

**ADENOPHYLLUM POROPHYLLUM (ASTERACEAE)
REPORTED FOR ARIZONA AND THE USA,
WITH A KEY TO SPECIES**

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ABSTRACT

Adenophyllum porophyllum is reported for the Arizona and USA flora. Its presence north of the Mexican border was overlooked for Flora of North America but only a single collection was made before 2006 (in 1984); others have been made from 2011 to 2018. Photographs, a species key for the genus in Arizona, and brief species descriptions are provided.

RESUMEN

Se reporta *Adenophyllum porophyllum* para la flora de Arizona y los Estados Unidos. Su presencia al norte de la frontera con México fue pasada por alto en Flora of North America pero solo una colecta fue hecha antes de 2006 (en 1984); otras se han realizado desde 2011 hasta 2018. Se proporcionan fotografías, una clave para especies del género en Arizona, y descripciones breves de especies.

While documenting the vascular flora of the Salero Ranch in central Santa Cruz Co., Arizona (Carnahan, in prep.), I made several collections of a rayless, annual composite that I provisionally identified as *Adenophyllum porophyllum* (Cav.) Hemsl. John Strother kindly confirmed my determination from photographs (Strother, pers. comm., 7 May 2018). The presence of *A. porophyllum* in the USA was overlooked for the Flora of North America (Strother 2006). A search of the SEINet Portal Network (SEINet 2019) indicates that a 1984 voucher (*Luetcke s.n.*, ARIZ) from the Mule Mountains in Cochise County is apparently the earliest collection from the state, followed by others beginning in 2011 (citations below).

With the addition of *Adenophyllum porophyllum*, five *Adenophyllum* taxa are known to occur in the USA.

Adenophyllum cancellatum (Cass.) Villareal
Adenophyllum cooperi (A. Gray) Strother
Adenophyllum porophylloides (A. Gray) Strother
Adenophyllum porophyllum (Cav.) Hemsl.
Adenophyllum wrightii A. Gray

Adenophyllum cancellatum occurs in the Central Plateau in Mexico and is known in trans-Pecos Texas from two collections (*Manning 5077*, SRSC, *Taylor 390*, SRSC; Powell & Worthington 2018). The other four taxa are documented for Arizona. A sixth species, *A. anomalum* (Canby & Rose) Strother, occurs in northwestern Mexico and has been collected within 20 miles of the Arizona border (e.g., W base of Sierra de Los Pinitos, E of Cibuta, *Van Devender 2005-539*, ARIZ).

Lack of a complete key to *Adenophyllum* in Arizona may have led to misidentifications. A key to *A. cooperi*, *A. porophylloides*, and *A. wrightii* is provided in Flora of North America (Strother 2006) and in Kearney and Peebles (1960) within the genus *Dyssodia*. McVaugh (1984) and Turner (1996) treated the Mexican species of *Dyssodia*, including those later transferred to *Adenophyllum* (Strother 1986). Turner (2013) included a key to *Adenophyllum* species near Yécora, Sonora (*A. cancellatum*, *A. porophyllum*, and *A. yecoranum* B.L. Turner). Spellenberg and Anderson (2010)

reported *A. porophyllum* for Chihuahua, Mexico, and noted its lack of ray flowers. The Malezas de Mexico website (Vibrans 2006) points out the difference between *A. porophyllum* and *A. cancellatum*.

The following key and descriptions pull together information from specimens and previous publications.

ADENOPHYLLUM Pers.

The genus *Adenophyllum*, formerly treated in *Dyssodia* (Strother 1969, 1986; see also Turner 1996), includes 11 species of annuals, perennials, and subshrubs. Leaves opposite below and mainly alternate above, entire or lobed, the lobes entire or toothed. Leaves and involucres with yellowish oil glands producing a skunk-like odor. Involucres usually with calyculi (outer bracts), these with entire or pectinate margins; phyllaries (inner bracts) fused at least at the base and generally no more than 1/3–2/3 their length. Heads discoid or radiate; ray florets (when present) pistillate, fertile, corollas yellow to red-orange; disk florets bisexual, fertile, corollas yellow to red-orange. Pappus mostly of scales divided into bristles; achenes compressed, glabrous to pubescent. Within the USA, *Adenophyllum* occurs only in Arizona, California, Nevada, New Mexico, Texas, and Utah.

Key to *Adenophyllum* species in the USA and northern Sonora

1. Calyculi with pectinate margins; phyllaries often with “horned” gland near apex; ray flowers present or absent.
 2. Ray flowers present and showy; trans-Pecos Texas and Mexico; not known in Arizona **Adenophyllum cancellatum**
 2. Ray flowers absent; southeastern Arizona **Adenophyllum porophyllum**
1. Calyculi with entire margins; phyllaries without “horned” gland near apex; ray flowers present (though sometimes small).
 3. Subshrubs, woody at base; mostly deserts in central and western Arizona.
 4. Herbage gray-green and minutely hispidulous; leaves mostly oval or ovate (rarely with 3 or more lobes); ligules of ray flowers 8–12 mm; Mojave Desert in northwestern Arizona **Adenophyllum cooperi**
 4. Herbage green and essentially glabrous; leaves mostly with 3–5 lobes; ligules of ray flowers less than 7 mm; Sonoran Desert in central and western Arizona ... **Adenophyllum porophylloides**
 3. Annuals to short-lived perennials, not usually woody at base; mostly above the desert.
 5. Involucres 7–8 mm; calyculi without glands; ligules of ray flowers 2–6 mm; pappus of 2 layers: outer of erose scales to 1 mm, inner of scales dissected into bristles, 8 mm; rare in mountains of east-central Arizona **Adenophyllum wrightii**
 5. Involucres 3.5–4.5 mm; calyculi usually with glands; ligules of ray flowers 8–10 mm; pappus of scales dissected into bristles; not known north of Sonora **Adenophyllum anomalum**

1. *Adenophyllum anomalum* (Canby & Rose) Strother

Dyssodia anomala (Canby & Rose) B.L. Rob.

Hierba del zorrillo, rosita

Annuals to short-lived perennials. Leaves 3–5 cm long, pinnatifid with 3–9 filiform segments. Calyculus of 1–4 narrow bracts with entire margins, or calyculus absent; phyllaries in 2 series, 4 mm long; calyculi and phyllaries with inset oil glands. Heads radiate; ligules of ray flowers 8–10 mm; disk and ray corollas yellow. Achenes 2–2.5 mm long; pappus of scales divided into bristles, 3 mm long. Flowering spring and fall. Oak woodland just south of the Arizona–Sonora border, southward in thornscrub and tropical deciduous forest to Durango; also at the desert edge near Guaymas, Sonora (Felger et al. 2017). It should be looked for along the Arizona–Sonora border.

2. *Adenophyllum cancellatum* (Cass.) Villareal*Adenophyllum porophyllum* var. *cancellatum* (Cass.) Strother*Dyssodia porophyllum* var. *cancellata* (Cass.) Strother*Cimpasúchil*

Robust annuals 0.4–0.7 m tall, branching above the middle. Leaves alternate, pinnatifid with 3–9 lobes, the lobes toothed. Calyculus of 12–20+ narrow bracts with pectinate margins; phyllaries 10–13 mm; calyculi and phyllaries with prominent oil glands. Heads radiate; ligules of ray flowers to 9 mm; disk and ray corollas yellow to yellow-orange. Achenes 4–5 mm; pappus of scales dissected into bristles, 8–9 mm. Flowering August–November. Grassland, thornscrub, and tropical deciduous forest in the Central Plateau of Mexico, including Chihuahua and southern Sonora, plus 2 roadside collections (waifs?) from trans-Pecos Texas (Powell & Worthington 2018).

In his treatment of the genus *Dyssodia* (1969, 1986), Strother considered *Adenophyllum cancellatum* a variety of *A. porophyllum*, differing from it mainly by the presence of ray flowers. McVaugh (1984) also treated the two taxa at the varietal level but commented that “The two sometimes occur together in nature and are occasionally confused by collectors. They differ rather strikingly, however, not only in the obvious characters used in the key, but in other more subtle features of flowers and involucre” (1984: 309). I follow the lead of Villareal (2001), who noted the lack of intergrading specimens in mixed populations and treated both at species rank, as did Turner (2013).

3. *Adenophyllum cooperi* (A. Gray) Strother*Dyssodia cooperi* A. Gray

Cooper’s dogweed

Perennial herbs to subshrubs, woody at base, to 0.6 m tall. Herbage gray-green and minutely hispidulous. Leaves usually oval or ovate (sometimes with 3 or more shallow lobes), with spinose-toothed margins. Calyculus of 12–20+ narrow bracts with entire margins; phyllaries 10–17 mm long; calyculi and phyllaries with inset oil glands. Heads radiate; ligules of ray flowers to 12 mm (occasionally ray flowers absent); disk and ray corollas yellow to red-orange. Achenes 5–6 mm; pappus of scales dissected into bristles, 8–12 mm. Flowering spring and fall. Mojave Desert in northwestern Arizona, also California, Nevada, and Utah.

4. *Adenophyllum porophylloides* (A. Gray) Strother*Dyssodia porophylloides* A. Gray

San Felipe dogweed

Perennial herbs to subshrubs, woody at base, to 0.6 m tall. Leaves pinnatifid with 3–5 narrow lobes. Calyculus of 12–20+ narrow bracts with entire margins ; phyllaries 9–16 mm; calyculi and phyllaries with inset oil glands. Heads radiate; ligules of ray flowers to about 6 mm; disk and ray corollas orange to red-orange. Achenes 4–5 mm long; pappus of scales dissected into bristles, 8–10 mm. Flowering spring and fall. Sonoran Desert in central and western Arizona, also Nevada, California, and Mexico in Baja California, Baja California Sur, and northwestern Sonora.

5. *Adenophyllum porophyllum* (Cav.) Hemsl.*Dyssodia porophyllum* (Cav.) Cav.Pore-leaf dogweed, *árnica del monte*

Robust annuals 0.4–0.8 m tall, branching above the middle. Leaves alternate, pinnatifid with 3–9 lobes, the lobes toothed. Calyculus of 12–20+ narrow bracts with pectinate margins; phyllaries 10–13 mm; calyculi and phyllaries with prominent oil glands. Heads discoid; disk corollas yellow to red-orange. Achenes 4–5 mm; pappus of scales dissected into bristles, 8–9 mm. Flowering August–October. Grassland and oak savanna in southeastern Arizona, also grassland, thornscrub, and tropical deciduous forest in Sonora and Chihuahua, Mexico, southward to Guatemala. It should be looked for in southern New Mexico.



Figure 1. *Adenophyllum porophyllum*. (A) Salero Ranch, Santa Cruz Co., Arizona. 13 Sep 2013. (B) Santa Rita Mountains, Santa Cruz Co., 22 Sep 2018. (C) Salero Ranch, Santa Cruz Co., 20 Sep 2015. (D) Salero Ranch, Santa Cruz Co., 29 Sep 2011. Photographs by Susan D. Carnahan.

Specimens reviewed. Arizona. Cochise Co.: Mule Mountains, Dixie Canyon, 25 Sep 1984, *Luetcke s.n.* (ARIZ); Fort Huachuca, between lower Garden and Huachuca Canyons, 26 Sep 2011, *Setaro s.n.* (ASU); Huachuca Mountains, between Brown and Ramsey canyons, 27 Sep 2013, *Setaro s.n.* (ASU). **Santa Cruz Co.:** Salero Ranch, Grosvenor Rd, 8 mi SE of Tubac, 13 Sep 2013, *Carnahan SC 160* (ARIZ); County Rd 58, SE of Patagonia, 21 Sep 2014, *Wolkis & Setaro s.n.* (ASU); Elgin, Southmoreland Pl., 11 Oct 2014, *Robinett 336* (ARIZ); Research Ranch, S of Cimarron Rd in Coronado Natl Forest, 20 Oct 2014,

Kennedy 338 (ARIZ); Salero Ranch, SSW of Salero HQ, 20 Sep 2015, *Carnahan 1508* (ARIZ); Santa Rita Mts, Forest Service Rd 143 S of Montosa and Cottonwood canyons, Coronado Natl Forest, 31 Aug 2018, *Carnahan 3331* (ARIZ).

6. *Adenophyllum wrightii* A. Gray

Dyssodia neomexicana (A. Gray) B.L. Rob.

Wright's dogweed

Annuals 20 to 40 cm tall. Leaves pinnatifid with 7–13 filiform lobes. Calyculus of 6–8 narrow, linear bracts with entire margins, lacking oil glands; phyllaries 5–9 mm, with inset oil glands. Heads radiate; ligules of ray flowers 2–6 mm; disk and ray corollas yellow. Achenes 3–5 mm; pappus of two series: outer series of erose scales to 1 mm, inner series of scales dissected into bristles, to 8 mm long. Flowering (July) August–October. Rare in mountains of east-central Arizona, also New Mexico and northern Chihuahua, Mexico.

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