

16a. *Crepis exilis* subsp. *originalis* subsp. nov. (Fig. 30a-t.)—Planta 3–7 dm alta; folia elongata, sæpissime glabrescentia; inflorescentia cymosa, capitulis 10–40 pro inflorescentia; involucri phylla asetosa vel ad apicem parce setosa.

Stems 3–7 dm tall; leaves mostly elongate, various in outline, but most often with linear, falcate-ascending, entire lobes, usually glabrate; inflorescence cymose, freely branching, strictly dichotomous or with a well-defined primary axis, bearing 10–40 heads; involucre variable as to height, number of bracts and florets, but mostly narrower than in subsp. *typica*, the inner bracts without setæ, or bearing a few glandless setæ at the apex; outer bracts usually short, the longest about 1/4 the length of the inner; florets, achenes, and pappus with more variation than in subsp. *typica*, but not materially different. (*C. occidentalis* var. *gracilis* D. C. Eaton, Rep. U. S. Geol. Expl. 40th Par. 5:203, 1871, in part; *C. acuminata* var. *gracilis* Torr., ex Eaton, *ibid.*; *C. intermedia* var. *gracilis* Gray, Syn. Fl. 1(2):432, 1884, in part; *C. gracilis* Rydb., Mem. N. Y. Bot. Gard. 1:461, 1900, non Hook, f. et Thoms. ex C. B. Clarke, Comp. Ind. 254, 1876; *C. angustata* Rydb., Bull. Torr. Bot. Club 32:135, 1905, in part.)

Subsp. *originalis* is considered to be the original form of this species, since it includes the diploid, sexual form. The two specimens on which Eaton based his description (*loc. cit.*) of *C. occidentalis* var. *gracilis*, i.e., that of Parry from Middle Park, Colorado, and Watson no. 716 from Nevada, differ in just those characteristics that separate subsp. *originalis* as here recognized from typical *C. exilis*. The Parry specimen resembles the diploid form in its relatively numerous, slender heads and short outer bracts, and the setæ are restricted to the apices of the inner bracts; that of Watson has only three heads that are considerably broader and have relatively long outer bracts, while the setæ are scattered over the upper half of the inner bracts. The original description, which calls for "3–6 narrow 9–14-flowered heads," partly covers both specimens (although that of Parry actually has 10 heads and 3 undeveloped buds in its inflorescence) and therefore, when applied to the segregation of *C. exilis* into two subspecies as outlined above, does not fit either one of them. Consequently, var. *gracilis* is best regarded as an ambiguous name, and is not applied to either of the two subspecies here recognized.

Almost throughout the range of the species, but rare in the Rocky Mountains, and not occurring at higher altitudes.

The following is a key to the apomicts which have been selected as representing the amount of variability to be found within the species. Many other forms exist, but they are more or less similar to those described. For a discussion of their taxonomic status, see p. 69.

- A. Inflorescence strictly dichotomous, i.e., without a straight central axis..... { diploid forms
1. apm. *simulans*
- A. Inflorescence corymbose, i.e., with a more or less straight central axis which is stronger than the side branches.

- B. Involucral bracts devoid of setæ.
- C. Lobes of leaves absent or short, shorter than the width of the lanceolate or narrowly elliptic central portion; involucre 8-10 mm high 2. apm. *breviloba*
- C. Lobes of leaves elongate, much longer than the lanceolate or linear central portion.
- D. Achenes 7-10 mm long, strongly attenuate or subrostrate toward the apex; leaves green and sparsely tomentose or glabrate.
- E. Involucres definitely tomentose.
- F. Pappus setæ 6.5-8 mm long.
- G. Lobes of leaves linear, entire; stems and peduncles slender, ascending; achenes yellowish green 3. apm. *longiloba*
- G. Lobes of leaves lanceolate, with a few, prominent teeth; stems and peduncles stout, the latter divaricate; achenes at maturity deep blackish green..... 4. apm. *yakimensis*
- F. Pappus setæ 9-10 mm long; lobes of leaves lanceolate, entire; achenes brownish green at maturity..... 5. apm. *coloradensis*
- E. Involucres glabrate; pappus 8-9 mm long 6. apm. *glabrescens*
- D. Achenes 5-7.5 mm long, thick and slightly contracted at the apex; leaves and stems conspicuously tomentose 7. apm. *brevicarpa*
- B. Inner (and rarely the outer) involucral bracts bearing a few glandless setæ at the apex.
- H. Anthers well developed and pollen-bearing.
- I. Lobes of basal leaves elongate; involucres 12-13 mm high; longest outer bracts 4.5-5 mm long..... 8. apm. *paucibarba*
- I. Lobes of basal leaves very short, barely exceeding the narrowly lanceolate central portion; involucres 11 mm high; longest outer bracts about 3 mm long.. 9. apm. *graminifolia*
- H. Anthers abortive, 3.5-4 mm long, and without pollen..... 10. apm. *sterilis*

Diploid form (fig. 30a-c).—Stems 3.5-6.5 dm high; basal leaves glabrate, 19-33 cm long, 0.5-10 cm broad, pinnatifid with linear lobes; inflorescence strictly dichotomous, without a well-defined central axis; bearing 10-30 heads on well-developed plants; involucral bracts 7-10, not setose; florets 22-35 per involucre; achenes deep green or greenish black, (3-)5.5-8 mm long, contracted at the apex or subrostrate; pappus 6-8 mm long. BRITISH COLUMBIA: near Similkameen River, near Hedley, alt. about 525 m, Wheeler in 1928 (2n = 22!) (type of subsp. *originalis*, UC no. 346445); Deer Park, Lower Arrow Lake, Macoun in 1890 (US); Cascade, near international boundary, Macoun 65028 (G, NY, DS). WASHINGTON: junction of Crab and Wilson Creeks, Grant ("Douglas")

County, alt. 475 m, *Sandberg & Leiberg 256*, part (UC); north of Blewett, Chelan County, alt. 500 m, *Keck & Clausen 3554* (UC); Garfield County, *Darlington* in 1913 (WSC); shore of Omak Lake, Okanogan County, *Fiker 1258, 1259* (WSC); north of Kahlotus, Franklin County, *Constance & McMurray 1159* (WSC); east of Winona, Whitman County, *Eastwood & St. John 13217* (WSC); Hartline, Grant County, alt. 580 m, *Eggleston 12869* (US); Chelan, Chelan County, *Jones* in 1911 (Po).

The Eggleston collection is an anomalous form with small heads and exceptionally short achenes, 3–4.5 mm long. Since, however, this form is not known to have a definite geographic distribution, and is approached in the size of the involucre and achenes by the three specimens cited previously to it, as well as by some of the plants of Miss Wheeler's collection from British Columbia, the treatment of it as a taxonomic segregate does not seem advisable at present.

1. apm. *simulans*.—Similar morphologically to the diploid form, but with the stomatal size of tetraploids; ($2n = 44$?). BRITISH COLUMBIA: Lake Osoyoos, *Macoun 76, 992* (NY); south of Lytton, junction of Fraser and Thompson Rivers, *McCabe 200* (UC). WASHINGTON: Wilson Creek, Douglas County, *Sandberg & Leiberg* in 1893 (Po); near Bickleton, Klickitat County, *Suksdorf 1997* (WSC); Deep Creek Canyon, Spokane County, *Large 42* (WSC). OREGON: near Kent, Sherman County, *Peck 9978* (DS, Will); Meacham, Umatilla County, *Peck 4143* (Will).

Related to apm. *simulans*.—WASHINGTON: Waitsburg, Walla Walla County, *Horner 167* ($2n = 33$?) (WSC). OREGON: east of Mitchell, Wheeler County, *Keck & Clausen 3672* ($2n = 33$?) (UC).

2. apm. *breviloba (exilis-acuminata)* (fig. 30*f-h*).—Stems 4–4.5 dm high; basal leaves narrowly elliptic, with a broad (1–3 cm) central portion and short, strongly falcate and ascending lobes; inflorescence with a zigzag, but well-defined central axis, bearing 25–35 heads; involucre 8.5–9 mm high; inner bracts 6–8; florets 7–10; pappus 6.5 mm long; achenes 6–6.5 mm long, pale green; ($2n = 44$?). WASHINGTON: Wawawai, Whitman County, *Elmer 761* (NY, Po, Minn, WSC); Conconully, Okanogan County, *Fiker 710, 770* (WSC); Coleville Reservation, Okanogan County, *Griffiths & Cotton 421* (NY, WSC). OREGON: East of Pendleton, Umatilla County, *Thompson 4755* (DS); Deep Creek, Walla Walla County, *Sheldon 8316*, part (NY).

Related to apm. *breviloba*.—OREGON: Wallowa Mtns., trail to Ice Lake, Wallowa County, alt. 1970 m, *B. & C. 79* ($2n = 55$!) (UC). IDAHO: Greer, Clearwater County, *Stillinger* in 1923 (WSC).

3. apm. *longiloba (exilis-acuminata)* (fig. 30*i-l*).—Stems 3.5–5.5 dm high; basal leaves with lance-linear central portion, and linear, ascending lobes; inflorescence with slender, ascending branches, bearing 17–25 heads; involucre 11–13 mm high; inner bracts 6–9; florets 8–11; achenes pale yellowish green, 7.5–8.5 mm long; pappus 7–8 mm; ($2n = 55$?). WASHINGTON: Pullman, Whitman County, *Elmer 102* (UC, Minn, Po, RM); Almota, Whitman County, *Piper* in 1894 (WSC). IDAHO: near Lake Coeur d'Alene, Kootenai County, *Aiton* in 1892 (Minn); Bear Creek

below Parker Mountain, Custer County, alt. 1750 m, *Macbride & Payson 3293*, part (UC, DS, Po, RM); Lake Waha, Nez Perces County, *Henderson* in 1894 (RM). MONTANA: Alta, Ravalli County, alt. 1515 m, *Jones* in 1909 (Po); Jack Creek Canyon, alt. 2120 m, *Rydberg & Bessey 5304*, part (G, UC, NY, RM).

Related to *apm. longiloba*.—BRITISH COLUMBIA: Deer Park, Lower Arrow Lake, *Macoun* in 1890 (NY); above Lardo, alt. 850 m, *Shaw 633* (NY); east of Kamloops, *McCabe 2358* (UC); Chilcotin, *Newcombe* in 1915 (G). WASHINGTON: Kettle Falls, Stevens County, *Beattie & Chapman* in 1903 (WSC, Clo). OREGON: near Blue Mtn. Hot Springs, Grant County, *Ferris & Duthie 842* (DS, RM); Mitchell, Wheeler County, *Peck 10100* (Will); near Blalock, Gilliam County, *Sherwood 340* (Will); Kamela, Union County, *Peck 4142* (Will); Ice-Lake trail, Wallowa Mtns., *Eastwood & Howell 3303* (CA). MONTANA: Bigfork, Flathead County, alt. 909 m, *Jones* in 1908 (DS, Po); Helena, Lewis and Clark County, *Kelsey* in 1898 (UC); between Hamilton and Darby, Ravalli County, *Kirkwood 1763* (CA, RM, FM). WYOMING: Yellowstone River near Junction Butte, Yellowstone National Park, *Nelson 5755*, part (NY, G, RM, Minn).

4. *apm. yakimensis (exilis-acuminata)*.—Stems rather stout, 3.5–4 dm high; basal leaves with a lanceolate-linear central portion and lanceolate, toothed lobes; inflorescence with rather stout, divaricate branches; involucre 12–14 mm high; inner bracts 8–9; florets 13–15; achenes deep green, 7–9 mm long; pappus 7–8 mm long; ($2n = 88$?). WASHINGTON: Natchez Valley near N. Yakima, Yakima County, *Piper 2737* (G, NY).

Related to *apm. yakimensis*.—WASHINGTON: Ellensburg, Kittitas County, *Whited 455* (WSC); Wenatchee, Chelan County, *Whited 1112* (US, WSC); south of Omak, Okanogan County, *Fiker 1596* (WSC); Stehekin, Chelan County, *Griffiths & Cotton 214* (US).

This form with its relatives is similar in habit to *C. barbiger* but is distinguished from that species by the complete absence of bristles from the involucre.

5. *apm. coloradensis (exilis-acuminata)* (fig. 30m–o).—Stems about 5 dm tall; basal leaves with lanceolate central portion and lanceolate, entire lobes; branches of the inflorescence ascending; involucre 12–15 mm high; inner bracts 8; florets 12–16; achenes 9–10 mm long, brownish when young, but becoming distinctly greenish at maturity; pappus setae 9–10 mm long; ($2n = 55$?). COLORADO: Larimer County, alt. 1660 m, *Baker* in 1895 (Po, Minn); Boulder Canyon, Jefferson County, *Ramaley 7014* (RM). Transitional to *C. intermedia*.

6. *apm. glabrescens (exilis-acuminata)*.—Stems stout, 6–7 dm tall; basal leaves with a lanceolate central portion and linear-lanceolate, entire, ascending lobes; inflorescence with very numerous heads, as in *C. acuminata*; involucre 12–13 mm high; inner bracts 6–8, nearly glabrous; florets 7–10; achenes 7–8 mm long, deep blackish green at maturity; pappus setae 8–9 mm long; ($2n = 55$?). WASHINGTON: Ellensburg Kittitas County, *Elmer 383* (Minn, Mo); near Wilson Creek, Douglas County, alt. 680 m, *Sandberg & Leiberg 232* (UC, Minn, WSC).

This form resembles *C. acuminata* in habit and in the glabrate involucre, but the achenes resemble those of *C. exilis* in shape and color.

Related to apm. *glabrescens*.—WASHINGTON: Oroville, Okanogan County, Jones in 1911 (UC, Po).

7. apm. *brevicarpa* (*exilis-acuminata-modocensis?*).—Stems 5 dm tall, rather stout; basal leaves with lanceolate-linear central portion and linear, spreading or reflexed lobes; both the stems and leaves rather strongly tomentose; branches of the inflorescence short and stout; involucre 8.5–10 mm high; inner bracts 8, obtuse; florets 10–12; achenes 5–7.5 mm long, thick and only slightly attenuate at the apex; pappus 5.5–6 mm long; ($2n = 44$?). WASHINGTON: Sawtooth Ridge, valley of War Creek, Okanogan County, alt. 1210 m, *St. John, Courtney, & Parker 3712* (WSC).

8. apm. *paucibarba* (*exilis-acuminata-modocensis?*) (fig. 30p-r).—Stems 5–6 dm tall; basal leaves with a linear central portion and elongate, linear lobes; inflorescence ample, many-headed; involucre 10–14 mm high; inner bracts 8–10, somewhat glabrate, with a few black setae near the apex; florets 10–15; outer bracts narrowly deltoid or lanceolate, the longest 4–5 mm long; anthers well developed and pollen-bearing; achenes deep green, 7.5–9 mm long; pappus 7.5–8 mm long; ($2n = 44$?). WASHINGTON: Snipe's Mtn., Yakima County, *Cotton 383* (G, RM, WSC); west of Ritzville, Adams County, alt. 550 m, *Keck & Clausen 3569* (UC); Wallula, Walla Walla County, *Cotton 1068* (NY, US, WSC); above Palouse Falls, Whitman County, *St. John & Pickett 6167* (WSC). OREGON: Grant's, Wasco County, *Suksdorf 195* (G, WSC); Arlington Hills, Gilliam County, *Henderson 14479* (UC); near Moro, Sherman County, *Lawrence & Powell 2913* (DS).

Related to apm. *paucibarba*.—WASHINGTON: Status Creek south of Toppenish, Yakima County, alt. 235 m, *Keck & Clausen 3503* ($2n = 44$!) (UC); Bridge Creek, near Lake Chelan, Chelan County, alt. 900 m, Jones in 1911 (Po); west of Spokane, *B. & C. 58* ($2n = \text{ca. } 88$!) (UC); southeast of Salmon Meadows, Okanogan County, *Fiker 251* (WSC). OREGON: Paterson Ferry, Morrow County, *Eastwood & Howell 3527* (CA). IDAHO: Moscow Mtn., Latah County, *Piper 1611* (G. NY, Minn.).

9. apm. *graminifolia* (*exilis-modocensis-acuminata*).—Stems 3.5–4 dm high; basal leaves with linear-lanceolate central portion and short, strongly falcate, linear lobes; inflorescence of 5–10 heads; involucre 10–11 mm high; inner bracts 8, with a few black setae near the apex; florets 10–12; outer bracts lance-deltoid, the longest 2.5–3 mm long; pappus setae 8 mm long; achenes not seen; ($2n = 33$?). OREGON: Silvies River, Harney County, *Peck 4139* (Will); mouth of Emigrant Creek, Harney County, *Peck 3977* (Will).

10. apm. *sterilis* (*exilis-acuminata-modocensis*) (fig. 30s, t).—Stems 3–5 dm tall, slender; basal leaves with linear-lanceolate central portion and linear, spreading or slightly ascending lobes; branches of the inflorescence conspicuously divaricate; involucre 11–13 mm high, inner bracts 7–9, with a few black setae near the apex; florets 7–12; outer bracts narrowly deltoid, the longest 2.5–3 mm long; anthers abortive and without

pollen; achenes 8–9.5 mm long, grayish green at maturity; pappus 7–8 mm long; ($2n = 44$ or 55 ?). COLORADO: Middle Park, *Parry* in 1864 (G); near Golden, Jefferson County, *Jones* in 1878 (Po).

Related to *apm. sterilis*.—MONTANA: Ravalli, Lake County, alt. 900 m, *Jones* in 1909 (Po); Spanish Basin, Gallatin County, *Flodman 922* (Minn); Hamilton, Ravalli County, *Blankinship 1906* (Po). WASHINGTON: near Trout Lake, Klickitat County, *Suksdorf 2693* (G, DS, Minn, WSC); near Spangle, Spokane County, *Suksdorf 1642, 12710* (WSC). COLORADO: Sulphur Springs, Grand County, *Osterhout 3315* (G, NY, RM, Nev). IDAHO: Shoshone Falls, Twin Falls County, alt. 1120 m, *Nelson & Macbride 1727* (RM, Minn); Nez Perces County, *Sandberg* in 1892 (Minn). NEVADA: Bunker Hill, Toiyabe Range, Lander County, alt. 2420 m, *Kennedy 4120* Nev); Clover Mtns., Elko County, *Greene* in 1893 (UC); Duck Creek, Schell Creek Mtns., White Pine County, *Jones* in 1924 (Po).

16b. *Crepis exilis* subsp. *typica* nom. nov. (Fig. 30u-b').—Stems stouter than in subsp. *originalis*, 1.5–3.5 dm tall; heads 3–18, mostly 5–10 in an inflorescence; involucre rather broad and many-flowered, longest outer bracts mostly about 1/3 the length of the inner; inner bracts bearing black setæ throughout their length. (*Crepis exilis* *Osterhout*, loc. cit., *C. occidentalis* var. *gracilis* Gray, loc. cit., and *C. gracilis* Rydb., loc. cit., all in part; *C. atribarba* Heller, Bull. Torr. Bot. Club 26:314, 1899.)

British Columbia to Alberta, south to the Blue Mountains of Oregon, and in the Rockies to Colorado, at higher elevations than subsp. *originalis*.

The following apomicts may be recognized (see p. 69):

- | | |
|---|-----------------------------|
| A. Lobes of leaves linear; anthers abortive and without pollen. | |
| B. Longest of the outer involucre bracts 3.5–5.5 mm long | 11. <i>apm. Osterhoutii</i> |
| B. Longest of the outer involucre bracts 2–3.5 mm long | 12. <i>apm. ambigua</i> |
| A. Lobes of basal leaves lanceolate; anthers well developed and bearing pollen..... | 13. <i>apm. Helleri</i> |

11. *apm. Osterhoutii (exilis-modocensis)* (fig. 30u-x). Stems 2–3 dm high; basal leaves with lance-linear central portion and short, linear spreading or ascending lobes; heads 3–8 in an inflorescence; involucre 11–13 mm high and rather broad; longest of the outer bracts 3.5–5.5 mm long; inner bracts 8–10, setose throughout most of their length; florets 12–20; anthers abortive and without pollen; achenes 8–8.5 mm long, brownish when immature but becoming greenish at least in the lower half at maturity; pappus 7.5–8 mm long; ($2n = 44$ or 55 ?) (see p. 49). MONTANA: Lima, Beaverhead County, *Jones* in 1908 (Po); Glacier National Park, *Van Dyke* in 1930 (CA). WYOMING: Jackson Lodge, Grand Teton National Park, *Van Dyke* in 1930 (CA); Pole Creek, *Nelson 1393* (G, Minn, RM); Green Top, *Nelson 3251* (RM); Mountain Home, Albany County, alt. 2600 m, *Keck 902* (DS); Big Horn County,

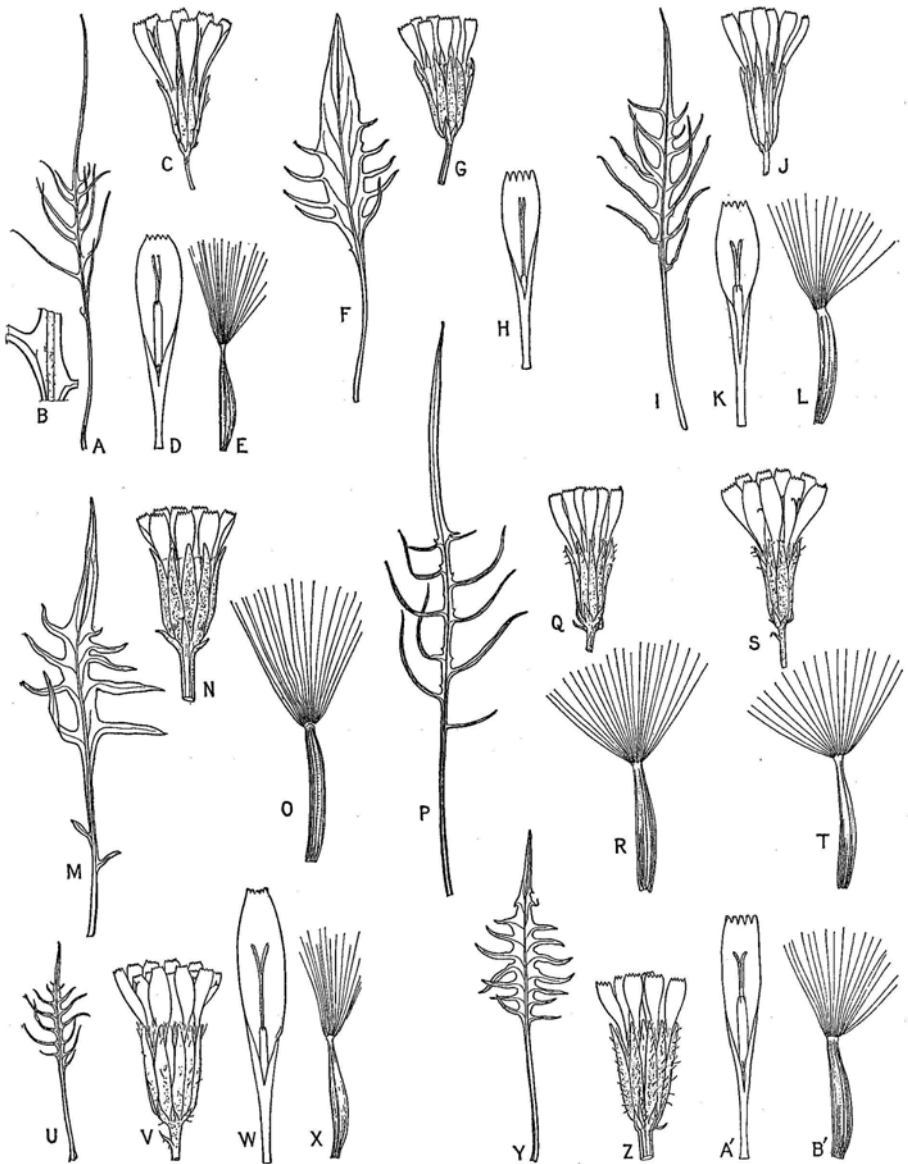


FIG. 30. *Crepis exilis*. a-t, subsp. *originalis*. a-e, diploid form—a-d, from type of subsp. *originalis*; e, from Jones in 1911: a, leaf, $\times \frac{1}{4}$; b, detail of pubescence, $\times 1$; c, involucre, $\times 1$; d, corolla, $\times 2$; e, achene, $\times 2$. f-h, apm. *breviloba*, from Fiker 710: f, leaf, $\times \frac{1}{4}$; g, involucre, $\times 1$; h, corolla, $\times 2$. i-l, apm. *longiloba*—i, l, from Elmer 102; j, k, from Piper in 1894: i, leaf, $\times \frac{1}{4}$; j, involucre, $\times 1$; k, corolla, $\times 2$; l, achene, $\times 2$. m-o, apm. *coloradensis*, from Baker in 1895: m, leaf, $\times \frac{1}{4}$; n, involucre, $\times 1$; o, achene, $\times 2$. p-r, apm. *paucibarba*, from Keck and a, achene, $\times 2$. y-a', apm. *Helleri*, from Heller 3302: y, leaf, $\times \frac{1}{4}$; z, involucre, $\times 1$; Clausen 3569: p, leaf, $\times \frac{1}{4}$; q, involucre, $\times 1$; r, achene, $\times 2$. s, t, apm. *sterilis*, from Jones in 1878: s, involucre, $\times 1$; t, achene, $\times 2$. u-w, subsp. *typica*. u-w, apm. *Osterhoutii*, from Nelson 1398: u, leaf, $\times \frac{1}{4}$; v, involucre, $\times 1$; w, corolla, $\times 2$; a', corolla, $\times 2$; b', near apm. *Helleri*, achene, $\times 2$, from Henderson 5559.