

Kossogol, *Turczaninow* in 1836 (DC, K). Siberia: Irkutsk, Burjata-Mongolia border, Tunea dist., Oka R., near Boin-Nol, *Nazarov 15032* (Mosc); Yakutsk, Kumach-Sur, *Nilsson* in 1898 (US) m.v. 7; Kamchatka reg., between Alach-Jan and Okhotsk, *Turczaninow* ? in 1835 (DC, K); "Kamchatka or N.W. America," *Steller* (L).

Alaska: Port Clarence, *Kjellman* in 1897 (K); Alaska Range, McKinley National Park, Savage R., *Mexia 2033* (UC); Alaska Range, Healy, *Anderson 1973* (NY) m.v. 1; Yukon Valley, Coal Creek Hill, *Funston 142* (G) m.v. 1; Porcupine R., *Turner* in 1891 (UC); Old Crow R., *Muris* in 1926 (UC) m.v. 1. **Canada:** Yukon, Dawson, bluffs along Klondyke R., *Eastwood 346* (UC) m.v. 1; Mackenzie R., *Onion et al.* in 1861-1862 (NY) m.v. 1; Arctic sea coast, "on Coppermine R.," *Richardson 878-80* (K) type, photograph (UC); *ibid.* (?) annotated "Hooker misit 1834-1835" (G, Fl) isotypes (?); Arctic coast, Ogden Bay to Coppermine R., *Hanbury* in 1902 (K). **Labrador:** Ramah, *Stecker 324* (G, UC, Minn, Wy); Okkak, *Weis* (K). **Newfoundland:** Pistolet Bay, Burnt Cape, dry limestone barrens, *Fernald et al. 29278* (Co). **Quebec:** Gaspé Pen., *vide* Fernald (Mem. Gray Herb. Harv. Univ. 2: 252, 1925). **British Columbia:** Kicking Horse Lake, *Macoun* in 1885 (G, CP, UC); Rocky Mts., Jasper House, *Hooker* in 1845 (K) m.v. 2; Rocky Mts., summit, *Lyll* in 1861 (K, G) m.v. 1. **Montana:** Rocky Mts., Marias Pass, *Canby 211* (K, CP, G) m.v. 2; Stanton Lake, *Williams* (Wy); Glacier National Park, Grinnell Glacier, *McKelvey* in 1921 (K). **Wyoming:** northwestern, *Parry* in 1873 (G). **Colorado:** Gray's Peak, headwaters of Clear Cr., *Patterson* in 1885 (K, FM); Fremont Co., Sierra Sangre de Cristo, *Brandegee 894* (G) m.v. 2; Castle Peak, near Aspen, *Penland* in 1929 (UC). **Utah:** Beaver Co., Tushar (Belknap) Pk., E. slopes of peak and saddle, 3508-3660 m, loose calcareous talus, *Maguire 19784* (UC); Lasal Mts., Mt. Mellinthin, S.W. slope, 3720 m, *Maguire 21265* (UC); Gold Mt., *Jones* in 1901 (UC, Po) m.v. 3; between Alta and American Fork, *Leonard* in 1883 (Po) m.v. 3. **Nevada:** Lander Co., Toiyabe Range, Bunker Hill, *Kennedy 4196* (UC, DS) m.v. 3; Clark Co., Charleston Peak, above timber line, *Clokey 5639* (Clo). **Oregon:** Wallowa Mts., *Cusick* in 1900 (Po) m.v. 3. **California:** Sierra Nevada, Sonora Pass, *Brewer 1884* (G, UC) m.v. 3; Sierra Nevada, Tuolumne Co., near Leavitt Peak, *Sharsmith 2879* (UC) m.v. 3; Tuolumne-Mono counties, near Leavitt Peak, *Sharsmith 2893* (UC); Fresno Co., Mt. Gould, S. slope, coarse granite sand, *Sharsmith 3226* (UC); San Bernardino Range, Mt. San Antonio, E. side, near small snow field, *Burlew* in 1916 (UC).

Minor Variants of *C. nana typica*

1. Caudex and branches somewhat elongated. Probably ecads caused by submergence or partial covering with detritus. *Anderson 1973* (NY) Healy, Alaska Range; *Funston 142* (G) Coal Creek Hill, Yukon Valley, Alaska; *Muris* in 1926 (UC) Old Crow R., tributary of Porcupine R., Alaska; *Eastwood 346* (UC) Klondyke R., Dawson, Yukon, Canada; *Onion et al.* in 1861 (NY) Mackenzie R., Canada; *Lyll* in 1861 (K, G) summit of Rocky Mts., British Columbia (?).

2. Plant somewhat larger, especially the heads and achenes; involucre up to 13 mm long; achenes up to 8 mm long in some specimens, ribs prominent. *Hooker* in 1845 (K) Jasper House, Burke, Rocky Mts., British Columbia (?); *Canby 211* in 1883 (K, G) upper Marias Pass, Rocky Mts., Montana; *Brandegee 894* (G) and *Brandegee 924* (FM) alpine summits, Sierra Sangre de Cristo, Fremont Co., Colorado.

3. Leaves broader, both blade and petiole, and caudex somewhat elongated. *Jones* in 1901 (UC, Po) Gold Mt., Utah; *Leonard* in 1883 (Po) ridge between Alta and American Fork, Utah; *Kennedy 4196* (UC, DS) Bunker Hill, Toiyabe Range, Lander Co., Nevada; *Cusick* in 1900 (Po) sliding gravel, Wallowa Mts., Oregon; *Brewer 1884* (G, UC) Sonora Pass; Sierra Nevada, California; *Sharsmith 2870* (UC) S.W. slope of divide leading to Leavitt Peak from Sonora Pass, loose lava loam, Tuolumne Co., California.

7. Branches elongated (probably from growing up through detritus), 1-2-headed; outer involucral bracts $\frac{1}{3}$ - $\frac{1}{2}$ as long as the inner; corolla 10-11 mm long; corolla tube 5 mm long; style branches 1.5 mm long; pappus 6 mm long. The specimen is fragmentary, consisting of 2 branches with flowers and fruits and a small plant with leaves only. Although the 2 branches appear to represent an extreme variant in the features noted above, yet the involucres, achenes, and notably the anther appendages are typical. Also, at the base of 1 of the branches there is a small withered leaf which is lyrate-pinnatifid with 1 pair of small lateral lobes as occasionally seen in this species. *Nilsson* in 1898 (US) Kumach-Sur, Yakutsk, Siberia.

107, b. *Crepis nana ramosa* subsp. nov. Planta 0.8-1.8 dm alta stolonifera; caules tenues ramosi, ramis remotis; inflorescentia aggregata composita paniculata; folia caudicalia interdum 8.5 cm longa 2.5 cm lata integra vel dentata; folia caulina similia vel sessilia lanceolata acuta; involucra plerumque 12-13 mm longa; corolla 7.5-9 mm longa, ligula circa 4 mm longa 1.5 mm lata; antherae circa 2.5 mm

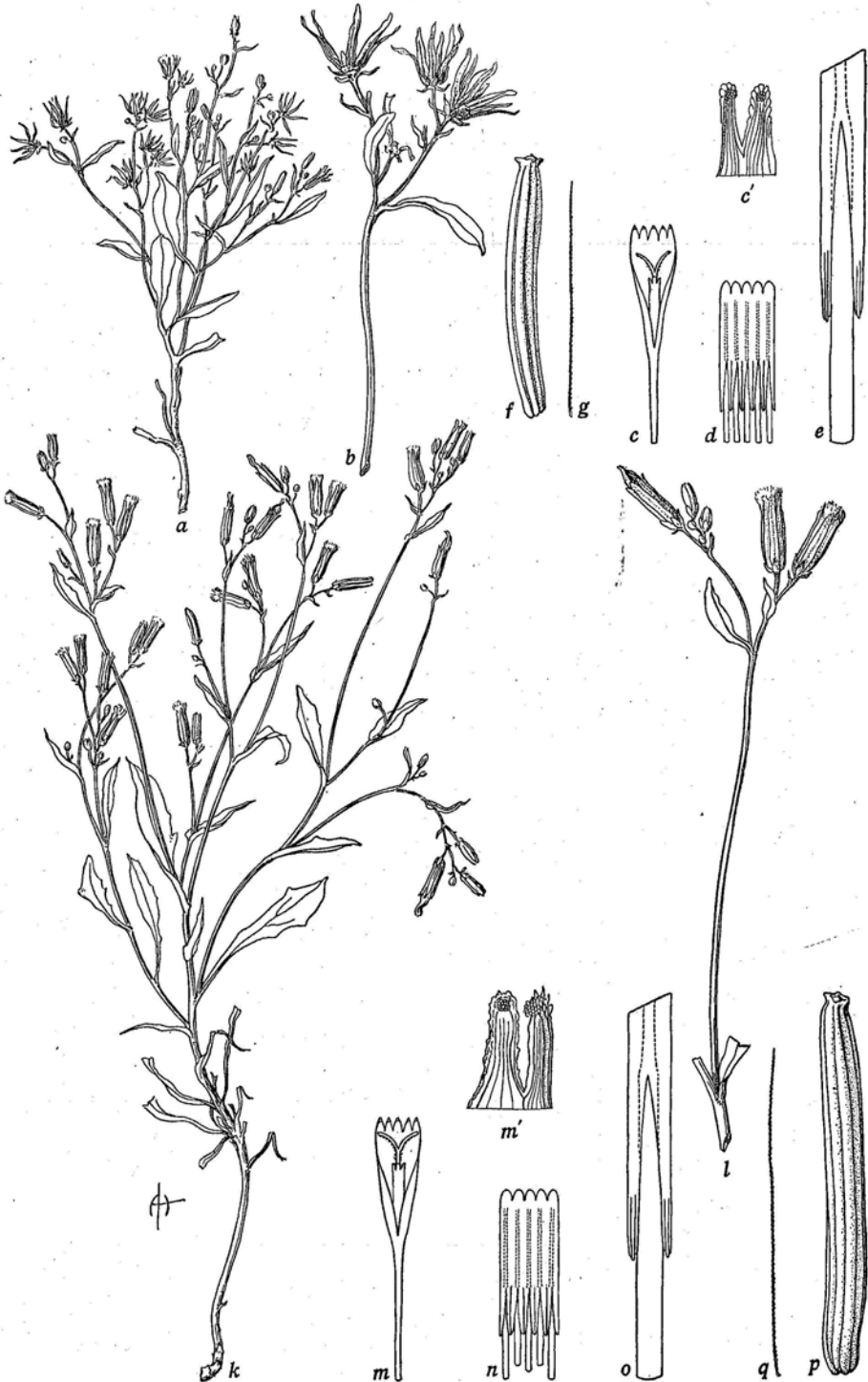


Fig. 155. *Crepis nana ramosa*, a-g, from Purpus 5202 (UC 91853)=m.v. 6; k-g, from type (UC 470750): a, plant, $\times \frac{1}{2}$; b, branch, $\times 1$; c, floret lacking ovary, $\times 4$; d, anther tube, $\times 8$; e, detail of appendages, $\times 32$; f, g, achene and pappus seta, $\times 8$; k, plant, $\times \frac{1}{2}$; l, branch, $\times 1$; m, floret lacking ovary, $\times 4$; n, anther tube, $\times 8$; o, detail of appendages, $\times 32$; p, q, achene and pappus seta, $\times 8$.

longae; rami styli 0.8–1.1 mm longi flavi; achaenia circa 6.5 mm longa 0.5–0.7 mm lata 10–13-costata, costis prominentibus; pappus 5–6 mm longus.

Plant with elongated stem and branches, 0.8–1.8 dm high, forming clumps from stolons; stems slender, terete, striate, often purplish, not fistulose, paniculately branched, branches remote, rebranched, the aggregate inflorescence an open or congested compound panicle; caudical leaves up to 8.5 mm long, 2.5 mm wide, entire or dentate; cauline leaves similar or sessile, lanceolate, acute; involucre 12–13 mm long (8–10 mm in m.v. 6); corolla 7.5–9 mm long; ligule 1.5 mm wide, teeth 0.3–0.5 mm long; corolla tube 3.25–5 mm long, slender, glabrous; anther tube (2.25)2.5 × 1 mm dis.; appendages 0.8–0.9 mm long, narrow, acuminate; filaments 0.5–0.75 mm longer; style branches 0.8–1.1 mm long, 0.1 mm wide, obtuse, yellow; achenes 4.5–7 mm long, 0.5–0.7 mm wide, 10–13-ribbed, ribs prominent, rounded, rugulose; pappus 4–6 mm long. See fig. 155.

The type of this subspecies simulates *Crepis elegans* in habit, and upon cursory examination might easily be mistaken for that species. The achenes, floral features, and stoloniferous habit are characteristic of *C. nana typica*; and variants 4, 5, and 6 are intergrades between the two subspecies. It may at first appear that these elongated ramose forms are hardly worthy of recognition as a subspecies, especially when it is realized that the type locality has an elevation of only 1818 m and is in a region of very heavy rainfall. It is believed by the author, however, that these are distinct genetic forms and that they are already well on the way toward differentiation into a species, results of experimental cultures of *C. nana typica* tending to support this view. When grown under favorable conditions in a greenhouse in Berkeley, plants of subsp. *typica*, from seeds collected in N.E. Alaska, were exactly typical, showing no tendency whatever to elongation of the stem or branches. The type of subsp. *ramosa* may therefore be assumed to be an ecospecies in the sense of Turesson, and variants 4 and 6 are probably similar but less extreme genetic types. The existence of a series of intergrading variants between the two subspecies is just what would be expected, if the type of subsp. *ramosa* represents the accumulated result of a large number of mutations by means of which subsp. *typica* has been transformed back again into an upright, elongated ramose plant similar to the one from which it doubtless developed during its gradual adaptation to arctic and alpine conditions.

British Columbia: Rocky Mts., Banff reg. (?), *Bourgeau* in 1858 (G) m.v. 4. **Idaho:** Blaine Co., Smoky Mts., *MacBride and Payson 3740* (G, RM) m.v. 4. **Oregon:** Willowa Mts., Hurricane Cr., *Cusick 1419* (G, CP, Or) m.v. 4. **Washington:** Cascade Mts., Yakima Co., Mt. Adams, *Suksdorf 4147* (G, US, DS, Minn, FM) m.v. 4; Olympic Mts., Clallam Co., Mt. Angeles, talus slopes below cliffs, *Thompson 7398* (Mo, Blake, UC); Jefferson Co., in Marmot Pass, rock slides, 1525 m, *Thompson 9921* (UC); Jefferson Co., near Marmot Pass, talus, *Helmrich 361* (WSC); Iron Mt., near Marmot Pass, coarse talus, *Thompson 7943* (US, Mo, UC); above Lake Constance, talus slopes, *Thompson 7883* (type UC 470750, Mo, Blake, DS). **California:** Yosemite National Park, Koip Pass, *Blasdale* in 1931 (UC) m.v. 5; Sierra Nevada, Farewell Gap, *Purpus 5202* (K, G, UC, Po) m.v. 6; *ibid.*, Excelsior Peak, *Mason 11451* (UC) m.v. 6.

Minor Variants of *C. nana ramosa*

4. Branches subelongated; heads not greatly exceeding the leaves; peduncles short, as in m.v. 6. *Bourgeau* in 1858 (G) Banff reg. (?), Rocky Mts., British Columbia; *MacBride and Payson 3740* (G, Wy) Smoky Mts., Blaine Co., Idaho; *Suksdorf 4147* (G, FM) Mt. Adams, Yakima Co., Cascade Mts., Washington; *Cusick 1419* (G, CP, Or) bars of Hurricane Cr. and adjacent subalpine summits, Willowa Mts., Oregon.

5. Stems numerous from stolons, leafy; leaves narrow, elongated; ligules without purple, except on teeth. This may correspond to *Prenanthes polymorpha* var. *flaccida* Ledeb., Fl. Alt. 4: 144, 1833. It may be merely an extreme ecad of subsp. *typica* caused by partial burial under detritus. *Blasdale* in 1931 (UC) Koip Pass, Yosemite National Park, Sierra Nevada, California.

6. Leaves more as in subsp. *typica*; heads shortly pedunculate, and mostly in small clusters at the ends of the branches (fig. 155, a-g). *Purpus* 5202 (K, G, UC, Po) Farewell Gap, Sierra Nevada; *Mason* 11451 (UC) Excelsior Peak, Sierra Nevada, California.

Relationship

Crepis nana is very closely related to *C. elegans*, of which it is probably the progenitor. Although the two cannot certainly be distinguished by presence or absence of the beak of the achenes, as Hooker thought, yet the achenes differ constantly in shape, those of *C. nana* being always more columnar and broader at the base; also, the ribs of *C. nana* are broader and merely faintly rugulose, whereas in *C. elegans* they are narrower and definitely spiculate. Furthermore, the stoloniferous habit so characteristic of *C. nana ramosa* is never seen in *C. elegans*. Differences in floral characters are noted under *C. elegans*. Another very closely related species is *C. lactea*, which has comparatively large light red florets and long anther tubes, with longer truncate appendages. The next nearest relatives are *C. flexuosa*, *C. naniforma*, *C. alaica*, and *C. corniculata*, which are very distinct in numerous characters.

108. *Crepis elegans* Hook.

Fl. Bor. Am. 1: 297. 1834. (Fig. 156.)

Glabrous perennial, 1.5–2.5 dm high and as broad or broader; caudex 4–6 mm wide, cylindrical or conical, rugose or scaly, simple or 2–4-divided, tapering into a strong woody taproot; stems several or numerous, stiffly erect or semierect, terete, striate, dichotomously branched from the base upward, in older plants excessively branched, forming a dense obconical clump topped by a mass of flower heads; caudical leaves numerous, up to 6 cm long, 1.5 cm wide, spatulate, blade elliptic or ovate, acute, entire or coarsely dentate, constricted below into a narrow petiole equal to or longer than the blade with broader clasping base, glaucous and purplish; cauline leaves linear, acuminate, petiolate or sessile, uppermost bractlike; heads erect, small, 6–10-flowered; involucre cylindrical, 8–10 mm high, 2–3 mm wide; outer bracts 7–8, very short, unequal, ovate or oblong-lanceolate, acute; inner bracts 8–10, equal, oblong, acute or obtuse, purple at apex, in 2 ranks, inner ones broadly scarious-margined, glabrous on inner face, becoming carinately spongy-thickened, ultimately reflexed; receptacle areolate, glabrous; corolla in marginal florets 8 mm long; ligule 1 mm wide; teeth 0.2–0.25 mm long; corolla tube 4 mm long, very slender, glabrous, epidermal cells with prominent transverse septa simulating minute protuberances; anther tube 2.75×0.6 mm dis.; appendages 1 mm long, very narrow, acuminate; filaments 0.75 mm longer; style branches 0.5 mm long, yellow; achenes golden brown, 5 mm long, very slender, fusiform, subterete or definitely flattened on one side, attenuate into a delicate beak $\frac{1}{4}$ as long as body, with expanded pappus disk, attenuate or constricted to the very narrow calloused base, 10-ribbed, ribs narrow, spiculate; pappus white, 4 mm long, 1-seriate, very fine, soft, caducous. Flowering June–Sept.; flowers yellow. Chromosomes, $2n = 14$.

Barkhausia elegans Nutt., Trans. Am. Philos. Soc. 7: 485. 1841.

Hieraciodes elegans O. Kuntze, Gen. 1: 346. 1891.

Youngia elegans Rydb., Fl. Rocky Mts. 1021. 1917.

North America, from central Alaska south to Alberta, Saskatchewan, Montana, and Wyoming; along river banks, on sand bars, occasionally on dry plains and bluffs, 600–1500 m alt.

Monomorphic.

Alaska: Alaska Range, McKinley National Park, near middle of N. boundary, Moose Cr., sandy bar, *Mexia* 2171 (UC); Alaska, Lynn Canal reg., in sand, *Krause* 436 (B). Canada: