Amer. Acad. Arts 19: 27. 1883. *Platyschkuhria oblongifolia* Rydb. Bull. Torrey Bot. Club 33: 155. 1906. *Platyschkuhria integrifolia* var. *oblongifolia* W. L. Ellison, Brittonia 23: 278. 1971. (*Newberry s.n.*, dry hills, San Juan [River], N.M. or Utah; holotype at GH!)

Bahia nudicaulis var. **desertorum** (M. E. Jones) Cronquist, comb. nov. *B. desertorum* M. E. Jones, Zoe 2: 249. 1891. *Platyschkuhria desertorum* Rydb. Bull. Torrey Bot. Club 37: 333. 1910. *Platyschkuhria integrifolia* var. *desertorum* W. L. Ellison, Brittonia 23: 276. 1971. (*Jones s.n.*, Cisco, Utah, 2 May 1890; holotype at US!)

Bahia nudicaulis var. **ourolepis** (S. F. Blake) Cronquist, comb. nov. *B. ourolepis* S. F. Blake, Proc. Biol. Soc. Wash. 35: 175. 1922. *Platyschkuhria integrifolia* var. *ourolepis* W. L. Ellison, Brittonia 23: 276. 1971. (*M. E. Jones 5482l*, Green River, Utah; holotype at US!)

Aromatic plants, mostly 1.5–5 dm tall, forming small to large clumps on a woody perennial taproot and also spreading by creeping roots, shortly strigose or strigose-puberulent below, often glandular above; leaves alternate, simple and entire, often glandular-punctate, more or less basally disposed or (var. *oblongifolia*) well distributed along the stems, the larger ones evidently petiolate, with a lanceolate or lance-elliptic to broadly ovate, subrotund, or rotund-obovate blade mostly 2–10 cm long and 1–3.5 cm wide; heads mostly (1) 2–10 on naked or subnaked peduncles mostly 2–15 cm long, forming an open-corymbiform inflorescence at the top of the stem; involucre mostly 7–11 mm high, its bracts more or less distinctly biseriate, often ca 21 or ca 13; disk mostly 1–2 cm wide; rays mostly (6) 8–15, often 13, yellow, mostly 1–2 cm long and up to 1 cm wide, usually evidently 3-toothed at the summit; achenes black, 4–5 mm long, hispidulous-ciliate on the angles and sometimes also short-hairy across the surfaces; pappus of 8–16 linear-oblong to elliptic, often distally erose, hyaline scales 1–2 mm long, each scale with a prominently cartilaginous-thickened midrib; $2n = 24$, 48, 60, 72.

Open places in the desert, in sandy or gravelly to clay soil, 1300–2200 m elev., tolerant of selenium; sc. Mont. and c. Wyo. to w. Colo., nw. N.M., ne. Ariz., and c. and e. Utah. May, June.

Bahia nudicaulis is fairly well differentiated into four geographic varieties, as follows:

1 Leaves well distributed along the stems, which are leafy nearly or quite to the top; diploid; four-corners area of Utah, N.M., Colo., and Ariz. ..... var. *oblongifolia* (A. Gray) Cronquist

1 Leaves usually more or less basally disposed, much of the upper (and often also the middle) part of the stem naked or nearly so.

2 Involucral bracts abruptly and subcaudately acuminate; upper stem and peduncles not glandular, or only sparsely and inconspicuously so; leaves of var. *desertorum*; diploid; Uinta Basin, s. rarely to Emery and Grand cos., Utah ..... var. *ourolepis* (S. F. Blake) Cronquist

2 Involucral bracts merely acute to more or less acuminate, but not at all caudate; upper stem and peduncles copiously and conspicuously stipitate-glandular.

3 Principal leaves relatively broad and blunt or rounded at the summit, usually broadest at or above the middle; diploid; w. Wyo. and adj. Mont. ..... var. *nudicaulis*

3 Principal leaves narrower and commonly tapering to an acute or acutish tip, usually broadest at or below the middle; diploid or often polyploid; c. and ec. Utah (Carbon, Duchesne, Emery, Garfield, Grand, Sevier, s. Uintah, and Wayne cos.) and wc. Colo. (Delta, Mesa, and Montrose cos.) ..... var. *desertorum* (M. E. Jones) Cronquist

The foregoing key does not work perfectly. The varieties intergrade, and some specimens or local populations are ambiguous or might be misidentified in the absence of geographic data. The weakest cleavage is between var. *nudicaulis* and var. *desertorum*, but even here only one known local population in our range is clearly out of pattern. This is represented in herbaria by *Cronquist & Holmgren 9321*, 35 kilometers south of Hanksville, in northern Garfield Co., Utah, near the southern end of the range of var. *desertorum* and far removed from that of var. *nudicaulis*. The leaves are typical of var. *nudicaulis*, but the population is polyploid like much of var. *desertorum*. This local population has attracted some attention, and the *Cronquist & Holmgren* collection was provided with an herbarium name by a student who eventually chose to include it in var. *desertorum*.

2. Bahia dissecta (A. Gray) Britton

Amauria? dissecta A. Gray, Mem. Amer. Acad. Arts, II. 4: 104. 1849. *Villanova chrysanthemoides* A. Gray, Pl. Wright. 2: 96. 1853. *Bahia chrysanthemoides* A. Gray, Proc. Amer. Acad. Arts 19: 28. 1883. *B. dissecta* Britton, Trans. New York Acad. Sci. 8: 68. 1889. *Eriophyllum chrysanthemoides* Kuntze, Revis. Gen. Pl. 1: 337. 1891. *Villanova dissecta* Rydb. Bull. Torrey Bot. Club 37: 333. 1910. *Amauriopsis dissecta* Rydb. N. Amer. Fl. 34(1): 37. 1914. (*Fendler 537*, a few mi e. of Mora River [N.M.]; holotype at GH!, without a collector's number.)

Taprooted biennial or short-lived perennial, mostly 2–8 dm tall, with 1–3 erect stems from the base, these sparingly branched from near or below the middle, or simple nearly to the top, generally puberulent toward the base, otherwise copiously stipitate-glandular or with spreading, gland-tipped hairs; leaves alternate, puberulent to subglabrous, subternately once or twice pinnatifid, somewhat basally disposed, the middle and upper ones progressively reduced and distant; larger leaves mostly 3–15 cm long overall and 1–5 cm wide, the petiole often longer than the blade, the ultimate segments rather small, up to as much as 2 cm long and 4 mm wide, often oblanceolate or narrowly oblong; heads few to rather numerous in a terminal, open-corymbiform inflorescence, yellow, the disk mostly 1–1.5 cm wide; involucre 4–8 mm high, shortly glandular-hairy or somewhat viscid-hairy, its 12–24 flat green bracts subequal but more or less distinctly biseriate or subtriseriate, strongly and often subcaudately acuminate; rays mostly 10–15 (20), 5–9 mm long and 2–4 mm wide, evidently (2) 3-toothed at the summit; basal tubular portion of both ray- and disk-corollas conspicuously stipitate-glandular; achenes black, 3–4.5 mm long, glabrous or short-hairy, evidently ribbed between as well as on the angles; $2n = 36$.

Gravelly, sandy, or rocky soil in open places, sometimes on roadcuts, from the pinyon-juniper zone into the spruce-fir zone, 1700–2900 m elev.; se. Wyo. to w. Texas and adj. Chihuahua, w. to Utah (as far n. as Daggett and Salt Lake cos.), s. Nev., s. Calif., and n. Baja Calif. (July) Aug, Sept.

A form with evident pappus-scales is found occasionally in Arizona and Baja California, but is not known in our range.

46. CHAENACTIS DC.

Taprooted herbs, often more or less arachnoid-tomentose, but varying to glandular or glabrous; leaves alternate, entire to more often 1–3 times pinnatifid into small or slender segments; heads discoid, the flowers all perfect, the other ones often with slightly enlarged, irregular, shortly subligulate corolla; involucral bracts

narrow, herbaceous or subherbaceous, commonly subbiseriate, equal or occasionally somewhat imbricate, commonly spreading or reflexed in age; receptacle flat or nearly so, naked except in *C. carphoclinia*; flowers white, pink, or yellow; anthers shortly sagittate; style branches slender and elongate, slightly compressed, externally short-hairy nearly or quite to the base, with introrsely marginal, sometimes obscure stigmatic lines extending nearly to the tip; achenes clavate, terete or somewhat compressed; pappus of 4–20 hyaline scales, without a midrib, or the midrib obscure, or rarely the pappus obsolete.

About two dozen species, native to w. N. Amer. (Name from the Greek *chaino*, to gape, and *aktis*, ray, referring to the enlarged orifice and irregular, subradiate limb of the marginal corollas of many of the species.)

It appears that most or all of our annual species will hybridize among themselves, given the physical opportunity. There is no doubt that they form distinctive populations, but identification of herbarium materials sometimes becomes problematical.

References:
Mooring, J. S. 1980. A cytogeographical study of *Chaenactis douglasii* (Compositae, Heleniеae). Amer. J. Bot. 67: 1304–1319.
Stockwell, P. 1940. A revision of the genus *Chaenactis*. Contr. Dudley Herb. 3: 89–168. A fairly good treatment for the annuals, but unperceptive for the biennial and perennial species.

1 Pappus-scales mostly 10–16, sometimes unequal and more or less biseriate, but not with a well defined outer series much shorter than the inner.
2 Leaves 1–3 times pinnatifid; plants mostly biennial or perennial.
3 Leafy-stemmed biennial (annual) or short-lived perennial, with or without basal rosettes, and with few or solitary stems, usually more than 1 dm tall; plants only seldom alpine ... 1. *C. douglasii*
3 True perennial, usually with several rosettes, the nearly naked axillary or terminal peduncles up to ca 1 dm long, the plants otherwise stemless or nearly so; alpine.
4 Involucre usually glandular, varying to thinly tomentose or subglabrous; leaves not flat (see description), with mostly 4–12 pairs of pinnae; inland, in our range known only from Utah ... 2. *C. alpina*
4 Involucre tomentose, not glandular; leaves mostly flat or flattish, with 2–4 (5) pairs of pinnae; Sierra Nevada and White Mts. ... 3. *C. alpigena*
2 Leaves entire or occasionally with a few irregular teeth or small lobes; annual ... 4. *C. cusickii*
1 Pappus-scales fewer, generally either 4, or 4 + 4 with the outer series much shorter than the inner; annual or winter-annual.
5 Pappus biseriate, of 4 long inner scales mostly 3–8 mm long and 4 short outer ones mostly 0.5–1.5 mm long; heads relatively large, the involucre mostly 9–18 mm high, the corollas 6–15 mm long.
6 Anthers included, or barely equaling the corolla-lobes; corollas mostly 9–15 mm long; leaves pinnatifid, or some or many of them bipinnatifid ... 5. *C. macrantha*
6 Anthers definitely exserted; corollas 6–10 mm long; leaves linear and entire or with a few slender lateral lobes ... 6. *C. xantiana*
5 Pappus uniseriate, of 4 short to elongate scales; heads smaller, the involucre 5–9 (10) mm high, the corollas 4–9 mm long.
7 Involucral bracts obtuse to narrowly acute or somewhat acuminate, but not attenuate, generally green throughout; receptacle naked.
8 Principal leaves entire or with a few scattered, subterete, callous-tipped segments, generally glabrous at anthesis; southern desert species ... 7. *C. fremontii*
8 Principal leaves evidently pinnatifid or bipinnatifid, with thick, often broadly sulcate or cupped-concave, distally blunt or rounded segments, tending to be thinly tomentulose at anthesis; fairly widespread with us ... 8. *C. stevioides*
7 Involucral bracts attenuate at the reddish tip; receptacle very often beset with scattered slender bracts ... 9. *C. carphoclinia*

1. Chaenactis douglasii (Hook.) Hook. & Arn.

Hymenopappus douglasii Hook. Fl. Boreali-Amer. 1: 316. 1833. *Chaenactis douglasii* Hook. & Arn. Bot. Beechey Voy. 354. 1839. *Macrocarphus douglasii* Nutt. Trans. Amer. Philos. Soc. II. 7: 376. 1841. (*Douglas s.n.*, along the Columbia River, near the Great Falls; holotype at K!)

Chaenactis achilleaefolia Hook. & Arn. Bot. Beechey Voy. 354. 1839. *Macrocarphus achilleaefolius* Nutt. Trans. Amer. Philos. Soc. II. 7: 376. 1841. *Chaenactis douglasii* var. *achilleaefolia* A. Nelson in J. M. Coult. & A. Nelson, New Man. Bot. Centr. Rocky Mts. 557. 1909. (*Tolmie s.n.*, dry plains of the Snake Country; holotype at K!)

C. douglasii var. *montana* M. E. Jones, Proc. Calif. Acad. Sci. II. 5: 700. 1895. (Rocky Mts. of Colo. to the Sierras; no specimens cited; *Jones 5822o*, Fish Lake, Utah, 10 Aug 1894; lectotype here designated, at POM!; *Jones 5261q*, at POM!, from Springdale, Utah, at 4000 ft, bears a Jones label as Type set, but does not fit the protologue and is not here regarded as the type.)

C. angustifolia Greene, Leafl. Bot. Observ. Crit. 2: 223. 1912. (*Merrill & Wilcox 625*, Point of Rocks, Wyo.; holotype at US!) = var. *achilleaefolia*.

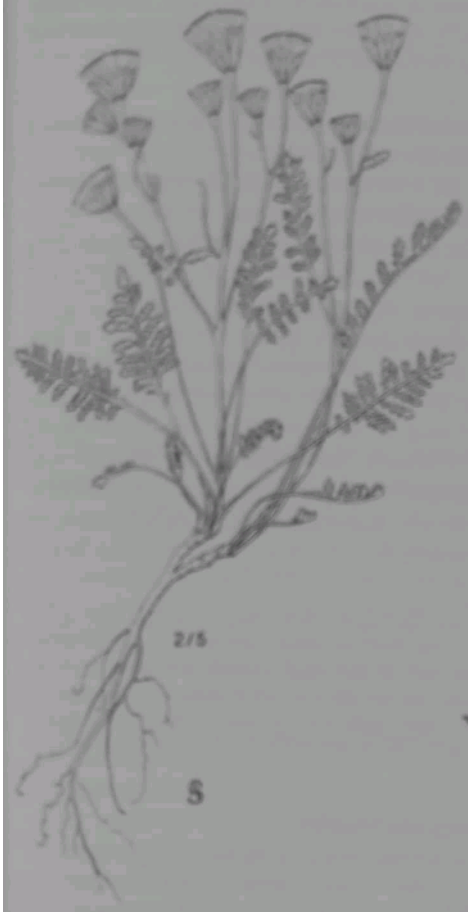
C. brachiata Greene, Leafl. Bot. Observ. Crit. 2: 224. 1912. (*Jones 5261q*, Springdale, Utah; holotype at US!) = var. *achilleaefolia*.

C. humilis Rydb. N. Amer. Fl. 34(1): 72. 1914. (*C. P. Smith 2273*, Franklin Basin, Bear River Range, Idaho; holotype at NY!) = var. *montana*.

C. rubricaulis Rydb. N. Amer. Fl. 34(1): 72. 1914. *C. douglasii* var. *rubricaulis* Ferris, Contr. Dudley Herb. 5: 100. 1958. (*Walker 2170*, Deer Park, Sierra Nevada, Placer Co., Calif.; holotype at NY!)

C. brachiata var. *stansburiana* Stockw. Contr. Dudley Herb. 3: 111. 1940. (*Stansbury*, Stansbury's Island, Great Salt Lake, Utah, 2 June 1850; cited by Stockw. as at US, but the apparent holotype at NY!) = var. *achilleaefolia*.

C. panamintensis Stockw. Contr. Dudley Herb. 3: 113. 1940. (*Gilman 1960*, Telescope Peak, Death Valley, Inyo Co., Calif.; holotype at US!) = var. *montana*.

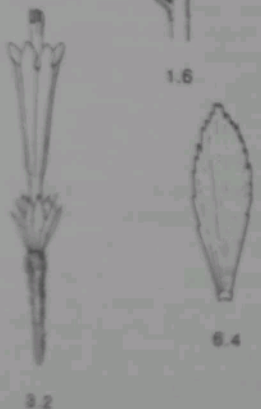


var. montana

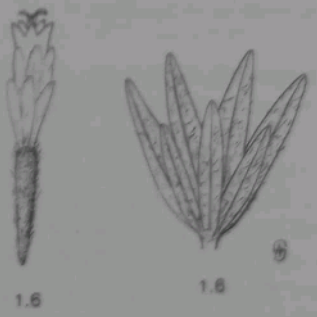
var. achilleaefolia

Chaenactis douglasii

Chaenactis alpina



Chaenactis cusickii



Chaenactis alpigena