

23. *C. minima* Rydb. Erect or widely spreading hirsute herb 1-1.5(-2) dm. high; stems usually numerous, branched, finely strigose and coarsely hirsute; leaves oblanceolate, thickish, 1-3 cm. long, 2-4 (-5) mm. broad, obtuse or rounded, hispid or hirsute and usually pustulate, upper ones little reduced and continuing through inflorescence as evident foliaceous bracts; spikes solitary or rarely geminate, bracted, 2-8(-15) cm. long, frequently springing from even the lowest axils; corolla inconspicuous, 1-1.5 mm. broad; fruiting calyces oblong-ovate, 5-7(-9) mm. long, spreading, asymmetrical; pedicels short but definite, 0.5-1.2 mm. long; mature calyx-lobes linear-lanceolate, connivent above, midrib hirsute and strongly indurated and thickened, margins sparsely appressed-hispid; nutlets 4, heteromorphous; odd nutlet persistent, next the axial calyx-lobe, 2-3 mm. long, brownish, very finely and closely papillate-granulate, ovate, acute; consimilar nutlets 1.2-1.5 mm. long, ovate, thickish, strongly tuberculate, not granulate; groove broadly dilated at least to beyond middle, commonly excavated, not forked; gynobase oblong, slightly more than  $\frac{1}{2}$  length of consimilar nutlets; style evidently surpassed by odd nutlet, equalling or surpassing consimilar nutlets.—Bull. Torr. Bot. Cl. xxviii. 31 (1901).

Plains east of continental divide from Saskatchewan southward to northern Texas; occurring west of the mountains only in southwestern Colorado.

SASKATCHEWAN: Medicine Hat, *Macoun 5803* in pt. (G). MONTANA: Great Falls, 1887, *Anderson* (UC). WYOMING: Blue Grass Hills, *Nelson 304* (G, UC). COLORADO: Castle Rock near Golden, 1800 m. alt., *Patterson 111* in pt. (G); near Golden, *Greene 301* (G); Ft. Collins, 1896, *Crandall* (UC); lat. 39°-41°, *Hall & Harbour 433* and *434* (G); 10 km. north of Pueblo, *Johnston & Hedgcock 509* (G); Canyon City, *Brandegee 406* (G, UC); Cuchara River, above La Veta, 2100 m. alt., *Rydberg & Vreeland 5697* (NY, TYPE); dry adobe flats and foothills, Paradox, 1620 m. alt., *Walker 155* (G); dry hillsides, Naturita, 1620 m. alt., *Payson 296* (G); without locality, 1842, *Freemont* (G). SOUTH DAKOTA: Bad Lands, 1881, *Hatcher* (UC). NEBRASKA: Kennedy, 1890, *Bates* (G); Callaway, 1901, *Bates* (G); Harrison, 1890, *Bates* (G); top of butte, Ft. Robinson, 1200 m. alt., *Bessey 1* (G). KANSAS: Ellis, 1876, *Watson* (G); plains, Ellis, *Hitchcock 346* (G). OKLAHOMA: low waste place, Waynoka, *Stevens 598* (G); sandy waste places, Alva, *Stevens 245, 616, 664* and *3040* (G); waste place, Shattuck, *Clifton 3083* and *3139* (G); waste place, Hornbeck's, *Stevens 282* (G). TEXAS: sandy plains, upper Colorado, *Reverchon 2120* (G); Big Wichita, 1880, *Ball* (G).

Although a very readily recognized species, *C. minima* has not been distinguished from its southerly ranging relative, *C. crassisejala*. *Cryptantha minima* has thick, hardened calyx-lobes and a gross habit very similar to that possessed by *C. crassisejala*, but differs very sharply in having definitely bracted inflorescences and in the fact that

the odd nutlet is simply papillate-granulate rather than covered with spiculate murications. The ranges of *C. minima* and *C. crassisejala* overlap only in southwestern Colorado. In the northern part of its range *C. minima* grows with *C. Kelseyana*, and, strange to say, has been frequently confused with it, although *C. minima* can at once be separated by its stockier nutlets with larger areolae, and, of course, by its bracteate inflorescence.

The name *C. minima* was originally proposed to cover certain material thought to be related to *C. pusilla*. An examination of the type, however, shows clearly that it is a very reduced form of the species here treated, and that though inappropriate, it is the name to be taken up for the bracteate material from the Great Plains until now passing as *C. crassisejala*.

24. *C. crassisejala* (T. & G.) Greene. Erect or widely spreading herb 5-15 cm. high; stems commonly numerous, loosely ascending, branched, hirsute or rarely hispid; leaves oblanceolate, 2-3(-6) cm. long, 3-4(-6) mm. wide, rounded or obtuse, thickish, hirsute, pustulate, the upper scarcely reduced; spikes solitary or rarely geminate, naked or few-bracted below, 5-8(-15) cm. long, frequently produced from the lowest axils; corolla inconspicuous, 1-1.5 mm. wide; fruiting calyces 6-7(-10) mm. long, oblong-ovate, somewhat asymmetrical, becoming distant below; mature calyx-lobes linear-lanceolate, connivent above, midrib very hirsute and strongly thickened and indurated, margins inconspicuously short-hispid; pedicels short but definite, 0.5-1.2 mm. long; nutlets 4 (1 or 2 rarely aborted), decidedly heteromorphous; odd nutlet next the axial calyx-lobe, persistent, 2-2.5(-3) mm. long, brownish, ovate, acute, finely granulate and spinular-muricate; consimilar nutlets readily deciduous, 1.2-1.5(-2) mm. long, oblong-ovate, thickish, coarsely tuberculate, very obscurely if at all granulate, groove usually dilated and commonly excavated to form an areola occupying much of the ventral face of the nutlet; gynobase narrowly oblong, usually about  $\frac{2}{3}$  height of consimilar nutlets; style equalling or a trifle exceeding the consimilar nutlets, surpassed by odd nutlet.—*Pittonia* i. 112 (1887). *Eritrichium crassisejalum* T. & G. Pacif. R. R. Rep. ii. pt. 4, 171 (1855). *Krynitzkia crassisejala* Gray, Proc. Am. Acad. xx. 268 (1885). *C. dicarpa* Nels, Proc. Biol. Soc. Wash. xvi. 30 (1903).

Southwestern Colorado and southern Utah southward to western Texas, Arizona and adjacent Mexico.

COLORADO: Deer Run, Gunnison Watershed, 1380 m. alt., *Baker 75* (G); Grand Junction, 1892, *Eastwood* (G, UC); dry sandy flat, Grand Junction,

*Macbride & Payson 689* (G). UTAH: Cisco, 1890, *Jones* (G, UC); Price, 1895, *Stokes* (UC); Green River, 1890, *Jones* (UC). NEW MEXICO: Ft. Wingah, *Mathews 40* (G); Gila River bottom near Cliff, 1350 m. alt., *Metcalf 52* (G, UC); Santa Fe, *Fendler 640* (G); Hueco Mts., *Thurber 61* (G); Albuquerque, *Jones 3709* (UC); mesa west of Organ Mts., 1200 m. alt., 1905, *Wootton* (G, UC); Silver City, *Eastwood 8401* (G). ARIZONA: Camp Lowell, 1883, *Pringle* (UC); Chino Valley, *Tuomey 240a* (UC); Clifton, *Davidson 501a* (UC); Aztec Ruins, Little Colorado, 1905, *Purpus* (UC); Verde Mesa, *Smart 141* (G); Douglas, 1200 m. alt., *Gooding 2273* (G, UC); Tucson, 1907, *Lloyd* (G); Bernardino, 1902, *Orcutt* (UC); without locality, 1882, *Pringle* (UC). TEXAS: vicinity of permanent camp on Rio Pecos, April 6-7, 1856, *Pope Exped.* (G, ISOTYPE?); abundant on sandy hills northeast of El Paso, *Hanson 402* (G, NY); western Texas, March 9th, *Wright* (G). CHIHUAHUA: sandy soil, Juarez, 1905, *Purpus* (UC); San Diego, 1800 m. alt., *Hartman 612* (G, UC).

*Cryptantha crassisejala* is a very interesting and readily recognized species most related to *C. minima*. Although it usually produces four nutlets some forms of it regularly mature only two or three. It is one of these forms, indistinguishable in other respects, that was made the type of *C. dicarpa*. The consimilar nutlets of *C. crassisejala* and *C. minima* are rather thick for their breadth. In this respect, as well as in general contour, they strikingly simulate the nutlets of *C. albida*, a species not closely related. The only material suggestive of a condition intermediate between *C. minima* and *C. crassisejala* is Eastwood's collection from Grand Junction. In that collection nutlets typical of *C. minima* are associated with the naked inflorescence and habit of *C. crassisejala*.

Ser. VII. BARBIGERAE. Nutlets 1-4, verrucose or muricate, lanceolate to ovate-lanceolate, dorsally convex, laterally rounded or obtuse, homomorphous with the abaxial one always developing; style reaching only to  $\frac{1}{3}$  height of nutlets or in varying degrees longer, sometimes even somewhat surpassing them.

- Nutlets normally solitary or rarely 2; style reaching  $\frac{1}{3}$ - $\frac{1}{2}$  height of nutlets.....25. *C. decipiens*.  
 Nutlets normally 4; style reaching  $\frac{2}{3}$  height of nutlets or beyond.  
 Spike solitary; style evidently surpassing nutlets.....26. *C. patula*.  
 Spike geminate or ternate; style almost always shorter than nutlets.  
 Hairs arming calyx-lobes very coarse, subobese; plant usually with an erect central axis; insular endemic....27. *C. foliosa*.  
 Hairs arming calyx-lobes slender, not conspicuously thickened; plant irregularly branched.  
 Corolla conspicuous; hirsute plants almost confined to coastal drainage of California.....28. *C. intermedia*.  
 Corolla inconspicuous; plants of the Great Basin and Californian deserts.  
 Plant spreading hirsute.....29. *C. barbiger*.

Plant with appressed hairs.

- Nutlets verrucose or verrucose-muricate.....30. *C. nevadensis*  
 Nutlets spinular-muricate.....31. *C. scoparia*.

25. *C. decipiens* (Jones) Heller. Loosely branched herb 1-4 dm. high, slender, strigose and frequently short-hispid; leaves rather few, linear, obtuse, 1-3 cm. long, 1-3(-4) mm. broad, strigose and sometimes hispid, minutely pustulate; spikes geminate or rarely ternate or solitary, slender, becoming loosely flowered or congested, 4-10 cm. long, naked; corolla inconspicuous to conspicuous, 0.8-3.5 mm. broad; fruiting calyces ovate to ovate-oblong, strictly ascending, asymmetrical, 2.5-7(-9) mm. long, deciduous, sessile; mature calyx-lobes lance-linear, decidedly connivent above with the tips frequently spreading or even recurving, midrib thickened and usually evidently hirsute, margins strigose, abaxial lobe evidently the longest and most hirsute; ovules 4; nutlets 1 or rarely 2, next the abaxial calyx-lobe, ovate-lanceolate or occasionally narrowly ovate, 1.5-2.4 mm. long, usually granulate or muricate-granulate, muricate-papillate or low-tuberculate, usually brownish, back convex, sides rounded, groove open or closed but always dilated below to form a definite areola; gynobase short,  $\frac{1}{3}$ - $\frac{1}{2}$  height of nutlet; style much surpassed by nutlet,  $\frac{1}{2}$ - $\frac{2}{3}$  the height of nutlet.—*Muhlenbergia* viii. 48 (1912).

Var. *genuina*. Corolla inconspicuous, less than 1 mm. broad.—*Krynitzkia decipiens* Jones, Contr. W. Bot. xii. 6 (1910). *C. decipiens* Heller, l. c.

Southern Nevada, western Arizona and Southern California.

NEVADA: Logan, *Kennedy 1838* (G, UC); Rhyolite, 1072 m. alt., *Heller 9632* (G). ARIZONA: Hot Springs, 1892, *Tuomey* (UC). CALIFORNIA: Kernville, *Brandegee* (UC); sandy places near Palm Springs, 120 m. alt., *Spencer 2072* (G); desert sand, mouth of Tahquitz Canyon, 210 m. alt., *Spencer 1522* (G); Whitewater, 300 m. alt., *Jones* (UC); without locality, *Palmer 150* (G).

Var. *corollata*, var. nov., a varietate genuina differt corolla conspicua 2-3.5 mm. lata.

Extreme western margin of the Mohave Desert and the adjacent coastal slopes.

CALIFORNIA: Fort Tejon, *Xantus 85* (G); Sespe Creek near Ten Sycamore Flat, *Abrams & McGregor 173* (G); Matilija Canyon, Ojai Valley, 1896, *Hubby 20* (G); towards foothills, Ojai Valley, 1896, *Hubby 21* (G, TYPE); Roble Canyon, San Rafael Mts., 1020 m. alt., *Hall 7408* (G, UC); Santa Inez Mts., 1888, *Brandegee* (UC); Huron, Fresno Co., *Brandegee* (UC); without locality, *Brandegee* (UC).

This species is probably most related to *C. intermedia* and *C. nevadensis* and has been somewhat confused with them. It differs, how-