

Annals of the Missouri Botanical Garden

Vol. 14

SEPTEMBER, 1927

No. 3

A MONOGRAPH OF THE SECTION OREOCARYA OF CRYPTANTHA¹

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INTRODUCTION

The group of plants treated in the present monograph is remarkably characteristic of the Upper Sonoran areas of the Great Basin region, although a few species are native to the eastern foothills of the Rocky Mountains, one or two have penetrated to the Canadian plains and two or three occur in northern Mexico and adjacent Texas. In western Colorado, Utah, Nevada, and southern Wyoming one or more species may be found on almost any barren hillside. Many seem to prefer soils that are so strongly impregnated with mineral salts that few other plants can compete with them. No species seems to be able to tolerate a moist or undrained situation.

These plants are often transient occupants of any habitat. They seem particularly at home on shifting or disturbed soil. A loose hillside or shale outcrop is a favorite locality for the commoner kinds. And yet they are never weeds in cultivated ground—that distinction is reserved for the annual members of the genus. What the factors are that determine this tendency to occupy changing habitats is as yet unknown to the author—one of many ecological problems suggested by the present study.

The members of the section *Oreocarya* are very similar in general appearance. They are usually gray with numerous trichomes and in most cases are beset with harsh bristles that render

¹ Issued October 8, 1927.

² Since the receipt of the manuscript of this paper, Dr. Payson passed away on May 15, 1927.

14. *C. insolita* (Macbr.) new comb. Plate 26, figs. 35-37.

Oreocarya insolita Macbr. Contr. Gray Herb. 48: 28. 1916.

Biennial (or short lived perennial?) from a rather slender root; stems one to several, rather stout, erect, 1.5-4 dm. high, abundantly setose and rather coarsely strigose; leaves clustered at the base, spatulate, obtuse, 3-5 cm. long, dorsal surface subtomentose and rather sparsely appressed-setose and pustulate, ventral surface similar but setae smaller and fewer, pustules rather few and small, petioles abundantly long-hairy at the base, otherwise scarcely ciliate; inflorescence mostly confined to the upper $\frac{1}{4}$ or $\frac{1}{2}$ of the stem, cymes rather few (for the genus) and conspicuously elongating, inflorescence abundantly but rather weakly setose, bracts inconspicuous; calyx densely hirsute, conspicuously setose with rather short weak bristles; sepals in anthesis linear-lanceolate, acute, about 4 mm. long, in fruit about 8 mm. long, exceeding the nutlets by about 4 mm.; corolla white, tube about 3 mm. long, equalling or somewhat shorter than the sepals, crests at the base of the tube well developed, fornicies 0.5-1 mm. long, probably yellow, minutely papillose, slightly emarginate, limb about 7 mm. broad, lobes and tube subequal, lobes united for about $\frac{1}{4}$ their length; fruit broadly ovoid, 1-4 nutlets maturing, style exceeding the nutlets by 1-1.5 mm.; nutlets ovate, obtuse or acute, 4 mm. long, margins in contact or nearly so, acute, surfaces of nutlets dull or slightly glossy, the dorsal more or less carinate, tuberculate, granulo-muriculate and sometimes slightly rugose, ventral surface tuberculate and somewhat rugose, scar narrow but slightly open, the margin showing some tendency to be elevated.

Distribution: lower part of the Upper Sonoran Zone, southern Nevada. Type: Las Vegas, Nevada, May 4, 1905, *L. N. Goodding 2286*.

Specimens examined:

Nevada: Las Vegas, May 4, 1905, *Goodding 2286* (R.Mt., Minn., Mo., Gray, TYPE); Las Vegas, *K. Brandegee* (Calif.); Las Vegas, April 29, 1905, *Jones* (Pomona).

C. insolita is probably most closely related to *C. virginensis* and *C. tumulosa*. The differences between them, which it will be noticed are mostly those of habit rather than of nutlet peculiarities, may be summarized in the following way:

<i>C. tumulosa</i>	<i>C. insolita</i>	<i>C. virginensis</i>
Perennial.	Biennial.	Biennial.
Stems 1-2.5 dm. high.	Stems 1.5-4 dm. high.	Stems 1.5-4 dm. high.
Leaves setose below, with subappressed bristles.	Leaves inconspicu- ously setose below with appressed bristles.	Leaves conspicuous- ly setose below with spreading bristles.
Inflorescence narrow, cymes short.	Inflorescence broad, cymes elongating, very numerous, flowers crowded.	Inflorescence broad, cymes elongating, few, and flowers rather distant.
Nutlets slightly carinate.	Nutlets distinctly carinate.	Nutlets distinctly carinate.
Dorsal surface with low indefinite tu- bercles.	Dorsal surface with short definite tu- bercles.	Dorsal surface with sharp definite tu- bercles.

In general appearance this species is very similar to *C. elata* of Grand Junction, Colorado. However, it is doubtful if the two species are closely related.

15. *C. virginensis* (Jones) new comb. Plate 27, figs. 38-40.
Krynitzkia glomerata var. *virginensis* Jones, Contr. West. Bot.
13: 5. 1910.

Oreocarya virginensis (Jones) Macbr. Proc. Am. Acad. 51: 547.
1916.

Biennial from a rather stout taproot; stems 1-many from the base, stout, 15-40 cm. high, conspicuously setose with divaricate bristles; leaves oblanceolate or spatulate, obtuse, 5-12 cm. long, rather sparsely setose, slightly hirsute and distinctly subtomentose on the dorsal surface, abundantly pustulate, ventral surface rather sparsely pustulate, weakly appressed-setose and subtomentose, at times subsericeous; inflorescence extending over $\frac{3}{4}$ or more of the stem, very floriferous; not interrupted, becoming a broad thyrsus in which the individual cymes are much elongated, densely setose, in age usually fulvous, lower foliar bracts often conspicuous and somewhat reflexed; calyx densely setose, sepals in anthesis lanceolate, about 4 mm. long, acute, in fruit linear,

10–12 mm. long, exceeding the nutlets by about 6 mm.; corolla white, tube 3–4 mm. long, equalling or slightly shorter than the sepals, crests at base of tube well developed, fornices conspicuous, probably yellow, nearly 1 mm. long, oblong, emarginate, conspicuously papillose, limb 6–8 mm. broad, lobes and tube subequal, lobes united for about $\frac{1}{3}$ their length; fruit ovoid, 1–2 nutlets usually maturing, style exceeding nutlets by about 1 mm.; nutlets lance-ovate, obtuse, about 4.5 mm. long, margins in contact, acute, surfaces of nutlets somewhat glossy, the dorsal usually distinctly carinate, sharply tuberculate and somewhat rugose, surface between the tubercles uneven, ventral surface very uneven with indeterminate rugae and tubercles, scar narrowly triangular, some tendency evident to an elevated margin.

Distribution: lower part of Upper Sonoran Zone, southwestern Utah, southern Nevada, southeastern California. Type: La Verken, Utah, May 8, 1894, *M. E. Jones 5195a*.

Specimens examined:

Utah: Valley of the Virgin near St. George, 1874, *Parry 173* (Field, N.Y., Gray); Diamond Valley, May 16, 1902, *Goodding 830* (R.Mt., Pomona, Mo., U.S., Gray); Diamond Valley, April 28, 1894, *Jones 5125* (R.Mt., Pomona, Calif., Mo., U.S.); La Verken, May 8, 1894, *Jones 5195a* (Pomona, TYPE, R.Mt., Calif., Mo., U.S.).

Nevada: Muddy Valley, Lincoln Co., May 16, 1906, *Kennedy & Goodding 78* (Calif., Mo., U.S.); Vegas Valley, Lincoln Co., May 1, 1891, *Bailey, Coville & Funston 1888* (U.S.); Las Vegas, *K. Brandegee* (Pomona); Gold Mountain, 1898, *Purpus* (Calif.); Indian Spring, Charleston Mts., May 7, 1906, *Jones* (Pomona); Good Springs, April 30, 1905, *Jones* (Pomona); Tonopah, April 24, 1907, *Jones* (Pomona); Amargosa Desert, April 27, 1907, *Jones* (Pomona).

California: Panamint Canyon, May 4, 1897, *Jones 6728* (Pomona); above Barstow, April 18, 1921, *Jaeger 1113* (Pomona).

C. virginensis is in general appearance more like *C. thyrsiflora* than any other species of the genus. It is not likely to be confused with that species because of the great distance between their ranges. The nutlets of the two species are entirely different, and it seems quite doubtful if they are in reality closely

related. Its nearest relatives are probably *C. tumulosa*, *C. modesta*, and *C. insolita*. The distinguishing characteristics of these species are contrasted under *C. insolita*.

16. *C. tumulosa* (Payson) new comb. Plate 27, figs. 41-43.

Oreocarya tumulosa Payson, Univ. Wyo. Publ. Bot. 1:164. 1926.

Long-lived caespitose perennial from a woody root; stems few to many from a branching caudex, rather stout, 10-25 cm. high, hirsute and densely setose with divaricate bristles; leaves numerous near the base, oblanceolate, obtuse, 3-5 cm. long, blade gradually narrowed into a long, slender, scarcely hirsute petiole, lower leaves conspicuously tomentulose, rather sparsely setose with weak, appressed bristles, dorsal surface slightly more pustulate than the ventral; inflorescence extending over $\frac{1}{2}$ to $\frac{3}{4}$ of the stem, floriferous, rather narrow, uninterrupted, densely setose with yellowish bristles (at least in age), foliar bracts inconspicuous, reflexed; calyx densely divaricate or retrorse-setose, hirsute, sepals in anthesis linear-lanceolate, acute, about 4 mm. long, in fruit 8-10 mm. long, exceeding the nutlets by 4-6 mm.; corolla white, tube 3.5-4 mm. long, equalling or slightly shorter than the sepals, crests at the base of the tube evident but not conspicuous, fornicies conspicuous, probably yellow, about 1 mm. long, limb 7 mm. broad, limb and tube subequal, lobes united for about $\frac{1}{3}$ their length; fruit asymmetrical, 1-2 nutlets only maturing, style exceeding the nutlets by about 0.5 mm.; nutlet ovate-lanceolate in outline, obtuse, 4 mm. long, very pale in color, dull or slightly glossy, margins in contact, acute, dorsal surface of nutlets with a low but evident medial ridge, indefinitely tuberculate and sometimes indistinctly rugose, ventral surface roughened with indefinite tubercles and rugae, scar triangular, open, short, margin only slightly elevated.

Distribution: Upper Sonoran Zone on or near the Providence Mountains, San Bernardino Co., California. Type: Providence Mts., May, 1902, *T. S. Brandegee*.

Specimens examined:

California: Ivanpah Mts., San Bernardino Co., June 4, 1915, *Parish 10243* (Calif.); Providence Mts., May, 1902, *T. S. Brandegee* (Calif., TYPE); Providence Mts., May, 1892, *T. S. Brandegee*

(Phila.); Barnwell, May 14, 1911, *K. Brandege* (Pomona, Calif.); vicinity of Bonanza King Mine, east slope of Providence Mts., May 21–24, 1920, *Munz, Johnston & Harwood 4209* (R.Mt., Pomona, Calif.).

This species has been confused with *C. humilis* and *C. nubigena*. The nutlets are quite different from either of those species. Its nearest relatives are probably *C. virginensis*, *C. insolita* and *C. modesta*. It is contrasted with the first two in the discussion of *C. insolita*. From *C. modesta* it differs in the lack of an elevated margin around the scar and by the indefinite roughening on the dorsal surface.

17. *C. modesta* new name.

Plate 27, figs. 44–46.

Krynitzkia depressa Jones, Contr. West. Bot. 13: 5. 1910, not *Cryptantha depressa* Nelson, Bot. Gaz. 34: 29. 1902.

Oreocarya depressa (Jones) Macbr. Contr. Gray Herb. 48: 32. 1916.

Densely caespitose, long-lived perennial from a woody root; stems few to many from the branching caudex which is densely clothed with the leaf-bases of former years, 8–15 cm. high, rather slender, setose with slender, weak bristles; leaves numerous on the crowns of the caudices, spatulate, obtuse, 1.5–4 cm. long, closely tomentose and setose with weak appressed bristles, pustulate on both surfaces, more abundantly on dorsal, petioles about as long as the blades, conspicuously ciliate near the base; inflorescence extending over $\frac{1}{2}$ to $\frac{3}{4}$ of the stem, narrow, not interrupted, cymules not elongating, rather softly setose-hirsute, foliar bracts inconspicuous; sepals setose-hirsute, linear-lanceolate, acute, in anthesis 3–4 mm. long, in fruit 7–8 mm. long, exceeding the nutlets by 2–3 mm.; corolla white, tube 3–4 mm. long, equaling the sepals, crests at the base conspicuous, fornications probably yellow, rounded, nearly closing the throat, minutely papillose, 0.5–1 mm. long, limb 7–8 mm. broad, lobes equalling or exceeding the tube, united for about $\frac{1}{3}$ their lengths; fruit ovoid, 2–3 nutlets usually maturing; nutlets broadly ovate, obtuse or acute, with slight tendency to be carinate, 3–4 mm. long, margins in contact, acute, surfaces of nutlets glossy, the dorsal tuberculate and often more or less rugose, tubercles and rugae (if present)