sites. *Grindelia laciniata* is the most narrowly distributed but is similar in habitat preference. *Grindelia ciliata* has a broader

range but show surprisingly little infraspecific variation. *Grindelia aphanactis* also has a broad range. The expansive range of *G. squarrosa* and its infraspecific variability mark it as distinct in biology.

Each species is mapped at least at county level and all collections examined are cited for species with narrower ranges. For species extending into Utah or New Mexico, the complete range is shown. Detailed citations hopefully will provide a way to interpret taxonomic decisions made here.

KEY TO COLORADO SPECIES

1. Heads eradiate.

2. Involucres 10–12(–14) mm wide; outer phyllaries coiling; basal leaves usually persistent, much larger than the cauline 5. ***Grindelia fastigiata***

2. Involucres 14–18 mm wide; phyllaries either coiling or loose and flexuous, sometimes recurving, basal leaves not persistent, similar in size to the cauline.

3. Leaf teeth acute, sharp-pointed, often with a spinulose apiculum; phyllaries usually coiling, often tightly so; involucres often resinous-viscid 4. ***Grindelia inornata***

3. Leaf teeth acute to rounded, with a blunt, gland-like (not spinulose) apex; phyllaries sometimes recurving, rarely coiling; involucres only sometimes resinous-viscid.

4. Leaves narrowly oblong to narrowly lanceolate or narrowly oblanceolate, margins sometimes entire to subentire but usually serrate at least distally, sometimes deeply toothed, teeth acute-tipped but not apiculate 2. ***Grindelia aphanactis***

4. Leaves mostly oblong to oblong-elliptic to elliptic, margins evenly serrate to serrate-crenate, teeth blunt-tipped 3. ***Grindelia nuda***

1. Heads radiate.

5. Pappus of 30–60 basally connate, awn-like bristles in 2–4 series 1. ***Grindelia ciliata***

5. Pappus of 2–8 awns or scales, quickly deciduous individually.

6. Involucres 7–11 mm wide; heads in a subcorymboid, relatively compact (short peduncles) inflorescence.

7. Leaf margins deeply toothed to pinnate; involucres 5–10 mm wide; phyllaries coiling; Mesa Co., Colorado, and San Juan Co., Utah 6. ***Grindelia laciniata***

7. Leaf margins entire to shallowly serrate; involucres 8–11 mm wide; phyllaries coiling or not; south and southeast of *G. laciniata*.

8. Phyllaries coiling or sharply reflexing at the very apex 7. ***Grindelia decumbens***

8. Phyllaries not coiling or reflexing 8. ***Grindelia stenophylla***

6. Involucres (12–)14–18(–20) mm wide; heads relatively few in a loose, open (long peduncles) inflorescence.

9. Leaf margins entire to serrate with blunt-tipped teeth; peduncles mostly 3–8 cm long; phyllaries lax and spreading, sometimes coiling 9. ***Grindelia squarrosa***

9. Leaf margins serrate with sharp-pointed teeth; peduncles 5–15(–30) cm long; phyllaries coiling or not.

10. Basal and proximal cauline leaves serrate to shallowly lobed; phyllaries not coiling 10. ***Grindelia subincisa***

10. Basal and proximal cauline leaves shallowly serrate to nearly entire; phyllaries tightly coiling.

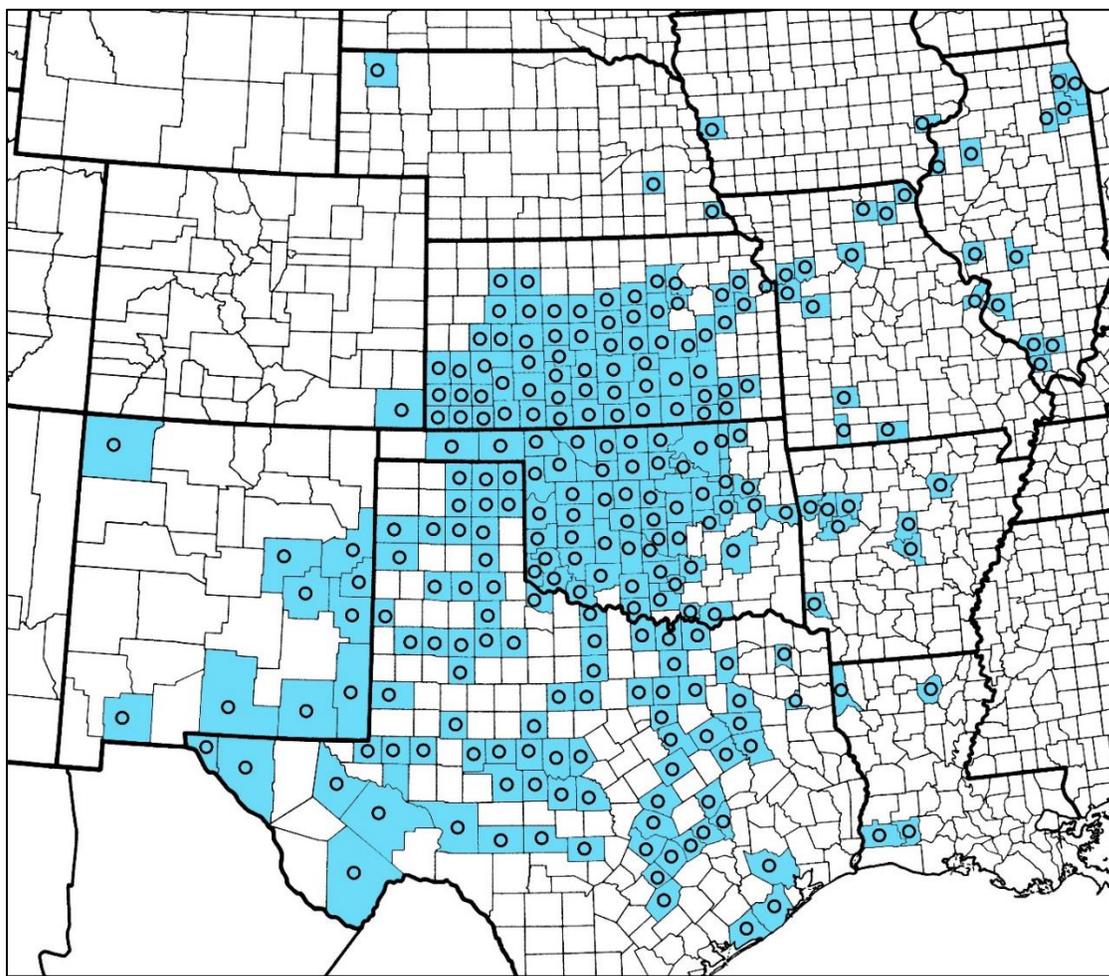
11. Heads not immediately subtended by bracts; pappus of 2–4 subulate scales 11. ***Grindelia revoluta***

11. Heads immediately subtended by narrow, reflexing bracts; pappus of 4–8 awns 12. ***Grindelia subalpina***

1. **GRINDELIA CILIATA** (Nutt.) Spreng., Syst. Veg., ed. 16, 3: 575. 1826. *Donia ciliata* Nutt., J. Acad. Nat. Sci. Philadelphia 2: 118. 1821. *Haplopappus ciliatus* (Nutt.) DC., Prodr. 5: 346. 1836. *Prionopsis ciliata* (Nutt.) Nutt. Trans. Amer. Philos. Soc., ser. 2, 7: 329. 1841. *Aster ciliatus* (Nutt.) O. Kuntze, Rev. Gen. Pl. 1: 317. 1891. *Grindelia papposa* Nesom & Suh [nom. nov. illeg.], Phytologia 75: 344. 1994. **TYPE: Arkansas territory.** "Arkansas" but probably northeastern Oklahoma [August 1819] (see Nesom 2019), *T. Nuttall s.n.* (holotype: BM 1025326; isotype: PH 9641).

Distinct in *Grindelia* as glabrous annuals or biennials with serrate-spinulose leaf margins, large, radiate heads, and a relatively profuse pappus of 30-60, persistent, flattened and scabrous-margined bristles in 2-4 series of uneven length and thickness, the inner thicker and basally connate and persistent or tardily deciduous as a single unit long after fruit maturity. No variants have been described.

Grindelia ciliata "presumably is native to portions of the Great Plains, but it has dispersed along railroads and highways to extend its range in all directions" (Yatskievych 2006, p. 234, with further comments on distribution). Known in **Colorado** only from Baca Co.: SE corner of county where County Rds 48 and 46 converge just N of the Cimarron River, sandsage prairie at the N edge of the river floodplain, ca. 3610 ft, 9 Aug 2005, *Clark 2301* (COLO, KANU); N side of Cimarron River just N of Oklahoma line, S of Walsh, sandy flats, cultivated land, 31 Aug 1949, *Weber 5152* (COLO, CS, NCSC).



Map 1. Distribution of *Grindelia ciliata*. The range also apparently includes disjunct localities in Michigan as well as in California and Maryland. Records from various sources.

2. GRINDELIA APHANACTIS Rydb., Bull. Torrey Bot. Club 31: 647. 1904. *Grindelia nuda* Alph. Wood var. *aphanactis* (Rydb.) Nesom, Phytologia 68: 310. 1990. **TYPE: Colorado.** [La Plata Co.]: Durango, 21 Jul 1898, *C.F. Baker, F.S. Earle, & S.M. Tracy 526* (holotype: NY; isotypes: F, GH, MICH, MIN, MO, POM, RM-2 sheets).

Grindelia squarrosa [var. *nuda*] forma *angustior* Steyerl., Ann. Missouri Bot. Gard. 21: 481. 1934. **TYPE: Texas:** Floyd Co.: 16 mi E of Sockney on Quitaque road, 23 Aug 1921, *R.S. Ferris & C.D. Duncan 3391* (holotype: MO; isotypes: CAS, NY).

Flowering mid-June-September. Roadsides, field edges, grassland, flats, disturbed sites, ditches, dry riparian woods, streamsides; (4700-) 5200-8400 (-8800) feet.

In an earlier study (Nesom 1990) it appeared to me that *Grindelia nuda* and *G. aphanactis* were intergrading entities, but a more detailed study and perspective places them as part of a geographically coherent population system comprising three allopatric (parapatric) species — *G. nuda*, *G. aphanactis*, and *G. inornata* (Map 2; details in Maps 3-5). Geography and morphology suggest that the group is monophyletic, but, as suggested by others, perhaps each is independently derived from a radiate ancestor. Tetraploid chromosome counts are reported for *G. aphanactis* in Coconino and Yavapai counties, Arizona, and Rio Arriba Co. New Mexico; a diploid count for *G. nuda* in Travis Co., Texas; a diploid count for *G. inornata* in El Paso Co., Colorado (see Nesom 1990).

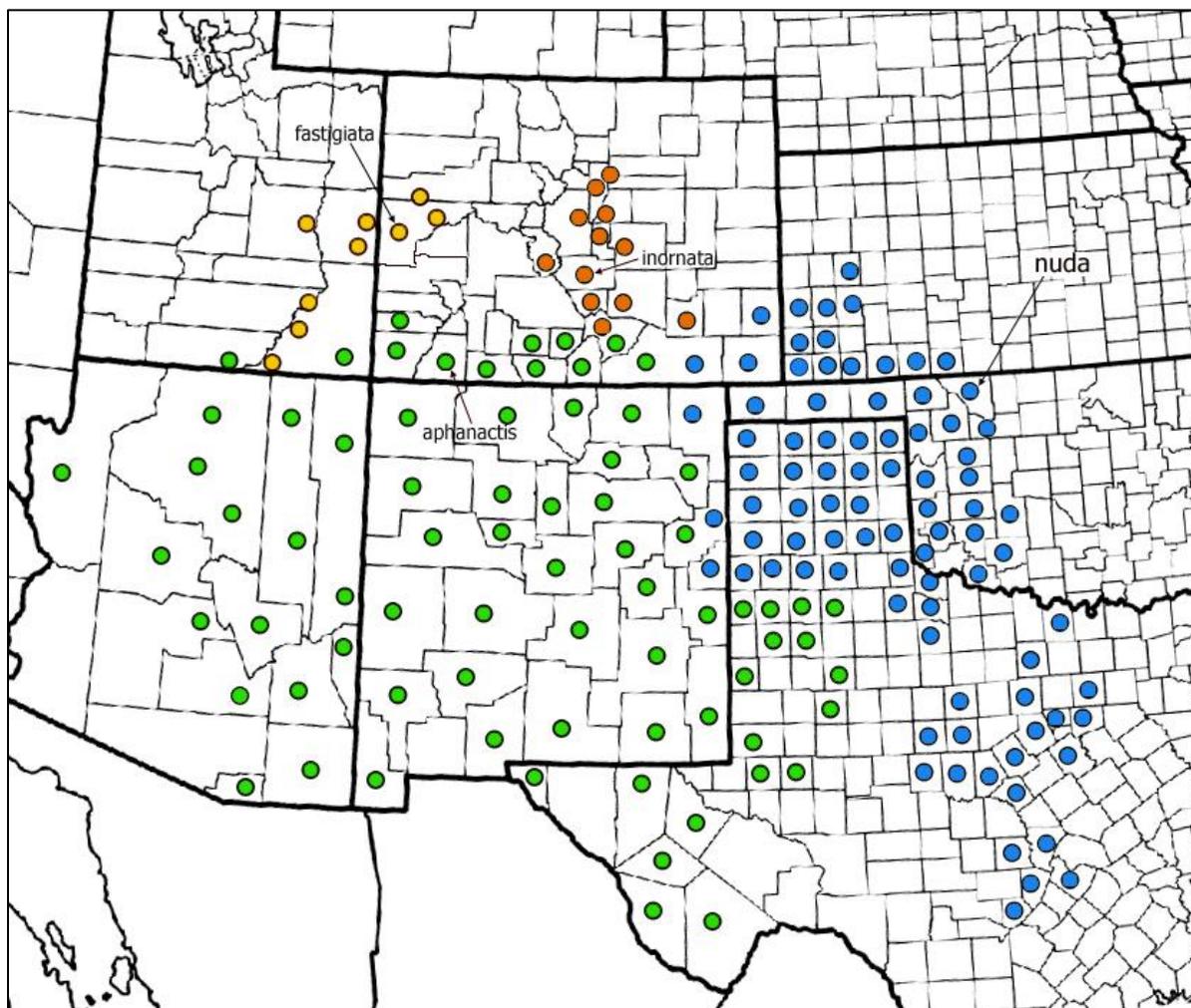
The most obvious way that *Grindelia nuda* and *G. aphanactis* are distinguished is by leaf morphology, although achenes of *G. aphanactis* have a tendency to become more deeply furrowed. Ackerfield and Heil (2025) provide a key couplet with further differences. The distinction of *G. inornata*, however, also can be seen in involucre morphology and its viscid vestiture. Differences among the three entities are subtle and morphological overlap occurs, but it is possible to see the zones of parapatry and correlation between morphology and geography.

Collections of *Grindelia aphanactis* are cited here for Custer, Huerfano, and Las Animas counties, where the parapatry of *G. aphanactis* and *G. inornata* is mapped.

***Grindelia aphanactis*. Colorado**, where parapatric with *G. inornata*: **Custer Co.:** Along Hwy 96, 0.2 mi S of jct of Hwy 96 and 67 at Wetmore, 9.5 mi N of junction of Hwy 96 and 165, [ca. 38.234 N, 105.087 W], along highway shoulder and adjacent embankment, 6000-6200 ft, clayish soil, 30 Aug 1985, *Wetter 851* (NY, RM). **Huerfano Co.:** 16 mi W of Walsenberg, roadside, 37.623817 N, 105.073179 W, 4 Aug 1937, *Ownbey 1378* (CHRB, COLO, NY, RM); Cuchara Valley, flat 2 mi above La Veta, 37.4773 N, 105.0188 W, 7200 ft, common in very dry sandy sunny situations, 8 July 1934, *Stigall s.n.* (COLO); along Hwy 12, 12.3 mi S of jct with Hwy 160 near La Veta, 55.5 mi NW of jct with I-25 at Trinidad, along hwy shoulder and turnout area, 7700 ft, 20 Aug 1984, *Wetter 817* (NY); along Hwy 160, 2.4 mi E of Huerfano-Costilla Co. line, on upcline for North La Veta Pass, 8750-9000 ft, 30 Aug 1985, *Wetter 854* (NY). **Las Animas Co.:** Trinidad, Jul 1915, *Beckwith 219* (NY); Trinidad, 6000-7000 ft, Aug 1912, *Beckwith 257* (NY); Mesa de Maya Region, top of unnamed mesa above Gotera Canyon, 37.0440597 N, 103.5480047 W, grassland, 5700 ft, 6 Aug 1993, *Clark 258* (COLO); Pinyon Canyon Maneuver Site, ½ mi NW of Burson Camp, 37.49589 N, 104.0281 W, 5380 ft, locally abundant on outwash mesas and roadsides within shortgrass prairie/juniper savannah, 17 Jun 2006, *Doyle GD06-03* (COLO); Pinyon Canyon Maneuver Site, ca. 1.2 mi SE of Burson Camp, 37.4751 N, 104.004 W, 5240 ft, locally common along two-track road, 29 Jun 2006, *Doyle GD06-06* (COLO); Pinyon Canyon Maneuver Site, near Burson Camp pond, 37.48695 N, 104.01382 W, locally common along 2-track road, 5325 ft, grassland with scattered juniper, 30 Jun 2006, *Doyle GD06-07* (COLO); Hwy 160 just after a narrow bridge; 15.7 mi E of the jct of Hwy 160 and 350, roadside, 37.227 N, 104.311 W, 5600 ft, 9 Sep 1994, *D'Souza 94* (UNM); Robert's Ranch, ca. 6 mi S on Road 210 from Hwy 10, then 1 mi E (<0.5 mi from Huerfano Co. line), near a large playa, 37.628206 N, 104.548249 W, 4700-4800 ft, 28 Jun 1906, *Hazlett 12224* (COLO); S of Tobe, N side of Mesa de Maya, 37.17699 N, 103.61621 W, frequent, 25 Jul 1947, *Rogers 5012* (COLO, US); ca. 24 mi E of Walsenburg, ca. 4 mi E of Rattlesnake Buttes [ca. 37.801 N, 104.326 W], dry plains, 14 Jun 1951, *Vestal s.n.* (ILLS, not

seen); Hwy 160 between Trinidad and Branson along tributaries of Purgatoire River [ca. 37.16 N, 104.07 W], Benton-Niobrara shale roadcuts, 23 Aug 1985, *Weber 17513* (COLO, NY); in Branson along Hwy 389 at the corner of Oliver St., 37.0247 N, 103.8758 W, 6289 ft, 16 Aug 1986, *Wetter 902* (NY-2).

***Grindelia aphanactis* in Utah** (the only known records): Kane Co.: "Sc Vermillion," 8 mi E of Kanab on Hwy 89, roadside, 5120 ft, 12 May 1977, *Foster 3764* (BRY). San Juan Co.: Near Bluffs, along San Juan River, 3900-4900 ft, 25-29 Aug 1911, *Rydberg & Garrett 9999* (NY).



Map 2. Distribution of *Grindelia fastigiata* (gold), *G. aphanactis* (green), *G. inornata* (orange), and *G. nuda* (blue). Arrows point to type localities. *Grindelia aphanactis* also occurs in Sonora, Chihuahua, Coahuila, and Nuevo León, Mexico.

3. GRINDELIA NUDA Alph. Wood, Bot. Gaz. (Crawfordsville) 3: 49. 1878. *Grindelia squarrosa* (Pursh) Dunal var. *nuda* (Alph. Wood) A. Gray, Syn. Fl. N. Amer. 1(2): 118. 1884. **TYPE: [Oklahoma]**. "Indian territory," 1875-77, *T.E. Wilcox s.n.* (holotype: NY 169629; isotype: NY 169620).

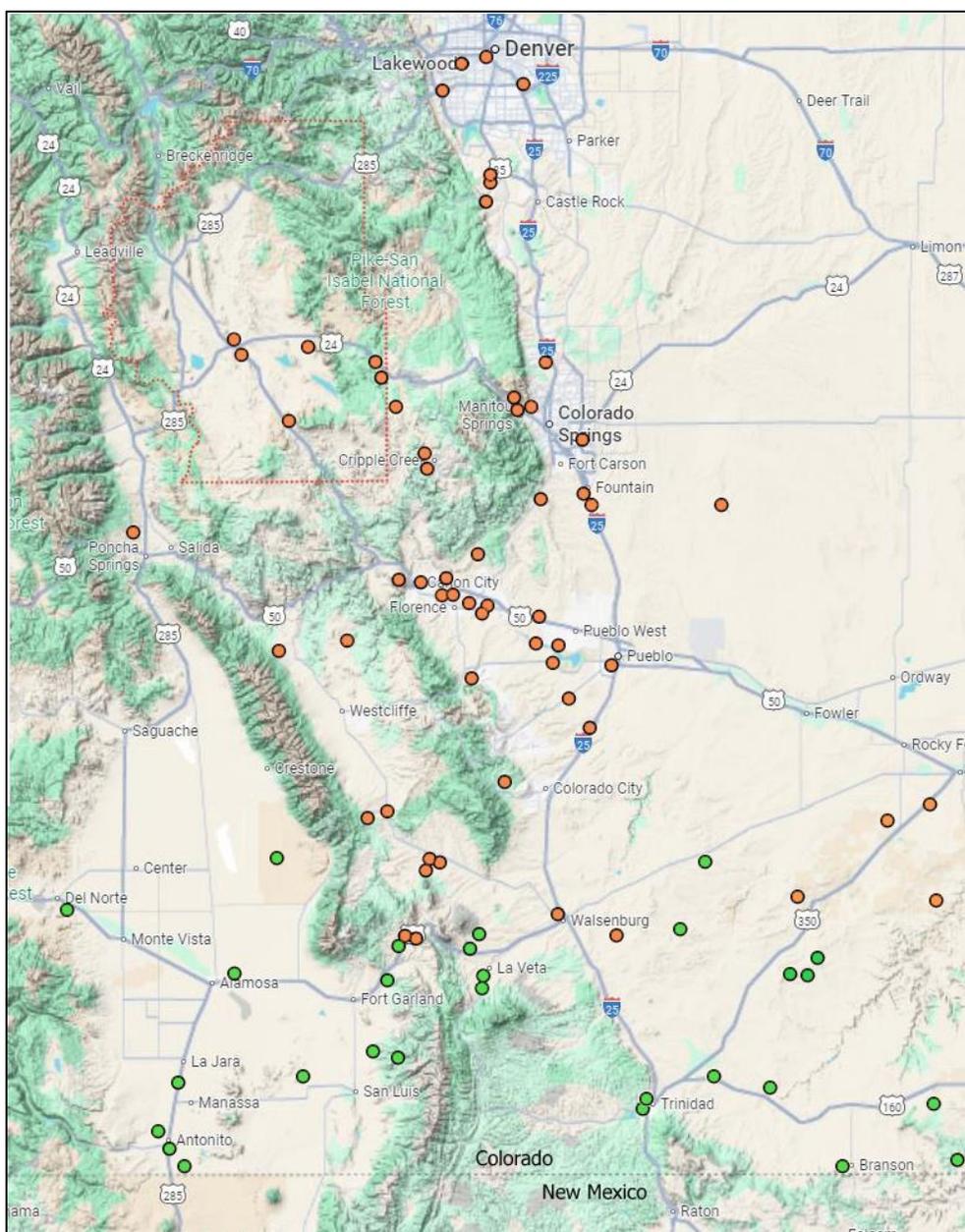
***Grindelia nuda* in Colorado.** Baca Co.: *Elliott 11992* (COLO); *Harmon 9520* (GREE); *Hazlett 18237* (COLO); *Morse 21698* (KANU); *Smookler 27* (KHD); *Wetter 900* (NY); *Wetter 901* (NY); *Wittman & Weber 18398* (COLO). Las Animas Co.: Ca. 25 mi S of La Junta, Comanche Natl Grasslands, Picket Wire Canyonlands, Purgatoire River floodplain, trailside, 37.64202 N, 103.56944 W, 4386 ft, 1 Sep 2021, *Wingate 13686* (KHD). Prowers Co.: S of Lamar, E of Hwy 287, N of Quail Ridge Estates, directly SW of town of Lamar water tanks, 38.03535 N, 102.60072 W, 15 Jun 2003, *Robertson 1-Mar* (COLO); ca. 10 air

mi NE of Lamar, 4 air mi N of Hwy 196, May Valley Ranch, Stony Point, W of Big Sandy Creek, roadside of canal road, 38.17457 N, 102.48443 W, clayey limestone outcrop of Niobrara Formation, 3658 ft, 8 Sep 2018, *Wingate 12811* (KHD).

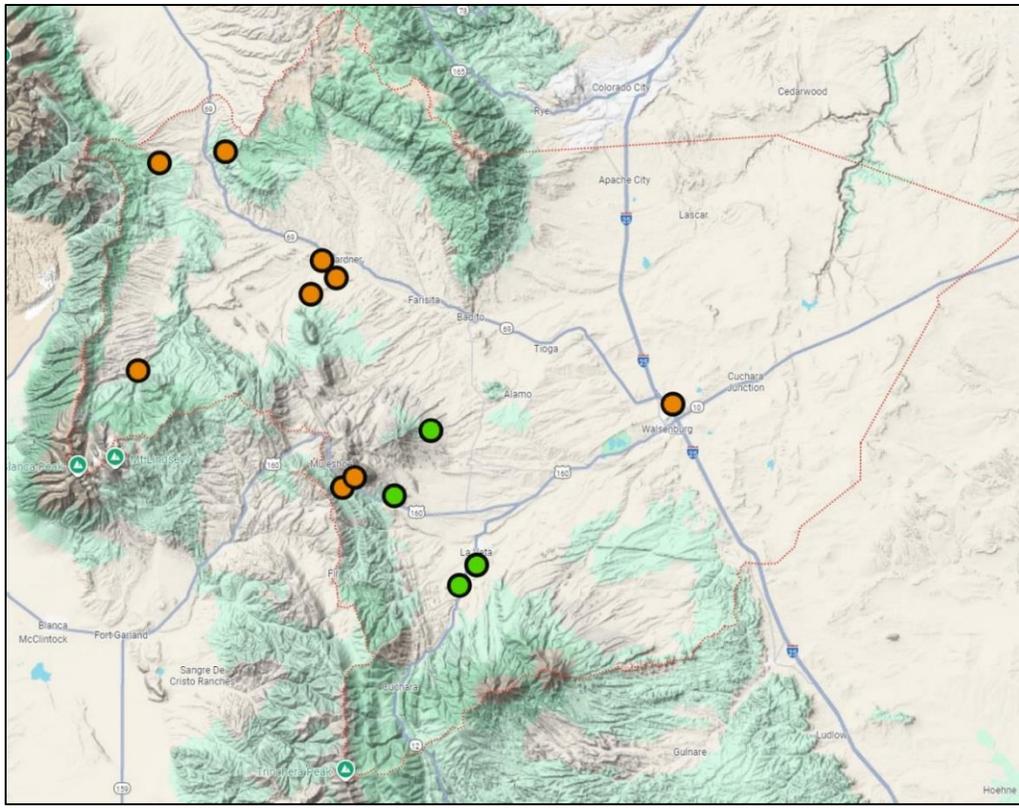
4. GRINDELIA INORNATA Greene, Pittonia 3: 102. 1896. **TYPE: Colorado.** Fremont Co.: Cañon City, 7 Aug 1896, *E.L. Greene s.n.* (holotype: NDG 53597; isotypes: NDG 53587, RM).

Grindelia inornata var. *angusta* Steyerl., Ann. Missouri Bot. Gard. 21: 496. 1934. **TYPE: Colorado.** El Paso Co.: Colorado Springs, 1903, *H.L. Shantz 597* (holotype: US).

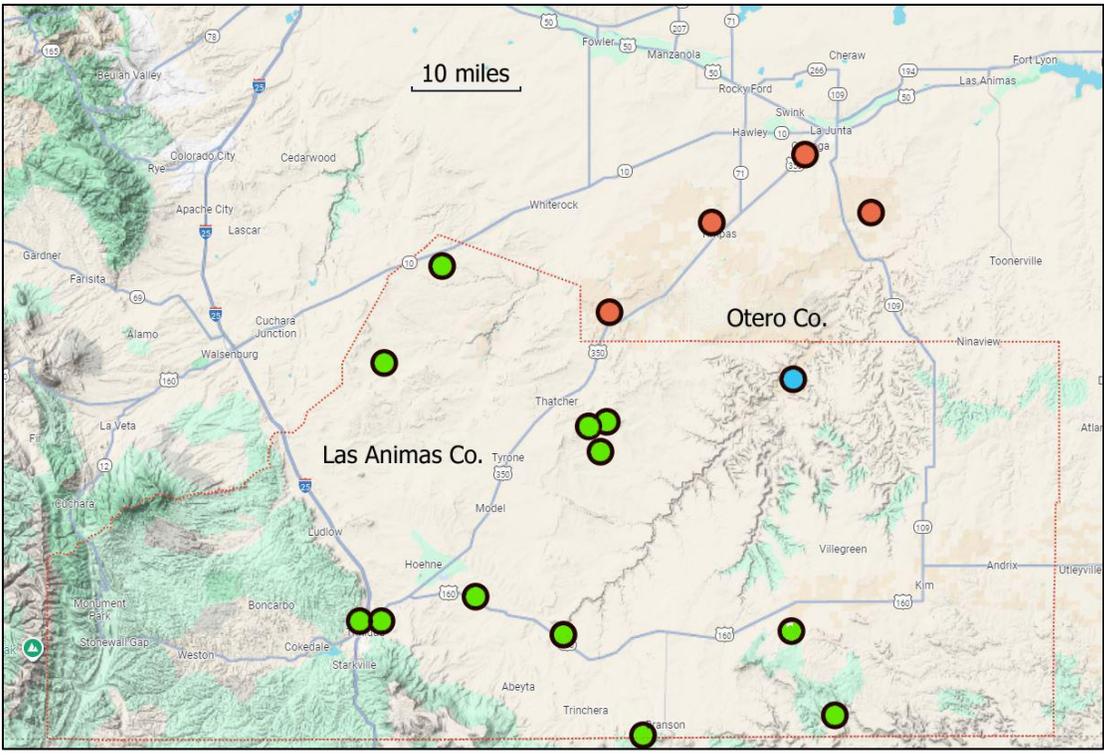
Flowering (June-) July-mid September. Roadsides, disturbed sites, borrow pits, meadows, prairies, field edges, shaly slopes, pinyon-juniper woodland, oak-pine woodland; (4300- in Otero Co.) 4800-9000 (-9300, at La Veta Pass) feet.



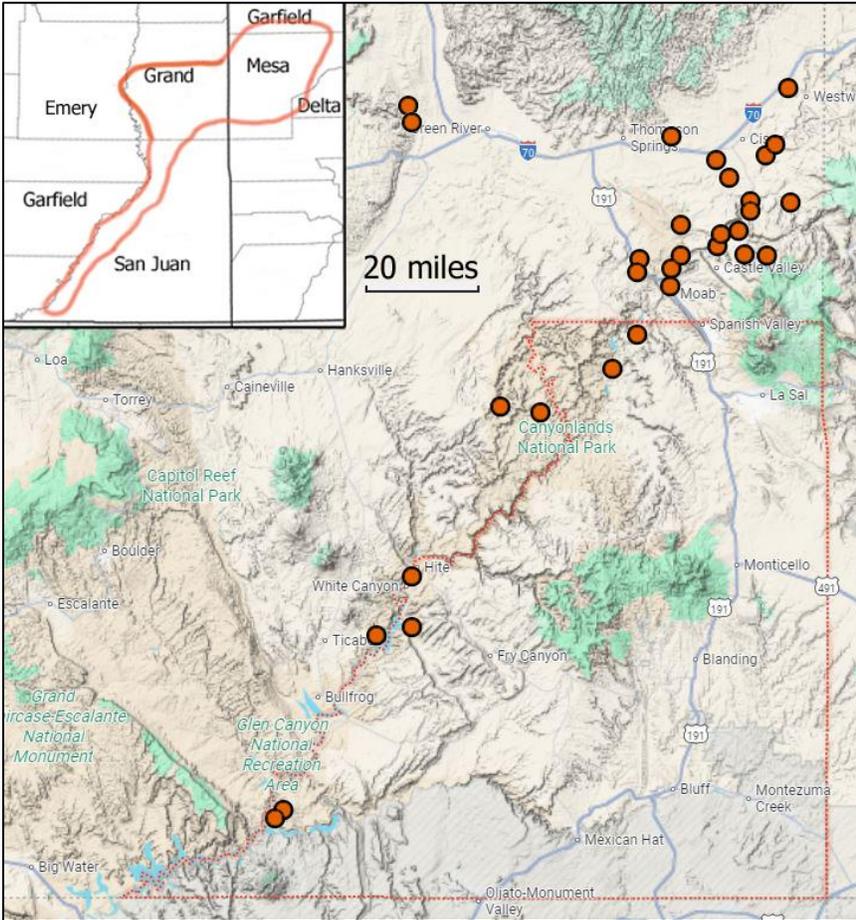
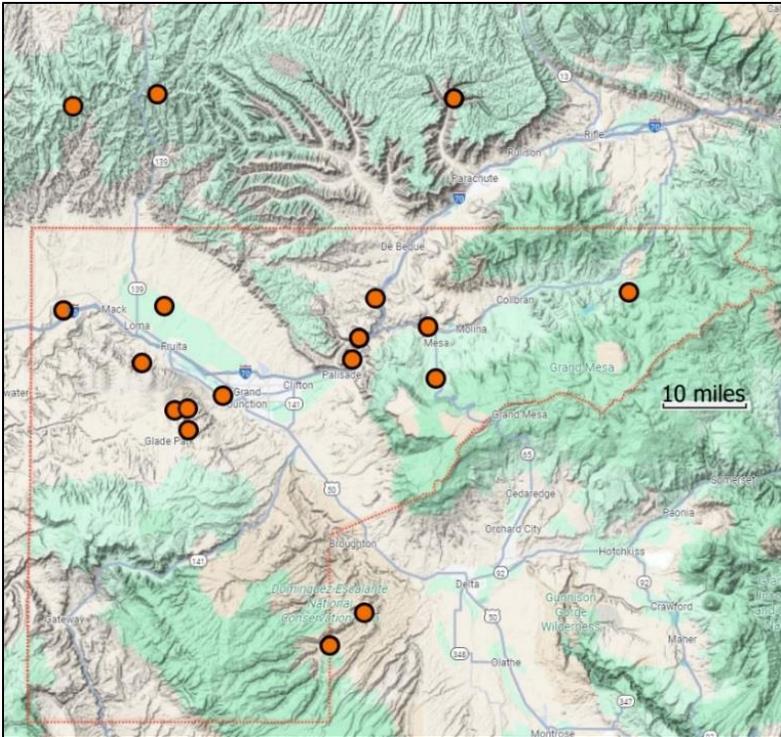
Map 3. Distribution of *Grindelia inornata* and *G. aphanactis* in southern and central Colorado, mostly the distribution northward along the eastern side of the Front Range. Park County is outlined in red.



Map 4. Distribution of *Grindelia inornata* (orange) and *G. aphanactis* (green) in Huerfano County (outlined in red).



Map 5. Distribution of *Grindelia inornata* (orange) and *P. aphanactis* (green) in Las Animas County and western Otero County. Las Animas County is outlined in red.

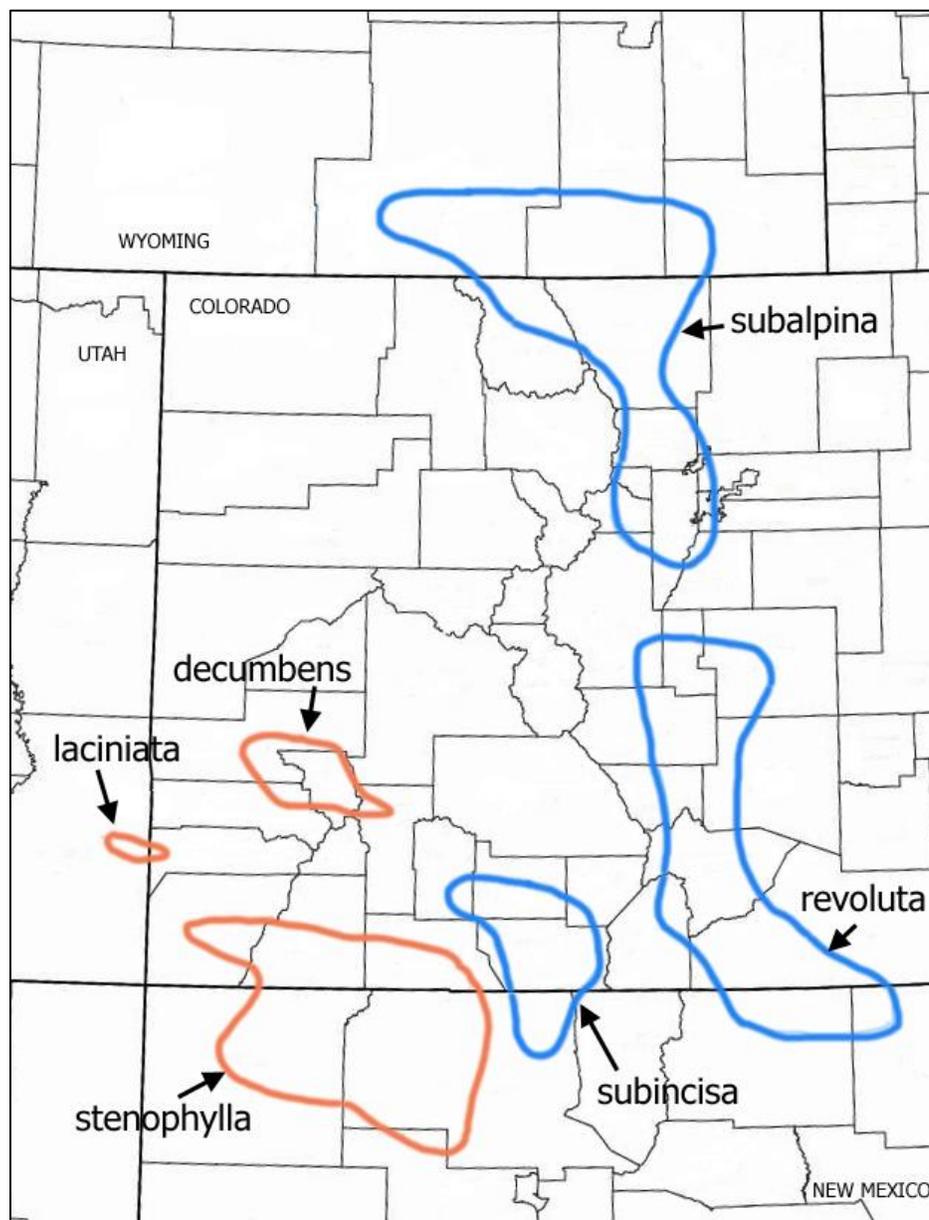


Map 6. Distribution of *Grindelia fastigiata* in Colorado (above) and Utah (below).

6. **GRINDELIA FASTIGIATA** Greene, Pittonia 3: 102. 1896. TYPE: Colorado. Mesa Co.: Grand Junction, 27 Aug 1896, *E.L. Greene s.n.* (holotype: NDG 53589; isotypes: NDG-4 sheets).

Flowering (June-) July-September (-October). Roadsides, dry washes, clay and shale slopes, desert shrub, ditches, river banks on sand and gravel-sand, talus, oak slopes, pinyon-juniper, hanging gardens; in Colorado at 4500-6400 (-8500) feet, in Utah at 3400-4300 (-5200) feet. The wide variance in elevation and the long southward range extension along the Colorado River in Utah seem unusual, but plants all fit within the morphological concept of the species.

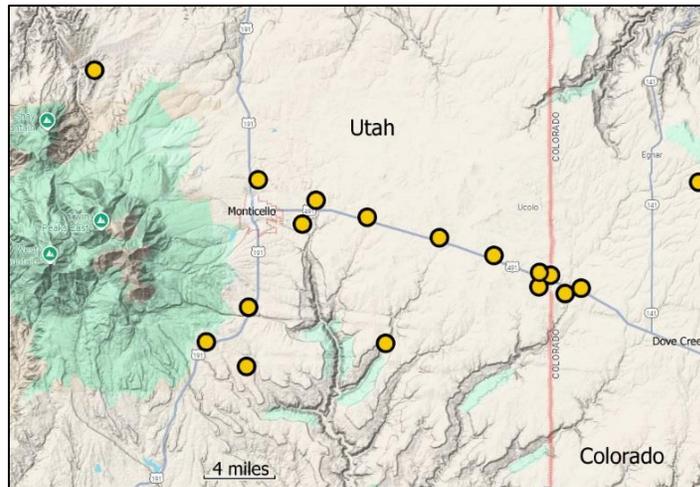
Ackerfield and Heil (2025) have included *Grindelia fastigiata* in the New Mexico flora on the basis of a record from Rio Arriba County (far out of range), but I've been unable to confirm its existence there.



Map 7. Distribution of six radiate species of Colorado *Grindelia*, showing discrete ranges and allopatry. Those in orange have relatively small heads on short peduncles; those in blue have larger heads and longer peduncles (see Key to Species, couplet 6). A detailed map for each species is provided below; map point vouchers are cited in the Appendix.

10. GRINDELIA LACINIATA Rydb., Fl. Rocky Mts., 848, 1066. 1917. **TYPE: Utah.** San Juan Co.: E of Monticello, Montezuma Canyon, 2000 m, 13 Aug 1911, *P.A. Rydberg* 9692 (holotype: NY; isotypes: GH, MIN, RM, US).

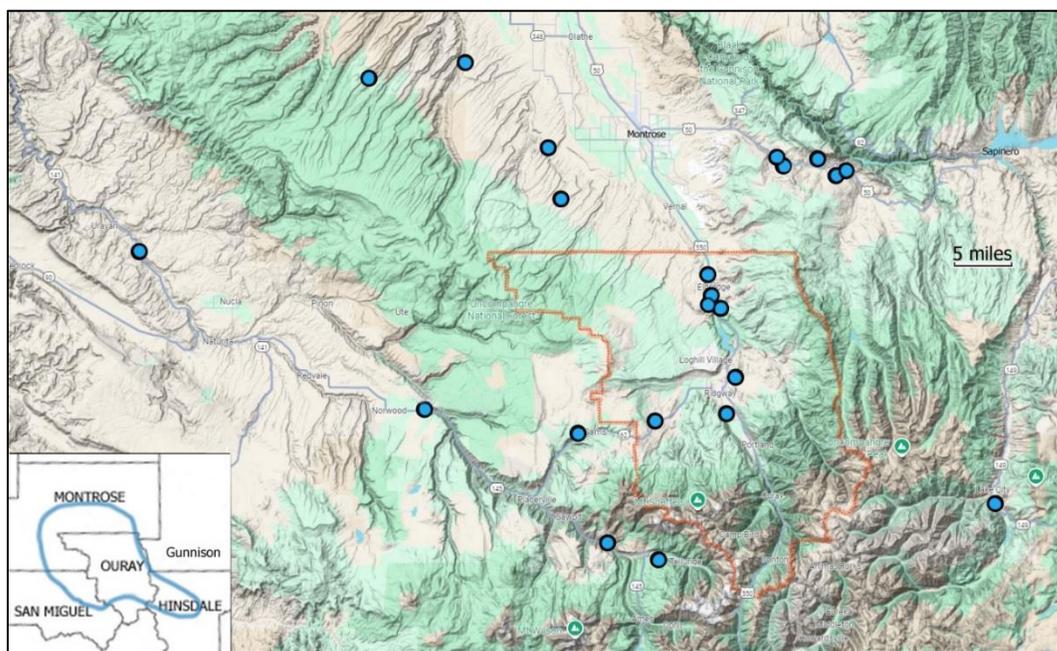
Flowering July-mid September (October). Road shoulders and embankments, disturbed areas, meadows and pastures, areas of pinyon pine, pinyon-juniper, and sagebrush-rabbitbrush, silty clay loam, clay, and sandy soil; 6800-7500 feet.



Map 8. Distribution of *Grindelia laciniata*. Utah (San Juan Co.) and Colorado (Dolores Co.).

7. GRINDELIA DECUMBENS Greene, Pittonia 3: 102. 1896. *Grindelia hirsutula* var. *decumbens* (Greene) Ackerf., Fl. Colorado, ix. 2015. **TYPE: Colorado.** Montrose Co.: Cimarron, 30 Aug 1896, *E.L. Greene s.n.* (holotype: NDG).

Flowering July-mid September. Grassy hillsides, roadsides, pastures, riparian, pinyon-juniper, sagebrush; (5600-)6600-8600(-9000) feet.

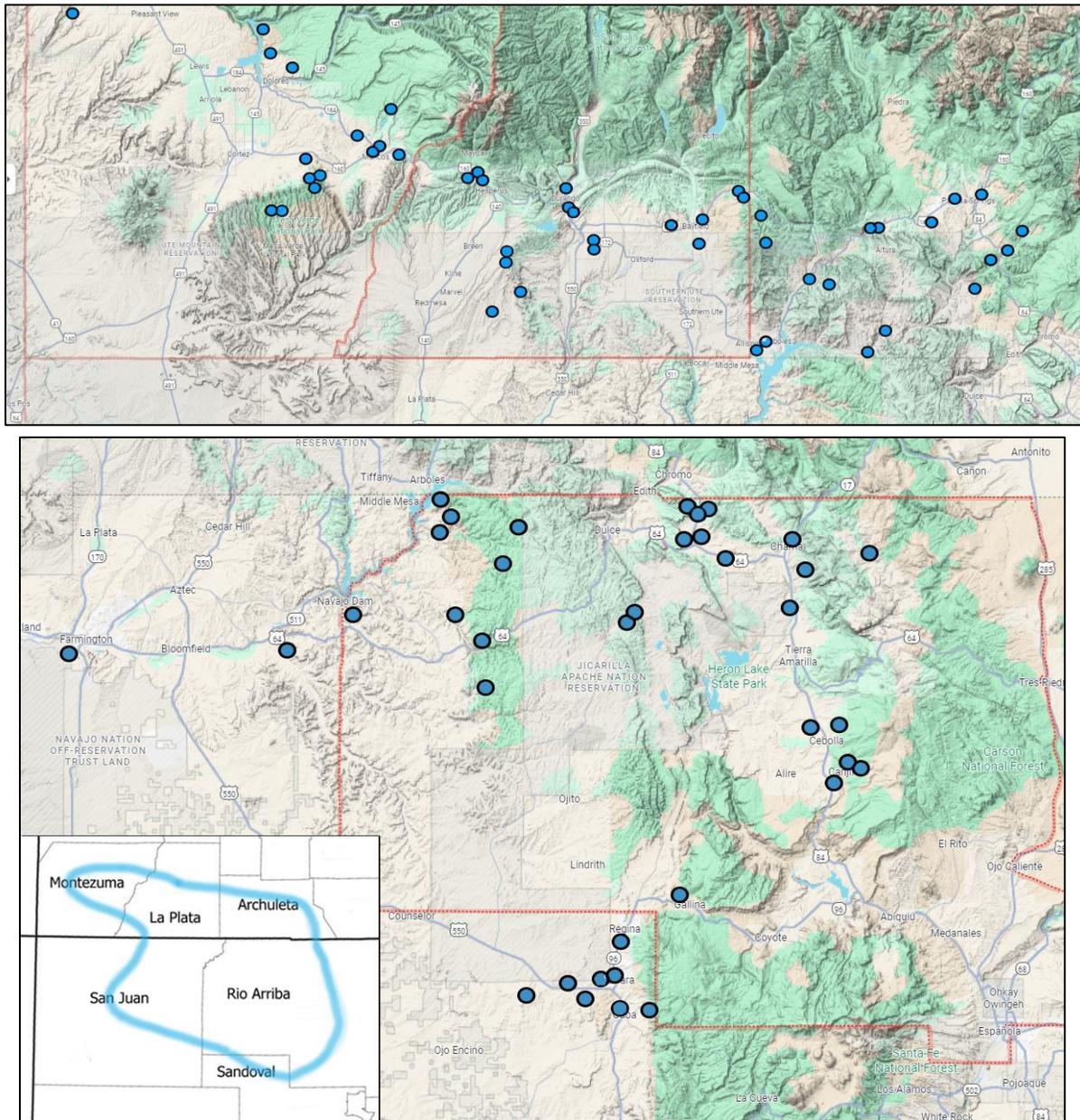


Map 9. Distribution of *Grindelia decumbens*. Ouray County is outlined in red. The cited collection from southeastern Gunnison Co. (*Wetter* 623, not mapped) seems out-of-range and perhaps is adventive.

8. GRINDELIA STENOPHYLLA (Steyserm.) Nesom, **comb. et stat. nov.** *Grindelia arizonica* var. *stenophylla* Steyserm., Ann. Missouri Bot. Gard. 21: 507. 1934. **TYPE. Colorado.** La Plata Co.: Near Bayfield, 12 Aug 1904, *E.O. Wooton* 2568 (holotype: US; isotypes: US-3).

Flowering June-September (-October). Ponderosa pine-Douglas fir, open ponderosa pine, cut-over pine, open Gambel oak, pinyon-juniper, sagebrush, roadsides, meadows, pastures, riparian and ditch edges, eroded slopes, sandy, clay, and clay-loam soil; (5650-) 6200-8400 (-9100) feet.

Typical *Grindelia arizonica* differs from *G. stenophylla* in its stems equably leafy into the inflorescence (vs. leaves becoming bracteate in the inflorescence) and annual duration (vs. perennial). *Grindelia arizonica* occurs in southwestern New Mexico and central Arizona (Nesom in prep.), allopatric with *G. stenophylla*.



Map 10. Distribution of *Grindelia stenophylla* in New Mexico. La Plata Co. (above) and Rio Arriba (below) cos. are outlined in red. Inset shows total range.

- 9. GRINDELIA SQUARROSA** (Pursh) Dunal, Mém. Mus. Hist. Nat. 5: 50: 1819. *Donia squarrosa* Pursh, Fl. Amer. Sept. 2: 559. 1814. **TYPE:** Northeastern **Nebraska** (near Sioux City). "Prairies in the camp near old Maha [Mahar] village," 17 Aug 1804, *M. Lewis 40* (holotype: PH).
 "No. 40. — Taken at our camp at the Maha vilage August 17th 1804. it is a handsome plant about 3 feet high much branched bears a yellow circular flower . . . annual plant is covered with a gumlike substance which adheres to the fingers and yealds a pleasant smell" — notes of M. Lewis.
- Grindelia perennis* A. Nels., Bull Torrey Bot. Club 26: 355. 1899. **TYPE: Wyoming.** Sweetwater River, 27 Jul 1898, *A. Nelson 4988* (holotype: RM; isotypes: MO, NY, UTC).
- Grindelia serrulata* Rydb., Bull Torrey Bot. Club 31: 646. 1904. *Grindelia squarrosa* var. *serrulata* (Rydb.) Steyer., Ann. Missouri Bot. Gard. 21: 482. 1934. **TYPE: Colorado.** Larimer Co.: Ft. Collins, 5000 ft, 10 Aug 1891, *J.M. Cowen s.n.* (holotype: NY).
- Grindelia squarrosa* var. *quasiperennis* Lunell, Amer. Midl. Naturalist 3: 143. 1913. **LECTOTYPE** (Cronquist 1994): **North Dakota.** McLean Co.: Butte, 2 Aug 1909, *J. Lunell 1040* (MIN).

Documented by collections from every Colorado county except Crowley. "*Grindelia squarrosa* is probably native to the Great Plains and, perhaps, Rocky Mountain areas; it is widely introduced in other areas" (Strother & Wetter 2006). Varietal names are often used in identification (particularly with regard to leaf shape and margin) but these taxa appear to be typologically defined, without clear geography — a detailed study is needed.

A distinctive morphological variant, unnamed, occurs in southwestern Colorado and adjacent New Mexico — phyllaries are tightly coiled at least distally, similar to those in (e.g.) *G. fastigiata*, *G. inornata*, and *G. revoluta*. This involucrel variant also occurs elsewhere (e.g., in California, see Moore 2010). Colorado examples cited below.

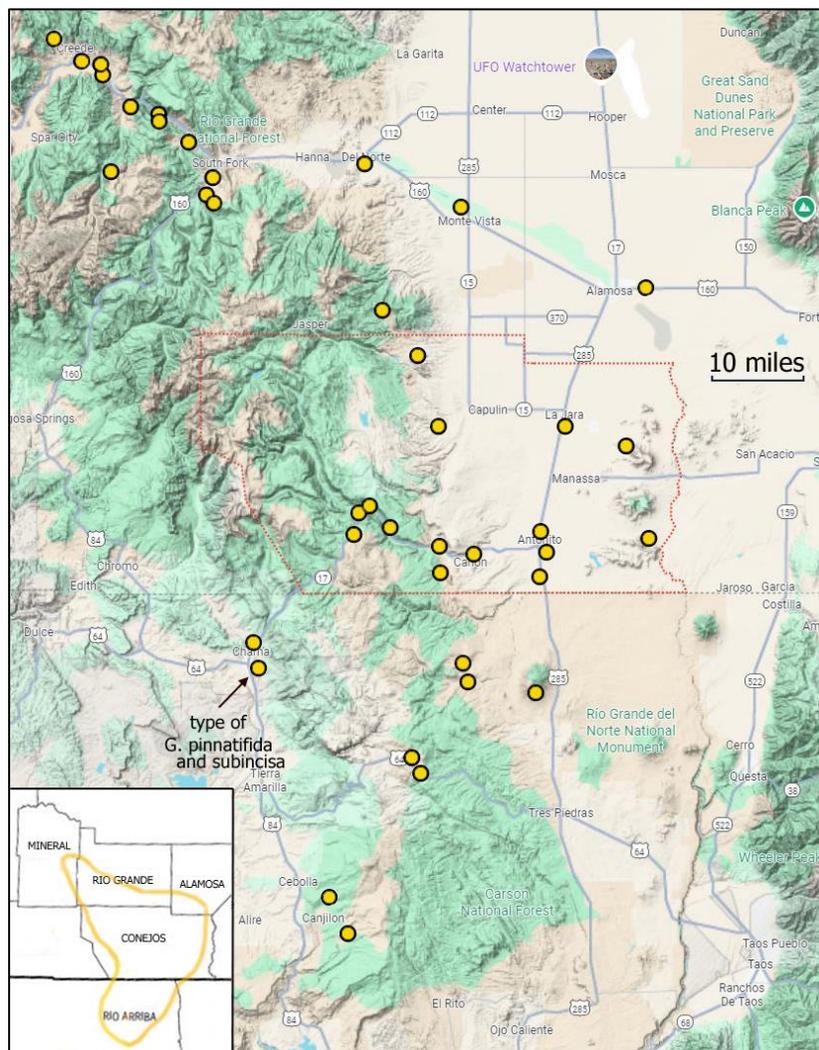
Colorado. Archuleta Co.: Jct of Hwy 151 and road to Chimney Rock Archaeological Center, 37.1756 N, 107.2956 W, 6590 ft, 31 Aug 2002, *Heil 20477* (SJNM). Dolores Co.: Along Hwy 666, ca. 200 ft E of CO-UT state line, 37.816239 N, 109.040942 W, 6800 ft, 14 Aug 1980, *Wetter 718* (NY). Gunnison Co.: Curecanti Natl Rec Area, East Elk Creek Group Campground, N of Blue Mesa Reservoir and Hwy 50, 38.48107 N, 107.17121 W, gravelly disturbed bench above creek, 7580 ft, 20 Aug 2004, *Lederer & Hogan 04-105* (COLO); 5 mi above Almont on road to Cumberland Pass, 38.7 N, 106.81 W, 8498 ft, 6 Aug 1961 *Rambolt 146* (CS); along Hwy 50, 5.1 mi W of jct Hwy 50 and 92, 10.1 mi E of Gunnison-Montrose Co. line, 8500 ft, 14 Sep 1979, *Wetter 561* (NY, RM); along Hwy 50, 2.8 mi W of jct with Hwy 146, 11.5 mi E of Sapinero, 13.1 mi E of jct with Hwy 92. Curecanti Natl Rec Area, 38.459 N, 107.089 W, 6350 ft, 12 Aug 1984, *Wetter 762* (NY-2, RM); along Hwy 50, 0.7 mi E of jct Hwy 92, just past bridge over lake at Sapinero, Curecanti Natl Rec Area, 7200-7400 ft, 1 Sep 1985, *Wetter 867* (NY, RM); along Hwy 50, 10.5 mi W of Hwy 50 and 92 at Sapinero, 3.9 mi E of Gunnison-Montrose Co. line, 8600 ft, 1 Sep 1985, *Wetter 868* (NY, RM). Mesa Co.: Along I-70, 6.4 mi E of CO-UT state line, 39.2214 N, 108.9481 W, 5000 ft, 17 Sep 1979, *Wetter 567* (CM, COLO, NY, RM). Montrose Co.: Ca. 12 air mi S of Delta, BLM lands off of H54 Road, 38.5768 N, 108.0746 W, 5670 ft, long irrigation ditch in desert scrub, 14 Aug 2011, *Brunner 7060* (KHD, RM); Dolores River Drainage, Roc Creek, 38.443151 N, 108.874859 W, 4850 ft, riparian area with *Salix exigua* and *Distichlis spicata*, 3 Aug 1994, Lyon 6678 (FLD, RM); along Hwy 347 (to Black Canyon of the Gunnison Natl Mon), 3.75 mi N of jct Hwy 347 and 50 E of Montrose, 1.9 mi S of Natl Monument boundary, 7600-7800 ft, 19 Jul 1988, *Wetter 1037* (NY). **New Mexico.** San Juan Co.: Farmington, B-Square Ranch, between Turtle Lake and Large Lake, 36.7092 N, 108.1511 W, 5300 ft, 19 Aug 1999, *Heil 13751* (SJNM); ca. 2 mi W of Aztec on South Side road, 36.808 N, 108.021 W, 5600 ft, 3 Sep 1980, *Sullivan 12* (SJNM).

- 10. GRINDELIA SUBINCISA** Greene, Pittonia 4: 154. 1900. *Grindelia decumbens* var. *subincisa* (Greene) Steyer., Ann. Missouri Bot. Gard. 21: 503. 1934. *Grindelia lanceolata* var. *subincisa* (Greene) Bart. & Tort., Ann. Missouri Bot. Gard. 98: 480. 2012. **LECTOTYPE** (Bartoli & Tortosa 2012): **New Mexico.** Rio Arriba Co.: Chama, 5 Sep 1899, *C.F. Baker 683* (NDG 53651; isolectotypes: F, GH, MO, NDG-2 sheets, NMC, NY, RM-2 sheets, RSA, US-2 sheets).

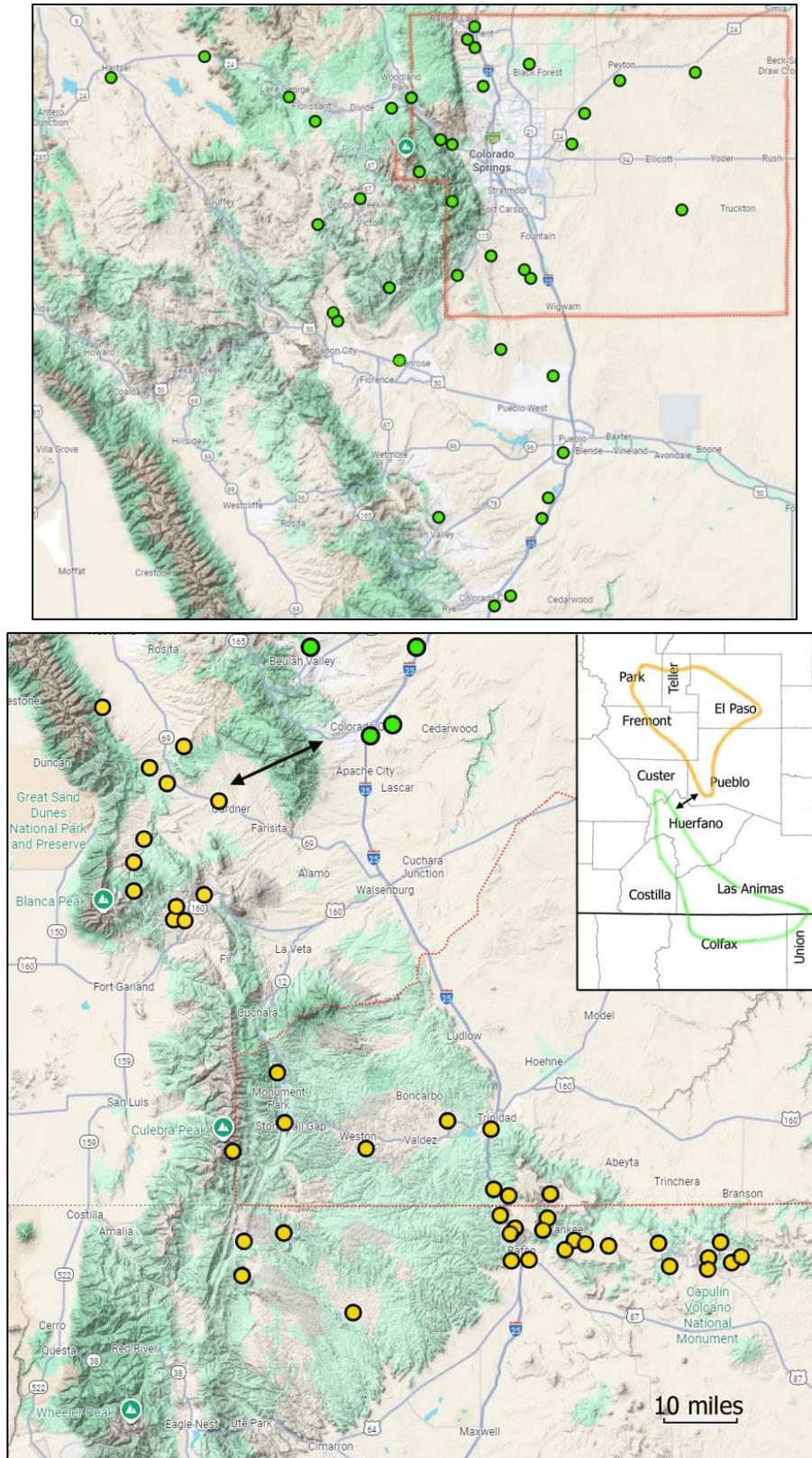
Grindelia pinnatifida Woot. & Standl., Contr. U.S. Natl. Herb. 16: 178. 1913. **TYPE: New Mexico:** [Rio Arriba Co.]: Vicinity of Chama, open slopes, 2380-2850 m, 9 Jul 1911, *P.C. Standley 6606* (holotype: US). The holotype appears to be rayless, but it is perhaps because the heads are immature. The protologue did not mention ray florets, which would seem unusual if the plants were eradiate — it did note that "the plant was very abundant about Chama, in the Transition Zone." *Standley 6519* from Chama (typical *G. subincisa*) was collected a day earlier and clearly is radiate, and the type of var. *subincisa* also was collected at Chama. The holotype of *G. pinnatifida* otherwise is a match for typical *G. subincisa* — if it indeed lacks rays, perhaps it is a hybrid with *G. aphanactis*.

Flowering (June-) July-mid September. Road edges and embankments, stream terraces, pastures, fields, open disturbed areas, dry slopes, openings in riparian and dry forest; (7000-) 7500-9500 (-9800) feet.

Grindelia subincisa is more similar to *G. revoluta* and *G. subalpina* than to *G. decumbens*. The rationale for considering it conspecific with *G. decumbens* has never been clearly stated.



Map 11. Distribution of *Grindelia subincisa*. New Mexico (Rio Arriba Co.) and Colorado (Conejos, Mineral, Rio Grande, and Alamosa cos.). Conejos County is outlined in red. Inset shows counties of occurrence. Collections from La Plata Co. (from the town of Durango and slightly west of it, not mapped but cited below), are out-of-range for the species and probably adventive there.



Map 12. Distribution of *Grindelia revoluta*, northern segment (above) southern segment (below). The inset shows the range of the two geographic segments, if they actually exist. El Paso Co. (above) and Las Animas Co/ (below) are outlined in red.

11. GRINDELIA REVOLUTA Steyererm., Ann. Missouri Bot. Gard. 21: 496. 1934. *Grindelia fastigiata* var. *revoluta* (Steyererm.) Bartoli & Tortosa, Ann. Missouri Bot. Gard. 98: 459. 2012. **TYPE: Colorado.** El Paso Co.: 14 mi S of Colorado Springs, along roadside, 1830 m, 30 Aug 1931, J.A. Moore & J.A. Steyermark 3784 (holotype: MO).

Grindelia acutifolia Steyererm., Ann. Missouri Bot. Gard. 21: 501. 1934. **TYPE: New Mexico.** Colfax Co.: Johnson's Mesa, 16 Aug 1910, E.O. Wooton s.n. (holotype: US).

Flowering July-September. Pine-fir, open pine woods (*P. contorta*, *P. ponderosa*), pine-oak, oaks, oak-juniper, pinyon-juniper, high prairie, plains, roadsides, disturbed areas, rocky hillsides, rocky stream bars; (5000-) 5500-8400 (-9500) feet.

A distinct species and apparently abundant, commonly weedy, especially along roadsides. In its southern range it has mostly been identified as *Grindelia acutifolia*, but it is included in New Mexico Rare Plants (<https://nmrareplants.unm.edu/node/88>), as *Grindelia hirsutula*, a "dropped" species.

Grindelia acutifolia and *G. revoluta* are contrasted in a couplet of Steyermark's key, as below (essentially repeated by Harrington 1954), with geography quoted from his subsequent descriptions.

- e. Leaves subcoriaceous and thickened, entire to regularly rather remotely dentate or denticulate with short broad teeth; "El Paso Co. south to northern Huerfano Co." **Grindelia revoluta**
 ee. Leaves firmly membranaceous, saliently and sharply toothed with acute to setulose-acuminate teeth; "southeastern Colorado in vicinity of Trinidad to northeastern New Mexico in vicinity of Raton" **Grindelia acutifolia**

Steyermark did not, however, consider them to be sister species, noting that *G. revoluta* is "the probable radiate equivalent and ancestor of the discoid *G. inornata*" (p. 498). Without specifying ancestry or relationship, he noted that *G. acutifolia* had sometimes been mistakenly identified as *G. subalpina*.

Ackerfield (2022) emphasized features of vestiture in their distinction:

- * Lower leaves without glandular hairs, the margins mostly scarcely scabridulous
 **Grindelia revoluta**
 * Lower leaves with small glandular hairs on the lower [abaxial] sides along the main vein, the margins mostly conspicuously scabridulous **Grindelia acutifolia**

The maps here suggest that a geographical gap exists (Map 12), as described by Steyermark, but if so it is a narrow one and habitats on either side appear to be similar. The current study is unable to find a consistent morphological distinction between northern (*revoluta*) and southern (*acutifolia*) plants — only a single species is recognized.

12. GRINDELIA SUBALPINA Greene, Pittonia 3: 297. 1898. **TYPE: Wyoming.** Albany Co.: Laramie, 9 Jul 1896, E.L. Greene s.n. (holotype: NDG).

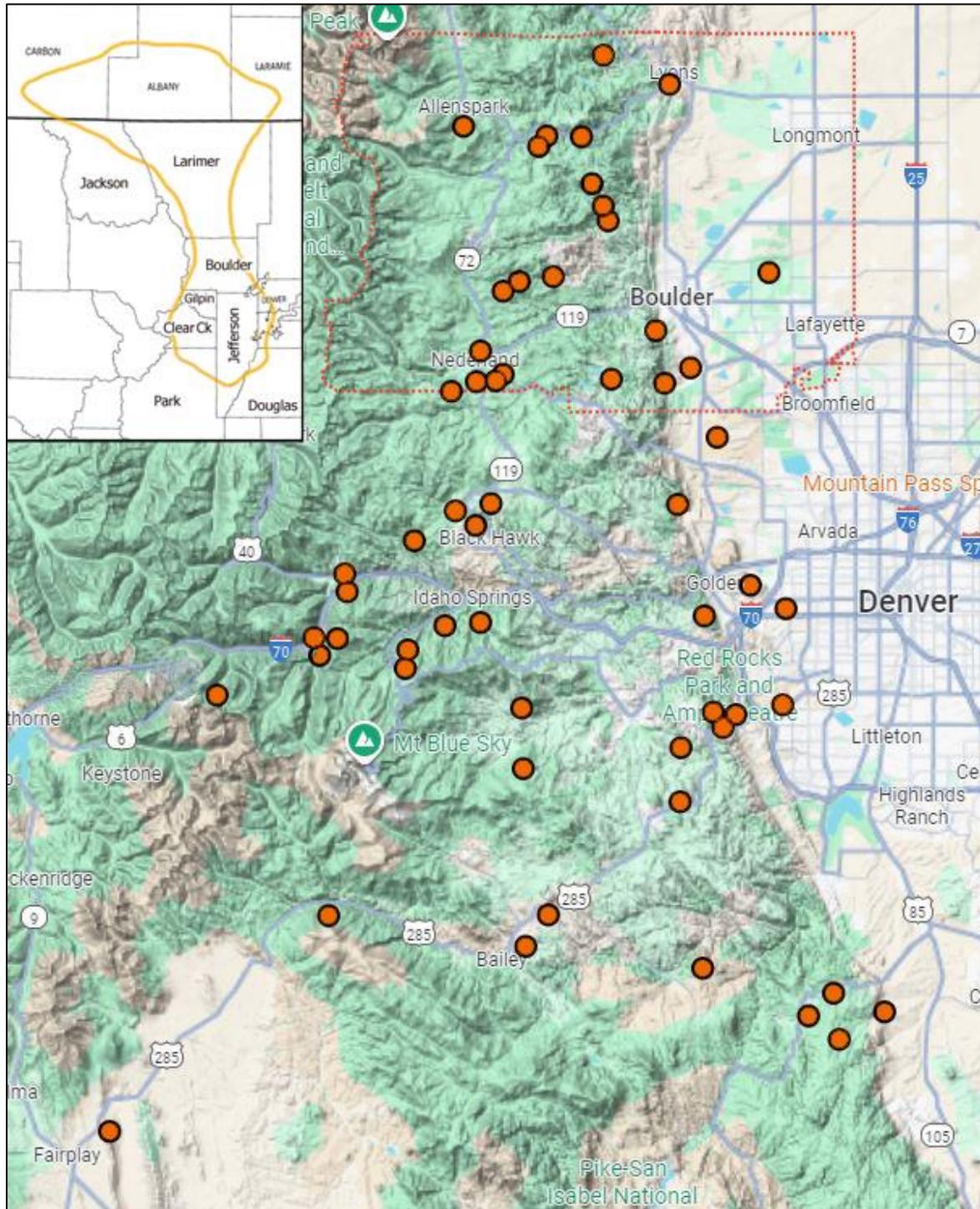
Grindelia platylepis Greene, Pittonia 3: 297. 1898. **LECTOTYPE** (Bartoli & Tortosa 2012): **Wyoming.** Albany Co.: Sherman, 29 Jul 1893, E.L. Greene s.n. (NDG 53627).

Grindelia erecta A. Nels., Bull. Torrey Bot. Club 26: 356. 1899. *Grindelia subalpina* var. *suberecta* (A. Nels.) Steyererm., Ann. Missouri Bot. Gard. 21: 501. 1934. **TYPE: Wyoming.** Albany Co.: Laramie Hills, 11 Sep 1898, A. Nelson 5306 (holotype: RM; isotypes: MO, NY, UTC).

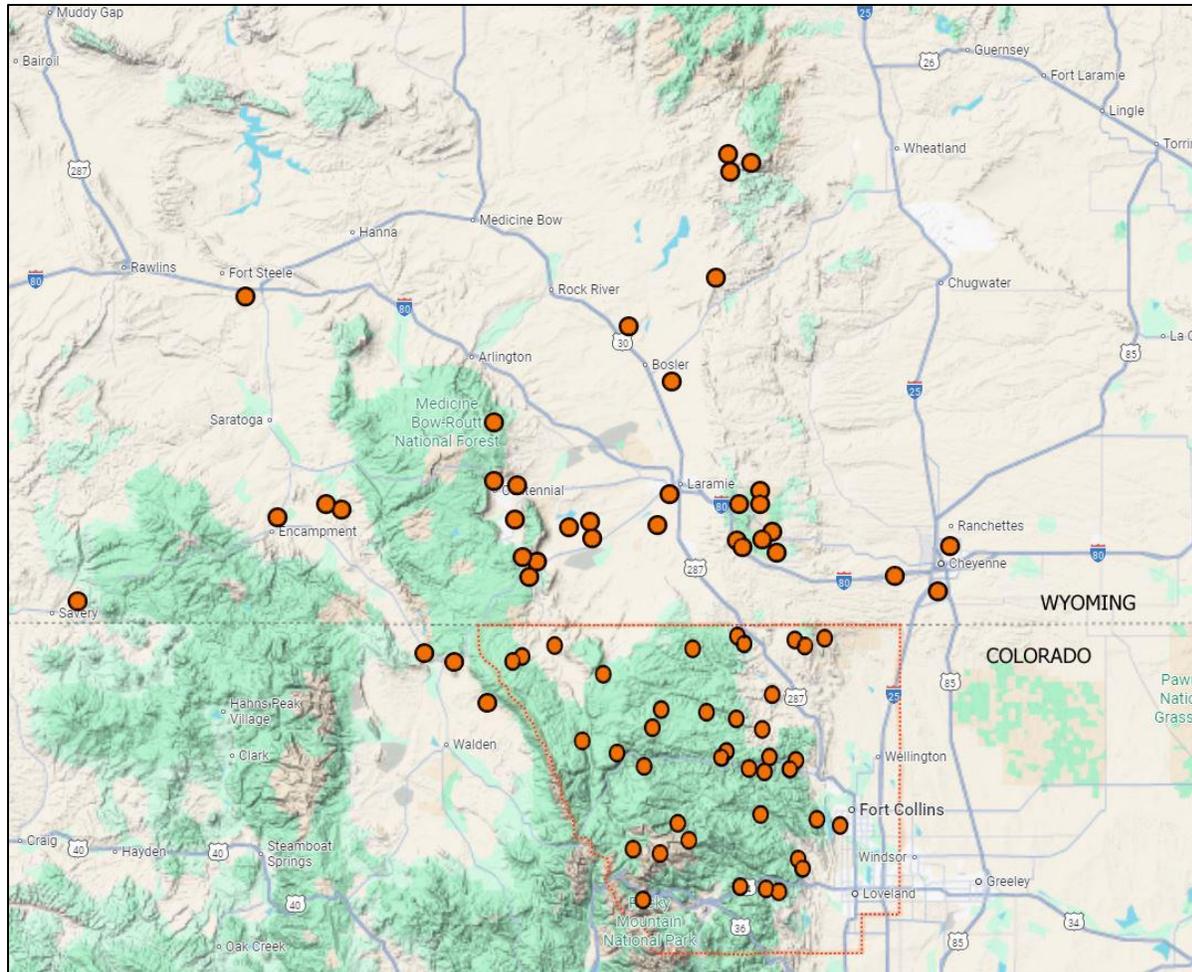
Grindelia eldorae Daniels, Univ. Missouri Stud., Sci. Ser. (Fl. Boulder, Colo.) 2(2): 227. 1911. **TYPE: Colorado.** Boulder Co.: Eldora, subalpine valley, 8700 ft, 31 Aug 1906, F. Daniels 859 (holotype: COLO; isotype: MSC).

Flowering July-September. Dry plains and foothills, open pine woods (*P. ponderosa*, *P. contorta*), pine-juniper, aspen-spruce, oak thickets, sagebrush, grassy hills, rocky road shoulders and embankments; (5000-) 5600-9000 (-9400) feet.

Grindelia subalpina is similar to *G. revoluta* in its coiled phyllaries and serrate-spinulose leaves, but the heads usually are immediately subtended by narrow bracts. The pappus of *G. subalpina* is of 4–8 bristles or awns, that of *G. revoluta* 2–4 subulate scales. They are allopatric (nearly parapatric, their ranges approaching each other in Park County) and it seems plausible that they are sister species. There appears to be essentially no difference in habitat.



Map 13. Distribution of *Grindelia subalpina* in Colorado (Larimer/Jackson Co. and Wyoming shown in Map 14). Larimer County is outlined in red.



Map 14. Distribution of *Grindelia subalpina* in Wyoming (Carbon, Albany, and Laramie cos.) and northern Colorado (Jackson and Larimer cos.). Larimer County is outlined in red.

ACKNOWLEDGEMENTS

Huge gratitude to Mark Wetter — without his collections and detailed notes an understanding of *Grindelia* in Colorado (and all of the southwestern USA) would be far less meaningful. Thanks also to Barney Lipscomb at BRIT for help with literature and to Abigail Moore (OKLA) for comments that considerably improved the manuscript.

LITERATURE CITED

- Ackerfield, J. 2022. Flora of Colorado, Ed. 2. BRIT Press, Botanical Research Inst. of Texas, Fort Worth.
- Ackerfield, J. and K.D. Heil. 2025. *Grindelia*. Pp. 226–228, in K.D. Heil and S.L. O’Kane, Jr. Vascular Plants of New Mexico. Missouri Botanical Garden Press, St. Louis.
- Bartoli, A. and R.D. Tortosa. 2012. Revision of the North American species of *Grindelia* (Asteraceae). Ann. Missouri Bot. Gard. 98: 447–513.
- Calflora. 2025. The Calflora Database, a non-profit organization. <<https://www.calflora.org/app/>> Accessed October 2025.
- Cronquist, A. 1994. *Grindelia*. Pp. 252–256, in Asterales. Intermountain Flora: Vascular Flora of the Intermountain West, U.S.A. Vol. 5. The New York Botanical Garden, Bronx.
- Harrington, H.D. 1954. Manual of the Plants of Colorado. Sage Books, Denver, Colorado.

- Moore, A.J. 2010. Phylogenetic and population genetic studies in *Grindelia* (Asteraceae: Astereae). Ph.D. dissertation, Univ. of California, Berkeley. <<https://escholarship.org/uc/item/6dx5f5n5>>
- Moore, A.J. 2025. *Grindelia*. In Jepson eFlora. Jepson Flora Project (eds.) <https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=451>
- Nesom, G.L. 1990. Studies in the systematics of Mexican and Texan *Grindelia* (Compositae: Astereae). *Phytologia* 68: 303–332.
- Nesom, G.L. 2019. Taxonomy of *Grindelia lanceolata* sensu lato (Asteraceae). *Phytoneuron* 2019-34: 1–22.
- Steyermark, J.A. 1934. Studies in *Grindelia* II. A monograph of the North American species of the genus *Grindelia*. *Ann. Missouri Bot. Gard.* 21: 433–608.
- Strother, J.L. and M.S. Wetter. 2006. *Grindelia*. Pp. 424–436, in *Flora of North America North of Mexico*, Vol. 20. Oxford Univ. Press, New York and Oxford.
- Weber, W.A. and R.C. Wittmann. 2012. *Colorado Flora: Eastern Slope*, Fourth Edition. Univ. Press of Colorado, Boulder.
- Yatskievych, G. 2006. Steyermark's Flora of Missouri. Vol. 2 (rev.). Missouri Bot. Garden Press, St. Louis, with Missouri Dept. of Conservation, Jefferson City.

Appendix: Collections examined. Species listed alphabetically.

GRINDELIA DECUMBENS

Additional collections. COLORADO. Gunnison Co.: NE of Sargents, Gunnison Natl Forest, along road to White Pine, 8 mi N of jct Hwy 50 and White Pine road, Snowblind Campground, 38.521389 N, 106.415027 W, 9000-9500 ft, most past flowering, same area as *G. squarrosa* (Wetter 871), no hybrids, 5 Jul 1980, *Wetter 623* (NY). **Hinsdale Co.:** Ca. 2 mi S of Lake City on Rte 149, grassy, E-facing hillside, ca. 9000 ft, abundant, 3 Aug 1966, *Barrell 164-66* (US). **Montrose Co.:** 1.3 mi ESE of Uravan along Hwy 141, 38.3582097 N, 108.7135178 W, edge of former cattle corral, 5020 ft, 23 Jul 1992, *Abbott 283* (COLO); Cerro Summit, 8000 ft, 1 Aug 1901, *Baker 702* (RM-2 sheets, US); ca. 20.5 air mi SW of Delta, Monitor Creek, 38.5305 N, 108.3175 W, pinyon-juniper with scattered ponderosa on sandstone mesa, 7000-7400 ft, 13 Aug 2010, *Brummer 1982* (KHD, RM); ca. 17 air mi NW of Montrose, Roubideau Canyon, middle canyon just NW of Camel Back, 38.5611 N, 108.1823 W, low elevation riparian area, 5600-5640 ft, 19 Sep 2012, *Brummer 12109* (RM); 10 mi E of Montrose, 4000 ft, 29 Aug 1931, *Moore & Steyermark 3780* (GH); along Hwy 50, 2.3 mi E of jct with County Rd 347 (road to Black Canyon Natl Monument), scattered in gravelly roadside embankment, with various grasses, *Melilotus*, and other weeds, 6 Jul 1980, *Wetter 630* (NMC, NY); Hwy 50 at Cerro Summit jct with Road P77, common but scattered along gravelly roadside and adjacent pasture, open areas with various grasses, oaks, legumes, and other weeds, 6 Jul 1980, *Wetter 629* (NY); along Hwy 50, 5.3 mi W of Montrose-Gunnison Co. line, 0.5 mi W of Cimarron, 3.6 mi E of Cerro Summit, 38.445246, 107.57453, sagebrush, 5900 ft, common in hard clay soil on flat areas at top of embankment, most in small drainage channels, 12 Aug 1984, *Wetter 763* (NMC, NY-2 sheets); along Hwy 50 at Cerro Summit, jct Road P77, 8.9 mi W of Montrose-Gunnison Co. line, 6.1 mi W of jct with County Rd 347 (road to Black Canyon of the Gunnison Natl Monument), 38.478204, 108.040996, 6650 ft, 12 Aug 1984, *Wetter 764* (NY); along Hwy 50, 2.9 ml W of Montrose-Gunnison Co. line, 1.3 mi E of Cimarron, at the power station (transformers) near Cimarron, 7000-7200 ft, only seen at edge of hwy in rocky shoulder at point where pavement ends, 1 Sep 1985, *Wetter 869* (NY); along Hwy 50, at Cerro Summit, jct Road P77, 9.5 ml W of Montrose-Gunnison Co. line, 29.7 mi E of Montrose-Delta Co. line, 38.477034, 107.326147, 7800 ft, 1 Sep 1985, *Wetter 872* (NY). **Ouray Co.:** Along County Rd 23, ca. 1.5 air mi S of Ridgway, 38.1245 N, 107.7483 W, roadside, 7141 ft, mountain shrub-sagebrush mix, 13 Sep 2012, *Brummer 11792*, damaged stems (KHD); 3 mi S of Montrose Co. line on Hwy 550, weedy roadside in agricultural area, occasional, 5 Aug 1991, *Keil 22531* (OBI); Owl Creek Pass Rd, 38.1678 N, 107.7153 W, Aug 1987, *Lyon 173* (FLD); Hwy 550, 13 mi S of Ouray, roadside, 18 Jul 1960, *Solbrig 3155*, n=6 (US); 23.7 mi SE of Montrose on Hwy 550, 3 mi N of jct of Hwy 550 and 62, common, 9 Aug 1973, *Urbatsch 1326* (LSU); along Hwy 550, 11.7 mi N of jct with Hwy 62 near Ridgway, 7 Jul 1980, *Wetter 631* (NY);

along Hwy 62 W towards Placerville, 2 mi E of summit of Dallas Divide, 7 Jul 1980, *Wetter 632* (NY); along Hwy 550, 2.5 mi S of Montrose-Ouray Co. line, 11.0 mi N of jct with Hwy 62 at Ridgway, common in hard, gravelly soil along hwy shoulder and in area between hwy and adjacent field, 6700 ft, 13 Aug 1984, *Wetter 765* (NY); along Hwy 550, 10.6 mi S of Montrose-Ouray Co. line, 4.1 mi N of jct with Hwy 62 at Ridgway, 7100 ft, 13 Aug 1984, *Wetter 766* (NY); along Hwy 550, 5.7 mi N of jct Hwy 550 and 62 near Ridgway, 9.1 mi S of Ouray-Montrose Co. line, common along hwy shoulder and along gravel access road leading up into pine forest, 7200 ft, 19 Jul 1988, *Wetter 1034* (NY); along Hwy 550, 2.7 mi S of Ouray-Montrose Co. line, 12.1 mi N of jct Hwy 550 and 62 near Ridgway, common along hwy shoulder and adjacent area between hwy and field, 38.2994 N, 107.549 W, 6600-6800 ft, 19 Jul 1988, *Wetter 1035* (NY); along Hwy 550, 2.7 mi S of Ouray-Montrose Co. line, 12.1 mi N of jct Hwy 550 and 62 near Ridgway, 37.983625 N, 107.671449 W, common along hwy shoulder and adjacent area between hwy and field, 7900 ft, very common along rocky hwy shoulder and gravelly edges of Road P77, also down embankment from hwy, 19 Jul 1988, *Wetter 1038* (NY). San Miguel Co.: 15 mi W of Ridgeway, roadside banks, aspen, 14 Sep 1935, *Maguire 12773* (GH); Norwood Hill, dry canyon sides, 7000 ft, 12 Aug 1912, *Walker 463* (GH); along CO Spur 145 (road to Telluride), 0.1-0.2 mi E of jct CO Spur 145 and Hwy 145, W of Telluride, 37.9444, 107.866, 8600 ft, 27 Aug 1986, *Wetter 971* (NY); along Hwy 145, 2.8 mi NW of jct Hwy 145 and CO Spur 145 (road to Telluride), 8.9 mi SE of jct Hwy 145 and 62 at Placerville, 7900-8000 ft, 27 Aug 1986, *Wetter 973* (BRY, CM, COLO, NY).

GRINDELIA FASTIGIATA

Additional collections. COLORADO. Delta Co.: Ca 16.5 air mi WNW of Delta, Little Dominguez Canyon from Poison Canyon to the bend on the E side of Star Mesa, 38.78 N, 108.3818 W, 5039-5240 ft, sparse pinyon-juniper-shrub, 17 Sep 2012, *Brummer 12064* (KHD). Garfield Co.: NW of DeBeque along County Rd 200 [Dry Fork Rd], 39.3703 N, 108.3061 W, dry clay hills, 5360 ft, common, 25 Jun 2016, *Ackerfield 16-28* (US); East Middle Fork of Parachute Creek, 39.577355 N, 108.107927 W, 5800 ft, 25 Aug 1972, *Ferchau & Vories s.n.* (WSC); along road on rim between East and West Douglas Creeks, ca. 5 mi S of road from Red Rock Canyon, 39.62 N, 108.76 W, 8465 ft, with *Quercus*, *Amelanchier*, *Chrysothamnus*, 4 Aug 1978, *Painter et al. 211* (CS); summit of Baxter Pass, 39.582547 N, 108.952585 W, douglas fir-aspen forest, 8400 ft, 12 Sep 1986, *Womack 8* (MESA). Mesa Co.: Plateau Creek Road, 10 mi NW of Mesa, 39.183332 N, 108.280987 W, desert shrub community in sandy soil, 5800 ft, 17 Aug 1982, *Kelley 82-187* (ILLS, MESA); SW side of Hightower Mtn, Buzzard Creek drainage, 39.24 N, 107.68 W, SW slope with oak, 8298 ft, 24 Jul 1969, *Kufeld K-60* (CS); Uncompahgre Plateau, Escalante Canyon, 38.680 N, 108.317 W, pinyon-juniper woodland, dry water course in sagebrush, gravel, 5500 ft, 20 Sep 1981, *Siplivinsky 2422* (CM, COLO, DES); Colorado Natl Monument, head of Ute Canyon just above Suction Point, 39.047 N, 108.723 W, 6300 ft, 25 August 1982, *Siplivinsky & Beck 4989* (CM, COLO); McInnis Canyon Natl Conservation Area, Devil's Canyon trailhead, wash on D3 trail ca. 1/2 mi S of trailhead, 39.133N, 108.761 W, grassy bank of dry wash, 4650 ft, 6 Aug 2022, *Stern 1258* (MESA); Plateau Creek Canyon 1/2 mi from I-70, at mouth of small side canyon on S side of creek, 39.17 N, 108.29 W, 4500 ft, sandy soil, 13 Sep 1986, *Walter 11546* (CS); East Glade Park Rd S of Colorado Natl Monument, 39.0047 N, 108.69954 W, roadsides, sandy soil, 1 Sep 1979, *Weber 15532* (BRY, COLO); Colorado River Valley, 16 road mi between Fruita and Garfield Co. line, 39.236 N, 108.757 W, wet roadside ditch in alkaline soil, 27 Aug 1982, *Weber 16383* (CM, COLO, DES); along I-70, 6.4 mi E of Colorado-Utah state line, 39.221 N, 108.948 W, 5000 ft, 17 Sep 1979, *Wetter 568* (NY); Colorado Natl Monument, 1.4 mi E of Highland view area on Rim Rock Drive, 15 Aug 1980, *Wetter 722* (NY, US); along Hwy 65, 5.0 mi W of jct Hwys 65 and 330, near Mesa, 5000 ft, 1 Sep 1985, *Wetter 877* (NY); along Hwy 65, 5.7 mi SE of jct Hwys 65 and 330, 15.3 mi NW of Mesa-Delta Co. line, 39.108 N, 108.140 W, 6400-6600 ft, 1 Sep 1985, *Wetter 875* (NY-2 sheets); I-70 near Horseshoe Canyon, roadside, 4700 ft, sandy, dry hot ground, 25 Sep 1981, *Young 37* (CM, COLO). **UTAH.** Emery Co.: Ca. 12 air mi WNW of downtown Green River, E side of San Rafael Swell, along County Rd 1030 [West Smith Camp Rd] just E of Tidwell Draw, 39.03066 N, 110.37371° W, roadside, 4500 ft, clay soil, Morrison Formation [Salt Wash Member], sand shrub community with *Atriplex*, *Astragalus flavus*, 14 Nov 2021, *Johnson 8045* (BRY); 5 mi W of Green River, just E of the San Rafael Swell [County Rd 1029 - West Four Corners Mine Rd], 38.978968877317° N, 110.3461850334° W, barren gray shale slopes [Mancos Shale, Juana Lopez Memeber], 4460 ft, with *Atriplex confertifolia*, *Atriplex garrettii*,

Atriplex corrugata, *Halogeton glomeratus*, *Plantago patagonica*, *Pleuraphis jamesii*, *Eremopyrum triticeum*, *Bromus tectorum*, 12 Oct 2007, *Rink 6748* (ASC, NY). Garfield Co.: 2 mi S of Hite, island of Colorado River, dry sandy soil, 3500 ft, 8 Sep 1977, *Cottam 14779* (UT); Tickaboo Canyon [ca. 37.706 N, 110.519 W], dry stream bank, 3400 ft, 6 Jul 1958, *Lindsay 38* (UT); Glen Canyon Natl Recreation Area, Flint Trail Orange Cliffs region, loose sand, 6035 ft, pinyon-juniper, 17 May 1983, *Shultz 6922* (UTC-2 sheets). Grand Co.: Arches Natl Park, W of Wolfe Cabin in draw, 25 Aug 1973, *Allan 414* (BRY, WTS); Arches Natl Park, Lower Courthouse Wash, 26 Aug 1972, *Allan 189* (BRY); along the Dolores River below Scharf Mesa, sandstone along river, 4350 ft, 25 Aug 1997, *Atwood 23208* (BRY); up to Colorado River from Moab, 24 mi N on Hwy 128, 38.830987 N, 109.287257 W, roadside, ca. 3900 ft, 21 June 1983, *Beegle 589* (COLO); N bank of the Colorado River at the Hwy 180 bridge at Moab, sand and gravel along the N bank of the river, 1 Oct 1966, *Dunford 1173* (NY); E side of Hwy 189, ca. 7 air mi NW of Moab, ca. 2 mi SSE of jct with road to Island in the Sky area of Canyonlands Natl Park, 38.647622 N, 109.670486 W, edge of *Atriplex canescens*-*Coleogyne ramosissima* community, 4580 ft, red sandy soil, with *Lepidium montanum*, *Gutierrezia sarothrae*, *Bouteloua curtipendula*, *Halogeton glomeratus*, and *Salsola tragus*, 21 Sep 2006, *Fertig 23009* (WS); 0.6 mi E of Dewy (Dewy Bridge-Colorado River), 38.80467 N, 109.28766 W, 4200 ft, scattered juniper-pinyon, sandy soil, 24 Aug 1984, *Franklin 1264* (BRY); SW of confluence of Dolores River with Colorado River, Pole Canyon, 38.8048 N, 109.3055 W, 4200 ft, 20 Aug 1985, *Franklin 2216* (NY); Richardson Amphitheater, Onion Creek, 38.7163 N, 109.3515 W, 4240 ft, 21 Sep 1985, *Franklin 2591* (BRY, NY); ca. 15 mi NE of Moab, NE end of Professor Valley, wash bottom, 4280 ft, juniper-rabbitbrush-squawbush community, 30 Aug 1986, *Franklin 4170* (BRY, UNLV); ca. 16.7 mi due NE of Moab Fisher Towers, 38.7163 N, 109.3149 W, 4680 ft, 3 Oct 1986, *Franklin 4350* (BRY, NY); along Hwy 128, ca. 5 mi W of Cisco, 38.937376 N, 109.398622 W, roadside desert, 4300 ft, dry silty soil, 11 Oct 1986, *Jorgenson 86-D2* (MESA); 2 mi SE of Cisco, 38.9498 N, 109.2871 W, 4500 ft, 24 May 1983, *Neese 13351* (BRY, NY); Onion Creek drainage of Fisher Valley (11 air mi NE of Moab) 7.3 m ESE of Hwy 128, 5200 ft, 24 Sep 1985, *Shultz 9036* (NY, UT); Moab, N side of Colorado River Bridge, 24 Sep 1977, *Stutz 8205* (BRY); 5 mi NW of Moab, 1 Oct 1981, *Stutz 8940* (BRY); Colorado River, Big Bend Hwy 120, 38.64501 N, 109.53074 W, talus slopes along base of mesa, 4200 ft, red sandstone cap, red purple mudstone, *Atriplex*-grass community, 11 May 1986, *Thorne 4651* (BRY); ca. 1 mi N of Professor Creek, Richardson Amphitheater, Fisher Towers vicinity, along road to Fisher Valley, 38.721079 N, 109.379165 W, 30 Sep 1974, *Welsh 12631* (BRY, MO, NY); ca 1/2 mi E of Castle Rock, 38.9063 N, 109.3793 W, 5200 ft, 14 Sep 1984, *Welsh 23138* (BRY, NY); along I-70, 5.2 mi W of Utah-Colorado state line, just past Westwater exit, 4500-5000 ft, 17 Sep 1979, *Wetter 569A* (NY); along I-70, 13.0 mi W of Utah-Colorado state line, 5.7 mi E of Cisco exit, 38.969937 N, 109.214392 W, 4500-5000 ft, 17 Sep 1979, *Wetter 571* (BRY, GA, NY); along I-70, 12.4 mi W of Cisco exit, 9.9 mi E of Ranch exit, 24.0 mi E of jct 1-70 and Hwy 191, 38.969757 N, 109.551878 W, 4500-5000 ft, 17 Sep 1979, *Wetter 572* (NY); along Hwy 191, 16.8 mi S of jct with I-70, 3.8 mi N of jct Hwys 313 and 191, 4500-5000 ft, 17 Sep 1979, *Wetter 573B* (BRY, GA, NY); along Hwy 191, at bridge over Colorado River, N of Moab, at jct with Hwy 128, 4000 ft, 2 Sep 1985, *Wetter 885* (NY); along Hwy 128, 5.8 mi E of jct Hwys 128 and 191, N of Moab, common along hwy shoulder and embankment down to the river, 4000 ft, 2 Sep 1985, *Wetter 886* (BRY, GA, NY). San Juan Co.: First hanging garden on the E side of the Colorado River, just N of confluence of the San Juan River, 23 Aug 1971, *Atwood 3189* (BRY); Canyonlands Natl Park, along Colorado River near Potash, 3889 ft, sand bank, 27 Aug 1973, *Loope 501* (UTC); Three Garden, E side of the Colorado River N of the confluence with the San Juan River, alcove in Navajo sandstone, 25 Jun 1972, *Welsh 11864* (BRY); Colorado River Canyon, E of Island in the Sky, at Little Bridge Canyon, 38.4124 N, 109.7616 W, 3900 ft, 12 Sep 1983, *Welsh 22468* (BRY, NY); Glen Canyon Natl Rec Area, Lake Powell, Goodhope Bay springs, sandy alluvium over Chinle formation, cottonwood-oak-willow community, 21 Sep 1983, *Welsh 22569* (BRY, UTC). Wayne Co.: Canyonlands Natl Park, Horse Canyon, ca. 1 mi upstream of the Green River, 38.26934 N, 109.95137 W, 4200 ft, 28 Oct 2005 [fruiting], *Rink 4613* (ASC)

GRINDELIA INORNATA

Additional collections. COLORADO. Chaffee Co.: along Hwy 285, 15.1 mi S of jct Hwy 24/285 near Johnson Village, 5.5 mi N of jct with Hwy 50 at Poncha Springs, at Christmas 1806 (Zebulon Pike) historic marker, 38.592 N, 106.085 W, 7300 ft, 12 Aug 1984, *Wetter 760* (NY). Custer Co.: Along Hwy 69,

8.6 mi S of Westcliff, 6.6 mi N of Custer-Huerfano Co line, jct of Hwy 69 and Road 310, 38.02 N, 105.49 W, 8048 ft, sandy rocky soil of roadside, 21 Aug 1986, *Wetter 945* (CS, NY, RM). Denver Co.: Denver, prairie, 5266 ft, 27 Aug 1921, *Clokey 4324* (COLO, NY); Barnum, 39.72498 N, 105.02776 W, 28 Aug 1910, *Eastwood 61* (COLO) *Eastwood 63* (COLO, NEB); Barnum, 39.72498 N, 105.02776 W, 14 Sep 1916, *Huestis s.n.* (COLO); Denver, 17 Jul 1872, *Redfield 161* (NY). Douglas Co.: Along I-25 at Greenland Rd-Hwy 74 exit, 6800-7000 ft, 8 Sep 1979, *Wetter 537* (NY); along Hwy 67, 1.1 mi S of jct Hwy 67 and 85 at Sedalia, 39.4249 N, 104.9879 W, 5800-5900 ft, 20 Aug 1986, *Wetter 932* (NY); along Hwy 67, 4.6 mi S of jct Hwy 67 and 85 at Sedalia, 39.3814 N, 105.0251 W, 6500-6550 ft, 20 Aug 1986, *Wetter 934* (NY); along Hwy 67, 4.6 mi S of jct Hwy 67 and 85 at Sedalia, 39.3814 N, 105.0251 W, 6500-6550 ft, 20 Aug 1986, *Wetter 935* (NY). El Paso Co.: I-25 Exit 53 near Pikes Peak Raceway, nature preserve, 38.614 N, 104.691 W, 5400 ft, 7 Sep 1999, *Hersh 99-7* (COCO); Fort Carson Maneuver Site 1/2 mi E of Gate #6 on Rte 2, S on Tank Trail 1/2 mi, side of road with *Grindelia squarrosa*, 38.686395 N, 104.821057 W, 6140 ft, 10 Sep 1998, *Rifici s.n.* (COCO); along I-25, 0.1 mi S of Academy Blvd (Hwy 83) exit, just S of city limits of Colorado Springs, 39.0124 N, 104.8389 W, 6000 ft, 2 Sep 1979, *Wetter 514B* (NY); Manitou Springs, hillside just opposite corner of Manitou Ave. & Mayfair Ave., 6400-6600 ft, 9 Sep 1979, *Wetter 545B* (NY-2); Manitou Springs, along Business Rte 24 near archway for west entrance, disturbed turnout area, 6400-6600 ft, rocky red soil, with usual roadside weeds, also intermixed with the radiate *G. revoluta* (*Wetter 546A*), about equal numbers of both taxa present, 10 Sep 1979, *Wetter 546B* (BRY) and 19 Aug 1986, *Wetter 923* (NY); Colorado Springs, along Hwy 83, corner of 2100 S Academy Blvd. and 3700 E Elmorro Rd, 6000-6200 ft, 11 Sep 1979, *Wetter 551A* (NY); along I-25, just N of Exit 125 (S of Colorado Springs), ca. 3 mi S of Fountain Exit, 38.6387 N, 104.7008 W, 5500 ft, 11 Sep 1979, *Wetter 552B* (NY); along Business Rte 24, at west entrance for Manitou Springs, area adjacent to west entrance arch, 6400-6600 ft, 27 Aug 1985, *Wetter 836* (NY). Fremont Co.: Garden Park Dinosaur Fossil site, ca. 3 mi N of Canon City on Red Canyon road, near quarry trail in very dry, clay soils, with *Juniperus scopulorum* and grasses, 5800-6200, 6 Sep 2008, *Baker 3-Mar* (COLO); 5 mi E of Florence, 5167 ft, 2 Sep 1921, *Clokey 4323* (COLO, NY); Cañon City, 5315 ft, 2 Sep 1921, *Clokey 4325* (COLO, NY); 3.5 mi E of Florence on Hwy 120, dry borrow pit at side of road, large population, 12 Sep 1965, *Dunford 1122* (COLO); Wet Mountains, ca 3.2 air mi S of Cotopaxi, McCoy Gulch, 38.323882 N, 105.688059 W, 7350 ft, 19 Aug 1998, *Hartman 63713* (NY); along Hwy 115 N towards Penrose, across from the reservoirs near Arkansas River, 38.391 N, -105.068 W, roadside, 25 Jun 2017, *Kelloff 1667*, exceptionally large leaves (US); Cañon City, along Hwy 50, 5340 ft, 6 Jun 2002, *King 12121* (MO, NY); western city limits of Canon City off Hwy 50 on Skyline Drive, 38.4467 N, 105.2494 W, 5906 ft, 31 Jul 2000, *King 11459* (MO, NY); Canon City, Water Gap Trail near Grape Creek, arid conditions, 38.424107 N, 105.282305 W, 5480 ft, 13 Sep 2005, *Parker 56* (COLO); Garden Park, ca. 10 mi N of Cañon City on private property under San Isabel Protection Trust, 38.57817 N, 105.20129 W, pinyon-juniper woodland with *Quercus gambelii*, 6643 ft, scattered to uncommon, 22 Jul 2013, *Regensberg 1233* (KHD); S-facing gentle grade N of Arkansas River between Florence and Penrose, 38.3920 N, 105.0684 W, alkaline ground, 24 Aug 1985, *Weber 17541* (COLO); Rustic Lamphouse Campground on Hwy 50 just W of city limits of Canon City, 5400-5600 ft, 13 Sep 1979, *Wetter 554* (NY); along Hwy 50, ca. 4.5 mi E of Five Points Rest area, 12.5 mi E of Texas Creek, W of Parkdale, along shoulder of road above the Arkansas River, 38.461389 N, 105.32641 W, 6000 ft, 13 Sep 1979, *Wetter 555B* (CM, NY); along Hwy 50, just E of Canon City, 3.1 mi W of jct Hwy 50 and 67, 5200-5300 ft, 30 Aug 1985, *Wetter 848* (NY); along Hwy 50, E of Canon City, 1.1 ml E of jct Hwy 50 and 67, 5200-5300 ft, 30 Aug 1985, *Wetter 850* (NY); along Hwy 69, 7.4 mi S of jct Hwy 69 and 50 at Texas Creek, 2.9 mi N of Fremont-Custer Co. line, at jct with paved road to Cotopaxi, 38.3091 N, 105.6106 W, 7200 ft, 21 Aug 1986, *Wetter 942* (NY). Huerfano Co.: Muleshoe, 37.5833 N, 105.1667 W, 8800 ft, mixed conifer, 18 July 1977, *Burns 82* (ALAM); top of Old La Veta Pass, 9300 ft, mixed conifer-lodgepole pine, 26 July 1983 *Dixon 3430* (ALAM); Walsenburg, 1 mi N of truck stop at jct I-25 and Hwy 69, 37.653 N, 104.794 W, 6110 ft, open, disturbed, silty to gravelly soil at edge of parking lot and adjacent pasture, 16 August 1999, *Freeman 13006* (COLO, KANU); Navajo Nation, Wolf Springs Ranch, ca. 16.6 air mi S of Westcliffe, ca. 3.0 air mi W of HQ, top of hill along 2-track, 37.894 N, 105.40878 W, montane meadow community, 9125 ft, 14 Sep 2019, *Heil 36720* (SJNM); ByPass Creek, 37.760236 N, 105.218488 W, 3 Sep 1952, *Kadesch s.n.* (ALAM); Huerfano River, hill, along road, 9000-9200 ft, 37° 40' 25" N, 105° 24' 55" W, 27 Aug 1967, *Mackay 8C-58* (UNM); along County Rd 550 ca. 2 mi from the jct with Hwy 69 and the town of Gardner, 37.778441 N,

105.189869 W, 7100 ft, dry roadside with rabbitbrush and *Brickelia rosmarinifolia*, 6 Aug 2011, *Smookler 557* (COLO, KHD); road fork Redwing-Gardner along Pass Creek Rd in flat just SW of Gardner, 37.771383 N, 105.1781039 W, 24 Aug 1985, *Weber & Hogan 17535* (COLO, UT); along Hwy 69, 4.4 mi S of Huerfano-Custer Co. line, 10.3 mi N of jct of Hwy 69 and the road to Red Wing at Gardner, 37.874 N, 105.3115 W, common along hwy shoulder in reddish, rocky soil, also common along gravelly edges of field access road, 7900-8000 ft, 21 Aug 1986, *Wetter 949* (NY). Jefferson Co.: Lakewood, Dog Park Path, 39.668 N, 105.159 W, 5790 ft, locally abundant, 16 Jul 2010, *Cooley 7* (GREE); [no other locality info], 39° N, 105° W, 6000 ft, among grasses, 23 Sep 1994, *Scharlau s.n.* (KHD); Lakewood, along Wadsworth Blvd (Hwy 121), 2.3 mi N of jct Hwy 121 and 8, common in cracks in asphalt of parking lot and along rocky soil bordering Wadsworth Blvd, 39.698 N, 105.082 W, 5400-5600 ft, 26 Aug 1985, *Wetter 828* (NY-2); along Hwy 285, at jct with Soda Lake Rd, along gravel parking lot, near corner of Soda Lake Rd and Hampden Ave, 5700 ft, 26 Aug 1985, *Wetter 829* (NY). Otero Co.: Vicinity of the Bent Co. line, shaly slopes, 4300 ft, 24 Aug 1997, *Denham s.n.* (CS); Hall Ranch, 1 mi W of Hwy 350, Devil's Canyon, near spring, 37.6726 N, 104.0287 W, 4984 ft, infrequent in dry creek bed, 14 Sep 2009, *Hazlett 13224* (KHD); ca. 1 mi E of Timpas and Hwy 350, along Timpas Creek, 37.874 N, 103.408 W, 4300 ft, 31 Aug 1998, *Hazlett 10740* (GREE); Comanche Natl Grassland. Near Timpas, W of Hwy 350, 37.8201 N, 103.7781 W, 4425 ft, riparian, 25 July 1997, *Hazlett 9951* (COLO); along US 50, W towards La Junta, ca. 3 mi E of rest area with Big Timbers marker [ca. 38.093 N, 102.563 W], 5 Jul 1980, *Wetter 611* (NY); along Hwy 350, 31.0 mi NE of Las Animas-Otero Co line, 2.2 mi SW of jct Hwy 350 and 50 at La Junta, ca. 37.96 N, 103.58 W, 4150 ft, 21 Aug 1984, *Wetter 822* (NY). Park Co.: Guffey, 38.75 N, 105.283333 W, well-drained flood plain, gravelly soil, 23 Sep 1995, *Sartin 10* (KHD); along Hwy 24, 2.9 mi W of Wilkerson Pass summit, 39.038 N, 105.580 W, 8800-9000 ft, 16 Aug 1980, *Wetter 727* (NY-2) and *Wetter 728* (NY); along Hwy 24/9, 0.4 mi E of jct Hwy 9 and 24 W of Hartsel, 0.6 mi W of jct Hwy 9 and 24 at Hartsel, 39.0208 N, 105.8029 W, 9000 ft, 20 Aug 1986, *Wetter 938* (NY); along Hwy 9, 13.9 mi S of jct Hwy 9 and 24 at Hartsel, 12.7 mi N of Park-Fremont Co. line, at jct for gravel roads to Agate Creek and 39-Mile Mtn in Pike Natl Forest, 38.8479 N, 105.636 W, 9200-9400 ft, 20 Aug 1986, *Wetter 941* (BRY, NY); along Hwy 24/9, 0.3 mi E of jct Hwy 9 and 24 W of Hartsel, 0.9 mi W of jct Hwy 9 and 24 E of Hartsel, 39.0208 N, 105.8029 W, 8800-9000 ft, 21 Jul 1988, *Wetter 1044* (NY); along Hwy 24, at jct with Round Mtn Campground Rd, (Pike Natl. Forest), 6.0 mi W of jct Hwy 24 and Park County Rd 96 at Lake George, 8.1 mi W of Park-Teller Co. line, common along hwy shoulder and along gravel edges of campground road, 8350 ft, 21 Jul 1988, *Wetter 1046* (NY); along Hwy 24, 1.5 mi W of Park-Teller Co. line (mile marker 266), 0.6 mi E of jct Hwy 24 and Park County Rd 96 at Lake George, 38.9767 N, 105.3587 W, 7800-8000 ft, 21 Jul 1988, *Wetter 1048* (NY). Pueblo Co.: Fort Carson, 38.47 N, 104.91 W, alongside dirt road in grassland, 5 Sep 2006, *Doyle 43* (CS); above Arkansas River on high dry prairie, 38.323562 N, 104.857752 W, 5100 ft, alkaline soil, 7 Sep 1972, *Corbyn s.n.* (COLO), 10 mi SW of Pueblo, 4900 ft, prairie, 2 Aug 1964, *Crawford s.n.* (WSC), S side of Pueblo Reservoir in Pueblo State Wildlife Area, 38.2874039 N, 104.8297643 W, 4800 ft, carbonate shales with *Oxybaphus rotundifolius*, 9 Aug 1997, *Kelso 97-148* (COCO, COLO); western city limits of Pueblo, ca. 1 mi W of Pueblo Ave along 24th St, 38.291 N, 104.64766 W, 4747 ft, 2 Sep 2000, *King 11558* (BRY); Pueblo State Wildlife Area, ca. 4 mi W of Pueblo off Hwy 96, 38.29266 N, 104.80439 W, toe slope of side drainage of Pueblo Reservoir 4900 ft, above *Tamarix ramosissima* zone and below *Pinus edulis-Sabina monosperma* woodland zone, 18 Aug 2006, *Neid s.n.* (COLO); ca. 3.5 mi NE of Beulah, Palmer Land Trust, private ranch above Wales Canyon, along 2-track road, 38.11959 N, 104.94901 W, 6727 ft, Gambel oak-ponderosa pine woodland, common, 23 Jul 2013, *Regensberg 1319* (KHD); along I-25, rest area between Pueblo and Colorado City (Civil War Activity in Colorado historic marker), 38.08926 N, 104.6976 W, 5000 ft, 18 Aug 1980, *Wetter 730* (NY); along Hwy 50 1.4 mi E of Pueblo-Fremont County line 3.4 mi E of jct Hwy 50 and 120, 5200-5300 ft, scattered along hwy shoulder in dry sandy soil, 30 Aug 1985, *Wetter 847* (NY, RM, UTC); along Hwy 165, 13.1 mi SE of Pueblo-Custer Co. line, 4.9 mi NW of jct Hwy 165 and I-25 at Colorado City, 38.120024 N, 104.438118 W, 6200-6400 ft, 30 Aug 1985, *Wetter 852* (NY). Teller Co.: Hayden Divide E of Quick Ranch, study site D, 38.8915 N, 105.3163 W, 8920 ft, 26 Jul 1985, *Minno s.n.* (KHD); along Hwy 67, going S towards Cripple Creek, 14.5 mi S of jct Hwy 67 and 24 at Divide, 38.781 N, 105.1424 W, 9200 ft, 27 Aug 1985, *Wetter 839* (NY); Cripple Creek, in small park at corner of 1st and Bennett Ave, 38.7464 N, 105.1804 W, 9500 ft, growing and hybridizing (*Wetter 842*) with *G. revoluta* (*Wetter 840*), 841 the predominant form at this location, 27 Aug 1985, *Wetter 841* (NY).

GRINDELIA LACINIATA

Additional collections. COLORADO. Dolores Co.: Dolores County Line Road ca. 3 mi E of Colorado Hwy 141, 37.881 N, 108.887 W, 7505 ft, 18 Sep 2003, *Heil 22980* (SJNM); along Hwy 666, 0.9 mi E of CO-UT state line, 37.812 N, 109.026 W, 6800-7000 ft, edge of mowed area on gravelly hwy embankment, intermixed and hybridizing with *G. squarrosa* (*Wetter 579*), 19 Sep 1979, *Wetter 580* (CM, NY); along Hwy 666, ca. 200 ft, E of Colorado-Utah state line, 6800 ft, 14 Aug 1980, *Wetter 717* (BRY, NY) and *Wetter 719* (NY); along US 666, just E (within 500 ft) of the UT-CO state line, 5.9 mi W of jct Hwy 141 and 666 near Dove Creek, 15.7 mi W of jct Hwy 666 and 191 at Monticello, 6800 ft, 27 Aug 1986, *Wetter 980* (NY) and 14 Jul 1988, *Wetter 1025* (NY). **UTAH. San Juan Co.:** Unpaved farm road on S boundary of the George Endter Ranch, 10 mi SE of Monticello, 4 mi S of Hwy 160, 37.768787 N, 109.213016 W, 7000 ft, 1 Oct 1966, *Dunford 1172* (NY); Hwy 666, 3 mi ESE of Monticello, common on red sandy soil with *Artemisia*, *Chrysothamnus*, *Gutierrezia*, and *Oryzopsis hymenoides*, 16 Jul 1972, *Hartman 3402* (LSU); ca. 13 mi E of Monticello, 37.882 N, 109.105 W, Quaternary Aeolian rock deposits. 6805 ft, silty clay loam soil, with *Achillea millefolium*, *Artemisia nova*, *Artemisia tridentata*, *Artemisia frigida*, *Gutierrezia sarothrae*, *Ericameria nauseosa*, *Koeleria macrantha*, *Agropyron cristatum*, *Sarcobatus vermiculatus*, *Pinus edulis*, and *Juniperus osteosperma*, 28 Jul 2016, *Hosna UT060-055* (BRY); S of Monticello, meadow, 6900 ft, 24 Jul 1911, *Rydberg & Garrett 9149* (UT); 13 mi SE of Monticello, clay bank in plains, 14 Aug 1958, *Waterfall 15111* (GH); along Hwy 666, 1.3 mi W of CO-UT state line, turnoff area adjacent to Summit Rd. exit, across hwy from picnic tables, 15.9 mi E of jct Hwy 666 and 163 [Hwy 191] in Monticello, 6800-7000 ft, 7 Jul 1980, *Wetter 644* [leaves entire] (NY); along Hwy 666, 1.3 mi W of CO-UT state line, turnoff area adjacent to Summit Rd. exit, across hwy from picnic tables, 15.9 mi E of jct Hwy 666 & 163 [US 191] in Monticello, 6800-7000 ft, [with *Wetter 644*, no hybrids], 7 Jul 1980, *Wetter 645* (NY); along Hwy 666, 12 mi W of jct Hwy 666 and 163 [Hwy 191] in Monticello, common along hwy shoulder and area adjacent to trash barrels, also scattered in vegetation away from hwy, 6800-7000 ft, 7 Jul 1980, *Wetter 648* (NY); N of Monticello along Hwy 163, at jct with a gravel road, 11.3 mi S of jct Hwy 163 and 211, 37.983 N, 109.504 W, very common along hwy shoulder and in adjacent pasture, 14 Aug 1980 *Wetter 720* (COLO, NY-2 sheets); along Hwy 666, 0.4 mi W of UT-COLO state line, 15.5 mi E of jct Hwy 666 191 at Monticello, 6800-7000 ft, 14 Aug 1984, *Wetter 775* (BRY, NY); along Hwy 666, 4.1 mi W of UT-COLO state line, 11.8 mi E of jct Hwy 666-191 at Monticello, 6800-7000 ft, 14 Aug 1984, *Wetter 776* (NY-3 sheets); along Hwy 191, 2.9 mi N of jct with Hwy 666 at Monticello, at jct with San Juan Co. Rd 120 (begin 120 Gordon Reservoir), 7250 ft, very common along rocky shoulder and in adjacent pasture below hwy and along gravel road, 14 Aug 1984, *Wetter 777* (NY-2 sheets); along Hwy 191, 3.05 mi N of jct Hwy 191 and 666 at Monticello, at jct with gravel road, San Juan Co. Rd 120 (begin 120 Gordon Reservoir), very common along rocky embankment, in adjacent pasture below hwy, and along gravel road, 7250 ft, 3 Sep 1985, *Wetter 888* (NY); along Hwy 666, 8.2 mi E of jct Hwy 666 and 191 in Monticello, 9.0 mi W of UT-CO state line, 6900-7000 ft, 3 Sep 1985, *Wetter 889* (NY); along US 666, just W (within 500 ft,) of the UT-CO state line, 5.9 mi W of jct Hwy 141 and 666 near Dove Creek, 15.7 mi W of jct Hwy 666 and 191 at Monticello, 6800 ft, 27 Aug 1986, *Wetter 978* (NY); along Hwy 666 [= Hwy 491], 2.1 mi W of UT-CO state line, 13.6 mi E of jct Hwy 666 and 191 at Monticello, 37.8275 N, 109.07889 W, 6800-6900 ft, with various weedy grasses, ragweed, *Melilotus*, and also intermixed with *Grindelia squarrosa* var. *serrulata* (*Wetter 982*), no hybrids found at this location, common along rocky shoulder and sandy embankment. 0.5-1.5 ft tall, most plants with 1-several stems from the base, apparently perennials, most well past flowering, 27 Aug 1986, *Wetter 981* (COLO, NY, UCR); along Hwy 666, 6.5 mi W of UT-CO state line, 9.2 mi E of jct Hwy 666 and 191 at Monticello, 37.871383 N, 109.342895 W, common along hwy shoulder in rocky soil and on sandy embankment, with various weedy grasses, with *G. squarrosa* var. *serrulata* (*Wetter 984*), no hybrids at this location, 27 Aug 1986, *Wetter 983* (ASC, COLO, NY, UTC); along Hwy 191, 2.8 mi N of jct Hwy 191 and 666 at Monticello, at jct with San Juan Co. Rd 149 (begin Gordon Reservoir), 37.7496 N, 109.3452 W, plants scattered along hwy shoulder and embankment and in along edges of a field in clay soil, 7100-7200 ft, 28 Aug 1986, *Wetter 985* (BRY, CM, NY); along Hwy 191, 4.85 mi S of jct Hwy 191

and 666 in Monticello, at jct with San Juan Co. Rd 146, 6900-7000 ft, scarce, only a few plants found, 28 Aug 1986, *Wetter 987* (NY); along Hwy 666, 11.3 mi E of jct Hwy 666 and 191 in Monticello, 7.0 mi W of UT-CO state line, 6800-7000 ft, 19 Sep 1979, *Wetter 578* (BRY, COLO-2 sheets, GA, NY-2 sheets, OBI); along Hwy 191, 2.9 mi N of jct Hwy 191 and 666 in Monticello, at the jct with San Juan Co. Rd. 149 (begin Gordon Reservoir), 37.7496 N, 109.3452 W, scattered along hwy shoulder, edges of field, in *Artemisia*-dominated pasture and among piñon woodlands in clayish soil, also along margins of hwy and gravel road, 7100-7200 ft, 14 Jul 1988, *Wetter 1024* (NY); along Hwy 666 just W (within 500 ft) of UT-CO state line, 17.6 mi E of jct Hwy 666 and 191 in Monticello, at CO-UT state line, 6800 ft, 14 Jul 1988, *Wetter 1026* (NY).

GRINDELIA REVOLUTA

Additional collections. COLORADO. Costilla Co.: Top of Old La Veta Pass, 9300 ft, mixed conifer-lodgepole pine, 26 July 1983, *Dixon 3430* (ALAM); along Hwy 160, 22.0 mi E of jct with Hwy 150 at Costilla-Alamosa Co. line, 12.2 mi E of jct Hwy 159, 7.0 mi W of Costilla-Huerfano Co. line, 8300 ft, sandy loam roadside, with sagebrush, *Penstemon*, *Helianthus*, grasses, 20 Aug 1984, *Wetter 816* (CS, NY-2 sheets, RM); along Hwy 160, 7.5 mi W of Costilla-Huérano Co. line, 12.9 mi E of jct Hwy 160 and 159, 8300-8600 ft, 30 Aug 1985, *Wetter 855* (NY, RM); along Hwy 160, 6.8 mi W of Costilla-Huérano Co. line, 12.0 mi E of jct Hwy and 159 at Fort Garland, 8300 ft, 21 Aug 1986, *Wetter 951* (NY, RM). **Custer Co.:** Along Hwy 69, 8.6 mi S of Westcliff, 6.6 mi N of Custer-Huerfano Co line, jct Hwy 69 and Road 310, 38.02 N, 105.49 W, roadside, 8048 ft, sandy rocky soil, with grasses, *Helianthus*, *Melilotus*, 21 Aug 1986, *Wetter 945* (CS, NY, RM). **El Paso Co.:** Garden of the Gods, Jul 1878, *Brown 259* (NY); E of Colorado Springs, Farmer's Hwy, 38.86 N, 104.63 W, road edge, 18 Jul 1935, *Christ 1138* (CS); Colorado Springs, 19-21 Sep 1895, *Clarke s.n.* (NY); Bohart Ranch ca. 23 mi ESE of Colorado Springs; E of Ellicott Hwy, N part of ranch, 38.739 N, 104.374 W, transitional between mixed grass and sandsage prairie, 5700 ft, with *Chondrosium gracile*, *Hesperostipa comata*, *Sporobolus cryptandrus*, *Oligosporus filifolius*, 24 Aug 1998, *Clark 802* (COLO); Glen Park, 7200 ft, 24 Jul 1895, *Cole s.n.* (MICH); SE of Calhan, along East Paint Mine Rd, slope above the colored arkose beds, 6750 ft, 21 Aug 1994, *Denham 94005* (CS); Monument turnoff, Hwy 25, 15 mi N of Colorado Springs, 12 Sep 1965, *Dunford 1118* (NMC, NY); 18 mi S and 7 mi W of Colorado Springs, 38.75 N, 104.91 W, hillside, 6198 ft, juniper-pinyon, 17 Sep 1948, *Finley 480917-4* (CS); along frontage road paralleling I-25, 2.7 mi N of the El Paso-Pueblo Co. line, roadside, 16 May 1983, *Freeman 1774*, basal rosettes only (NY); Monument, 3/4 mi N of Monument Rock, 39.099 N, 104.904 W, S-facing hillside, rocky, sandy soil, shaded by oak, 7200 ft, 13 Sep 1991, *Gillette 116* (COLO); Colorado Springs, 9 Aug 1884, *Goldsmith s.n.* (BRIT-2 sheets); Hwy 24, 3 mi W of Garden of the Gods, 38.85 N, 104.89 W, 6700 ft, 4 Sep 1998, *King 10710* (CS, MO-2 sheets); ca. 5 mi W of Monument, Pike Natl Forest, along Forest Rd 320, 39.08333 N, 104.88333 W, 7088 ft, 13 Jul 1999, *King 10986* (MO, NY, RM); Colorado Springs, Broadmoor district, 6281 ft, 24 Aug 2003, *King 12699* (GH, MO); plains, disturbed weedy roadside, 38.933114 N, 104.598854 W, 5900 ft, 3 Sep 1985, *Lavis 23* (COCO); Black Forest, La Foret, disturbed area S side of Kettle Creek, vicinity of culvert under Milam Road, 39.0045854 N, 104.7380486 W, disturbed area, 7000 ft, 16 Aug 1992, *Maley 525* (COLO) and 25 July 1993, *Maley 553* (COLO); Colorado Springs, plains, 6000 ft, 8 Sep 1923, *Penfound 69* (COLO); Pine Creek, 38.94 N, 104.81 W, 7000 ft, 9 Sep 1999, *Ravenscroft s.n.* (CS); Fort Carson Military Resevation, 4.5 mi from jct of Rte 1 and 5, across from Range 119, along Firebreak road, next to boundary fence, 38.5736 N, 104.7193 W, *Bouteloua gracilis* grassland, 3 Sep 1998, *Rifici s.n.* (COCO, COLO, KHD); Fort Carson Maneuver Site, 1 mi E of Hwy 115, 0.2 mi N of Rock Creek, 38.686395 N, 104.821057 W, roadside, 10 Sep 1998, *Rifici s.n.* (COCO, COLO); along Interstate 25, 0.1 mi S of Academy Blvd. (Hwy 83) exit, just S of city limits of Colorado Springs, 39.012 N, 104.839 W, 6000 ft, 2 Sep 1979, *Wetter 514A* (COLO, NY-2 sheets, RM); I-25 and Palmer Lake exit, just past weigh station, adjacent to Dairy Queen parking lot, 7000 ft, 8 Sep 1979, *Wetter 541* (NY., RM); Monument Lake Camping Resort, 6900-7000 ft, 9 Sep 1979, *Wetter 542* (BRY, COLO, NY. RM); Manitou Springs, hillside opposite corner of Manitou Ave and Mayfair Ave, 6400-6600 ft, 9 Sep 1979, *Wetter 545A* (COLO, CS, NY, RM-2 sheets); along Business Hwy 24, Manitou Springs, near archway for west entrance, 6400-6600 ft, 10 Sep 1979, *Wetter 546A* (BRY, NY-2 sheets); Manitou Springs, along Manitou Ave, lot between 7-11 store and car wash, across street from Green Willow Motel, 6400-6600 ft, 11 Sep 1979, *Wetter 547* (COLO, CS, NY, RM-2 sheets); Peyton, along Hwy 24, hwy shoulder and area between hwy and gravel

road on the right, next to M&M Garage and Cafe, 6700-6800 ft, 11 Sep 1979, *Wetter 550* (BRY, NY); Colorado Springs, along Hwy 83, corner of 2100 S Academy Blvd and 3700 E Elmorro Rd, 6000-6200 ft, 11 Sep 1979, *Wetter 551B* (BRY, CS, KHD, NY, US); along I-25, just to the N of Exit 125 (S of Colorado Springs), ca. 3 mi S of Fountain exit, 38.638, 104.701, 5500 ft, 11 Sep 1979, *Wetter 552A* (NY); Manitou Springs, along Manitou Ave, hilly area behind the 7-11 store, 6300-6500 ft, 27 Aug 1985, *Wetter 835* (BRY-2 sheets, CS, NY, RM); along Business Rte 24, at W entrance for Manitou Springs, area adjacent to west entrance archway, 6400-6600 ft, 27 Aug 1985, *Wetter 837* (NY); S of Colorado Springs along Hwy 115, 10.0 mi NE of El Paso-Fremont Co. line, 6200-6400 ft, 29 Aug 1985, *Wetter 846* (NY); along Business Rte 24, at W entrance archway for Manitou Springs, gravel turn-around area, highly disturbed, 38.861 N, 104.9143 W, 6400-6600 ft, 19 Aug 1986, *Wetter 924* (NY); along Hwy 83 N of Colorado Springs, 2.2 mi S of jet Hwy 83 and Shoup Rd, 8.4 mi S of jct Hwy 83 and 105, 6700-6800 ft, 19 Aug 1986, *Wetter 927* (NY); along Hwy 105, a few hundred feet N of jct Hwy 105 (Monument-Palmer Lake exit, - Exit 161) and I-25, disturbed field, 7000 ft, 19 Aug 1986, *Wetter 928* (NY-2 sheets, RM); along Hwy 105 at Palmer Lake, 0.9 mi S of El Paso-Douglas Co. line, 3.6 mi N of jct Hwy 105 and I-25, road at edge of park and between park and railroad tracks, 39.122048 N, 104.914563 W, 7200-7400 ft, 22 Jul 1988, *Wetter 1050* (NY); along Hwy 105 at Monument, a few hundred feet N of jct Hwy 105 and I-25 (Exit 161), 7000-7200 ft, 22 Jul 1988, *Wetter 1051* (NY); ca. 1 mi SE of Calhan, Paint Mines Interpretive Park, adjacent to pond, 39.02103 N, 104.27851 W, mid-grass prairie, 6625 ft, with *Schizachyrium scoparium*, *Calamovilfa longifolia*, and *Bouteloua gracilis*, 25 Jul 2024, *Wingate 14242* (KHD). **Fremont Co.:** Phantom Canyon, County Rd 67, mi 11.5, 38.5551 N, 105.0985 W, gravelly soil at roadside, 7000 ft, 2 Jul 1985, *Minno 426* (KHD-2 sheets); 13 mi N of Cañon City on Red Canyon Rd, E side of road, 38.488788 N, 105.211584 W, pinyon-juniper area, 7036 ft, common, 10 Jul 1977, *Payne 79* (WSC); 0.4 mi E of Coaldale along Hwy 50, at jct with field access road, 38.366 N, 105.750 W, 6600-6800 ft, 13 Sep 1979, *Wetter 556C* (NY); E of Cañon City along Hwy 50, 1.1 mi E of jct Hwy 50 and 67, 5200-5300 ft, 30 Aug 1985, *Wetter 849* (NY, WIS). **Huerfano Co.:** Navajo Nation, Wolf Springs Ranch, ca. 10 mi NW of Gardner, McKinley Reservoir area, 37.854 N, 105.323 W, highly disturbed riparian site, 7800 ft, area surrounded by pinyon pine and juniper, meadows to the west, 29 Jun 2019, *Heil 36617* (NAVA, SJNM); Huerfano River, 37.702 N, 105.371 W, along road, 8400-8500 ft, 8 Aug 1967, *Mackay 7C-36* (UNM); hills along the roadway of the Huerfano Canyon [S Fork Huerfano River], 9000 ft, 27 Aug 1967, *Mackay 8C58* (UNM-2 sheets); Navajo Nation, Wolf Springs Ranch, upper hay field slopes area, near irrigation ditch, 37.8643 N, 105.3358 W, weedy area along roadside, 7900 ft, 27 Jul 2019, *Tsinigine 306* (NAVA, SJNM); Huerfano Valley, near Gardner, 7000 ft, 10 Sep 1900, *Vreeland 663* (NY-2 sheets, RM-2 sheets); along Hwy 69, 4.4 mi S of Huerfano-Custer Co line, 10.3 mi N of jct of Hwy 69 and road to Red Wing at Gardner, 37.87N, 105.31 W, top of steep embankment, 7950 ft, rocky sandy soil, with *G. inornata*, 21 Aug 1986, *Wetter 950* (CS, NY, RM). **Las Animas Co.:** Crazy French Ranch, E side of I-25 ca. 6 mi S of the town of Trinidad and just N of New Mexico, slopes flanking McBride Creeek, 37.012 N, 104.473 W, dry, rocky, S-facing slope within *Pinus edulis* woodland, with *Quercus*, *Cercocarpus montanus*, *Yucca baccata*, 17 July 2019, *Clark 4763*, 7515 ft, (COLO, UNM) and 18 July 2019, *Clark 4826*, ca. 6700 ft, (COLO, UNM); Trinidad, Jul 1915, *Beckwith 218* (NY); Wet Mountain Valley, Hwy 12, ca 0.5 mi W of Cordova Plaza between the hwy and river, 37.13071 N, 104.83649 W, aquatic and pondside, 6000 ft, 6 July 1999, *Elliott 8380* (COLO); Vermejo Park Ranch, Long Canyon 0.65 air mi N of mouth of Joe Baker Canyon, 1.1 air mi N of New Mexico and 15 air mi SW of Raton, 37.01025 N, 104.6990556 W, rocky bar adjacent to flowing stream, 6950 ft, with *Verbascum thapsus*, *Ambrosia*, *Ratibida columnifera*, grasses, scattered in gravelly areas, 3 Aug 2007, *Legler 7002* (CS, RM); Whiskey Pass Jeep Road, NW of Hwy 12 and Stonewall, with *Picea*, *Abies*, *Festuca*, *Poa*, *Carex*, *Calamagrostis*, 3 Aug 1986, *Neely 3715* (CS); just N of COLO-NM state line above Lake Maloya, 1 Sep 1985, *Robertson s.n.* (CM, COLO, NY); "Wootton" [N side of Raton Pass, 36.99919 N, 104.487766 W], 11 Sep 1909, *Rusby s.n.* (NY-3 sheets); along Hwy 12, 25.2 mi S of jct with Hwy 160 near La Veta, 46.6 mi NW of jct with I-25 at Trinidad, on downslope from Cuchara Pass, 37.281368 N, 105.048078 W, pine-oak, 9050 ft, clayish soil of roadside, 20 Aug 1984, *Wetter 818* (CS, NY, RM); along Hwy 12, 35.2 mi S of jct with Hwy 160 near La Veta, 32.6 mi W of jct with I-25 at Trinidad, 37.175577 N, 105.045141 W, 8350 ft, 20 Aug 1984, *Wetter 820* (NY, RM); along Hwy 12, 5.9 mi W of jct with I-25 at Trinidad, along gravel access road to hwy, 37.1607 N, 104.6009 W, 20 Aug 1984, *Wetter 821* (NY); along I 25, at the rest area (Trinidad) and weight station just N (ca 100 ft) of the CO-NM state line at Raton Pass, N side of the "Welcome to Colorful Colorado" sign, 36.994131 N, 104.480415 W,

7800 ft, 17 Aug 1986, *Wetter 913* (NY, RM); along I-25, at scenic overlook just down from Raton Pass, 0.9 mi N of CO-NM state line, mile marker 1, 7400-7600 ft, 18 Aug 1986, *Wetter 917* (NY, RM). **Pueblo Co.:** Pueblo, Jul 1874, *Brandegeee 906* (NY); along I-25, rest area between Pueblo and Colorado City (Civil War Activity in Colorado historic marker), W side of I-25, 38.089 N, 104.698 W, 5000 ft, 18 Aug 1980, *Wetter 729* (NY, RM) and *Wetter 731* (NY); along a paved road (paralleling I-25), 0.6 mi S of jct of I-25 and Exit 71 (road to Graneros Canyon), 5900-6000 ft, 18 Aug 1986, *Wetter 919* (NY, RM); along I-25 N, rest area near the St. Charles River at mile marker 82, S side of river, 5000 ft, 18 Aug 1986, *Wetter 920* (NY); along a paved road (paralleling I-25), 0.6 mi S of jct of I-25 and Exit 71 (exit for Graneros Canyon), 5900-6000 ft, 22 Jul 1988, *Wetter 1052* (NY); along Interstate-25, rest area 2.6 mi N of the Cedarwood exit (Exit 77), on the S side of the St. Charles River, 38.0256, 104.734, 16 May 1983, *Freeman 1775*, with last year's inflorescence (NY); E side of Colorado City, E of I-25 and 0.6 mi SSW of jct I-25 and Hwy 165 (Exit 74), rocky slopes above Greenhorn Creek, 37.949166 N, 104.796983 W, Gambel oak-juniper woodland, 5700 ft, 10 Aug 1998, *Freeman 11192* (KANU, KHD); Pueblo, common, 18 Sep 1873, *Greene s.n.* (GH); Fort Carson Maneuver site, ca. 23 mi S of Range Control Hdq, E side of Rte 1, 38.4595 N, 104.7520 W, 5999 ft, 7 Oct 2009, *Kelso 09-103* (COCO); Arkansas River Valley, ca. 3.5 mi NE of Beulah, Palmer Land Trust private ranch above Wales Canyon, along two-track road, 38.11959 N, 104.94901 W, Gambel oak-ponderosa pine woodland, 6727 ft, common, 23 Jul 2013, *Regensberg 1319* (KHD); Pueblo West-Maverick, 38.38296 N, 104.67227 W, desert steppe, dry clay soil, 10 Sep 2011, *Skogen s.n.* (CHIC); Pueblo, 1883, *Woodward s.n.* (GH 2587213). **Teller Co.:** Woodland Park, 38.978 N, 105.0376 W, drainage ditch, sandy-gravelly soil, 8300 ft, 12 Sep 2007, *Austin 558* (COCO); Mueller Ranch, 38.833 N, 105.002 W, dry Pikes Peak gravel on E-facing slope, ponderosa pine forest, 8350 ft, 26 Jun 1979, *Darrow 9088* (COCO); Florissant Fossil Beds Natl Monument, trail from monument headquarters to fossil Sequoia stumps, 38.912111 N, 105.280846 W, open dry meadow, 8300 ft, common, 27 Aug 1983, *Edwards E-554* (COLO, KHD); N slope of Pikes Peak, 9000 ft, 16 Aug 1968, *Larson 680116* (COCO); Cripple Creek, small park at corner of 1st and Bennet Ave, 9500 ft, 27 Aug 1985, *Wetter 840* (NY, RM) and *Wetter 842* (NY). **NEW MEXICO. Colfax Co.:** 1 mi N of Raton, Clayton Ave, 16 Jul 1968, *Averett 346* (SRSC); E of Yankee, high mesas, 8 Aug 1951, *Clark 16130* (UNM); Goat Mtn, Raton, Aug 1900, *Cockerell s.n.* (US); Yankee Canyon, 2400 m, 9 Aug 1923, *Eggleston 18965* (US); along Hwy 64/87, 1.3 mi E of jct with I-25 at Raton, 36.882329 N, 104.408071 W, 18 Aug 1983, *Freeman 2176B* (NY); along I-25, 3.7 mi S of NM-COLO state line in mountains, 18 Aug 1983, *Freeman 2171* (NY); along Hwy 25, 3.7 mi S of NM-COLO state line, in mountains, plants scarce on the E side of I-25, 18 Aug 1983, *Freeman 2174* (NY, RM); along Hwy 64/87, 1.3 mi E of jct with I-25 at Raton, 36.882329, 104.40807, 18 Aug 1983, *Freeman 2176B* (NY); along Hwy 72, 20.2 mi W of Union-Colfax Co. line, W side of Johnson Mesa, 18 Aug 1983, *Freeman 2177* (NY); Hwy 72, 4 road mi E of I-25 (Milepost 4), 36.9193° N, 104.37° W, grassy roadside, 6700 ft, 16 Aug 1998, *Hartman 63391* (UNM, RM); Hwy 72, 26 road mi E of I-25 (Milepost 26), 36.8712° N, 104.0098° W, oak and ponderosa pine woodland and roadside, 6900 ft, 16 Aug 1998, *Hartman 63535* (NMC, RM, UNM); Hwy 72, 5.3 mi E of Raton, 36.922 N, 104.363 W, gravel in sandy clay loam of moist roadside area, 6700 ft, 18 Jul 1991, *Hutchins 13053* (UNM); near Raton, 6500 ft, 1 Sep 1954, *Jones 20344* (UT); Vermejo Park Ranch, roadside along Vermejo River at mouth of Gachupin Canyon, 9.3 air mi SE of Casa Grande, 36.786 N, 104.865 W, dry weedy roadside, 6920 ft, with *Kochia scoparia*, *Ambrosia acanthicarpa*, *Chenopodium* spp., 12 Aug 2007, *Legler 7510* (COLO); Vermejo Park Ranch, along Rock Creek 1.8 air mi W of W end of Mary's Lake, E base of Ash Mtn, 36.847 N, 105.137 W, rocky road cut and road shoulder, 8757 ft, loose sandy soil, surrounded by open forest of *Pseudotsuga menziesii*, *Pinus flexilis*, *Abies concolor*, shrubby *Quercus gambelii*, scattered in road bed, 1 Aug 2007, *Legler 6933* (KHD); Vermejo Park Ranch, small dirt road at W end of Vermejo Park, S side of Vermejo River 1.5 air mi WNW of Casa Grande, 36.8968333° N, 105.0064722° W, weedy roadside and adjacent grassland, 7540 ft, silty soil, with *Ambrosia acanthicarpa*, *Amaranthus powellii*, *Bidens tenuisecta*, grasses, occasional, 13 Aug 2007, *Legler 7584* (RM, UNM); 11 mi W of Folsom on Hwy 72, 36.907° N, 104.073° W, ditch, 7575 ft, 26 Jul 2004, *Schiebout 1841* (GREE, UNM); 12 air mi E of Raton along Hwy 72 at mile marker 15, 36.91422167° N, 104.2232217° W, roadside, high prairie 8100 ft, 3 Aug 2005, *Schiebout 8730* (GREE, UNM); Vermejo Park Ranch, E side of the Little Wall 0.8 mi NW of Merrick Lake, 36.930° N, 105.129° W, high meadow surrounding a stream, 8400 ft, 12 Aug 2005, *Schiebout 9089* (UNM); 3.5 mi E of Raton on Hwy 72, common roadside weed in the vicinity of Raton, sandy shale, with *Melilotus officinalis*, *Convolvulus arvensis*, *Sitanion hystrix*, 22 Jul 1992,

Sivinski 1924 (UNM); vicinity of Raton, canyons, 2100-2380 m, 21-22 Jun 1911, *Standley 6326* (US); vicinity of Raton, dry hillsides, ca. 6625 ft, 18 Aug 1916, *Standley 13291* (US); 1.9 mi S of Colorado border on Hwy 25, 36.96778 N, n, 104.47722 W, 8000 ft, with *Quercus*, *Lactuca*, *Melilotus*, *Helianthus*, grasses, very abundant on highway median, 22 Aug 1985, *Timmermann 84-11* (UNLV, UNM); along I-25, N of Raton, top of first incline N of jct I-25 and Hwy 87, 7000-7400 ft, 31 Aug 1979, *Wetter 510* (NY-2, RM); along I-25 N of Raton, 1.8 mi N of the top of first incline N of jct I-25 & Hwy 87, E side of hwy in rocky soil, 7200-7600 ft, 31 Aug 1979, *Wetter 512* (NY, RM); along Hwy 25, ca. 1.8 mi N of top of first incline N of I-25 and Hwy 87 in Raton, in hwy median, W side of N bound lanes, 7200-7600 ft, with usual weeds and intermixed with *Wetter 513B* (*Grindelia aphanactis*), *Wetter 513A* is the predominant taxon at this location, no hybrids found, 31 Aug 1979, *Wetter 513A* (BRY-3, COLO, NY, RM); along Hwy 72, 1.1 mi W of jct Hwy 72 and 325 at Folsom, 4.5 mi E of Union-Colfax Co. line, 36.8505 N, 103.9287 W, 6500-6600 ft, 17 Aug 1986, *Wetter 905* (NY); along Hwy 72, 2.8 mi W of jct Hwy 72 and 325 at Folsom, 2.8 mi E of Union-Colfax Co. line, 36.8651 N, 104.0709 W, 6600-6700 ft, 17 Aug 1986, *Wetter 907* (NY); along Hwy 72, 11.5 mi W of jct Hwy 72 and 325 at Folsom, 5.9 mi W of Colfax-Union Co. line, 36.909 N, 104.0709 W, rocky hwy shoulder and especially in rocky field access road, 7200-7300 ft, with various grasses, *Artemisia*, and *Helianthus*, 17 Aug 1986, *Wetter 908* (BRY, COLO, NY, RM); along Hwy 72, 22.4 mi W of jct Hwy 72 and 325 at Folsom, 16.8 mi W of Colfax-Union Co. line, 36.921857 N, 104.268866 W, 8000-8100 ft, 17 Aug 1986, *Wetter 909* (GA, NY); along Hwy 25, 3.5 mi N of jct I-25 and Hwy 72 (exit 452) at Raton, in median between the N and S bound lanes of I-25, 7200-7400 ft, 17 Aug 1986, *Wetter 911* (NY, RM); along I-25, 3.5 mi N of jct I-25 and Hwy 72 (exit 452) at Raton, edge of hwy shoulder and throughout the median between the N and S bound lanes of I-25, 7200-7400 ft, 17 Aug 1986, *Wetter 912* (NY, RM); along Hwy 25 at Raton Pass, NM visitor's center and weight station, ca. 100 ft S of the NM-CO state line, 7800 ft, 17 Aug 1986, *Wetter 914* (NY). Union Co.: Oak Creek, 36.915014 N, 103.912189 W, incised drainage of mesa lands and the main drainage of Oak Creek watershed, 6240 ft, silty clay loam, with *Schoenoplectus tabernaemontani-Eleocharis palustris*, 29 Jul 1997, *Archer 97MB001-F5* (UNM); along Hwy 72, 3 mi E of Union-Colfax Co. line, 18 Aug 1983, *Freeman 2179* (NY); 3.5 air mi NW of Folsom, Rainbow Ranch, riparian area with grassland and juniper-oak forest, 5245 ft, 21 Jul 2005, *Schiebout 8064* (GREE); on and near the Sierra Grande, plains, 2100-2925 m, Jun 1911, *Standley 6209* (US); along Hwy 72, 2.8 mi W of jct Hwy 72 and 325 at Folsom, 2.8 mi E of Union-Colfax Co. line, highly disturbed road shoulder and adjacent pull-out area, 6600-6700 ft, very rocky, sandy soil, with various weeds, *Liatris*, and scattered oaks, 17 Aug 1986, *Wetter 907* (BRY).

GRINDELIA STENOPHYLLA

Additional collections. **COLORADO.** Archuleta Co.: Pagosa Springs, Aug 1899, *Baker 682* (NY, RM-2, US); 6 mi W of Pagosa Springs, clay soil on mesa, 2 Jun 1936, *Christ s.n.* (COLO); ca. 9 air mi E of Bayfield, San Juan Natl Forest, Hwy 160 W to Forest Rd 743, 37.2588 N, 107.4631 W, 8400 ft, ponderosa pine woodland into xeric meadow, 16 Aug 2003, *Flaig 2816* (KHD, RM); State of Colorado land, ca. 1/8 mi N of Sambrito Wetlands Rest Area, 37.005 N, 107.477 W, arroyo W of access road, 6139 ft, 7 Aug 2002, *Heil 19825* (SJNM); ca 5.45 air mi WSW of Pagosa Springs, jct. Hwy 160 & Dichoso St., Private Land, 37.2378 N, 107.1019 W, SW of hwy, 7383 ft, 31 Aug 2002, *Heil 20482* (SJNM); Tiffany, near jct Hwy 151 and County Rd 988, just W of mile marker 13, 37.0244 N, 107.4786 W, 6262 ft, 19 Sep 2002, *Heil 20824* (SJNM); Southern Ute Indian Res, Pagosa Junction, near San Juan River.S of railroad tracks, 37.037 N, 107.199 W, 6149 ft, 19 Sep 2002, *Heil 20855* (SJNM); private land, County Rd 557 at jct with Pagosa Junction road, 37.00472 N, 107.24416 W, 6200 ft, 21 Jul 2003, *Heil 22194* (BRY, SJNM); 11 mi E of Chimney Rock on Hwy 160, 7.9 mi W of the jct of Hwy 84-160 in Pagosa Springs, 37.229 N, 107.202 W, 30 Aug 1982, *Lane 2978* (COLO); Valle Seco and ridge S of the head of Frio Canyon, ca 9.5 air mi S of Pagosa Springs, 37.1256 N, 106.9943 W, 6960-7388 ft, clay knoll with scattered ponderosa pine, Douglas fir, juniper, and little ground cover, 10 July 2003, *Nelson 58947* (RM); ca. 7 air mi ESE of Pagosa Springs, on the divide between Rito Blanco and the upper drainage leading into Lefthand Canyon and down drainage toward Lefthand Canyon, 37.2285 N, 106.8958 W, 7760-7920 ft, open clay slope, 10 Jul 2003, *Nelson 59011* (RM); ca. 7 air mi SSE of Pagosa Springs, Turkey Mtn and to the W along Forest Rd 651 at the NE base of Eightmile Mesa, 37.1772 N, 106.9583 W, 7450-7858 ft, meadow and openings in ponderosa pine/Rocky Mountain juniper/Gambels oak forest, 17 Aug 2004, *Nelson 62778* (RM); ca. 7.5 air mi ESE of Bayfield, ca

10.5 air mi NE of Ignacio, high point on Forest Road 766 above the head of Spring Creek, Ritter Canyon, Armstrong Canyon, and Salt Canyon, 37.1944 N, 107.4727 W, roadside, 8720-8870 ft, 18 Aug 2004, *Nelson 62816* (RM); San Juan Natl Forest, eroded, semi barren slope, 7 Aug 1937, *Ownbey 1403* (COLO, CS, GH, NY, RM); 10 mi SE of Bayfield, *Pinus edulis*, dry soil, 15 Aug 1936, *Rollins 1531* (CS, GH, NY); 3 mi W of Pagosa Springs, 7500 ft, cut-over *Pinus ponderosa*, 19 Aug 1936, *Rollins 1557* (CS-2, NY, RM); 26 mi SE of Pagosa Springs, opening in pine woods, 25 Aug 1952, *Waterfall 11096* (COLO); 9 mi NW of Pagosa Jct, 37.1301481 N, 107.3142808 W, black shales, 16 June 1951, *Weber 6264* (COLO); along Hwy 84, 7.5 mi SE of jct Hwy 84 and 160 at Pagosa Springs, 21.4 mi NW of CO-NM state line, 37.184911 N, 106.936634 W, 7000 ft, 18 Jul 1988, *Wetter 1033* (NY); along Hwy 160, 2.4 mi E of jct Hwy 160 and 151 E of Chimney Rock, 37.2177 N, 107.2238 W, 13 Aug 1980, *Wetter 710* (NY-2, RM). La Plata Co.: Durango, dry fields S of town, 20 Jul 1898, *Baker 538* (CM, GH, NEB, NY, US); Durango, alongside Horse Gulch Road, 37.262988 N, 107.862614 W, flat pasture land, 6800 ft, 6 Oct 1979, *Gomez s.n.* (FLD); Lorings Ranch 1/2 mi N of Gem Village on hill in back of barn, 37.22489 N, 107.63211 W, dry hills and area, 9 Jul 1950 *Green 214* (COLO); between Mancos and Durango, roadside, 7400 ft, 15 Aug 1944, *Hartwell 1560* (KHD); roadside between Mancos and Durango, 37.3181 N, 108.08098 W, roadside, 7400 ft, 15 Aug 1944, *Hartwell 1663* (COLO); Southern Ute Indian Res, ca 7.5 mi E of Red Mesa Forty-Four Canyon Dist. site near well location, 37.061 N, 108.048 W, 6560 ft, 6 Aug 1995, *Heil 9364* (SJNM); State of Colorado land, Pastorius Reservoir, S side (dam) and SW shore, 37.1986 N, 107.8142 W, 6880 ft, 17 Sep 2002, *Heil 19508* (SJNM); SW part of Durango, near Manna Soup Kitchen, 37.2775 N, 107.8858 W, 6571 ft, 1 Sep 2002, *Heil 20521* (SJNM); Southern Ute Indian Res, County Rd 136 to Long Hollow Ranch main entrance with mail boxes, 37.1839 N, 108.0169 W, 7383 ft, 17 Sep 2002, *Heil 20781* (SJNM); ca. 5 mi SE of Durango, E side of Pastorius Reservoir, 1 mi S on County Rd 301 and ca. 3/4 mi E of County Rd 304, 37.1986 N, 107.8094 W, 6862 ft, 17 Sep 2002, *Heil 20807* (SJNM); County Rd 318 ca. 5 mi E of Hwy 550, 37.0742 N, 107.8108 W, 6708 ft, 17 Sep 2002, *Heil 20821* (SJNM); Southern Ute Indian Res, Road 136 just S of power station and ca. 1 mi S of Wild Cat Canyon Rd, 37.1822 N, 108.0167 W, 7420 ft, 25 Oct 2002, *Heil 21117* (SJNM); Southern Ute Indian Res, Black Ridge near Bridge Timber Mountain, 37.12 N, 107.979 W, 7558 ft, 17 Jun 2003, *Heil 21937* (SJNM); San Juan Natl Forest, Lemon Dam N of Durango, 37.382 N, 107.66 W, 8180 ft, 27 Jun 1996, *Holmes 1084* (SJNM); 2 mi S of Bayfield, County Rd 510, 37.202574 N, 107.623003 W, clay field, 7000 ft, 18 Aug 1993, *Komarek 408* (FLD); San Juan Natl Forest, Beaver Creek, 37.273329 N, 107.533978 W, dry slopes, 7400 ft, sandy clay loam, overgrazed, abundant, 14 Sep 1934, *Loughridge 455* (BUT, CHRB, FLD); Southern Ute Mountain Indian Res, 5 mi E. of Hwy 550 on the road to Ignacio, 37.071 N, 107.815 W, 6606 ft, 26 Sep 1985, *Porter 2539* (SJNM); 21 mi E of Durango on pass between Bayfield and Piedra, 37.28501 N, 107.50057 W, 7546 ft, oak-grass zone, 26 Jul 1984, *Weber 17461* (COLO); 0.9 mi E of Hwy 160 on County Rd, just E of Bayfield, 13 Aug 1980, *Wetter 711* (NY); E of Durango, vicinity of La Plata County Rd 223 and Pinon Acres KOA, 13 Aug 1980, *Wetter 712* (NY-2 sheets); Durango, along Business Rte 160/550, 2.4 mi E of 6th St and 8th Ave, road shoulder above river, 14 Aug 1980, *Wetter 713* (NY); along Hwy 160, 14.3 mi W of jct Hwy 160/550 at Durango, 5.9 mi E of La Plata-Montezuma Co. line, 8250 ft, 13 Aug 1984, *Wetter 774* (NY); along Hwy 160, 6.6 mi E of Montezuma-La Plata Co. line, 4.3 mi W of jct Hwy 160 and 140 near Hesperus, 14.8 mi W of jct Hwy 160 and 550 at Durango, 8300 ft, 3 Sep 1985, *Wetter 891* (BRY, NY). Montezuma Co.: Mancos, 8 Jul 1898, *Baker 1130* (NY); Mancos, 1 Sep 1921, *Bethel s.n.* (CS); Mancos, 17 Aug 1917, *Bethel 7933* (COLO, RM); along Dolores River, Escalante Sector, 37.573 N, 108.557 W, pinyon-juniper and riparian woodland, 6890 ft, summer 1978, *Bye s.n.* (COLO); Mesa Verde Natl Park, park entrance along Park Road, edge of first parking lot S of Hwy 160, 37.3328 N, 108.4132 W, 7065 ft, 7 Aug 1980, *Colyer 1148* (SJNM); Mesa Verde Natl Park, entrance road, 1st parking lot, 7000 ft, 7 Aug 1980, *Colyer s.n.* (CS); Mesa Verde Natl Park, Chapin Mesa, Far View terrace, 15 Sep 1987, *Colyer s.n.* (CS-2); 3 mi E of Mancos on Hwy 160, 7000 ft, 30 Sep 1966, *Dunford 1170* (NMC, NY); Mancos, July 1890, *Eastwood s.n.* (COLO); Mancos, 4 Jul 1895, *Eastwood s.n.* (GH); along Hwy 160, ca 100 yds E of the Kampark Camping Area and 0.9 mi E of the entrance to Mesa Verde Natl Park, 37.336 N, 108.396 W, 17 May 1983, *Freeman 1791* (NY); Mesa Verde Natl Park, near entrance, roadside, 6200 ft, 15 Aug 1944, *Hartwell 1675* (COLO); Mancos River canyon bottom, along canal, ca. 5.7 air mi NNE of Mancos, ca. 1/4 mi down, S, from access road, 37.4217 N, 108.2486 W, 8059 ft, 15 Aug 2002, *Heil 20092* (SJNM); Hwy 666 to Pleasant View, turn W on County Rd CC 10.5 mi, take track N to WSA, take W track to where canyon rim begins to drop off, 37.59 N, 108.95 W, colluvial slopes facing

west, 6680 ft, pinyon-juniper-bitterbrush, 17 Aug 1992, *Loebig 337* (CS); Mesa Verde Natl Park, 2 mi S of checking station, pinyon-juniper, 22 Aug 1935, *Maguire 12695* (GH); ca 3.5 air mi N of Dolores, McPhee Reservoir Area, House Creek boat launch, 37.523 N, 108.5131 W, W-facing pinyon-juniper woodland with patchy sagebrush clearings, 6900-7100 ft, 3 Aug 1994, *Moore 3603* (RM); Mesa Verde Natl Park, Far View House, on and in ruined pueblo dwellings, 19 Sep 1947, *Weber 3648* (COLO, CS, NCSC, NMC, RM); along Hwy 160, 1.8 mi W of entrance to Mesa Verde Natl Park, across hwy from San Juan Basin Area Vo-Tech School, 6800-7000 ft, 21 Sep 1979, *Wetter 582* (CS, NY, RM, UNM); along Hwy 160, 4.9 mi W of jct Hwy 160 and 184 at Mancos, 10.7 mi E of Montezuma-La Plata Co. line, common along hwy shoulder and small embankment in sandy soil, 6800-7000 ft, 3 Sep 1985, *Wetter 890* (NMC, NY, RM); along Hwy 184, 13.75 mi NW of jct Hwy 184 and 160 at Mancos, 2.35 mi SE of jct Hwy 184 and 145 near Dolores, 37.4937 N, 108.4587 W, 7000 ft, 27 Aug 1986, *Wetter 968* (NY); along Hwy 184, 13.75 mi NW of its junction with Hwy 160, 2.35 mi SE of jct of Hwy 184 and 145 near Dolores, 37.4499 N, 108.5131 W, shoulder and along rocky edges of an irrigation ditch, 7000 ft, with *G. squarrosa* var. *serrulata*, 27 Aug 1986, *Wetter 969* (CS, NY, RM). **NEW MEXICO. Rio Arriba Co.:** N of Chama on Hwy 89, 4 Aug 1996, *Atwood 21229* (BRY, NY) and *Atwood 21230* (BRY, NY); 4 mi N of Cebolla, 6000 ft, sage and juniper, 5 Sep 1951, *Bohrer 126* (BRY); Carson Natl Forest, Jicarilla District, N of Hwy 64, Forest Rd 218, N side of Eul Point, 36.999 N, 107.355 W, 7590 ft, 2 Jul 1995, *Clifford 32* (SJNM); Carson Natl Forest, Chicoso Ridge area, S of Ulibari Canyon, 36.8586 N, 107.2166 W, 7170 ft, 23 Jul 1995, *Clifford 95-678* (SJNM); Carson Natl Forest, ca. 1.37 air mi N of Canjilon, roadside, 36.500 N, 106.433 W, 7930 ft, 13 Jul 1993, *Heil 7930* (SJNM); BLM, Gobernador Hwy to Sims Mesa, ca. 1 mi N of Gomez Ranch turn E on dirt road, ca. 3.5 mi E, 36.767 N, 107.37 W, roadside, 22 Aug 1993, *Heil 8095* (SJNM); Carson Natl Forest, Cave Spring, ca. 1.1 mi SW of Cedar Spring, 36.65892 N, 107.27617 W, 7405 ft, 7 Jul 1995, *Heil 9122* (SJNM); Jicarillo Apache Indian Reservation, Telephone Canyon, 1 mi NW of the Continental Divide, 36.6976 N, 106.9564 W, 7900 ft, 18 Jul 1996, *Heil 10198* (SJNM); 5.75 air mi SE of Chromo, N side of ridge just S of Colorado state line, in and near small pond, 36.991 N, 106.756 W, 8330 ft, 8 Jul 2000, *Heil 15186* (SJNM); Chromo Mountain area, 0.2 mi W of Salso Gomez Ranch along boundary of Gooding Ranch, 36.976 N, 106.744 W, 8324 ft, 9 Sep 2000, *Heil 15690* (SJNM); ca. 1 mi W of Salso Gomez Ranch house, next to dry pond, mountain meadow, 36.971 N, 106.753 W, 8320 ft, 9 Sep 2000, *Heil 15695* (SJNM); Chromo Mountain Ranch ca. 2 mi up Stove Ridge, 36.986 N, 106.740 W, white fir and Gambel's oak, 9114 ft, 10 Oct 2000, *Heil 15716* (SJNM); Jicarilla Apache Indian Reservation, Telephone Canyon, ca. 2 mi SE of Hwy 537, stagnant pond W of road, 36.702 N, 106.979 W, 7640 ft, 16 Oct 2000, *Heil 15831* (SJNM); Chama Land & Cattle Company, hill S of Lodge of Chama, radio tower and picnic table, 36.866 N, 106.564 W, 26 Jul 2007, *Heil 28835* (SJNM); Carson Natl Forest, just S of Carracas Creek at stock pond W of road, 36.958 N, 107.215 W, 6605 ft, 9 Jul 2013, *Heil 34939* (SJNM); Gallina, 5 Sep 1926, *Koelz s.n.* (MICH); Carson Natl Forest, WSW of Dulce, Arroyo La Jara near W forest boundary, just S of Hwy 64, 36.7099 N, 107.3028 W, 6570-6750 ft, arroyo floodplain and flats with *Artemisia tridentata* and chamisa, 22 Aug 2005, *Larson 4632* (RM); W of Dulce, Eul Point on Carracas Mesa via Forest Rd 218/2182, 0.5 air mi S of state line, 36.9929 N, 107.3534 W, pinyon-juniper woodland surrounding gas pad, W-facing rocky slope, 7300-7550 ft, 22 Aug 2005, *Larson 4690* (RM); Carson Natl Forest, Carracas Mesa at jct Forest Rd 218 and Eul Canyon Road (Forest Rd 218B) and NE to Carracas Rim, 36.9818 N, 107.2999 W, 7400-7565 ft, ponderosa pine forest with oak understory, meadow openings with Asteraceae, forest burned approximately 40-50 years ago, 23 Aug 2005, *Larson 4717* (RM); W of Dulce, Forest Rd 209A, Anselmo Bench, N of Cabresto Canyon, 36.9163 N, 107.3367 W, mesa top with *Cercocarpus*, chamisa, burned and bulldozed with gas pads, 23 Aug 2005, *Larson 4767* (RM); Forest Rd 125 to Trout Lakes, ca. 3 air mi SW of Trout Lakes, ca. 8.5 air mi N of Canjilon, 36.5862 N, 106.4188 W, 8350 ft, cattle-grazed shrub land of *Quercus gambelii*, *Rosa* species, and *Crataegus* with scattered *Pinus ponderosa*, 29 Jul 2006, *Larson 9361* (RM); ca 2.5 air mi ENE of Canjilon, Forest Rd 724, above N side of Blas Canyon, 36.8889 N, 106.3953 W, 8400-8500 ft, burned ponderosa pine forest with *Quercus gambelii* and *Elymus longifolius*, 30 Jul 2006, *Larson 9519* (RM); ca 3.5 air mi ESE of Canjilon, Lopez Canyon off Forest Rd 337, 36.4673 N, 106.3789 W, 8250 ft, flats of clay/sand soils with *Artemisia tridentata* including groupings of *Pinus edulis* and juniper species, 30 Jul 2006, *Larson 9552* (RM); ca. 1.5 mi SW of Canjilon, 2.5 mi from Hwy 84 on Las Jollas Road, swale of ridge 10 meters from 4-wheel drive road, 36.458 N, 106.464 W, pinyon-juniper woodland with *Artemisia nova* understory, clay soil, 7875 ft, 22 Sep 1995, *Lowrey 1610* (COLO); 3 mi SE of Gobernador along Forest Rd 314, 7300 ft,

rocky sand-clay, with *Juniperus osteosperma*, *Pinus edulis*, 5 Aug 1977, *Peabody 1887* (BRY); 3.5 mi S of NM-CO state line along Hwy 84, picnic table pullout, 7800-8000 ft, 18 Jul 1988, *Wetter 1032* (NY); Carson Natl Forest, along Hwy 84, 4.4 mi S of jct with Hwy 115 (110 ?), 12 Aug 1980, *Wetter 700* (NY-2 sheets); along US 84, 5.4 mi N of jct with NM 115 (NM 110?), 12 Aug 1980, *Wetter 701* (NY, RM); Chama along Hwy 17 (Terrence Ave.), 2.3 mi N of jct Hwy 17 and 64/84, 13 Aug 1980, *Wetter 702* (NY); along Hwy 64/84 NW of Chama, 3.5 mi SE of where Hwys 64/84 divide, 36.886 N, 106.736 W, 13 Aug 1980, *Wetter 704* (NY); along Hwy 84, 1.0 mi N of jct Hwy 64/84, 5.4 mi S of NM-CO state line, 36.920 N, 106.798 W, 13 Aug 1980, *Wetter 708* (NY); along Hwy 84, 17.5 mi NW of jct with Hwy 94, 2.7 SE of jct with Hwy 115 near Cebolla, 16.8 mi SE of jct. Hwy 64/84 at Tierra Amarilla, rocky shoulder and bar ditch, 7500 ft, sagebrush, juniper, pine, and usual weeds, 19 Aug 1984, *Wetter 805* (BRY, COLO, NMC, RM); along Hwy 84, 17.5 mi NW of jct Hwy 94, 2.7 mi SE of jct Hwy 115 near Cebolla, 16.8 mi SE of jct Hwy 64/US 84 at Tierra Amarilla, 7500 ft, common in rocky shoulder and bar ditch, sagebrush, juniper, pine, usual weeds; hybrid, intermediate between *G. nuda* [*aphanactis*] and *G. stenophylla* in bracts, head size, and ray floret morphology, 19 Aug 1984, *Wetter 807* (NMC); along Hwy 84, 6.3 mi NW of jct with Hwy 15, 7.8 mi SE of jct with Hwy 64/84 at Tierra Amarilla, 19 Aug 1984, *Wetter 808* [unusually long peduncles] (NY, RM); along Hwy 84 [at mile marker 318], 8.5 mi S of jct Hwy 84 and 64 at Tierra Amarilla, 7500-7600 ft, 17 Jul 1988, *Wetter 1029* (NY). San Juan Co.: BLM, 1.5 mi N of 5-mile bridge and E side of Largo Canyon, 36.7074 N, 107.7766 W, riparian, 5650 ft, 17 Sep 1998, Heil 12,727 (SJNM); vicinity of Farmington, dry fields, 17 Jul 1911, *Standley 6899* (US); vicinity of Farmington, river bottoms, 5100-5400 ft, 18 Jul 1911, *Standley 6978* (US). Sandoval Co.: Jemez Mtns, 6 mi E of Cuba, old copper mine, 6200 ft, 24 Aug 1931, *Castetter 583* (UNM, RM); Jemez Mtns, near Cuba on hwy, 24 Aug 1931, *Castetter 8518* (NMC); 3 mi N of Cuba, hills, gravel soils, with yellow pine, 1 Oct 1950, *Dittmer 8527* (NMC); 5.4 mi W of Regina turnoff NW of Cuba, N side of Hwy 44, just above dirt tank, 36.078786 N, 107.09054 W, pinyon-juniper, 7250 ft, 10 Oct 1984, *Fletcher 7916* (NMC); along Hwy 44, 0.6 mi N of jct Hwy 44 and 96 N of Cuba, 36.0791 N, 107.0006 W, 7200-7400 ft, 17 Jul 1988, *Freeman 1027* (NY); , ca. 4 air mi NW of Cuba, head of Arroyo San Jose on Mesa de Cuba on County Rd 8836.0608 N, 107.0155 W, clayey sagebrush areas adjacent to sandy piñon forest, 7200-7400 ft, 18 Jul 2004, *Nelson 61956* (RM); 10 mi NW of Cuba, Rio Puerco Forest Expt. Area, Shroyer Allotm., 36.167029 N, 106.969133 W, 7100 ft, 20 Aug 1979, *Pase 2612* (NMC, RM); vicinity of Dry Spring, Taylor Ranch, 3 mi S of Hwy 550, ca. 0.6 mi below the continental divide, 36.048 N, 107.168 W, 7160 ft, 10 Sep 2002, *Tonne s.n.* (UNM); along Hwy 96, 0.7 mi N of jct Hwy 96 and 44 just N of Cuba, 1.0 mi S of jct Hwy 96 and 476, 10.6 mi S of Sandoval-Rio Arriba Co. line, 36.0791 N, 106.9826 W, 7000-7100 ft, 24 Aug 1986, *Wetter 955* (BRY, COLO, NY, RM); along Hwy 96, 3.6 mi NE of jct Hwy 96 and 44 N of Cuba, 8.1 mi SW of Sandoval-Rio Arriba Co. line, 36.1369 N, 106.9826 W, 7200-7400 ft, 17 Jul 1988, *Wetter 1028* (NY).

GRINDELIA SUBALPINA

Additional collections. COLORADO. Boulder Co. (representative): Eldora, dry soil, 2575 m, 13 Sep 1921, *Bethel et al. 4321* (US); Lake Eldora, 8500 ft, 1 Aug 1918, *Clokey 3133* (NY, RM-2, US); Ft. Collins, dry plains, 5000 ft, 19 Jul 1890, *Crandall 255* (US); 2 mi S of Nederland on Hwy 119, 0.7 mi. N of jct Hwy 119 and 72, or 2.5 mi N of Rollinsville, 8000 ft, with *P. ponderosa* and *P. contorta*, abundant between Nederland and Central City, 11 Sep 1965, *Dunford 1116* (NMC, NY); Boulder Mtn Parks, W side of Bear Peak and South Boulder Peak, 39.95 N, 105.32 W, with *Pinus ponderosa*, 17 Aug 1991, *Hogan 1498* (COLO, CS); along Hwy 36, ca. 3 mi NW of Lyons, along Indian Lookout Road, 40.2244 N, 105.2814 W, 5757 ft, 4 Sep 2001, *King 11955* (MO, NY); along Left Hand Canyon Road, ca. 5 mi W of Hwy 36, 40.1039 N, 105.3489 W, 6380 ft, 21 Sep 2001, *King 11998* (MO, NMC); along Hwy 7, ca. 12 mi W of Lyons, 40.16666 N, 105.4 W, 7196 ft, 21 Sep 2001, *King 12004* (MO); Eldorado Springs, 39.93194 N, 105.27888 W, 5881 ft, 10 Aug 2002, *King 12371* (MO); vicinity of Riverside, ca. 3.5 mi S and 9 mi W of Lyons, 40.17528 N, 105.43333 W, mesic aspen-spruce forest along Middle St. Vrain Creek and open montane pine-juniper forest on steep, rocky N-facing slope and ridge above creek, scattered Douglas fir on slope, 7429 ft, 8 Aug 2001, *Morse 6711* (KANU, UCR); below brickyard, near Boulder, 5577 ft, 18 July 1905, *Ramaley 1284* (COLO); Glazier Lake, 23 Aug 1912, *Rusby s.n.* (NY); Ft. Collins, 7 Jul 1884, *Sheldon 6* (US); near Boulder, plains and foothills, 5000-6000 ft, Jul 1902, *Tweedy 4878* (NY, RM); along Hwy 72/119, 1.1 mi of jct where Hwy 72 turns east, 1.7 mi N of Gilpin Co. line, 39.882198 N, 105.522531 W,

8700 ft, very common along rocky hwy shoulder and adjacent embankment, 10 Aug 1984, *Wetter 744* (NY-2). **Clear Creek Co.:** Along Hwy 103 W of jct with Hwy 5, 8 Aug 1973, *Atwood 5751* (BRY, RM, WTS); Jeffco Outdoor Lab School, 39.64 N, 105.45 W, disturbed site, 7999 ft, 4 Aug 1972, *Brown J-491* (CS); Georgetown, roadside, 15 Jul 1936, *Christ 2934* (CS-2); Idaho Springs, grassy hill, 11 Aug 1942, *Degener 16376* (RM); Georgetown, 8300 ft, 10 Jul 1878, *Jones 820* (CM, NY); ca. 8.5 air mi SW of Winter Park, Arapaho Natl Forest, ca 0.5 mi NW of Empire on secondary Forest Rd 261, 39.7709 N, 105.6888 W, 9400 ft, mixed coniferous forest and roadside, 28 Jul 2003, *Foley 3716* (RM); ca. 6 air mi SW of Idaho Springs. Arapaho Natl Forest, E of Hwy 103, ca 0.5 air mi N of Chicago Forks Campground, 39.6907 N, 105.6141 W, roadside, 9000 ft, 2 Aug 2003, *Foley 4047* (RM); ca. 6.5 air mi NE of Empire, ca 4 air mi WNW of Central City, Arapaho Natl Forest, between Sheridan Hill and Mount Pisgah, 39.8122 N, 105.5888 W, 9200-9600 ft, dry, regenerating *Artemisia* slope with scattered mixed conifers, 10 Aug 2003, *Foley 4576* (RM); ca. 5.5 air mi WSW of Idaho Springs and ca. 5 mi E of Georgetown, Arapaho Natl Forest, West Chicago Creek along Hwy 103, 39.6976 N, 105.6128 W, 8740 ft, along road and creek, 16 Aug 2004, *Foley 11720* (RM); ca. 2.5 air mi WSW of Idaho Springs and ca 7 air mi ENE of Georgetown, Arapaho Natl Forest, along Hwy 103, 39.7237 N, 105.5625 W, 7900 ft, along road, 16 Aug 2004, *Foley 11735* (RM); Empire, 26 Aug 1929, *Johnston 1339* (RM); valley near Empire, mountains about the headwaters of Clear Creek, dry places, Sep 1892, *Patterson 235* (US); Denver Botanic Gardens, 6 mi W of Evergreen, Upper Bear Creek Canyon, Site K, 39 37' N, 105 25' W, 2300 m, 6 Aug 1982, *Richards RP82216* (KHD); Georgetown, 17 Aug 1895, *Rydberg s.n.* (COLO, NY); Georgetown, 19 Aug 1895, *Shear 4705* (NY); E-bound I-70, 0.6 mi E of Silverplume S of overview turn-out, 39.7 N, 105.71 W, 8880 ft, sandy soil, 10 Sep 2000, *Slaughter & Miller 28* (CS); 8 mi W of Idaho Springs, opening in pines, 16 Aug 1954, *Waterfall 12079* (BRY); along Hwy 6W, 2.1 mi NW of Clear Creek Co. line, 0.1 mi from exit road to I-70 E, frontage road, 7300 ft, 11 Aug 1984, *Wetter 747* (NMC, NY-2, RM). **Douglas Co.:** Pike Natl Forest, Rampart Range Rd (Forest Rd 300) ca. 0.6 mi from jct with Hwy 67, 39.37138 N, 105.09111 W, dry pine forest, 22 Jul 2005, *Gust 814* (MO); ca. 7 mi SW of Sedalia, 39.365148 N, 105.052604 W, 9 Jul 2000, *King 11380* (MO, NY); Devils Head, 39.2602699 N, 105.1011054 W, oak thicket, 19 July 1928, *Ramaley 12101* (COLO); along Hwy 67, 1.1 mi S of jct Hwy 67 and 85 at Sedalia, 39.4249 N, 104.9879 W, 5800-5900 ft, 20 Aug 1986, *Wetter 931* (NY); along Hwy 67, 7.3 mi S of jct of Hwy 67 and 85 at Sedalia, just N of Pike Natl Forest boundary, 39.3814 N, 105.0624 W, 7200 ft, 20 Aug 1986, *Wetter 933* (NY, RM); along Hwy 67, 4.6 mi S of jct Hwy 67 and 85 at Sedalia, 4.0 mi S of jct Hwy 67 and 105 near Sedalia, 39.3814 N, 105.0251 W, 6500-6550 ft, 20 Aug 1986, *Wetter 936* (NY). **Gilpin Co.:** Tolland, 12 Aug 1921, *Bethel s.n.* (CS); Hwy 119, 3 mi N of Blackhawk, 39.831593 N, 105.520879 W, 8300 ft, 11 Sep 1965, *Dunford 1117* (KANU, NMC, NY); Tolland, 10 Aug 1912, *Bradburn 9455* (COLO); along Rollins Pass Road (Hwy 16), ca. 1 mi W of Rollinsville, 39.91666 N, 105.5 W, 8479 ft, 8 Aug 2001, *King 11914* (MO, NY); Tolland, 9000 ft, 26 Jul 1910, *Rankin 175* (NY); Axton Ranch Mtn Park, 450-acre parcel just E of Starr Peak and ca. 13.75 km WNW of jct of Hwy 72 and 93, 39.898983 N, 105.401513 W, 8960 ft, disturbed manmade berm below perennial stock pond above montane meadow, 21 Jul 2021, *Spencer 305* (KHD); Peak to Peak Hwy at Rollinsville, along dirt road paralleling railroad R-O-W, 39.91707 N, 105.5025227 W, side-by-side with *G. squarrosa* (lacking basal leaves) and putative hybrid, ray flowers twice as long as those of *G. squarrosa*, 25 August 1996, *Weber 19184* (COLO); along Hwy 119, 0.2 mi S of jct with Hwy 46, edge of Arapaho Natl Forest Campground, Cold Spring, 9400-9500 ft, 11 Aug 1984, *Wetter 745* (NY-2, RM); along Hwy 119, 0.9 mi N of jct with Hwy 279, 8.0 mi N of jct with Hwy 6W and Clear Creek Co. line, 8250 ft, 11 Aug 1984, *Wetter 746* (NY); along Hwy 119, 8.5 mi S of Rollinsville, 39.82 N, 105.52 W, 8990 ft, gravelly banks, *Pinus contorta*, 21 Aug 1974, *Wilken 21204* (CS); near Rollinsville, Smartweed Lake [W side of the Peak to Peak Hwy right on the Boulder-Gilpin co. line], 39.9321275 N, 105.5020827 W, 9 Aug 1911, *Ramaley 9008* (COLO); Tolland, 11 August 1911, *Ramaley 9056* (COLO). **Jackson Co.:** ca. 6 mi N of Cowdrey along Hwy 125, 2 mi W of jct Hwy 127, 6.5 mi S of the Wyoming state line, dry hills, 7900 ft, *Artemisia tridentata*, 21 Jul 1985, *Bayer CO-529* (NMC); Colorado State Forest State Park, along County Rd 8A, 3.1 road mi from County Rd 8, 40.85407 N, 106.16372 W, 8600 ft, 4 Aug 2001, *Hartman 73499* (COLO, RM); 5 mi N of Cowdrey on Hwy 127, 40.916 N, 106.273 W, roadside, 8300 ft, sagebrush, 31 July 1952, *Lafferty 23* (COLO). **Jefferson Co.:** 2 mi W of Morrison and 500 yds E of the Fort along Hwy 285, 39.62895 N, 105.187037 W, roadside, 28 Jul 1967, *Bryant 11-Jan* (WSC); Golden, corner of Genesee Village Rd, rocky soil, 8 Sep 2007, *Heit 2* (CS); Golden, top of Lookout Mtn, 39.733 N, 105.239 W, 28 Aug 1916, *Johnston*

226A (NY, US); 7 mi S of Boulder on Rocky Flats Pediment, gulches NE of plant site, 39.89 N, 105.23 W, 31 Jul 1973, *Kunkel 346* (CS); Bear Creek area E of Morrison, 39.64 N, 105.15 W, 5650 ft, sandy clay with cobbles, 21 Jul 1972, *Mooradian 72-323* (CS); 10 mi W of Denver, 3 Sep 1928, *Nelson 10952* (RM); S of Golden, 3 mi above Junction on Hwy 68, open flat area, 9 Sep 1960, *Perdue 4029* (US); opposite the Indian Hills Post Office, 39.617256 N, 105.235838 W, gravelly roadside, 18 Aug 1968, *Scheideman 18-8-68-1* (WSC); Ralston Buttes, 39.848 N, 105.273 W, 7700 ft, 20 Aug 1995, *Smookler 408* (KHD); Welchester Tree Grant Park, N of West 8th Ave between Beech St and Welch St, 39.72944 N, 105.14426 W, 5724 ft, 14 Jul 2023, *Stong 107* (KHD); S of Evergreen along Hwy 73, 2.0 mi S of jct with Hwy 74, 6.4 mi N of jct with Hwy 285, 7400 ft, 11 Aug 1984, *Wetter 748* (NMC, NY, RM); along Hwy 285, 0.3 mi S of jct with Hwy 73 in Conifer, 5.8 mi N of Jefferson-Park Co. line, 8350 ft, 11 Aug 1984, *Wetter 749* (NY); along Hwy 285 at jct with Soda Lake Rd, along gravel parking lot near corner of Soda Lake Rd and Hampden Ave, 5700 ft, 26 Aug 1985, *Wetter 830* (NY); along Hwy 285, 1.1 mi N of jct for North Turkey Creek and Tiny Town, common along rocky shoulder and hwy embankment, 6750 ft, 26 Aug 1985, *Wetter 831* (NMC, RM); along Hwy 126 (road to Pine), 3.0 mi SE of Pine, between Logan Rd and Pine Top Rd, 6800 ft, 26 Aug 1985, *Wetter 832* (NY, RM); South Table Mtn, along Serpentine trail, 0.5 mi NW from jct of Quaker and Golden Hills roads, 39.74808 N, 105.1859 W, among rocks of small old quarry just N of trail, 6080 ft, 21 Oct 2024, *Yeatts 7015* (KHD); along Quaker Rd on South Table Mtn, 39.754081 N, 105.19826 W, 6200 ft, hard-packed clay, 20 Aug 1983, *Yeatts 802* (KHD). **Larimer Co.** (representative): Shambhala Mtn Center near Red Feather Lakes, along road to stupa, 40.72 N, 105.53 W, dry upland area of *Pinus ponderosa* woodland and adjacent *Purshia* shrubland, 8200 ft, common, 24 Jul 2013, *Ackerfield 4171* (CS); Rocky Mountain Natl Park, Cub Lake Trail, 40.3459 N, 105.6375, 8600 ft, 5 Sep 1980, *Anderson 1772* (KHD); along a gravel road ca. 5.8 mi W of Poudre Park off Hwy 14 and 0.5 mi S of the hwy, 40.686 N, 105.4155 W, 12 Jun 1980, *Freeman 592* (NY); E side of Horsetooth Res, W of Ft. Collins along the paved road up to the dam, abundant in disturbed sites along the road and occasionally on the rocky slopes, 12 Jun 1980, *Freeman 601* (NY); Poudre River Canyon, along Hwy 14, 29.5 road mi W of Hwy 287, N side of Poudre river on terrace above river, 40.697 N, 105.544 W, 7300 ft, 11 Sep 1999, *Hamilton 15* (GREE); E of Poudre Park, Cache La Poudre Canyon on Rte 14, 40.693 N, 105.242 W, 5100 ft, 8 Aug 1984, *Hill 14971* (NY); along County Rd 80C ca. 5 mi W of Hwy 287, 40.8406 N, 105.3219 W, 6475 ft, 14 Jul 2001, *King 11809* (MO, NY); Rocky Mountain Natl Park, Hwy 34 ca 4 mi inside East Entrance, 40.405 N, 105.629 W, 8775 ft, 23 Sep 1999, *King 11188* (MO, RM); Estes Park, along the W side Hwy 34, NE of jct with Hwy 36, 40 22 80 N, 105 30 99 W, 7543 ft, 10 Aug 2004, *King 13273* (NY, UNM); Old Roach area off Forest Rd 200 on Forest Rd 206, 40.9374 N, 106.1337 W, 8700-9000 ft, 24 Jul 2001, *Nunn 3335* (NY, RM); slopes of Bull Mountain across from Jimmy Creek Spring on County Rd 80C, 40.904 N, 105.8408 W, 8800-9600 ft, E-facing slopes, 27 Jun 2001, *Nunn 2101* (BRY, RM); head of Lone Pine Creek, 40.788 N, 105.441 W, 16 Aug 1899, *Osterhout 2032* (COLO, NY, RM); along Hwy 287, rest area just S of CO-WY state line, Virginia Dale Historic Marker, 40.981 N, 105.393 W, 7400 ft, 5 Sep 1979, *Wetter 525* (BRY, NY); along Hwy 34, 5.1 mi E of jct with road to Glen Haven at Drake, 17.2 mi E of jct Hwy 34/36 at Estes Park, Big Thompson Canyon, 5822 ft, 10 Aug 1984, *Wetter 740* (NY, RM); along Hwy 7, 8.0 mi S of jct Hwy 7 and 36 near Estes Park, 1.2 mi N of Larimer-Boulder Co. line, at Enos A. Miller historic marker, 8950-9000 ft, 10 Aug 1984, *Wetter 742* (NY, RM). **Park Co.:** along Hwy 285, 2 mi W of Pine Junction, 39.452 N, 105.426 W, dry roadside, 28 Jul 1967, *Bryant 16-Feb* (WSC); along Hwy 285, ca. 0.5 mi E of Bailey, 39.41527 N, 105.47388 W, 8174 ft, 16 Jul 2003, *King 12549* (MO); along Hwy 24, 2.9 mi W of Wilkerson Pass summit, 39.038035 N, 105.57968 W, 8800-9000 ft, 16 Aug 1980, *Wetter 726* (NY); along Hwy 285, 1.9 mi SW of Clear Creek-Park Co. line, 2.0 mi NE of jct Hwy 285 and 72, 8300 ft, along hwy in gravelly soil, also in adjacent pasture off highway embankment: aspen-ponderosa pine community, 11 Aug 1984, *Wetter 750* (NY, RM); along Hwy 285, 7.6 mi SW of jct with Hwy 72, 11.5 mi SW of Jefferson n, Park Co. line, 5.5 mi NE of jct with Hwy 62 in Grant, 39.259237 N, 105.953057 W, 8300 ft, 11 Aug 1984, *Wetter 751* (NY); along Hwy 285, at East Portal of Roberts Tunnel display, 0.7 mi SW of jct with Hwy 62 at Grant, 4.8 mi NE of jct with Park Co. Hwy 58, scattered along hwy shoulder above Tarryall River, 8625-8650 ft, 11 Aug 1984, *Wetter 753* (NY-3); along Hwy 24/Colo 9, 0.4 mi E of jct Hwy 9 and 24 W of Hartsel, 0.6 mi W of jct CO 9 and 24 at Hartsel, 39.0208 N, 105.8029 W, 9000 ft, 20 Aug 1986, *Wetter 939* (NY, RM); along Hwy 24, 1.5 mi W of Park-Teller Co. line (mile marker 266), 0.6 mi E of jct Hwy 24 and County Rd 96 at Lake George, 38.9767 N, 105.3587 W, 7800-8000 ft, 21 Jul 1988, *Wetter 1047* (NY). **WYOMING. Albany Co.** (representative):

Ca. 12 mi S[E] of Laramie, Middle Crow Creek, 41.2132 N, 105.412 W, 8200-8400 ft, near road along creek and adjacent slopes, 5 Aug 1965, *Feddema 3201* (RM); ca. 13 air mi SE of Laramie, NE base of Twin Mountain, ca 1.25 mi SW of Hwy 210 (Happy Jack Road), ca 1.5 mi S of South Branch Crow Creek, 41.1973 N, 105.3575 W, 8200 ft, SE-facing base of granite boulder and cliff slope and adjacent *Artemisia tridentata* var. *vaseyana*-*Purshia-Juniperus scopulorum* grassland, 18 Aug 1996, *Fertig 17139* (RM); ca. 12 air mi SE of Laramie, Vedauwoo area, N of Forest Service Rd 700, summit above valley of beaver ponds along South Fork Middle Crow Creek, 1.2 mi N of I-80, 41.15502 N, 105.35592 W, 8120 ft, gravelly granite flats above valley in *Artemisia tridentata* var. *vaseyana*-*Artemisia tripartita* var. *rupicola*-*Artemisia frigida* community with scattered *Juniperus communis* and *Pinus ponderosa*, 27 Jul 2016, *Fertig 31454* (ASU, RM); ca. 11.5 air mi E of Laramie, N side of Eagle Rock, 1/4 mi S of North Branch Middle Lodgepole Creek, 41.2823 N, 105.355 W, 8100-8300 ft, clearing of *Artemisia tridentata* var. *vaseyana* and *A. tripartita* on gravelly Sherman granite surrounded by *Pinus ponderosa* woods, 23 Jul 1995, *Fertig 16065* (RM); ca. 12 air mi SE of downtown Laramie, Sherman Mountains, near head of South Branch Crow Creek on W side of Headquarters Rd (Forest Service Rd 707), 41.2195 N, 105.3908 W, 8445 ft, sagebrush-grass community in opening of ponderosa pine-aspen forest, 11 Aug 2020, *Johnson 7487* (BRY); Laramie, Univ. of Wyoming campus, 20 Sep 1895, *Nelson 1148* (RM); Dunn's Ranch, 41.709 N, 105.772 W, 18 Jul 1900, *Nelson 7615* (CM, COLO, GH, NEB, NY, RENO, RM); ca. 32 air mi NE of Rock River, Laramie Peak Wildlife Habitat Management Area, Pine Mtn, 42.0252 N, 105.4188 W, 7550-7870 ft, southern slope granite outcrop, 13 Jul 1997, *Packer 1689* (RM); ca. 21.5 air mi SE of Laramie; 3/4 mi N of Colorado on Hwy 287, 1/2-3/4 mi W of Hwy 287, 41.0099 N, 105.4306 W, 8170-8200 ft, gravelly soil on grasslands, 21 Aug 1997, *Packer 3108* (RM); along Hwy 287, 3.4 mi S of the Tie Siding Post Office, 5.2 mi N of WY-CO state line, 41.552824 N, 105.636657 W, 8000 ft, 5 Sep 1979, *Wetter 523* (NY, RM). **Carbon Co.:** Ca. 1.5 air mi S of Morgan, ca 12 air mi N of Centennial, end of improved Forest Rd 329 (Fallen Pines Rd), 41.4629 N, 106.1398 W, 9300 ft, meadow where the forest was either clear-cut or burned long ago, 22 Jul 2008, *Lukas 6322* (RM); ca. 40 air mi WSW of Medicine Bow, North Platte River, 41.7401 N, 106.9479 W, 6472 ft, dry banks and uplands, 10 Jul 2005, *Newton 1769* (RM); ca 15 air mi E of Baggs, Little Snake River, 41.0164 N, 107.4019 W, 6396 ft, adjacent meadows, 19 Jul 2005, *Newton 2134* (RM); confluence of Corral Creek and North Platte River, 41.2605 N, 106.5748 W, 7283 ft, dry uplands, 29 Jul 2005, *Newton 2699* (RM); ca. 16.8 air mi SE of Saratoga; ca 11 air mi NE of Encampment, North Platte River, N of Bennett Peak, 41.2684 N, 106.5957 W, 7240 ft, cottonwood and willow lined area adjacent to river, 10 Jul 1997, *Roderick 2011* (RM); Encampment, 41.20941 N, 106.789762 W, 7200 ft, 10 Jul 1901, *Tweedy 4016* (NY). **Laramie Co.** (representative): Happy Jack Road, Pole [Creek] Campground, 41.25232 N, 105.41651 W, 8600 ft, ponderosa, moist understory, 5 Sep 1974, *Allred 1114* (RM); Cheyenne, 11 Jul 1934, *Davis 309-W* (NY); canyon below Crystal Lake Reservoir, 41.154 N, 105.183 W, 7000 ft, mountain mahogany with *Eriogonum*, *Ranunculus*, 3 Aug 1983, *Dorn 3914* (RM); ca. 22.5 air mi W of Cheyenne, ca. 3.5 air mi NE of Buford, 41.1537 N, 105.2404 W, 7550 ft, short grass and open ponderosa pine forest with several small streams, 5 Jul 1979, *Edwards 137* (RM) and *Edwards 206* (RM); NW bank of Crystal Lake Reservoir and adjacent banks of Crow Creek N of reservoir, ca. 2 air mi S of Hwy 210 (Happy Jack Rd), ca. 1.75 air mi W of Hecla, 41.168 N, 105.202 W, summit of ridge W of reservoir, 7000-7100 ft, rolling mixed grass prairie knolls, 17 Aug 1995, *Fertig 16302* (RM); 2 mi W of Granite Reservoir at BSA Camp, 7100 ft, 21 Aug 1979, *Lichvar 2498* (NY); ca. 15 air mi E of Laramie, Granite Reservoir, 41.1863 N, 105.2621 W, 7500-7700 ft, N-facing slope, 29 Jul 1998, *Packer 4810* (RM); W of Cheyenne along I-80 at Warren Rd Exit, at jct of Warren Rd and Frontage Rd, 6200-6250 ft, 3 Sep 1979, *Wetter 516b* (NY, RM).

GRINDELIA SUBINCISA

Additional collections. **COLORADO.** **Conejos Co.:** 2 mi NNE La Manga Pass, Horseshoe Curve, 37.1167 N, 106.367 W, roadside, 9400 ft, 1 Sep 1984, *Dixon 4414* (ALAM); 1 mi S of Old Mesita Bridge, 37.067 N, 105.767 W, 7500 ft, 2 Sep 1993, *Dixon s.n.* (ALAM); Osier, 9580 ft, 13 Jul 1910, *Eggleston 5946* (US); 17 air mi SW of Centro, Fox Creek Road, just S of Hicks Canyon, 37.074 N, 106.229 W, roadside, 8625 ft, 24 Jun 2004, *Flaig 4783* (RM); La Jara Canyon 6 mi SW of Capulin, 37.25 N, 106.2 W, open area, 7900-8100 ft, occasional, 20 Jul 2004, *Hazlett 12256* (KHD); ca. 12 air mi NW of Capulin, The Canyon and adjacent areas on Forest Rd 255 at the forest boundary, ca 15 air mi SSE of Monte Vista, 37.3854 N, 106.26 W, drier areas in the bottom, 8350-8550 ft, 15 Jul 2003, *Nelson 59334a* (RM) and *59334b*

(RM); ca. 10.5 air mi WSW of Antonito, along Rito Hondo ca 3/4 mi above Bighorn Creek, ca 2 3/4 air mi S of Fox Creek, 37.0242 N, 106.1949 W, drier slopes near the stream meadows, 8400-8550 ft, 22 Aug 2004, *Nelson 63003* (RM); 1 mi N of Antonito, roadside, 5 Aug 1937, *Ownbey 1389* (COLO, NY, RM-2 sheets); La Jara, openings of river bottom forest, sandy soil, 13 Aug 1931, *Ramaley 13007* (COLO); Conejos Canyon, openings in dry forest, 9000 ft, 24 Jul 1936, *Ramaley 15708* (COLO); Alamosa Canyon, grassland opening in coniferous forest, 14 Sep, 1938, *Ramaley 16840* (COLO); San Juan Mtns on W side of San Luis Valley, ca. 27 mi SW of Alamosa, Rajadero Canyon ACEC [Area of Critical Environmental Concern], 37.21027 N, 106.24156 W, rich drainage in ponderosa pine-Arizona fescue community, 8626 ft, with *Ribes cereum*, *Holodiscus dumosa*, *Populus tremuloides*, *Symphoricarpos occidentalis*, *Ericameria nauseosa*, *Carex duriuscula*, *Festuca arizonica*, infrequent, 26 Jul 2015, *Regensberg 2422* (KHD); 2 mi SW of Bighorn Corral, 1/2 mi S of Rito Hondo Creek, 8500 ft, gravelly granitic soil, 3 Aug 1936, *Rollins 1481* (GH, NY); vicinity of Antonito, 7 Jul 1911, *Standley 6506* (US); 3 mi N of Colorado line on Hwy 285, near mile marker 3, hilly area, sandy loam, 7000 ft, 30 Jul 1984, *Walter 9834* (HPC); Conejos River Canyon, 12 mi W of Antonito, 37.0494343 N, 106.1606956 W, 8200 ft, 18 July 1952, *Weber 7823* (COLO); along Hwy 17, 13.8 mi NE of Conejos-Archuleta Co. line, 14.1 mi NE of NM-CO state line, 22.5 mi SW of jct with Hwy 285 at Antonito, 37.230 N, 105.842 W, 9450 ft, 20 Aug 1984, *Wetter 810* (NY-2 sheets, RM); along Hwy 17, 17.0 mi NE of NM-CO state line, 16.7 mi NE of Archuleta-Conejos Co. line, 19.6 mi SW of jct with Hwy 285 at Antonito, 8800 ft, 20 Aug 1984, *Wetter 811* (NY, RM); along Hwy 285, 0.3 mi N of jct with Hwy 17 at Antonito, area adjacent to train depot for Cumbres and Toltec Scenic Railroad, 8800 ft, 20 Aug 1984, *Wetter 812* (NY); along Hwy 17, 14.5 mi NE of CO-NM state line, 13.3 mi NE of Conejos-Archuleta Co. line, 24.0 mi SW of jct Hwy 17 and 285 at Antonito, 37.1137 N, 106.3675 W, 9300-9500 ft, 24 Aug 1986, *Wetter 956* (NY, RM); along Hwy 17, 21.0 mi NE of CO-NM state line, 19.8 mi NE of Conejos-Archuleta Co. line, 17.5 mi SW of jct Hwy 17 and 285 at Antonito, 37.291099 N, 105.765232 W, 8600 ft, 25 Aug 1986, *Wetter 957* (NY, RM). La Plata Co.: Durango, gravelly banks in town, the prevailing form [cf. *Baker 600*], 19 Jul 1898, *Baker 497* (GH, NDB, NEB, NY, RM-2, US); Durango, growing with No. 497 but taller and with lighter colored foliage, 26 Jul 1898, *Baker 600* (GH, NDG, NEB, NY, RM); Durango, along Business Rte 160/550, 2/4 mi E of 6th St. and 8th Ave, only 1 plant found, rocky soil under *Artemisia*, with *G. stenophylla* (*Wetter 713*) and *G. aphanactis* (*Wetter 714*), 14 Aug 1980, *Wetter 715* (NY); along Hwy 160 at jct with La Plata County Rd 124, W of Durango, numerous in sandy soil along hwy shoulder and adjacent field, sagebrush-grassland area, heads sticky, apparently perennial, 14 Aug 1980, *Wetter 716* (NMC, NY-2, RM); along Hwy 160, 10.4 mi W of jct Hwy 160/550 at Durango, 9.8 mi E of La Plata-Montezuma Co. line, 8350 ft, common in rocky shoulder of hwy, dark gravelly soil, perennial, with *G. aphanactis* (*Wetter 771*)-no hybrids found, 13 Aug 1984, *Wetter 770* (NY); along Hwy 160, 0.4 mi W of jct Hwy 160 and 140 near Hesperus, 10.9 mi W of jct Hwy 160 and 550 at Durango, common at jct of La Plata Canyon Rd and Hwy 160 in rocky shoulder, 8000-8200 ft, with *G. aphanactis* (*Wetter 894*) and perhaps hybridizing with with, at least some of the plants have intermediate characteristics, 3 Sep 1985, *Wetter 893* (BRY, NMC, NY, RM); along Hwy 160, at jct La Plata Canyon Rd., 0.4 mi W of jct Hwy 160 and 140, 10.2 ml W of jct Hwy 160 and 550 at Durango, 9.6 mi E of La Plata-Montezuma Co. line, 37.2909 N, 108.0361 W, 8050 ft, scattered in rocky, loamy soil along hwy and road shoulders, intermixed and apparently hybridizing (*Wetter 965*) and *G. aphanactis* (*Wetter 966*), 26 Aug 1986, *Wetter 964* (NY). Mineral Co.: Creede Cemetery, 37.85 N, 106.933 W, grassland, 9000 ft, 5 Aug 1989, *Dixon 5485* (ALAM); Humphreys Ranch (private property) that includes Lake Humphreys and Hay Press Lake, ca. 6.5 mi S of Wagon Wheel Gap and confluence with Rio Grande, 37.67609 N, 106.86199 W, dry, open roadside meadow, 9025 ft, with *Artemisia dracuncululus*, 18 Aug 2014, *Regensberg 1943* (KHD); Wason, disturbed soil near old road, 24 Jul 1938, *Ramaley 16609* (COLO); Wason, Dry south exposure; frequent, 9600 ft, 20 Sep 1937, *Stewart 696* (COLO); Wason, near Creede, 37.82396 N, 106.89328 W, common on dry terrace, S exposure, 8570 ft, 29 Jul 1938, *Stewart 1104* (COLO); Wason, dry gulch; occasional, 15 Aug 1939, *Stewart 1360* (COLO); Creede, bottom of Dry Gulch just N of Wason Ranch, 37.84861 N, 106.90083 W, abundant along side of primitive road entering the gulch, 9348 ft, 14 Sep 1985, *Weber 17543* (CM, COLO, UCR); along Hwy 149, 7.2 ml NW of jct Hwy 149 and 160 at South Fork, 2.8 ml NW of Rio Grande-Mineral Co. line, 8450 ft, 31 Aug 1985, *Wetter 864* (NY, RM); along Hwy 149, 13.9 mi NW of jct Hwy 149 and 160 at South Fork, 9.5 mi NW of Rio Grande-Mineral Co. line, Wagon Wheel Gap, 8550 ft, 31 Aug 1985, *Wetter 865* (BRY, LSU, NY, RM); along Hwy 149, 12.5 mi SE of Mineral-Hinsdale Co. line, 7.5 mi SW of Creede, 37.772 N, 107.024 W, 8800-8900 ft, 31

Aug 1985, *Wetter 866* (NY-2 sheets, RM); along Hwy 149, 8.5 mi SE of Mineral-Hinsdale Co. line, 11.6 mi SW of where Hwy 149 turns at Creede, 28.3 mi NW of Mineral-Rio Grande Co. line, 8900 ft, 25 Aug 1986, *Wetter 961* (NY, RM). **Rio Grande Co.:** Beaver Creek Road across from South Fork Guard Station, ca 2 air mi SW of South Fork, 37.6377 N, 106.6593 W, conifer and aspen forest with open meadows, 8395-9030 ft, 15 Jul 2003, *Flaig 940* (RM); South Fork Guard Station, ca 1.5 air mi SW of South Fork, 37.6385 N, 106.6604 W, ponderosa pine, spruce and aspen forest and xeric meadow, 8350 ft, 14 Aug 2003, *Flaig 2651* (RM); Del Norte, streamside, 4 Sep 1930, *Ramaley 12647* (COLO); Monte Vista, dry grassland, 16 Jul 1934, *Ramaley 14283* (COLO); 12 mi W of Monte Vista, 37.433333 N, 106.316667 W, pinyon-juniper, 8800 ft, 24 Sep 1977, *Trujillo 142* (COLO); Hwy 160 ca. 1 mi E of mile marker 182 and 4 mi SW of South Fork (village), flat meadow in pine forest, 8530 ft, 1 Aug 1984, *Utech 84-622* (CM not seen, det. M. Wetter). **NEW MEXICO. Rio Arriba Co.:** Carson Natl Forest, Madrid Ranch, 36.4587 N, 106.4104 W, S slope, 8000 ft, clay loam, 23 Aug 1921, *Cassidy 25* (RM); Chama, 18 Jul 1898, *Earle 36* (NY); Ortega Mountains, Hwy 64, 0.5 mi W of Hopewell Lake, 9800 ft, 17 Aug 1984, *Hill 15166* (GH, NY, VT); Carson Natl Forest, Forest Rd 78A to Chino Lake, ca. 4 air mi S of San Miguel on Rio Los Pinos and ca. 2 air mi S of Chino dry lake, 36.9007 N, 106.126 W, dry meadow with low rocky basalt outcrops, 8950 ft, with *Artemisia frigida*, *Hymenoxys richardsonii*, and *Artemisia nova*, 17 Jul 2006, *Larson 8648* (RM); Carson Natl Forest, Forest Rd 80, just N of Rio Tusas, ca. 3 air mi NE of Hopewell Lake and ca. 12 air mi NW of Tres Piedras, 36.7449 N, 106.1869 W, meadows, 9150 ft, with *Festuca arizonica* and groups of *Populus tremuloides*, *Abies concolor*, and *Pseudotsuga menziesii*, *Juniperus communis* underneath, 26 Jul 2006, *Larson 9233* (RM); San Antonio Mtn, 36.85 N, 106 W, roadside, ca. 8700-8800 ft, common, 19 Aug 2001, *Lumer 2104* (ASU); Stewart Meadows, La Jara Canyon N of Forest Rd 87, 36.85895 N, 106.120723 W, riparian community in the drainage, 8780 ft, 1 Sep 2006, *McGrath 794* (BRY, UNM); vicinity of Chama, along the river, *Standley 6519* (US); along Forest Rd 87 from road Tres Piedras-Antonito towards the Brazos, 7000-9000 ft, 1 Aug 2009, *van der Werff 22567* (MO-2 sheets, UNM); NE of Canjilon along Hwy 110 near Canjilon Creek, ca. 1.95 km SE of Fuertes Spring, 36.5158 N, 106.3927 W, gravelly (quartzite) soil on gentle S-facing slope, 8365 ft, with nearby *Quercus*, *Symphoricarpos*, *Erigeron*, *Populus*, 4 Aug 2007, *Windham 3480* (UT).