

From that species it differs in its small corollas and in invariably having strigose pubescence. The variety intergrades with *C. intermedia* and through it *C. nevadensis*, var. *genuina* is related to *C. intermedia* and eventually to *C. barbiger*. The axial nutlet of *C. nevadensis*, var. *genuina* is frequently somewhat smoother than the others and usually has a closed groove.

31. ***C. scoparia*** Nels. Erectly branched stiff usually strigose herb 1–3.5 dm. high; stems closely short-strigose and frequently also sparsely hispid; leaves linear to lance-linear, obtuse, 2–4 cm. long, 1–3 mm. broad, strictly ascending, strigose or appressed-hirsute, finely pustulate; spikes stiff, naked, solitary or geminate, 2–10 cm. long; corolla inconspicuous, tube about equalling calyx, limb ca. 1 mm. broad; fruiting calyx ovate-oblong, 5–6 mm. long, strictly ascending, sessile, slightly asymmetrical, becoming rather obscurely biserial at maturity and 5–10 mm. distant; mature calyx-lobes lance-linear, stiffish, usually subconnivent above with the herbaceous tips somewhat spreading, midrib thickened and hirsute, margins shortly canescent-villous, axial lobe slightly the longest; nutlets 4, homomorphous, lanceolate to broadly lanceolate, 1.8–2.2 mm. long, antrorsely spinulose-muriculate especially towards apex, margins and base rounded, groove narrow and forked below where occasionally open to form a small triangular areola; gynobase subulate, about  $\frac{3}{4}$  height of nutlets; style reaching to tip of nutlets.—Bot. Gaz. liv. 144 (1912); Macbr. Contr. Gray Herb. n. s. xlviii. 48 (1916). *C. muriculata*, var. *montana* Nels. Erythea vii. 69 (1899).

Southwestern Wyoming, southern Idaho and eastern Washington.

WYOMING: Granger, 1898, *Nelson* (G, ISOTYPE of *C. muriculata*, var. *montana*). IDAHO: loose, disturbed soil near road, Challis, 1620 m. alt., *Macbride & Payson* 3221 (G); Big Butte Station, *Palmer* 204 (G); Aberdeen, *Piper* 5030 (G); sagebrush land, Minidoka, *Nelson & Macbride* 1801 (G), 1311 (G, ISOTYPE of *C. scoparia*); dry slopes, Castleford, *Nelson & Macbride* 2231 (G); Buhl, *Nelson & Macbride* 1703 (G). UTAH: Ogden Hot Springs, 1903, *Stokes* (UC). WASHINGTON: plains, Morgan's Ferry, *Suksdorf* 405 (G) and 1494 (UC).

In gross habit much suggesting *C. nevadensis*, but differing in its shorter fruiting calyces and particularly in its spinulose nutlets. In addition to these morphological differences the ranges of *C. nevadensis* and *C. scoparia* are separated by the northern half of Nevada.

Ser. VIII. MURICATAE. Nutlets 4, verrucose or coarsely tuberculate, triangular-ovate, decidedly homomorphous, back obtuse and bearing a suggestion of a medial ridge, with sides evidently

angled and beaded; style usually surpassing the nutlets though rarely only equalling them.

32. **C. muricata** (H. & A.) Nels. & Macbr. A tawny-green erect hirsute herb 1–10 dm. tall; stems solitary or several, conspicuously hirsute and rarely also short appressed-hirsute, usually stiff, branches few and ascending or paniculate; leaves linear to oblance-linear, 1–5(–9) cm. long, 2–4 mm. broad, villous-hirsute, usually inconspicuously pustulate; spikes few to very numerous, naked, geminate to quinate, 2–15 cm. long; corolla minute to conspicuous, 1–7 mm. broad; appendages well developed; fruiting calyx, ovate, 2–4 mm. long, deciduous, subsessile, older ones obscurely biserial; mature calyx-lobes lanceolate, decidedly connivent, once to twice length of nutlets, margins short-hispid, midrib thickened and tawny-hirsute; nutlets 4, homomorphous, ovate-triangular, 1.5–2.5(–3) mm. long, lucid or dull, verrucose or tuberculate, frequently somewhat granulate, margin angled and usually beaded, base truncate, back frequently obtuse-angled, groove narrow or closed and towards base broadly forking or dilated into a small areola; gynobase elongate, about  $\frac{4}{5}$  length of nutlets; style much surpassing the nutlets or rarely scarcely reaching them.—Bot. Gaz. lxi. 42 (1916).

Var. **genuina**. Corolla conspicuous, 2–7 mm. broad; stems with (usually a few) well developed terminally floriferous lateral branches; spikes for the most part not especially numerous.—*Myosotis muricata* H. & A. Bot. Beechey 369 (1840). *C. muricata* Nels. & Macbr. l. c. *Eritrichium muriculatum* A. DC. Prodr. x. 132 (1846). *Krynitzkia muriculata* Gray, Proc. Am. Acad. xx. 273 (1885). *C. muriculata* Greene, Pittonia i. 113 (1887). *C. horridula* Greene, Pittonia v. 55 (1902).

Western California in and along the Coast Ranges from Monterey to Los Angeles counties.

CALIFORNIA: Point Sur, 1888, *Brandege* (UC); Sur River, 1893, *Eastwood* (UC); Salinas River, 1885, *Curran* (UC, ISOTYPE of *C. horridula*?); Santa Lucia, 1897, *Plaskett* (UC); Pine Mts. back of San Simeon Bay, *Palmer 376* (G, UC); San Simeon, 1888, *Brandege* (UC); Salinas River near Poza, 1902, *Eastwood* (G, UC); Painted Cave Ranch, *Eastwood 66a* (G); Santa Barbara, 1889, *K. Brandege* (UC); dry hills near sea, Ventura, *Brewer 232* (G, UC); Topatopa Mts., 1650 m. alt., *Abrams & McGregor 94* (G); Santa Clara River, 1885, *Gray* (G); creek arroyo, Ojai Valley, *Hubby 24* (G); Sulphur Mt., *Hubby 23* (G); Oakgrove Canyon, Liebre Mts., 900–1200 m. alt., *Abrams & McGregor 343* (G); Leonis Valley, Antelope Valley, *Davy 1648* (UC); creek bed, Saugus, *K. Brandege* (G, UC); Topango Canyon, Santa Monica Mts., *Crawford & Hiatt 326* (G); Sepulveda Canyon, Santa Monica Mts., *Abrams 2555* (G, UC); South Beach, 1898, *Barber* (UC); Los Angeles, 1880, *Nevin* (G); Pasadena, *Grant 238* in pt. (G); without locality, *Douglas* (G, ISOTYPE of *M. muricata*).

Var. **Jonesii** (Gray) Johnston. Corolla inconspicuous, 1–2.5 mm. broad; stems commonly solitary and erect or several and fastigiate, clothed to below middle with numerous very short floriferous branchlets; spikes usually short, very numerous, grouped to form an elongate leafy paniculate inflorescence.—Plant World xxii. 114 (1919). *Krynitzkia Jonesii* Gray, Proc. Am. Acad. xx. 274 (1885). *C. Jonesii* Greene, Pittonia i. 113 (1887). *C. vitrea* Eastw. Proc. Calif. Acad. Sci. ser. 3, ii. 292 (1902); Fl. S. Fk. Kings River 77 (1902).

Middle and Southern California and the northern part of Lower California.

CALIFORNIA: gravelly slopes, Alder Springs, Glenn Co., Heller 11449 and 11450 (G); Lake County, 1898, Purpus (UC); Mt. St. Helena, K. Brandegee (G, UC); Tamalpais, 1892, Bioletti (G); along railroad above West Point, Tamalpais, 1907, K. Brandegee (UC); Mt. Tamalpais, 1899, Congdon 40 (G); Tamalpais, 1892, K. Brandegee (UC); above Whitlocks, Mariposa Co., 1897, Congdon 52 (G); Yosemite, 1897, Congdon 41 (G); Leavitts Meadow, 1898, Congdon (G); Bubbs Creek, S. Fk. of Kings River, 1899, Eastwood (G, part of TYPE of *C. vitrea*); Tenaya Trail, Yosemite Nat. Park, 1650 m. alt., Hall 8940 (UC); Ben Lomond, Santa Cruz Co., 1890, Brandegee (UC); Soledad, 1882, Jones (G); Santa Cruz, Jones 2810 (G, TYPE of *K. Jonesii*); above Alma Soda Springs near "French Settlement," Santa Clara Co., Heller 7491 (G, UC); Santa Cruz Island, 1888, Brandegee (UC); Santa Cruz Island, 1886, Greene (UC); dry sandy ground near Upland, 360 m. alt., Johnston 1958 (G); side of road, San Antonio Canyon, 720 m. alt., Johnston 2048a (G); Summit of Cajon Pass, Spencer 345 (G); sandy wash, Highland, 300 m. alt., Spencer 1306 (G), dry sandy ground, San Bernardino, 360 m. alt., Johnston 1886 (G); foothills, San Bernardino, Parish 929 (G); dry mesas, San Bernardino Valley, 300 m. alt., Parish 11118 (G, UC); stony sandy slopes, Banning, 692 m. alt., Spencer 1781 (G); San Jacinto Valley, 1897, Reinhardt (UC); Chalk Hill, San Jacinto Mts., 1500 m. alt., Hall 2052 in pt. (UC); Palamar Mts., 1200 m. alt., Chandler 5355 (UC); Ramona, 1894, Brandegee (UC); Mesa Grande, 1220 m. alt., Spencer 1178, 1302 and 1303 (G); Witch Creek, 1894, Anderson (G); Lakeside, 1894, Brandegee (UC); mesa, La Jolla, Clements 108 (G, UC); in chaparral, vicinity of San Diego, 520 m. alt., Spencer 38 (G, UC); Mission Hills, San Diego, Abrams 3418 (G); Point Loma, 1906, K. Brandegee (UC); Point Loma, 1902, Brandegee 1646 (G, UC). LOWER CALIFORNIA: Todos Santos Bay, 1885, Greene (UC); near U. S. border, 1884, Orcutt 1022 (G); near Jamul, 1885, Orcutt 1281 (G); Topa, 1884, Orcutt 1127 (G); Vallederos, 1893, Brandegee (UC).

Var. **denticulata** (Greene), comb. nov. Corolla inconspicuous, 1–2 mm. broad; plant with a few well developed loose branches; spikes not numerous; nutlets usually larger than in var. *Jonesii*.—*Krynitzkia denticulata* Greene, Bull. Calif. Acad. Sci. i. 205 (1885). *C. denticulata* Greene, Pittonia i. 114 (1887). *C. densiflora* Nels. & Kenn. Proc. Biol. Soc. Wash. xix. 156 (1906).

Western Nevada and adjacent California, southward to western Arizona and the mountains of Southern California

NEVADA: Dog Valley Road, 1895, *Hillman* (UC); Clear Creek Canyon, 2000–2615 m. alt., *Baker 1381* (G, UC); Reno, 1884, *Curran* (G); near Reno, 1893, *Hillman* (UC); along railroad above Laughton's, 1894, *Hillman* (UC), Verdi, 1904, *Kennedy 952* (UC, ISOTYPE of *C. densiflora*); Hunter Creek, Washoe Co., 1800 m. alt., *Kennedy 1917* (G); western Nevada, 1884, *Curran* (G, UC, ISOTYPES of *K. denticulata*). ARIZONA: mesas near Camp Lowell, 1881, *Pringle*; Skull Valley, 1290 m. alt., 1903, *Jones 7028* (UC); Yucca; 1884, *Jones 26* (G). CALIFORNIA: Truckee, 1887, *Sonne* (UC); Donner Lake, 1888, *Curran* (UC); Summit Station, Placer Co., 2083 m. alt., *Heller 12886* (G); Mammoth, 1913, *K. Brandegeee* (UC); open pine woods, Mt. Wilson, *Abrams 2590* (G); dry rocky canyon floor, Coldwater Fk. of Lytle Creek, 2100 m. alt., *Johnston 2073* (G, UC); rocky ground under pines near head of N. Fk. Lytle Creek, 2250 m. alt., *Johnston 2077* (G, UC); sunny rocky summit, Telegraph Peak, 2700 m. alt., *Johnston 1542* (G); open place on canyon floor, N. Fk. San Antonio Canyon, 2400 m. alt., *Johnston 1598* (G, UC); dry sunny canyon side, San Antonio Canyon, 1110 m. alt., *Johnston 1950* (G); Little Green Valley, *Hall 12* (UC).

A species readily recognized by its ovate-triangular nutlets, tawny pubescence, and characteristic yellowish-green herbage. It breaks up into three intergrading varieties. The var. *genuina*, characterized by its large corollas, occurs in western California. It varies noticeably in the size of the nutlets and fruiting calyces. The type of *C. muricata* is one of the coarse, large-flowered forms and was probably collected by Douglas somewhere between Monterey and Santa Barbara. The other varieties are small-flowered. The var. *Jonesii* commonly assumes a peculiar erect habit by which it can be distinguished at a glance from all other forms in the genus. The stems are usually single or several and fastigiate, and are erect, producing in the upper half or two-thirds abundant very short floriferous branchlets. Rarely the plant becomes diffusely branched. The distribution of var. *Jonesii* is peculiar. It occurs in the Coast Ranges from Santa Cruz to Glenn County, and in the middle Sierra Nevada. Jumping the several hundred kilometers occupied by the var. *genuina* it reappears in the vicinity of San Bernardino and is frequent from there south into Lower California. The var. *denticulata* is perhaps unworthy of recognition since it is frequently distinguishable from the var. *Jonesii* only with difficulty. It differs chiefly in habit, being sparsely and loosely long-branched. It grows in western Nevada in the general region of Reno, in California about Truckee, in western Arizona and in the pine belt of Southern California. The material from Nevada usually has coarsely granulate nutlets and perhaps might be separable from the southern material that I have associated with it.

Ser. IX. AMBIGUAE. Nutlets 1–4, smooth to papillate or tuberculate, ovate, dorsally low-convex, laterally rounded or obtuse