

Ventral groove of nutlet ending about $\frac{1}{4}$ the distance from base; c. Mohave Desert and Inyo Co.

Stems several to many, caespitose on a branched perennal root-crown; panicle narrow, the branches short, few-flowered; nutlets whitish. 4. *O. tumulosa*.

Stems 3 or 2 from a simple biennial root; panicle broad, the branches many-flowered, somewhat elongated; nutlets light gray. 5. *O. virginiana*.

Corolla-tube well exserted ($1\frac{1}{2}$ to 2 times as long as calyx); Inyo Co. 6. *O. maculata*.

B. Nutlets smooth.

Stems erect; leaves very much shorter than the panicles; Inyo Co. and c. Mohave Desert and bordering ranges. 7. *O. confertiflora*.

Stems prostrate or decumbent; leaves mostly exceeding the panicles; San Bernardino and White mountains. 8. *O. abertica*.

1. *O. nubigena* Greene. Stems slender, erect but somewhat flexuous, sparingly leafy, 1 to several from the densely leafy and much-branched root-crown, 3 to 11 inches high; herbage thinly strigose and also spreading-hispid, the leaves dark-colored; leaves 1 to $2\frac{1}{2}$ inches long, the blades narrow-obovate to spatulate, narrowed to a petiole 1 to $1\frac{1}{2}$ times as long; flowers in terminal dense head-like clusters, the heads 5 to 8 lines broad, densely bristly-hispid, leafy-bracteate, usually with supplementary solitary flowers in the upper leaf-axils; calyx-lobes lanceolate or linear; corolla white, 2 to 3 lines long, $\frac{3}{4}$ to $1\frac{1}{2}$ lines broad, the tube little or not at all exserted, the throat with prominent crests; nutlets brown or clay-color, long-ovate, flat on the back, sparingly rugose or tuberculate or smoothish, narrowly wing-margined, the groove narrow or closed at maturity.

Gravelly ridges and rocky summits, 7500 to 12,000 feet: southern Sierra Nevada from Tuolumne Co. to Tulare Co. June-Aug.

Geog. note.—*Oreocarya nubigena* is a high-altitudinal species with a broad densely leafy root-crown, slender somewhat flexuous stems, small flowers in densely bristly small heads, and rather soft or papery texture to the pericarp of the nutlet. Authentic material from the type locality, Clouds Rest above Yosemite, is well matched by collections from the southern Sierra Nevada, which have passed or would pass under the name *Oreocarya clemense*. The following stations for *Oreocarya nubigena* may be cited: Parker Pass, Tuolumne Co., A. L. Grant 1669; Kaiser Peak, Fresno Co., A. L. Grant 1048; Palisade Creek, Fresno Co., E. Ferguson 216; Mt. Whitney, Jepson 1666. All the above collections are cismontane. Transmontane plants or plants from high easterly crests of the northern Sierra Nevada, with somewhat stoutish, somewhat rigid stems, cylindrical inflorescences and larger corollas, heretofore included by the author and by Payson in the species here called *Oreocarya nubigena*, are in this work referred to *Oreocarya humilis*. However, the following transmontane collection is referred to *O. nubigena*: Mt. Patterson, Sweetwater Mts., Mono Co., Hoover 5547.

Refs.—*Oreocarya nubigena* Greene, Pitt. 3:112 (1896), type loc. Clouds Rest, Yosemite, Chouat & Dress; Jepson, Man. 845 (1925). *Cryptantha nubigena* Payson, Ann. Mo. Bot. Gard. 14:265 (1927). *C. clemense* Payson, Ann. Mo. Bot. Gard. 14:267 (1927), type loc. Glenn's Pass, Fresno Co., *Clemens*.

2. *O. crymophila* (Jtn.) Jepson & Hoover comb. n. Stems several from a woody branched root-crown, erect or suberect, 8 to 13 inches high, puberulent and spreading-bristly; leaves oblanceolate or linear, 1 to 4 inches long, puberulent and ascending-hirsute, the cauline with the blades narrowed to a subsessile base, the lower or basal ones with the blades gradually narrowed to petioles as long; inflorescence very bristly; terminal flower-cluster dense, several-flowered, the lateral clusters axillary and scattered or discrete, one or few-flowered; corolla white, 2 to 3 lines broad, its tube equaling or slightly exceeding the calyx-lobes; fruiting calyx 5 to 6 lines long, its lobes erect, bristly; style $\frac{1}{2}$ longer than nutlets; nutlets long-ovate or ovate-lanceolate, strongly compressed, narrowly winged, irregularly and weakly rugulose dorsally; ventral groove open.

Rocky slopes, 9000 to 10,000 feet: ridge between Clark Fork and Middle Fork of Stanislaus River, Sierra Nevada of Alpine Co. July.

Endemism note.—As thus far known *Oreocarya crymophila* is an endemic of especial interest which in the high Sierra Nevada replaces *Oreocarya nubigena* north of Parker Pass. Only the following stations are known: Bald Peak, Hoover 4465; Red Peak; betw. Sonora Pass and Sonora

Peak, Hoover 4454. It is closely allied to *Oreocarya subgenata*, the nutlets of which are essentially similar in shape, surface features and general appearance. Comparison with fully mature material of *O. humilata*, when collected, will have decisive effect on the status of *O. erymophila*.

Refs.—*OREOCARYA ERYMOPHILA* Jepson & Hoover. *Cryptantha erymophila* Jtn., Jour. Arn. Arb. 21:65 (1940), type loc. Red Peak, Alpine Co., Hoover 4193.

3. *O. humilis* Greene. Stems few, erect or ascending, leafy, 3 to 9 inches high, arising from the densely leafy root-crown; herbage (especially the leaves) silky-tomentose and also spreading-hispid throughout; leaves $\frac{3}{4}$ to $1\frac{1}{2}$ inches long, the blades obovate to spatulate, obtuse, drawn down to petioles 1 to 2 times as long; flowers in a spike-like or cylindrical thyrse, leafy-bracteate below; calyx-lobes ovate-lanceolate, densely hispid; corolla white, 4 lines long, the limb 3 lines broad and crests prominent, its tube not exceeding or little exceeding the calyx; nutlets crowded dorsally with fine tubercles or fine short rugae or both.

Montane ridges and cañons, 5000 to 8000 (or 10,400) feet: Sierra Nevada (east side or easterly summits) from Mono Co. to Modoc Co. and eastern Siskiyou Co.; North Coast Ranges in southwestern Siskiyou Co. East to Nevada, north to Oregon. June-July.

Geog. note.—*Oreocarya humilis*, mainly transmontane or essentially so in the central Sierra Nevada and northward, is mostly high mountain, its occurrence at 9000 feet on the slopes east of Blue Lake, Virginia Lakes basin, western Mono County (Peirson 11,184), at 10,400 feet near Mt. Lake in the same region (Peirson) and in Sonora Pass (D. E. Goddard 1418) at about 9500 feet. Thence northward as follows: betw. Truckee and Tahoe, Placer Co., Sonce 391; Donner Pass, Nevada Co., Kellough; Castle Peak, Nevada Co., Sonce; Diamond Mt. (sw. cf.), se. Plumas Co., Stebbins & Jenkins 2267. More northerly stations (North Fork Parker Creek, Warner Mts., Taylor & Bryant; Deep Creek, Warner Mts., L. S. Smith 1114; Caldwell Butte, e. Siskiyou Co., Applegate 9486; Mt. Eddy, sw. Siskiyou Co., see Jour. Arn. Arb. 20:394—1939) represent *Cryptantha (Oreocarya) subretusa* Jtn., a newly proposed unit. Apparent differences between *Oreocarya humilis* Greene and *C. subretusa* Jtn. would seem to be as follows: the nutlet of *Oreocarya humilis*, perhaps a little triangular-ovate, has, when mature, a thickened or linate margin not extending around base, whereas the nutlet of *O. subretusa*, perhaps ovate-lanceolate, gives the appearance of a thinner slightly broader wing extending around the base. Such possible differences do not, however, even on the basis of present material, seem sound. The wing of the nutlet apparently varies in breadth with age, tending to become narrower towards maturity as the embryo grows. Young nutlets usually have a more obvious wing than fully matured ones. One may consider the collection from Sonora Pass (Breder 1887), here unhesitatingly referred to *O. humilis*: the nutlets are distinctly ovate-lanceolate and have a rather broad wing but are very young. No available material of *C. subretusa* has fully ripe nutlets. Indeed, all of the above-cited collections, including those cited for *O. humilis*, are in flower; although some have very young fruits and a few full-sized fruits, only one collection has mature fruits. All of the available California material, which is here thought to represent *C. subretusa*, is like *O. humilis* in habit, in size of plant, in leaves and distribution of leaves, in pubescence, inflorescence and flowers.

Refs.—*OREOCARYA HUMILIS* Greene, Pitt. 3:112 (1896). *Eritrichium glomeratum* var. *humile* Gray, Proc. Am. Acad. 10:61 (1874), no precise locality given, but by a process of restriction I. M. Johnston (Contrib. Arn. Arb. 3:187) has logically defined the type locality as Summit sta. (that is, Donner Pass, Nevada Co.), Bolander. *Cryptantha humilis* Payson, Ann. Mo. Bot. Gard. 14:278 (1927). *O. echinosides* Muhl., Contrib. Gray Herb. 48:31 (1916), (excluding Utah plants); Jepson, Man. 845 (1925); not *Krynitzkia echinosides* Jones, Proc. Cal. Acad. ser. 2, 5:700 (1895), type loc. Fabrica Cañon, Utah, Jones 5279. *Cryptantha subretusa* Jtn., Jour. Arn. Arb. 20:393 (1939), type loc. Crater Lake, Ore., Thompson 12,206.

4. *O. tumulosa* Payson. Stems 1 to several from the root-crown, erect, 4 to 8 inches high; herbage puberulent and also hispid throughout with spreading tawny-yellow or white hairs, the ones on lower part of plant often discoid-dilated at base; leaves mostly in a basal tuft, a few cauline, 1 to $1\frac{1}{2}$ inches long; leaf-blades obovate, attenuate to a petiole 1 to 2 times as long; panicle subcylindric, often somewhat dense, 2 to 4 inches long; corolla white, 2 lines long, the tube about equaling the linear calyx-segments; nutlets ovate or pyriform, rather flattened, narrowly and sharply margined, sparingly and coarsely tuberculate or rugose dorsally, $1\frac{1}{2}$ to 2 lines long.

Gravelly ridges of desert ranges, often in the piñon belt, 4500 to 6000 feet: eastern Mohave Desert. May-June.