

## TWO NEW VARIETIES OF AGOSERIS (ASTERACEAE: LACTUCEAE)

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### ABSTRACT

*Agoseris grandiflora* var. *leptophylla* occurs predominately west of the Cascade Mountains from southwestern British Columbia to western Oregon and is morphologically and geographically distinct from *A. grandiflora* var. *grandiflora*. The two varieties are parapatric and intermediate forms are found where they occur together. *Agoseris heterophylla* var. *quentinii* is known from Sonoran Desert regions of Arizona and New Mexico and is geographically isolated and morphologically distinct.

### RESUMEN

*Agoseris grandiflora* var. *leptophylla* está predominantemente al oeste de las Montañas de las Cascadas desde el suroeste de la Columbia Británica hasta el oeste de Oregon y es morfológica y geográficamente distinta de *A. grandiflora* var. *grandiflora*. Las dos variedades son parapátricas y se encuentran formas intermedias allí donde conviven. *Agoseris heterophylla* var. *quentinii* es conocida de las regiones del desierto de Sonora en Arizona y Nuevo México, está aislada geográficamente y es diferente morfológicamente.

### INTRODUCTION

*Agoseris* Raf. is a genus of perennial, lactucoid herbs that are found throughout western North America. One species is known from temperate regions of southern South America. Some *Agoseris* are considered taxonomically challenging. This is due, in part, to similar or overlapping morphologies between certain species and/or the formation of occasional hybrids between sympatric species. In addition, most members of the genus are very widespread and often contain local forms or regional phases that can appear quite distinct. Past attempts to formally recognize these forms or phases have largely failed as they either occur as sporadic populations or they form broad clines, thus their separation becomes arbitrary. Despite these challenges, in a recent review of *Agoseris* (Baird 1996) two variants were discovered that were geographically and morphologically distinct enough to merit nomenclatural recognition.

***Agoseris grandiflora* (Nutt.) Greene var. *leptophylla* G.I. Baird, var. nov.** TYPE: U.S.A. WASHINGTON: PIERCE OR LEWIS CO.: "dry open ground, upper valley of the Nisqually River," 19 Jul 1896, Allen 225 (HOLOTYPE: GH; ISOTYPES: CASI, DS, K!, NY[2 sheets], UCI, WSI).

Varietas haec ab var. *grandiflora* differt capitulis minoribus et flosculis paucioribus, plerumque 40–60+, phyllariis involucri saepe cum maculis purpureis, foliis et lobis perangustis, plerumque ca. 2–4 mm latis, magis saepe in habitationibus humidis vel sylvaticis vel umbriosis.

**Perennial** herbs,  $\pm$  acaulescent; **leaves** linear-filiform to narrowly oblanceolate, 10–25(–36) cm  $\times$  1–4(–8) mm (excluding lobes), toothed (rarely) to laciniately lobed or pinnatifid, sub-glabrous to villous; lobes mostly in 3–5 opposite to sub-opposite pairs, linear to filiform, spreading to antrorse, often with a reduced secondary tooth or lobe on distal side of base of each primary lobe; **heads** borne singly, erect, scapiform; peduncles 15–40 cm tall at anthesis, 25–75(–96) cm tall at maturity, mostly 2–4 leaf lengths when mature, 3–4 mm in diameter, proximally glabrate, distally villous to tomentose, non-glandular; **involucre**s campanulate, 2–4 cm tall at maturity; phyllaries  $\pm$  ovate-attenuate, in 4–5 series, subequal at anthesis, unequal at maturity, usually entire, rarely dentate, herbaceous, often purple spotted and/or with a rosy-purple medial stripe, adaxially sub-glabrous to tomentose, abaxially glabrous or villous, margins  $\pm$  ciliate; hairs whitish-opaque or translucent, non-glandular; outer phyllaries apically spreading to squarrose, not overtopping the inner series at anthesis; inner phyllaries erect, elongating, exceeding the outer at maturity; receptacles naked; **florets** 40–60+; corollas equal to or just exceeding phyllaries at anthesis, yellow, often with an abaxial purplish stripe on the outermost; tubes 4–5 mm; ligules 3–5  $\times$  1 mm; anthers ca. 1 mm; **cypselac** pale brown to whitish, 15–24 mm long, 10-ribbed, beaked, glabrous or slightly scabrous, homogenous or outermost slightly different; bodies fusiform, 3–6 mm, abruptly contracted to their beaks; ribs ridged to sub-alate, straight; beaks 11–18 mm long, filiform, mostly 3–4 lengths of cypselac bodies; **pappi** of capillary bristles in 2–3 series, 7–15 mm long, white;  $n = 9$  (Tomb et al. 1978, voucher: *Chambers* 2238(OSC-143201), reported as *Agoseris apargioides* subsp. *maritima*).

*Common name.*—Puget Sound agoseris.

*Agoseris grandiflora* var. *leptophylla* occurs primarily west of the Cascade Mountains from Vancouver Island and southwestern British Columbia, south throughout the Puget Sound trough and Willamette Valley to southwestern Oregon and northwestern California (see Fig. 1). It also occurs eastward through the Columbia River gorge and sporadically on the eastern slopes of the Cascade Mountains in Washington and Oregon. Some specimens from the moist, western slopes of the Rocky Mountains of British Columbia and northern Idaho (panhandle region) are assignable to var. *leptophylla*. Ecological notes on specimen labels suggest that var. *leptophylla* occurs most commonly in lowland prairies or open forest habitats within the region outlined.

As a whole, *A. grandiflora* manifests two or three geographic phases that grade together and cannot be satisfactorily or consistently separated. Conversely, var. *leptophylla* represents what is arguably the most distinct phase of the species, with the specimens of var. *leptophylla* from the Puget Sound region

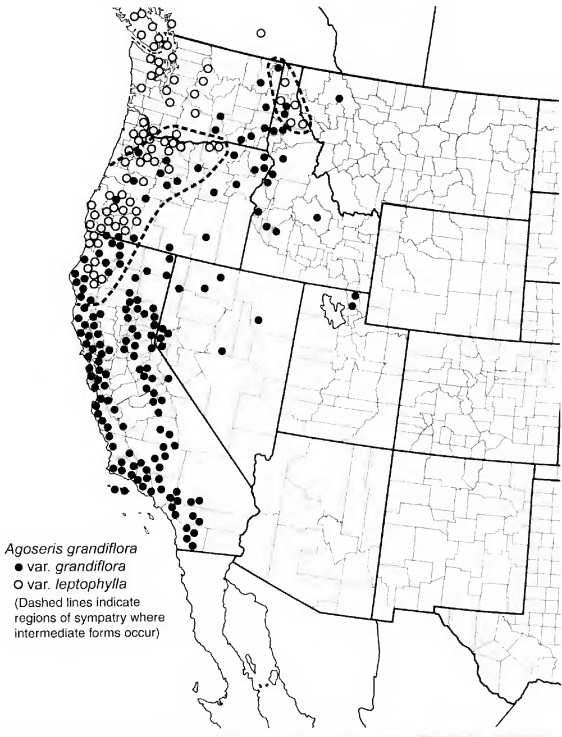


FIG. 1. Approximate distribution of *Agoseris grandiflora* in western North America. The two accepted varieties transition primarily within the regions indicated by the dashed lines (intermediate specimens not mapped).

morphologically the most distinct from var. *grandiflora*. Within this region var. *leptophylla* appears to completely supplant var. *grandiflora*. Jones (1954) felt this was only the "expressions of different environmental regimens" and that the morphological overlap and geographical transition between this variant

and the remainder of the species was too great to justify recognition of intraspecific taxa. The separation and transition between the two varieties of *A. grandiflora*, however, are no different than that found between other well-accepted varietal pairs within *Agoseris* (e.g., *A. aurantiaca* var. *aurantiaca* and var. *purpurea*, or *A. glauca* var. *glauca* and var. *dasycephala*). In the Columbia River gorge and southern Willamette Valley, extending into northern California, and in the panhandle region of northern Idaho, the two varieties do intermingle and intergrade such that the distinction between them falters and not all specimens are clearly assignable to one or the other variety. In general, var. *leptophylla* differs from var. *grandiflora* by its more diminutive size, slender, laciniately lobed leaves, slender peduncles, smaller heads with fewer florets, and outer phyllaries subequal to (rather than longer than) inner phyllaries at anthesis. The following couplet will assist in separating the two varieties:

1. Leaves  $\pm$  entire, toothed, or pinnatifid, mostly 10–35 mm wide (excluding lobes), rarely less, lobes lanceolate to oblanceolate; involucre 3.0–5.5 cm tall at maturity, florets mostly 150–500+, rarely fewer; outer phyllaries often with a purplish medial stripe, usually not spotted \_\_\_\_\_ var. **grandiflora**
1. Leaves mostly laciniately pinnatifid, mostly 2–4 mm wide (excluding lobes), rarely wider, lobes filiform to narrowly lanceolate; involucre 2.0–4.0 cm tall at maturity, florets mostly 40–60, rarely more; outer phyllaries occasionally with a purplish medial stripe but often purple spotted \_\_\_\_\_ var. **leptophylla**

Specimens assigned here to var. *leptophylla* have often been identified as *Agoseris laciniata* (Nuttall) Greene or *A. grandiflora* var. *laciniata* (Nuttall) Jepson, names based on *Stylopappus laciniatus* Nuttall. In 1834–1835, Thomas Nuttall collected the types of four *Agoseris* taxa from the Willamette Valley of western Oregon, all of which he placed in *Stylopappus*. Three (*Stylopappus elatus*, *S. laciniatus*, and *S. laciniatus* var. *longifolius*) were collected at the mouth of the Willamette River and belong to the enigmatic *Agoseris*  $\times$  *elata* (Nuttall) Greene (Jones 1954; Baird 1996). The fourth (*Stylopappus grandiflorus*) was collected on the “high plains” or “hills” of the Willamette (the exact location is not known but possibly in present-day Marion or Polk Counties; see Ewan, 1971) and is the type of *Agoseris grandiflora*; the specimen is teratological but is clearly assignable to *A. grandiflora*. The type description of *S. laciniatus* seems to describe *A. grandiflora* var. *leptophylla* and applying the name “*laciniatus*” to this variant of *A. grandiflora* seems an appropriate course of action. However, the lectotype (Nuttall’s original gathering at BM) of *S. laciniatus* appears to be part of the *A.  $\times$  elata* hybrid complex and is therefore excluded from *A. grandiflora* (Jones 1954; Baird 1996). The lectotype of *S. laciniatus* var. *longifolius* (also teratological) is more clearly of hybrid origin, with *A. grandiflora* var. *leptophylla* as one of the putative parents.

Representative collections of *Agoseris grandiflora* var. *leptophylla*. **CANADA. BRITISH COLUMBIA: Alberni–Clayquot R.D.:** Alberni region, 26 Jun 1907. *Rosendahl* 1969 (GH, MO, NY, UC). **Capital R.D.:**

Near Victoria, 21 Apr 1885, *Fletcher s.n.* (GH, US); vicinity of Victoria, 31 May 1893, *J. Macoun 573* (GH, MO); Goldstream, Vancouver Island, 12 Jun 1939, *Eastham s.n.* (UBC); Maxwell Mt., Salt Spring Island, 7 Aug 1955, *Ashlee s.n.* (UBC). **Central Kootenay R.D.:** Longbeach, Nelson, 12 Jul 1937, *Eastham s.n.* (UBC); Gray Creek, Kootenay Lake, 12 Jul 1941, *Eastham s.n.* (UBC). **Cowichan Valley R.D.:** Cowichan Lake, 30 Jun 1939, *Buckland 44* (UBC). **Greater Vancouver R.D.:** South Face of Black Mt., 15 Jun 1912, *Davidson s.n.* (UBC). **Nanaimo R.D.:** Cameron Lake, 14 Jul 1917, *Carter s.n.* (GH); First Lake, Nanaimo River Valley, 25 Jul 1955, *Mueller-Dombois 61-3* (UBC); Parksville, 13 Jul 1961, *Taylor 3098* (UBC). **U.S.A. CALIFORNIA: Del Norte Co.:** On road to Bear Basin, 1 mi. W of Doe Flat, 2 Aug 1955, *Van Deventer 1003* (JEPS). **Humboldt Co.:** Mackay Prairie, Trinity Summit, 25 Jul 1935, *Tracy 14234* (UBC); Garberville, at N end of town, 18 Jul 1942, *Tracy 17275* (UBC); Gravelly place at summit of ridge near "Clear Lake," 31 Jul 1950, *Tracy 19233* (UC). **Mendocino Co.:** South Fork of Eel River, near the Mendocino Co. line, 6 Jul 1918, *Tracy 5074* (UC). **Trinity Co.:** Two mi W of Hayfork, 23 Jun 1943, *Pitelka 256* (UC); Trinity Centre, 27 Jun 1982, *Straley 2341* (UBC). **IDAHO: Clearwater Co.:** One mile S of Weipe, 26 Jun 1941, *Davis 3592* (UC). **Idaho Co.:** Above Little Granite Creek, 13-30 Jun 1937, *Packard 265* (UC). **Kootenai Co.:** Coeur d'Alene, E slope of Tubb's Hill, 28 Jun 1913, *Rust 316* (US). **Shoshone Co.:** Coeur d'Alene Mountains, between Old Mission and Wardner, 30 Jul 1895, *Leiberg 1413* (GH, US); Roundtop Ranger Station, on the road to Avery, 4 Aug 1941, *Wilson 488* (GH, UC). **OREGON: Benton Co.:** Corvallis, 12 Jun 1916, *Gilbert 26* (OSC). **Clackamas Co.:** Boring, 18 Aug 1918, *Diehm and Gorman 4339* (ORE). **Curry Co.:** Brookings, 11 Jul 1919, *Peck 8784* (WILLU); Trail above Agness, Rogue River, 8 Jul 1929, *Henderson 11386* (UC). **Douglas Co.:** Roseburg, 21 Jun 1916, *Peck 2447* (WILLU); Umpqua National Forest, Bear Creek Road No. 2735, 21 Sep 1975, *Williams s.n.* (ORE). **Hood River Co.:** Bonneville, 6 Aug 1895, *Canby s.n.* (US); Hood River, 23 Jun 1911, *Peck 2453* (WILLU). **Jackson Co.:** Ashland, 19 Jun 1927, *Peck 14999* (WILLU); 4 mi E of Central Point, 22 May 1948, *Peck 24856* (WILLU). **Jefferson Co.:** Bank of Suttle Lake, 19 Jul 1925, *Peck 14426* (WILLU). **Josephine Co.:** Grants Pass, 28 Jul 1913, *Peck 2457* (WILLU); Takilma, 24 Jun 1918, *Peck 7953* (WILLU). **Klamath Co.:** Klamath Falls, 28 Aug 1916, *Peck 2446* (WILLU). **Lane Co.:** Amazon Slough, W of Eugene, 31 May 1925, *Constance s.n.* (UC); Spencer's Butte, 11 Jul 1933, *Brown 229* (ORE). **Lincoln Co.:** Yachats, bluff above the sea, 25 Aug 1921, *Peck 10612* (WILLU). **Linn Co.:** Cascade Mtns., vicinity of Tombstone Pass, Iron Mtn., Cone Peak, Tombstone Prairie, by Hwy. 20, 16 Aug 1983, *Chambers and Ross 8378* (OSC). **Multnomah Co.:** Dry hills in Portland, 25 Jun 1886, *Henderson 584* (US); St. Johns, 28 Jul 1902, *Sheldon 11021* (US). **Tillamook Co.:** Neahkahnie, 3 Jul 1924, *Peck 13313* (WILLU). **Wasco Co.:** The Dalles, 7 Jun 1869, *Kellogg and Harford 604* (US). **WASHINGTON: Clallam Co.:** Mt. Angeles, 21 Jul 1931, *Howell 7429* (CAS). **Clark Co.:** East Mill Plain, 27 Jun 1925, *English 452* (US). **Chelan Co.:** Nason Creek, 30 Jul 1893, *Sandberg and Leiberg 612* (GH, UC, US). **Grays Harbor Co.:** near Montesano, 27 Jun 1898, *Heller and Heller 3964* (MO, NY, PH, US). **Island Co.:** Whidby Island, Deception Pass Park, Goose Rock, 8 Jul 1937, *Smith 2113* (DS). **Jefferson Co.:** Evergreen, 13 Jul 1902, *Conrad 326* (PH, US). **King Co.:** Seattle, 19 Jun 1889, *Smith s.n.* (US). **Klickitat Co.:** Bingen Mountain, 16 Jul 1907, *Suksdorf 6007* (GH). **Mason Co.:** Olympic National Park, Lincoln Ranger Station, road shoulder, 10 Jul 1941, *Rogers 860* (UC). **Pierce Co.:** Tacoma, edge of forest prairies, 13 Jun 1908, *Flett 3390* (UC). **San Juan Co.:** Friday Harbor, 25 Jun-1 Aug 1917, *Zeller and Zeller 857* (GH, US).

**Agoseris heterophylla** (Nutt.) Greene var. **quentinii** G.I. Baird, var. nov. TYPE: U.S.A. ARIZONA: Pima Co. "On gravelly slopes in scrub oak - mesquite openings; altitude 4000 ft., Sawmill Canyon, near upper well, Santa Rita Mountains," 26 Mar 1945, *Gould and Haskell 3045* (HOLOTYPE: LL; ISOTYPES: ARIZ!, CAS!, DS!, GH!, NY!, UC!).

Varietas haec aliis differt forma valde acauli, foliis saepe decumbentibus lobatis et abaxialiter glabris sed adaxialiter pubescentibus, lobis rotundatis vel obtusatis raro foliis dentatis vel integris, scapis tomentosus prope apicem, involucri floriferis sessilibus vel his aliquanto longioribus sed foliis scapum superantibus, acheniis costatis vel porcatis, sine variatione varietatum ceterarum.

**Annual** (winter annual?) herbs, acaulescent; **leaves** oblanceolate to spatulate, 2–12 cm × 3–9(–12) mm, spreading to prostrate, adaxially pubescent, abaxially glabrous, mostly lobed, rarely toothed; lobes in 2–3 pairs, rounded to blunt, lacking secondary denticulations; **heads** borne singly, erect, ± sessile to scapiform; peduncles to 26 mm tall at maturity, mostly less than 0.5 leaf lengths at anthesis (rarely longer), 0.5–3 leaf lengths at maturity, villous to tomentose, proximally ± glabrate, distally tomentose; **involucre**s campanulate to hemispheric, 1–2 cm tall at maturity, sometimes proximally pubescent, hairs yellowish-translucent, glandular; phyllaries lanceolate, in 2–3 series, subequal at anthesis, unequal at maturity, entire, herbaceous, often with a purplish medial stripe, adaxially lanate, hairs whitish-opaque, abaxially ± glandular-villous, hairs purple-septate, translucent (intermixed with whitish-opaque hairs), marginally ± ciliate to lanate; outer phyllaries erect to squarrose, not elongating at maturity; inner phyllaries erect, ± elongating at maturity; receptacles naked; **corollas** ± equal to phyllaries at anthesis, yellow, outermost often with an abaxial purplish stripe; tubes 2–3 mm; ligules 2–3 × 0.8–1.5 mm; anthers 1 mm or less; **cypselae** pale brown to whitish, 9–10 mm, ca. 10-ribbed, beaked, ± glabrous, ± homogenous; bodies fusiform, 3–4 mm, gradually tapering to abruptly narrowing to their beaks; ribs ridged, straight, not diminishing proximally; beaks 5.0–6.5 mm long, 1.5–2.5 lengths of cypselae bodies; **pappi** of capillary bristles in 2–3 series, 4–9 mm, whitish.

Common name.—Arizona agoseris.

*Agoseris heterophylla* var. *quentinii* is known from Arizona and New Mexico (see Fig. 2). It most commonly occurs in desert grasslands, scrublands, and open woodlands between 1200 and 2000 m. It is found on various mountain ranges from the vicinity of the San Francisco Peaks southeastward to southeastern Arizona and southwestern New Mexico. It has not yet been reported from Mexico, although it has been found not far from the border in the Baboquivari and Huachuca mountains of Arizona and the Peloncillo Mountains of New Mexico.

The principle features that distinguish var. *quentinii* from the other two varieties of *A. heterophylla* are its strongly acaulescent form, leaves adaxially pubescent and abaxially glabrous, peduncles apically tomentose and typically much shorter than the leaves at anthesis, and homogenous cypselae that lack the morphological variation and heterogeneity typical of this species. The three varieties of *A. heterophylla* accepted here may be separated using the following key:

1. Corolla ligules 2–4 mm long, ± equaling phyllaries; anthers less than 1.5 mm long; leaves entire, toothed, or lobed, the lobes mostly 2–3 paired; found in California and/or elsewhere
2. Peduncles mostly 1.5–4.5 leaf lengths at anthesis, proximally glabrous or glabrate, distally glabrous or ± pubescent; leaves glabrous or uniformly pubescent; wide-

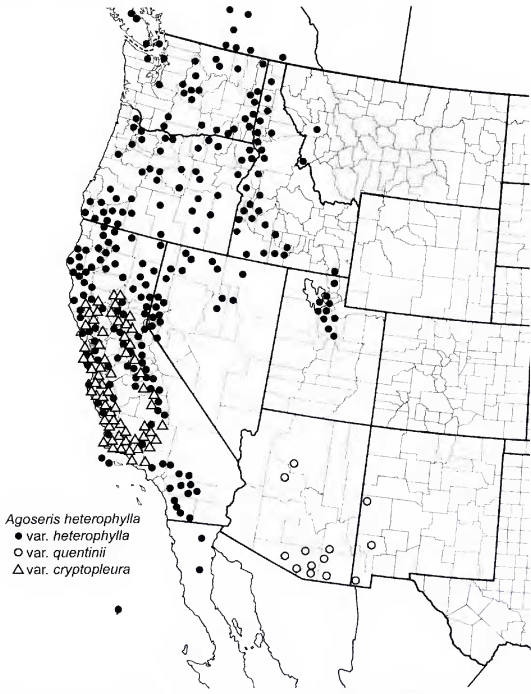


FIG. 2. Approximate distribution of *Agoseris heterophylla* in western North America.

- spread in western North America but not known from Arizona or New Mexico \_\_\_\_\_ var. **heterophylla**
2. Peduncles 0–1 leaf length at anthesis, proximally glabrous or glabrate, distally tomentose; leaves adaxially pubescent, abaxially glabrous; desert regions of southern Arizona and New Mexico \_\_\_\_\_ var. **quentinii**
1. Corolla ligules 10–15 mm long, much exceeding phyllaries; anthers 2–4 mm long; leaves toothed to lobed, the lobes mostly 3–5 paired; coast ranges and foothills of central California \_\_\_\_\_ var. **cryptopleura**

*Agoseris heterophylla* var. *quentinii* is named in honor of Quentin Jones, Ph.D., who monographed *Agoseris* for his doctoral thesis (Jones 1954). His work was instrumental in stabilizing and establishing much of the current nomenclature within the genus. He was the first to recognize that specimens of *A. heterophylla* from Arizona and New Mexico are distinct from the remainder of the species. His manuscript name was never published.

Observed collections of *Agoseris heterophylla* var. *quentinii* U.S.A. **ARIZONA:** **Cochise Co.:** Three mi N of Mescal, 17 Mar 1945, *Pultz and Phillips 1571* (ARIZ); Galuro Mountains, Bass Canyon on Muleshoe Ranch, ca 25 mi NW of Willcox, T12S, R21E, 14 May 1983, *Daniel and Butterwick 2863* (ASU, NY). **Coconino Co.:** Sedona, 25 May 1941, *Stitt and McLellan s.n.* (ASU). **Gila Co.:** Pinal Mountains, Six Shooter Canyon, 2 May 1968, *Pase 1797* (ASU); Pinal Mountains, Russell Gulch, 2.7 mi below intersection of forest roads 55 and 55A, 24 Apr 1970, *Keil, McLeod, Lamb, and Lehto 16792* (ASU). **Navajo Co.:** White Mountain Indian Reservation, on grassy flats around Kinishba Ruin, 31 Apr 1947, *Lane 1946* (ASU). **Pima Co.:** Plains near Arivaca, 6 Apr 1884, *Pringle s.n.* (PH-2, NY-2); Santa Rita Mountains, Stone Cabin Canyon, 17 Apr 1903, *Thornber 374* (ARIZ-2, NY); Santa Rita Mountains, Stone Cabin Canyon, 5 May 1905, *Thornber s.n.* (ARIZ-2); Santa Rita Mountains, "Rosemont" (Rosemont?), 12 Apr 1907, *Thornber s.n.* (ARIZ); Santa Catalina Mountains, 16.1 mi S of Oracle on road to Mt. Lemmon and 0.4 mi E on ranch road, 27 Apr 1973, *Lehto, Hansel, and Pinkava 10848* (ASU). **Santa Cruz Co.:** Santa Rita Mountains, McCleary's, base of Old Baldy, Apr 1901, *Griffiths 2671* (NY). **Yavapai Co.:** 1.6 mi N of Skull Valley, 8 May 1967, *Keil, Pinkava, and Lehto 8147* (ASU); Weaver Mountains, Arrastre Creek, 18 May 1980, *Butterwick and Hillyard 6439* (ARIZ, ASU); Finch Wash, E of Skull Valley, near National Forest boundary, 2 Jun 1980, *Butterwick and Hillyard 6697* (ASU); Woodchute Wilderness Area, NW base of Woodchute Mountain, ca. 9 km WNW of Jerome, 12 May 1992, *Baker 9086* (ASU). **NEW MEXICO:** **Catron Co.:** Base of Mogollon Mountains, Sheridan Gulch trail ca. 6 mi SE of Glenwood, 4 mi from Hwy. 180, 21 May 1983, *Soreng and Ward 2130C* (NMC). **Grant Co.:** Mangas Spring, 27 May 1941, without collector (NMC). **Hidalgo Co.:** Peloncillo Mountains, Coronado National Forest, about one mile NW of Pendleton Ranch House along Cloverdale Creek, T33S, R21W, S5, 20 Apr 1986, *Worthington 14026.5* (NMC, NY). **Location Uncertain:** Mexican Boundary Survey (without location, date, or collector; NY); *Griffiths 2671* (without location or date; ARIZ); Arizona, "Toros Canyon," 28 Mar 1927, *Peebles, Harrison, and Kearney 3769* (ARIZ)

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