

## New Species of *Oreocarya*

BY ALICE EASTWOOD

In 1892 and 1895 the author collected several species of *Oreocarya* in Colorado and Utah which differed from each other and did not agree with any of the then described species. These were laid aside on account of more pressing work. Some of these have since been described by Dr. E. L. Greene and Professor Aven Nelson; but there still remain several which apparently have not come under the observation of these botanists, while others are to be found in the herbarium of the California Academy of Sciences which, in the opinion of the author, have been incorrectly assigned to species from which they differ sufficiently to be considered distinct.

Duplicates of types of many of the species are in the Academy's herbarium and I have besides, through the kindness of Mr. Carl F. Baker, had the opportunity of examining others which we did not possess.

### *Oreocarya disticha*

Stems several from a woody perennial root, erect, slender, about 3 dm. high, with few erect branches, canescent with fine short closely appressed pubescence and few longer appressed bristly hairs: radical leaves wanting but the remains of the broad sheathing petioles indicating a cluster; cauline leaves somewhat scattered, oblanceolate, tapering to margined petioles which are dilated and clasping at base, upper surface appressed-pubescent, lower appressed-hirsute and pustulate, acute, entire, of falcate outline when the edges are folded together, 2-4 cm. long: panicle becoming 8 cm. or more long, pedunculate, branching into a few slender spikes, with the flowers close and distichous on pedicels less than half as long as the sepals; bracts linear, but little surpassing the pedicels, the upper ones very small: divisions of the calyx involute, keeled, ovate-lanceolate, 4 mm. long, conniving around the fruit but with the obtuse tips spreading, pubescence like the stem: corolla white; limb with the divisions obovate-oblong, entire, obtuse, extending almost to the throat, a little more than 2 mm. long and almost as wide, about 5 mm. shorter than the tube; tube constricted at base and throat with the crests in

the throat half as long as the anthers, those at base forming a moniliform ring that closes around the style above the ovary: stamens inserted in the throat, the upper part of the anthers alternating with the crests: fruit with but one nutlet maturing, this sharply keeled on the ventral side, rounded and arched on the dorsal, acutely margined, depressed, mottled dark and light brown, glossy, slightly roughened with a few scattered papillae.

This is to be included in the group formerly under *Krynitzkia Jamesii* Gray. It was reported with that name (no. 90) in my Report on a Collection of Plants from San Juan County, Southeastern Utah, Proc. Cal. Acad. Sci., II. 6: 311. It was collected by the writer on the mesa above the San Juan River, Utah, on what was known as Barton's Range, July 13, 1895. It differs from *O. suffruticosa* (Torr.) Greene, in habit, pubescence, flowers and seeds. In habit of growth it more closely resembles *O. multicaulis* (Torr.) Greene, but differs in the size of the flowers, the number and appearance of the nutlets.

### Oreocarya Lemmoni

Stems several from a branched caudex, about 10–15 cm. high, rather stout and leafy, floriferous throughout, densely yellowish or white tomentose and hairy with long fine white soft hairs, neither striate nor ribbed: leaves linear-oblong, obtuse, with no distinction of petiole and blade; the lowest 9 cm. long, diminishing to the bracts, 1 cm. long, 2–5 mm. wide, tomentose and but slightly hairy: inflorescence with axillary clusters capitate on peduncles 5–10 mm. long; bractlets long, surpassing the sessile or short-pedicelled flowers; terminal spikelets aggregated into capitate clusters (in flower): divisions of calyx ovate-acuminate, almost as long as the corolla, 4 mm., densely tomentose and sparingly hairy: corolla white; tube campanulate, broadening from a base 1 mm. in diameter to the throat more than 2 mm. across, 2.5 mm. long; lobes orbicular, extending almost to the throat, 2 mm. wide; crests in throat conspicuous, 1 mm. wide at base, bilobed at apex, fleshy; crests at base small, forming a moniliform ring less than 1 mm. from the base: stamens with oblong anthers, attached below the middle of the tube by very short broad filaments, the apex reaching the base of the crests in the throat: nutlets immature but apparently smooth and depressed like *O. suffruticosa* Greene.

This is well distinguished from all other members of the group and from all other species of the genus by the peculiar shape of

the corolla. All others that are known are distinctly salverform while this approaches the rotate form. It was collected by J. G. Lemmon, in whose honor it is a pleasure to name it, in Arizona, without definite locality, 1884. The type is in the Herbarium of the California Academy of Sciences.

### *Oreocarya celosioides*

Stems stout, apparently simple from a leafy caudex which is clothed with the broad imbricated petioles of former leaves, 8 mm. in diameter, more than 4 dm. high, floriferous from above the middle, leafy, striate, setose-hispid with stiff tawny or white bristles and pubescent beneath the bristles with dense intricately appressed pubescence; radical leaves mostly wanting, the persistent bases of the petioles remaining, these about 6 mm. broad, densely clothed with fine white appressed hairs and ciliate with spreading white bristles; the one or two small persistent leaves spatulate with petioles 2-3 times longer than the blades, together 3 cm. long, pubescence as on the stem, except that the bristles are pustulate at base; cauline leaves linear-lanceolate, 2-4 cm. long, 3-4 mm. wide, sessile, hispid with numerous very stiff bristles: inflorescence of thick, densely clustered, unilateral spikes, elongating upwards; bractlets conspicuous, linear, shorter than the calyx: calyx about equalling the tube of the corolla, densely setose with yellowish bristles; divisions linear-lanceolate, 5 mm. long in flower, becoming 15 mm. in fruit, conniving over the nutlets but with the foliaceous tips free: corolla white with orbicular divisions extending to 1 mm. of the throat, 4 mm. long and of equal width; tube 5 mm. long, with the crests in the throat small, obtuse, less than 0.5 mm.; scales at base forming a moniliform ring above the ovary, less than 1 mm. from the base: anthers oblong, 1.3 mm. long, not quite reaching the crests; filaments short and broad, inserted about the middle of the tube: nutlets erect, acute, slightly cordate at base, keeled on the dorsal side and with the narrowly winged margins elevated so that there is a shallow concavity between the ridge and the continuous margin, 5.5 mm. long, 3 mm. wide, rugose with transverse ridges and fine papillae between; scar shallow and narrow, not extending to the apex nor forked at base, nor extending to the very base; gynobase subulate, 5 mm. long, attached for almost its entire length.

This approaches *O. setosissima* (Gray) Greene. It differs in the denser inflorescence, resembling somewhat that of *Celosia cristata* L., its larger flowers and different nutlets. It was distributed as *Eritrichium glomeratum* DC. by Thos. J. Howell, from

the banks of the Columbia River, eastern Washington, July, 1881.

### *Oreocarya elata*

Stems one to several from a woody tap-root, 3-4 dm. high, virgate, ribbed, floriferous from near the base with sessile or peduncled clusters which form heads of few to several flowers in the somewhat distant leaf-axils, later becoming spikes; summit of the stem branched, forming a panicle of unilateral bracteate spikes which are at first capitate but later lengthen, the lower flowers becoming distant more than their own length: pubescence of lower part of stem and leaves snowy white, consisting of densely appressed and interlaced fine hairs with some scattered appressed bristles mostly pustulate at base; pubescence of the upper leaves and inflorescence tawny and more spreading: radical leaves densely clustered on the caudex, spatulate, entire or crenate, acute or obtuse, with the margined petioles as long as the blade, together 2-3 cm., strongly ribbed; cauline leaves distant from each other 1-3 cm., lanceolate, together with the broad margined clasping petioles 2-4 cm. long, 5 mm. wide: divisions of the calyx ovate with strong midvein, 4 mm. long, 2 mm. wide at base, densely hispid, surpassing the tube of the corolla, enlarging in fruit, conniving over the nutlets but with the tips spreading: corolla white; tube 3.5 mm. longer than the orbicular lobes which do not extend to the throat; crests slightly emarginate, fleshy, arching over the elliptical anthers; basal scales crescent-shaped, forming a ring 1 mm. from the base: anthers 1.5 mm. long, 1 mm. wide, on short broad concealed filaments: nutlets erect, ovate, with the lateral edges acutely margined but not winged, obtuse, tuberculate with glossy white tubercles which are separate or confluent in irregularly transverse ridges, especially along the middle of the dorsal surface: gynobase subulate; scar forked at base and extending almost to the apex.

This is nearest to *O. setosissima* (Gray) Greene from which it differs in all its parts. It was collected by the author near Grand Junction, Colorado, on the road to the coal mines, growing on the bare clay hills characteristic of the region, flowering May 15, fruiting June 28, 1892.

### *Oreocarya aperta*

Caudex branched from a woody root, with leaves densely clustered at base and the dilated petioles imbricated: stems several, rather slender, 1-2 dm. high, branching from near the base with many spreading simple or 2-forked spikes, those of all the stems aggregated into a closely branched thyrses: pubescence gray, setose-hispid, the spreading white bristles pustulate at base, 2-3 mm.

long, the surface under the bristles clothed with fine white densely and intricately appressed hairs: radical leaves spatulate to oblanceolate, together with the margined petioles 3 cm. long, 8 mm. wide, the midrib forming a ridge on the lower surface; cauline leaves oblanceolate, about as long as the radical leaves but narrower: spikes peduncled, longer than the subtending leaves, distichous or unilateral; bractlets linear, longer than the internodes, shorter than the mature calyx; pedicels very short, about 0.5 mm. long: divisions of the calyx subulate-acuminate, equalling the tube of the corolla in flower, elongating from 3–10 mm., strongly ribbed, densely setose, not conniving over the nutlets but spreading open and becoming campanulate, readily disarticulating from the peduncles when the seed is ripe, leaving an umbilicate scar at the base of each spreading bractlet: corolla white; tube equal to the limb, together 6 mm. long; divisions not extending to the throat, obovate with the apex obcordate or obtuse, 2.5 mm. broad, margin obscurely sinuate; crests conspicuous, 1-nerved, truncate, 0.5 mm. long and as broad; crests at base less than 1 mm. from the bottom, forming a moniliform ring of 10 nipple-like projections around and above the ovary: anthers oblong, 1.25 mm. long, concealing the short broad filaments and extending to the base of the crests: nutlets erect, 2.5 mm. long, ovate, obtuse, the dorsal ridge prominent, acutely margined all around; scar sulcate, extending almost to the apex, not forked at base, rough with glossy white papillae which are confluent into small papillae, becoming somewhat star-shaped in outline, the smaller papillae intervening: gynobase linear-subulate.

This is near *O. thyrsiflora* Greene, but is entirely distinct. It was collected by the author at Grand Junction, Colorado, June 27, 1892.

### **Oreocarya Wetherillii**

Biennial from a slender tap-root, the caudex densely clothed with the petioles of former leaves, branched from the base with one stout stem and one or more low slender ones, 1–3 dm. high: leaves and stem white with densely appressed interlaced fine hairs and spreading bristles pustulate at base: radical leaves spatulate, obtuse or acute, with blades as long as the broad margined petioles, which are dilated and imbricated at base, 1–3 cm. long, 5–10 mm. broad: glomerule extending from the base, consisting of numerous unilateral or distichous spikes with oblong sessile bracts diminishing upwards; bractlets linear-lanceolate, equalling or surpassing the calyx: calyx of 5 narrow, linear divisions, 5 mm. long, densely hispid with white bristles, which are tawny in bud, in fruit conniving over the nutlets but with spreading tips, becom-

ing 1 cm. long: corolla white with orbicular lobes not extending to the throat, nor so long as the tube, together equalling 6 mm.; the tube surpassing the calyx in flower; crests hispid, rounded, base of tube without scales or crests: anthers linear-oblong, inserted below the crests on short subulate filaments which are concealed by the anthers: nutlets erect, ovate-oblong, 2 mm. broad, 3-5 mm. long, obtuse, acutely margined on the lateral angles, inserted almost the entire length, rarely all maturing; scar scarcely forked at base, when ripe the surface brown, covered with glossy white, irregular, minute, often confluent tubercles: gynobase elongated-subulate.

This showy species is related to *O. thyrsiflora* Greene but differs in the naked base of the corolla-tube, the hispid crests in the throat, and in the longer tube of the corolla. It was collected by the author in flower and fruit, May 25, 1892, in Court House Wash, near Moab, southeastern Utah. It is named in honor of Mr. Alfred Wetherill who was my guide and companion on the trip when it was discovered.

### *Oreocarya nana*

Stems low, caespitose, 5-10 cm. high, 3-several from a slender tap-root, the simple or branched caudex densely covered with the petioles of former leaves, hispid throughout with spreading white or yellowish bristles which are frequently pustulate at base, striate, floriferous almost from the base: radical leaves crowded on the caudex, white with closely appressed hairs mixed with coarser bristles, oblanceolate, petiolate, acute, 1-2 cm. long, 2-5 mm. wide; cauline leaves few, similar to the radical but shorter, the appressed hairs tawny, the bristles white and more spreading: inflorescence spicate-glomerate, 4 cm. long, 1-2 cm. wide: flowers 1-3 in the axils of the linear bracts, with pedicels shorter than the bracts, half as long as the calyx: divisions of calyx linear-subulate, longer than the corolla-tube, 4.5 mm. long, enlarging in fruit and conniving over the nutlets, outer surface densely clothed with spreading yellow bristles, inner with the bristles appressed: corolla white, the tube shorter than the limb; divisions broadly oval to orbicular, not extending to the throat, 3 mm. long, equalling the tube; crests in the throat prominent, rounded, half as large as the anthers; crests at base nipple-like, in pairs, 1 mm. from the bottom: anthers on scarcely perceptible subulate filaments, oblong, 1 mm. long, inserted below the crests in the throat: nutlets 1-2 maturing, erect, ovate, obtuse, keeled on the dorsal side and rough with sharp transverse interrupted muriculations, having fine

papillae intervening; ventral surface with coarser papillae; scar open and broad like a furrow, forked at base, reaching within 0.5 mm. of the apex: gynobase elongated-subulate.

This is perhaps nearest to *O. caespitosa* A. Nelson from which it differs in fruit and floral organs as well as habit and pubescence. It was collected by the author near Grand Junction, Colorado, on the mesa above the Gunnison River, May 17, 1892.

### *Oreocarya cristata*

Caudex with many branches from a slender woody tap-root, apparently perennial; stems slender, about 2 dm. high, ribbed, not floriferous at base, pubescent with appressed tangled hairs and fine spreading white bristles which are 2 mm. long: leaves oblanceolate-spatulate, with broad petioles dilated at base, the lower ones twice as long as the blades, the upper about equalling them, together 1.5–5 cm. long; blades 6 mm. broad; petioles 4 mm. broad at base; pubescence on younger leaves tawny, that on older ones cinereous with appressed hairs and bristles, the latter pustulate at base; pubescence of inflorescence gray or tawny: inflorescence a compound spike or glomerule, little more than half as long as the stem; peduncles 2–4 mm. long; pedicels about 1 mm. long: spikelets 2–4-flowered: calyx of five lanceolate very bristly divisions 6 mm. long, not enlarging much in fruit, shorter than the tube of the corolla, with pubescence gray or tawny: corolla with broad orbicular divisions, not extending to the throat, 4 mm. broad; tube almost 1 cm. long; crests in throat conspicuous, oblong, 1 mm. long, without scales or crests at base: anthers oblong, more than 2 mm. long, almost sessile, the apex 1 mm. from the base of the crests: nutlets globose, incurved, ovate, acutely margined to the scar, rough with transverse ridges and minute papillae intervening; scar broad and open, with open, forking base: gynobase mitriform.

This is peculiar in the broad limb of the corolla with orbicular lobes, the prominent crests in the throat of the corolla-tube, and the peculiar nutlets of which one was generally abortive. This was collected by the author at Grand Junction, May 17, 1892.

### *Oreocarya tenuis*

Caudex densely clothed with dry imbricated petioles, much branched from a woody tap-root having a dark brown epidermis: stems many, slender, erect, 1–2 dm. high, ribbed, floriferous from near the base with few scattered flowers or clusters, above becom-

ing a panicle of pedunculate spikes, grayish throughout with a rough pubescence of closely appressed hairs and some scattered white bristles which are pustulate at base: leaves spatulate-oblan-  
ceolate, tapering to broad petioles which exceed the blade and are dilated and clasping at base, together with the blade 1-3 cm. long, 2-5 mm. broad, acute, entire but bristly ciliate, appressed-hispid on the upper surface, lower surface with bristles as on the stem, the midrib forming a ridge through the center: internodes 1-2 cm. long: spikes peduncled, few-flowered (2-5); pedicels 1-3 mm. long, with or without bractlets, which when present surpass the pedicels: calyx shorter than or equalling the tube of the corolla, with linear-acuminate divisions 6 mm. long, hispid with spreading bristles, the margins whitened by densely appressed white hairs: corolla white; tube 5 mm. long, exceeding the border by 1 mm.; divisions oblong, 3 mm. long, 2 mm. wide, obtuse, not extending to the throat; crests in the throat bisected by a central ridge, short and broad: anthers linear-oblong, 1.5 mm. long, inserted about the middle on short broad filaments, the apex about on a level with the top of the crests; no scales or crests at base of tube: nutlets ovate, obtuse, 3 mm. long, 2 mm. wide, acutely margined except below the scar; dorsal surface keeled, corrugated-rugose with the epidermis pale gray and lucid; scar broadest at the middle and with broad bifurcation at base: gynobase mitriform, 4-angled.

This peculiar species is distinguished from all others by the more slender stems and more contracted inflorescence. Its long corolla-tube marks it as distinct from any of the group formerly included under *O. glomerata*. It was collected by the author near Moab, in Court House Wash, southeastern Utah, May 25, 1892. It grew in red sandy soil.

### **Oreocarya Shockleyi**

Stems several from a tufted branching caudex which is densely clothed with dry imbricated petioles of former leaves, 1-2 dm. high, leafy, striate, not more than 2 mm. in diameter, floriferous from the middle, cinereous with downwardly appressed pubescence and spreading fine white silky bristles which are 1-2 mm. long: leaves on caudex oblanceolate, tapering to a broad petiole which is dilated and ciliate at base, strongly ribbed, together with the blade 3-6 cm. long, 3-7 mm. wide, cinereous with fine, white appressed pubescence and fine scattered bristles with papillae at base which dot the surface; cauline leaves linear-oblong or narrowly oblanceolate, sessile or with petioles more than half as broad as the blades: spikes consisting of short-peduncled spikelets or



heads, containing from two to five sessile flowers, the lower clusters somewhat distant, the upper becoming almost capitate: bracts, the diminished upper leaves; bractlets linear, about equaling the divisions of the calyx: calyx 7 mm. long, shorter than the tube of the corolla, with lanceolate-acuminate divisions 6 mm. long, ribbed, with the pubescence yellowish, appressed and bristly, densely so on the outer surface and the foliaceous tips of the inner, the lower part conniving over the nutlets: corolla white, the tube twice as long as the limb, 9 mm.; divisions orbicular, 4 mm. long and wide, crenate-sinuate; crests truncate, slightly emarginate, minutely papillate, 1 mm. long; no crests or scales at base of corolla-tube: anthers linear-oblong, almost 2 mm. long; on short broad filaments, inserted below the middle of the anthers, the apex reaching to 1 mm. below the crests: nutlets ovate, 4 mm. long, dorsal side arched and keeled; surface rough with pointed muriculations like microscopic mountain peaks and with fine vermiculate elevated lines intervening, margined except at base, ventral surface with similar sculpture, the scar protuberant, extending from near the summit, broadening to the deep fork which is about 2 mm. across: gynobase conical, about 3 mm. high.

This well-marked species was collected by W. H. Shockley, in whose honor it is named. It was collected in gulches on Miller Mountain, Esmeralda County, Nevada, at an elevation of 7500 ft. It is No. 244 of Mr. Shockley's collection, distributed as *Krynitzkia fulvocanescens* Gray.