
New Combinations in Californian *Grindelia* (Compositae: Astereae)

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ABSTRACT. As treated for the forthcoming revision of the Jepson *Manual of the Flowering Plants of California*, there are six species of *Grindelia* in California. Hybridization among them is common, and is apparently the reason for proliferation of epithets in the group. Thorough study of over 6,000 specimens (including the types for all epithets involved) from 34 herbaria has necessitated the recognition of several new combinations, and synonymization of many others.

Grindelia Willd. (Compositae: Astereae) is even more highly variable in California than elsewhere in its range in the western United States, Mexico, and South America. Several of the taxa apparently hybridize freely when they are in contact; this is the primary source of the taxonomic confusion that has led to the erection of more than 60 epithets for taxa of California alone. Though a more thorough discussion of the systematics of this group will be published elsewhere, it is necessary now to provide new combinations that may be used in a treatment of *Grindelia* for the forthcoming revision of the Jepson *Manual of the Flowering Plants of California*. Based on examination of the types for all the basionyms involved and over 6,000 specimens from 34 herbaria, I have come to the conclusion that it is most reasonable to recognize six species for the state.

One of these, *Grindelia squarrosa* (Pursh) Dunal, represented in California by *G. squarrosa* var. *serulata* (Rydberg) Steyermark, is probably adventive, and occurs in only a few localities. It is not a major player in the hybridization reticula, and is easily distinguished from other California specimens by its bluntly dentate-serrulate leaf margins.

Another species, *Grindelia fraxino-pratensis* Reveal & Beatley, is known only from the Ash Meadows area of Nye Co., Nevada, and Inyo Co., California, and is not involved in hybridizations with other taxa. The involucre of *G. fraxino-pratensis* are broadly turbinate; all other grindelias in California have broadly campanulate to hemispheric heads.

Grindelia nana Nutt. is found in northeastern California, and though it is variable and probably

participates in hybridizations with other taxa, the nomenclatural situation surrounding it (in California, at least) is straightforward. Steyermark (1934: 541–546) treated it as having three varieties in California; I agree with Keck (1959: 1166) that there are insufficient characters for such subdivision of the taxon. Plants of this species may be recognized by the tightly coiled phyllaries, coppery-red stems, and sharply serrate leaves.

The remaining three species have been treated differently by each worker who has encountered them, and for that reason synonymies for each new and recognized combination are included here. I have adopted a broad species-concept, accepting a wide range of variability for each species; geographical components of the variability have been recognized at the varietal level. The characters that distinguish the taxa are few enough and intergrade sufficiently that the recognition of more taxa than those listed below is unwarranted. Combinations that have been applied to California specimens of *Grindelia* but that do not appear in the lists of synonyms below represent hybrids, and cannot legitimately be assigned as synonyms to either of the parent taxa.

Grindelia stricta DC. and its varieties are coastal in distribution and are found on beaches and at the edges of marshes and sloughs. They have very robust pappus awns (> 0.3 mm wide at base) that are generally V-shaped in cross section, and the leaves are usually more or less succulent. The varieties are distinguished by habit of the plant and shape of the leaves. The other two species have slender pappus members (< 0.3 mm wide) and are mostly found inland. *Grindelia camporum* E. Greene and its variety have stiff phyllaries usually with reflexed apices, mostly white to buff-colored stems and light green, very resinous leaves, and are found in the San Francisco Bay area, the Great Valley, and the lower foothills of the Sierra Nevada. *Grindelia hirsutula* Hook. & Arn. and its varieties usually have somewhat flexible phyllaries with ascendant to reflexed apices, coppery-buff to deep red-brown stems, and leaves that are variously invested but not highly resinous; they are found in the San Francisco Bay area and the Coast Ranges.

Grindelia camporum E. Greene, Man. Bot. S. F. Bay Reg. 171. 1894. TYPE: U.S.A. California: Antioch, *Greene*, 1881 (lectotype, MO, selected here).

Grindelia robusta Nutt. var. (?) *rigida* A. Gray, Geol. Surv. Cal. Bot. 1: 304. 1876. TYPE: U.S.A. California: (holotype, GH).

Grindelia procera E. Greene, Man. Bot. S. F. Bay Reg. 171. 1894. TYPE: U.S.A. California: San Joaquin Co., Banta, *Bioletti*, 1892 (lectotype, selected here, UC). [Contrary to Howell (1931), I agree with Jepson (1901) that this is a synonym of *G. camporum*.]

Grindelia camporum E. Greene var. *parviflora* Steyermark, Ann. Missouri Bot. Gard. 21: 534. 1934. TYPE: U.S.A. California: Contra Costa Co., Liberty School on Marsh Creek road, *Howell 5496* (holotype, CAS; isotypes, GH, IND not seen, MO).

Grindelia camporum E. Greene var. *abbreviata* Steyermark, Ann. Missouri Bot. Gard. 21: 228. 1934. TYPE: U.S.A. California: Los Angeles Co., Lancaster, *Hoffmann*, 1927 (holotype, SBBG; photograph, MO).

Grindelia camporum E. Greene var. *australis* Steyermark, Ann. Missouri Bot. Gard. 21: 228. 1934. TYPE: U.S.A. California: Los Angeles Co., 3 mi. E of Elizabeth Lake, *Munz & Johnston 11157* (holotype, POM; isotype, LL; photograph, MO).

Grindelia camporum E. Greene var. **bracteosa** (J. Howell) M. A. Lane, comb. nov. Basionym: *Grindelia bracteosa* J. Howell, Madroño 2: 22. 1931. *G. rubricaulis* DC. var. *bracteosa* (J. Howell) Steyermark, Ann. Missouri Bot. Gard. 21: 227. 1934. *G. robusta* Nutt. var. *bracteosa* (J. Howell) Keck, Aliso 4: 102. 1958. TYPE: U.S.A. California: Orange Co., N side of Santa Ana Canyon, *J. Howell 2786* (holotype, CAS; isotypes, CAS, MO, RSA; photographs, F, GH, US).

Grindelia rubricaulis DC. var. *elata* Steyermark, Ann. Missouri Bot. Gard. 21: 227. 1934. Syn. nov. TYPE: U.S.A. California: Ventura Co., 7 mi. SW of Simi, *J. Howell 6574* (holotype, CAS; photograph, MO).

Grindelia hirsutula Hook. & Arn., Bot. Beech. Voy. 147. 1833. TYPE: U.S.A. California: in vicinity either of Monterey or of San Francisco Bay (A. Gray in Geol. Surv. Cal. Bot. 1: 304. 1876), *Lay and/or Collie s.n.* (holotype, E; isotype, K; photographs, GH, UC).

Grindelia humilis Hook. & Arn., Bot. Beech. Voy. 147. 1833. Syn. nov. TYPE: U.S.A. California: in vicinity either of Monterey or of San Francisco Bay (A. Gray in Geol. Surv. Cal. Bot. 1: 304. 1876), *Lay and/or Collie s.n.* (holotype, E not seen; isotype, K; fragments, CAS, GH; photographs, GH, US). [In the past, this name consistently has been misapplied, based on a misinterpretation of the type; however, the type is clearly conspecific with *G. hirsutula*. The

plant that has been called *G. humilis* is *G. stricta* var. *angustifolia*.]

Grindelia rubricaulis DC., Prod. 5: 316. 1836. Syn. nov. *G. hirsutula* Hook. & Arn. subsp. *rubricaulis* (DC.) Keck, Aliso 4: 102. 1958. TYPE: U.S.A. California: *Douglas 55* (holotype, G-DC; isotypes, BM, K; fragment, GH; photographs, GH, MO, UC).

Grindelia pacifica M. E. Jones, Bull. Torrey Bot. Club 9: 31. 1882. TYPE: U.S.A. California: Santa Cruz Co., Santa Cruz, *M. E. Jones 2750* (holotype, POM; isotypes, GH, NY).

Grindelia hirsutula Hook. & Arn. var. *subintegra* Steyermark, Ann. Missouri Bot. Gard. 21: 229. 1934. TYPE: U.S.A. California: Ventura Co., 2 mi. E of Ojai, *J. Howell 11414* (holotype, MO; isotypes, CAS—2, F, GH, K, LL, NY).

Grindelia hirsutula Hook. & Arn. var. *brevisquama* Steyermark, Ann. Missouri Bot. Gard. 21: 572. 1934. TYPE: U.S.A. California: Sonoma Co., Black Point Road, *J. Howell 5338* (holotype, CAS; isotype, UC; photograph, MO).

Grindelia hirsutula Hook. & Arn. var. *calva* Steyermark, Ann. Missouri Bot. Gard. 21: 575. 1934. TYPE: U.S.A. California: San Luis Obispo Co., San Luis Obispo, *Roadhouse 65* (holotype, UC; photograph, MO).

Grindelia hirsutula Hook. & Arn. var. **davyi** (Jepson) M. A. Lane, comb. nov. Basionym: *G. robusta* Nutt. var. *davyi* Jepson, Fl. W. Mid. Cal. 554. 1901. *G. camporum* E. Greene var. *davyi* (Jepson) Steyermark, Ann. Missouri Bot. Gard. 21: 534. 1934. TYPE: U.S.A. California: Alameda Co., Berkeley, Peralta Park, *Davy*, 1896 (holotype, JEPS; isotypes, UC—2; photographs, F—3, GH—2, MO).

Grindelia rubricaulis DC. var. *interioris* Jepson, Man. Fl. Pl. Cal. 1021. 1925. *G. camporum* E. Greene var. *interioris* (Jepson) Steyermark, Ann. Missouri Bot. Gard. 21: 534. 1934. TYPE: U.S.A. California: Calaveras Co., Copperopolis, *Davy 1383* (holotype, UC; photograph, F).

Grindelia hirsutula Hook. & Arn. var. **hallii** (Steyermark) M. A. Lane, comb. nov. Basionym: *G. hallii* Steyermark, Ann. Missouri Bot. Gard. 21: 229. 1934. TYPE: U.S.A. California: San Diego Co., Cuyamaca Lake, *Abrams 3957* (holotype, NY; isotypes, CAS, E, F, GH, K, MO, POM).

Grindelia hirsutula Hook. & Arn. var. **maritima** (E. Greene) M. A. Lane, comb. nov. Basionym: *G. rubricaulis* DC. var. *maritima* E. Greene. Pittonia 2: 289. 1892. *G. robusta* Nutt. var. *maritima* (E. Greene) Jepson, Fl. W. Mid. Cal. 554. 1901. *G. maritima* (E. Greene) Steyermark, Ann. Missouri Bot. Gard. 21: 576. 1934. TYPE: U.S.A. California: San

Francisco Co., Point Lobos, *E. Greene*, 1892 (holotype, ND-G; isotype, UC).

Grindelia stricta DC., *Prod.* 7: 28. 1838. TYPE: "in America boreali-occid., ad portum Mulgrave," *Haenke s.n.* (holotype, G-DC not seen; photographs, CAS, GH, UC).

Grindelia blakei Steyermark, *Ann. Missouri Bot. Gard.* 21: 567. 1934. *G. stricta* DC. subsp. *blakei* (Steyermark) Keck, *Aliso* 4: 102. 1958. TYPE: U.S.A. California: Humboldt Co., Eureka, *Moore & Steyermark 3686* (holotype, MO; isotypes, MO, UC).

Grindelia stricta DC. var. ***angustifolia*** (A. Gray) M. A. Lane, comb. nov. Basionym: *G. robusta* Nutt. var. *angustifolia* A. Gray, *Geol. Surv. Cal. Bot.* 1: 304. 1876, as nom. nov. for *G. cuneifolia* Nutt., *Trans. Amer. Philos. Soc. n.s.* 7: 315. 1841. TYPE: U.S.A. California: Santa Barbara Co., Santa Barbara, *Nuttall s.n.* (holotype, PH not seen; isotype, BM; fragment, GH). [The type of *Grindelia robusta* Nutt. is a hybrid between *G. hirsutula* var. *hirsutula* and another variety of *G. stricta*; therefore, the autonym does not take precedence.]

Grindelia stricta DC. var. ***platyphylla*** (E. Greene) M. A. Lane, comb. nov. Basionym: *G. robusta* var. *platyphylla* E. Greene, *Pittonia* 2: 289. 1892. *G. rubricaulis* DC. var. *platyphylla* (E. Greene) Steyermark, *Ann. Missouri Bot. Gard.* 21: 227. 1934. *G. latifolia* Kellogg subsp. *platyphylla* (E. Greene) Keck, *Aliso* 4: 102. 1958. TYPE: U.S.A. California: Monterey Co., Monterey, *Howe*, 1892 (holotype, UC; isotype, UC; photograph, MO).

Grindelia arenicola Steyermark, *Ann. Missouri Bot. Gard.* 21: 229. 1934. TYPE: U.S.A. California: Mendocino Co., 4.5 mi. N of Fort Bragg, *Howell 5473* (holotype, CAS; isotypes, GH, MO, POM, UC).

Grindelia arenicola Steyermark var. *pachyphylla* Steyermark, *Ann. Missouri Bot. Gard.* 21: 596. 1934. TYPE: U.S.A. California: Mendocino Co., Point Arena, *Howell 8106* (holotype, CAS; isotypes, GH, MO).

Grindelia stricta DC. var. *procumbens* Steyermark, *Ann. Missouri Bot. Gard.* 21: 559. 1934. TYPE: U.S.A. California: Humboldt Co., 10 mi. N of Trinidad, *Moore & Steyermark 3687* (holotype, MO; isotype, MO).

Grindelia venulosa Jepson, *Man. Fl. Pl. Calif.* 1021. 1925. *G. stricta* DC. subsp. *venulosa* (Jepson) Keck, *Aliso* 4: 102. 1958. TYPE: U.S.A. California: Humboldt Co., Big Flat, *Bolander 6493* (holotype, JEPS; isotypes, K, US; photograph, F).

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Literature Cited

- Howell, J. T. 1931. *Plantae Occidentales*.—II. *Madroño* 2: 18–23.
- Jepson, W. L. 1901. *A Flora of Western Middle California*. Encina Publishing, Berkeley.
- Keck, D. D. 1959. *Grindelia*. Pp. 1164–1166 in P. A. Munz, *A California Flora*. Univ. California Press, Berkeley & Los Angeles.
- Steyermark, J. A. 1934. *Studies in Grindelia*. II. *Ann. Missouri Bot. Gard.* 21: 434–608.