

NEW SPECIES IN OREOCARYA AND ITS ALLIES.

BY AVEN NELSON.

AMONG the characteristic plants of the high plains, the arid foothills and the more desert areas, such as the Red Desert of Wyoming, one of the conspicuous groups is the one we only recently knew as *Krynitzkia*. During several years of rather extensive collecting, especial effort has been made to fully represent the species in this group, and, as a result, not only are the species accredited to this range fairly well illustrated but a considerable collection representing most of the species of the western United States has, through the kindness of other collectors, been secured.

In the mass of material that has been piling up as possible novelties there are several forms now so fully represented and so evidently different from any heretofore published as to warrant proposing them as new. Some others are at hand, but further observations in the field, and specimens in other stages of development, are needed before they may be passed upon.

In many respects it is an uninviting group, one into which one enters with much trepidation at best, though with less if familiar with the forms under consideration in the field. It seems to me that some of the difficulties, too, have been removed by the arrangement of the species under three more closely-delimited genera.

Oreocarya cæspitosa.* The multicapital caudex densely tufted, its branches short and thickly clothed with dead leaves; stems short, only 5-10 cm. high, numerous, singly from the crowns, simple; leaves crowded on the crowns and several on the stems, linear to spatulate, obtuse or sub-acute, 5-30 mm. long including the slender petiole-like base, densely silky canescent; inflorescence at first capitate, at length more open, thyrsoid-glomerate or short spicate, the dense pubescence fulvous or canescent (scarcely hispid); lower bracts leaf-like, the upper small and not surpassing the calyx;

*Of most of the species in this paper, material in abundance is at hand and typical specimens will shortly be found in the leading herbaria of this country, affording opportunity for their study.

sepals linear, 4–5 mm. long; corolla white, its tube scarcely equaling the sepals and about equaled by its sub-orbicular lobes, crests conspicuous; nutlets narrowly ovate, scarcely roughened on the back, attached nearly their whole length to the subulate gynobase.

Not very closely allied to any of the known species. I was at first inclined to associate it with *O. fulvocanescens* (Gray) Greene or *O. humilis* (Gray) Greene, but its cæspitose habit, its softer pubescence and short corolla tube preclude such comparison.

It is common on arid, naked hills throughout southern Wyoming,† often forming solid mats several dm. across. The following collections fully represent it: 3072, Green River, June 1, 1897; 3120, Red Desert, June 3, 1897; 4338, Cooper Creek, June 6, 1898; 4749, Point of Rocks, June 15, 1898; 4497, Medicine Bow, July 9, 1898. Other numbers are 4671, 4772, and 2876, the latter from Pine Bluffs, May 1897, more strictly canescent, inflorescence more capitate and anthers nearly oval instead of oblong.

Oreocarya flavoculata. Rather loosely tufted, the branches of the caudex few to many, very short, clothed with dead leaf bases: stems singly from the crowns (some of the crowns only leaf bearing), 1–2 dm. high, with a loose, spreading, hispid-ciliate pubescence: leaves crowded on the crowns and the stems somewhat equably leafy to the top, linear-spatulate or narrowly obovate, tapering into a slender petiole with expanded base, the cauline becoming linear-oblong and sessile, finely canescent with some longer, strigose, spreading hairs: inflorescence at first crowded but at length a thyrsus of short, axillary racemes, the pubescence fulvous and somewhat strigose: sepals narrowly lanceolate, about 7 mm. long: corolla white or yellowish, the throat and conspicuous oblong crests a bright, clear yellow, tube slightly exceeding the calyx and nearly twice the length of the oval lobes: nutlets short, ovate, distinctly roughened-papillate on the back.

This species has some characters in common with the preceding and with *O. flava* Aven Nelson but is very distinct from them both. Its long fornicate crests, yellow-eyed flowers and tufted habit make it easily distinguishable. Collections of it as follows are at hand: 4572, Piedmont, June 7 (taken as the type); 4616, Carter, June

† All localities given in this paper are in Wyoming unless otherwise stated.

10; 4815, Fort Steele, June 18; and 4337, Cooper Creek, June 6, 1898,—the latter by Mr. Elias Nelson.

✓ **OREOCARYA FLAVOCULATA spatulata.** The multicipital caudex and deep-seated root covered with loose shreds of the brown bark, much of their tissues dead and easily crushed or torn into strips (in these respects like the species): branches of the caudex naked except on the 1–few crowns which are swollen with the crowded leaf-bases: pubescence similar but less (dense than in the species: stems spreading or ascending: leaves spatulate, obtuse: beginning to flower when very young, inflorescence at first congested but later, as in the species, leafy bracted: corolla white, slightly yellow in the throat, crests emarginate: essential organs dimorphic; stamens in the throat or $\frac{1}{4}$ below; style equaling the exerted crests or only about half as long as the tube.

Two collections of this are at hand, both from gravelly hilltops near Evanston, No. 2977, May 29, 1897 and 4513, June 4, 1898. Possibly a fuller knowledge of it will show it to be distinct. It is at once to be distinguished from the species by its spreading-assurgent habit, its broader, spatulate leaves, shorter stems, thinner pubescence and white flowers.

✓ **OREOCARYA AFFINIS perennis.**—Perennial, size of the species, stems several, singly from the crowns of the branched ligneous caudex, nearly equal, floriferous $\frac{1}{2}$ their length or more; thyrsus very narrow, more open than in the species (the cluster distinctly axillary): nutlets nearly smooth, obscurely wing-margined.

Further material of this with fully mature nutlets may show it to be a distinct species. If the wing-margined nutlets prove constant it will have to be separated from *O. affinis* (perfectly characterized in Pitt. III., 110) in spite of its great similarity in floral characters, pubescence and habit. Secured at Green River, May 31, 1897, No. 3035, and again at the same place in 1898, June 14, No. 4715.

✓ **Oreocarya longiflora.** Biennial, or probably a short-lived perennial, 1 or more stems from the mostly simple crowns, 1–2 dm. high: leaves mostly on the crowns, crowded, obtuse, spatulate, on broadish petioles, whole length 3–7 cm., cinereous with a close canescence and an open, strigose pubescence: inflorescence thyrsoid, occupying the whole length of the stems, its numerous racemes in

the axils of the leaf-like bracts (only the upper bracts small and inconspicuous), the whole densely yellowish setose-hairy: sepals linear, erect, closely approximate so that the calyx appears tubular, 8–10 mm. long, longer in fruit: corolla tube slender, exceeding the calyx by $\frac{1}{3}$ – $\frac{1}{2}$, its lobes only $\frac{1}{4}$ – $\frac{1}{5}$ as long as the tube: stamens dimorphic, anthers linear, about 3 mm. long, nutlets ovate, obtuse, 3–4 mm. long, acute angled, slightly keeled on the back, somewhat obscurely transversely rugose and low papillate towards the margins.

A very strongly marked species with somewhat the habit of *O. thyrsoflora* Greene but never to be confused with that or any of the related species on account of its long, tubular calyx, its long corolla tube and short lobes, and its characteristic pubescence. Perhaps it will help to locate it to say that it is somewhat intermediate between *O. fulvocanescens* (Gray) Greene and *O. humilis* (Gray) Greene, from both of which it differs both in foliage, pubescence and inflorescence. Collected by Prof. C. S. Crandall, at Palisades, Mesa Co., Colo., May 14, 1898, and distributed as *Eritrichium fulvocanescens* Gray. Type in Herb. University of Wyoming.

✓ **Cryptanthe ramulosissima.** Densely and intricately branched from the base upward, the whole forming a sub-spherical mass 2–4 dm. in diameter, in autumn probably becoming a “tumbleweed” by the snapping of the slender tap-root, densely hispid throughout: leaves small, very numerous, linear, green, the sparse hairs with pustulate bases: spikes very numerous, densely flowered, uniserial, but the flowers arranged in pairs: sepals setose-hispid, linear with midrib slightly thickened at base, 5–6 mm. long, the tips open or spreading; nutlets smooth, sub-conical, somewhat acuminate, 2 mm. long, the narrow ventral groove widening slightly toward the base and terminating in an open areola, usually all four maturing.

This species is most nearly related to *C. Fendleri* (Gray) Greene, but its remarkably branched habit will at once separate it from that and more distinctively yet from *C. Pattersoni* (Gray) Greene. It is separated also by the less thickened sepals, the slender branchlets, and somewhat paired flowers.

It was found in considerable abundance at Laramie, the type being No. 5275, Sept. 6, 1898.

✓ **CRYPTANTHE MURICULATA montana.** Resembling the species but smaller, erect, with few and rather strict branches, the inflorescence sparse when fully evolute; fruiting calyx 5–6 mm. long, tips of sepals spreading or merely open, the midrib narrow but distinct: nutlets very closely and minutely muriculate, the tooth-like points (as seen under the microscope) curved ascending.

This is clearly related to *C. muriculata* (Gray) Greene, but whether its characters are such that it may be considered distinct further collections only can settle. *C. muriculata* is of the far west and southwest while this is of the interior. Its smaller size, closely and finely muriculate nutlets, which have more rounded sides, will serve to distinguish it. The specimens before me are from Granger, June 13, 1898, where they were growing on a rocky ridge in the protection of the undershrubs. Specimens by Mr. M. E. Jones, from Silver Reef, Utah, May 4, 1894, distributed as *Krynitzkia Watsoni* Gray are probably the same.

✓ **Allocarya Hendersoni.** Simple at the base but sparsely branched above, erect, 2–4 dm. high, slender, sparsely and rather softly strigose-pubescent throughout: leaves broadly linear, 4–6 cm. long, 3–6 mm. broad, acutish: spikes naked, at length long and slender, the uppermost geminate with a floret in the fork: fruiting calyx short pediceled, its sepals linear and moderately strigose-hispid, about 5 mm. long: corolla 5–6 mm. in diameter, the throat nearly closed by the comparatively large emarginate crests: nutlets ovate, sub-acute, 2–3 mm. long, very closely and finely muriculate, with a few small, rounded papillæ interspersed, moderately carinate on the ventral side only.

This excellent species I have only seen from western Idaho and eastern Washington, represented by the following specimens: L. F. Henderson, Potlatch River, Idaho, May 31, 1895, distributed as *Krynitzkia muriculata* Gray; A. D. E. Elmer, Pullman, Wash. June, 1896, distributed as *Krynitzkia Torreyana* Gray; A. A. & E. Gertrude Heller, Lewiston, Idaho, April 30, 1896, distributed as *Allocarya Scouleri* (H. & A.) Greene.

That this is an *Allocarya*, I think, can scarcely be questioned, but it must be admitted, that in habit it greatly resembles the *Cryptanthus*. Its nearest ally is probably *A. Scouleri*, but from that

species its less branched habit, its shorter and relatively broader leaves, its smaller and fewer flowers and very different akene easily distinguish it.

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ISLAND FLORA NOTES.

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Hemizonia Clementina. *H. Streetsii* Gray, Syn. Fl. Suppl., p. 451, not of Proc. Am. Acad. XII, 162. Hirsute, especially below; stems erect or ascending, at length much branched and leafy to the numerous corymbosely-crowded heads, 3-4 dm. high: leaves linear, obtuse or acute, attenuate to the base, 4-8 cm. long, entire or with a few short teeth: heads 8-10 mm. high; involucral bracts linear, those of the receptacle about 15, slightly united below; rays 14-20, 5 mm. long; disk flowers numerous: akenes of the ray rugose-tuberculate at maturity, indistinctly triangular, with an upturned beak, and stipe 1 mm. long, those of the disk sterile, bearing a pappus of about 10 subulate-linear paleæ, unequal in length and width.

This species grows upon San Clemente and Santa Catalina Islands, It was referred by Dr. Gray to *H. Streetsii* of San Benito Islands, who considered the smaller plants from these islands "dwarf and early specimens." The living plants of these two species are strikingly different, and at first sight of those on San Benito, I was certain they could not be the same as those from the more northern islands.

H. Clementina on San Clemente Island seemed to me to be a semi-shrubby perennial, with many stems from the root; while *H. Streetsii* is an annual six to ten inches high, with a single stem, although I have seen one or two plants having an indurated root and prostrate spreading habit, that might have been more than a year old. *H. Streetsii* has simple stems branched above, the heads not so crowded, rays longer and more conspicuous, leaves shorter and more obtuse, more coarsely toothed, and with an auriculate clasping base.

On Todos Santos Islands, a shrubby *Hemizonia* is very common. It seems to be the same as specimens named *H. frutescens* Gray,