

Comments: Key revised to align with species concepts presented in *Jepson Manual*, 2nd Edition and *Flora of Oregon* treatments authored by Abigail J. Moore. *Grindelia hirsutula* is a serpentine species of southwestern Oregon and California misapplied in previous treatments to our coastal plants (here treated as *G. stricta*) and plants east of the Cascades and in the Columbia River Gorge (here treated as *G. nana*).

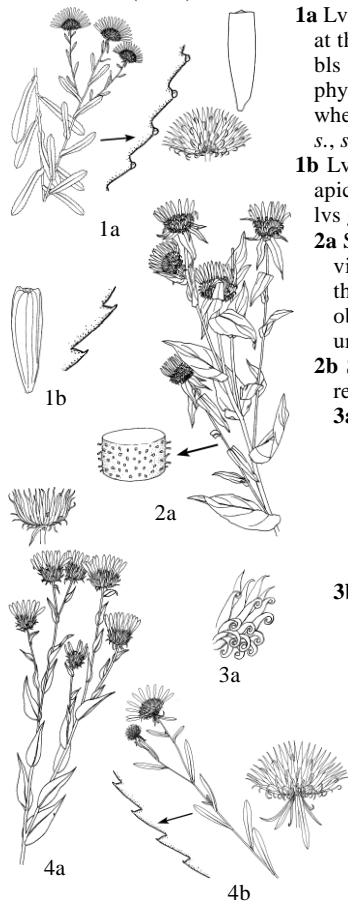
References:

Moore, A. J., A. Bartoli, R. D. Tortosa, and B. G. Baldwin. 2012. Phylogeny, biogeography, and chromosome evolution of the amphitropical genus *Grindelia* (Asteraceae) inferred from nuclear ribosomal and chloroplast sequence data. *Taxon* 61:211-230.

Grindelia Willd. Gumweed; Gumplant; Resinweed; Grindelia

Heads radiate or discoid, medium-sized to rather large, gen globose to hemispheric, several–∞ in corymbiform to paniculiform arrays; ray fls, if present, 5–60, ♀ and fertile, yellow (ours) to orange; phyllaries ± ∞, in 3–9 series, imbricate or occ subequal, chartaceous with herbaceous tips, ± resinous or gummy; recep flat or convex, naked; disk fls ∞, yellow, ♀ and fertile, or the inner and often also outer sterile; anthers ± entire or at base; style brs flattened, with marginal stigmatic lines and an externally hairy, linear-lanceolate or deltate appendage; achenes compressed to subquadrangular, scarcely nerved; pappus of 2–several firm deciduous awns, often ± serrulate; ann, bien, or per herbs (subshrubs), ours gen 1–10 dm, with alt, ± resinous-punctate, toothed (occ entire or irreg incised) lvs. (For David Hieronymus Grindel, 1776–1836, Latvian botanist).

Taxonomically perplexing genus that has undergone several treatments over last 30+ years. Here we follow Moore et al. (2012).



1a Lvs closely crenate-serrulate, the teeth each with a rounded to obtuse, resinous bump at the tip; achenes gen without apical knobs; sts and lvs glab; pls gen bien; cauline lf bls oblong to oblanceolate, 1.5–4(–7) cm; tips of at least the middle and outer phyllaries recurved, forming loops, through an angle > 180°; plains to hills, often where disturbed; Gr Pl and RMS intro, e Cas, sc BC to CA; r., curly-cup g. (*G. s.* vars. *s.*, *serrulata*) **1 G. squarrosa** (Pursh) Dunal

1b Lvs remotely to closely serrulate, or occ entire or irreg incised, the teeth acute to apiculate or setose; achenes gen with 1 or more short knobs on apical margin; sts and lvs glab, pilose, villous, or stipitate-glandular; pls per

2a Sts stipitate-glandular, at least in infl and more often throughout, not also pilose or villous; tips of the middle and outer phyllaries forming loops or hooks, recurved through an angle ≥ 180°; invol ± strongly resinous; cauline lf bls oblong to oblanceolate or lanceolate, 2.5–6(–9) cm; grassl, for openings, disturbed areas; uncommon, nc ID and wc MT; Howell's g. **2 G. howellii** Steyerm.

2b Sts glab to pilose or villous, occ also stipitate-glandular near the infl; phyllaries recurved through an angle < or > 180°; invol glab to strongly resinous

3a Pls e Cas and in CRG; middle and upper cauline lvs oblong to oblanceolate, glab or glandular punctate, margins entire to deeply serrate, tips rounded, acute, or acuminate; tips of outer phyllaries tightly coiled through an angle > 180°, glab; grassl, rocky areas, for openings, streambanks, and roadsides; WA to CA, e to MT, UT, and NV; low g. (*G. hirsutula*, misapplied); 2 vars. **3. G. nana** Nutt.

a1 Heads radiate; range of sp.; ID g. **var. nana**

a2 Heads discoid; mostly in CRG; Columbia g. **var. discoidea** A. Gray

3b Pls w Cas, including coast; spp. often intergrading and difficult to distinguish **4a** Middle and upper cauline lvs mostly lanceolate to oblong, broadest at or below middle, margins gen entire, rarely serrate to denticulate, tips acute to attenuate; tips of outer phyllaries recurved through an angle gen much < 180°, often stipitate-glandular; grassl, balds, marshes, and ditches; sw BC to Wi Va; Wi Va g., PS g. (*G. i.* var. *i.*) **4 G. integrifolia** DC.

4b Middle and upper cauline lvs mostly oblanceolate to spatulate or oblong, broadest at or above the middle or ± parallel-sided, margins gen serrate to dentate, occ entire, tips acute, obtuse, or rounded; tips of outer phyllaries strongly recurved or looped through angle > 180°, rarely, if ever, stipitate-glandular; salt marshes, coastal bluffs and sand dunes, tidel; AK to CA (*G. hirsutula*, misapplied); ours var. **stricta** **5. G. stricta** DC.