

Greene, we here designate the generic type as *Oreocarya virgata* (Porter) Greene, *Pittonia* 1: 57. 1887b (basionym: *Eritrichium virgatum* Porter, Prelim. Rep. U.S. Geol. Surv. Montana [Hayden] 479. 1870; TYPE: C. C. Parry 288, GH). Most of the approximately 62 described species of *Cryptantha* section or subgenus *Oreocarya* have validly published names in the genus *Oreocarya* (see Payson 1927; Abrams 1951; Higgins 1971; Weber 1987). Twenty-one taxa known to us, however, require new combinations.

3. *Oreocarya atwoodii* (L. C. Higgins) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Cryptantha atwoodii* L. C. Higgins, *Southw. Naturalist* 19(2): 127. 1974.—TYPE: U. S. A. Arizona: Coconino Co., 7 mi N of junction of hwy 89 and 164 on hwy 89, 20 May 1970, *N. D. Atwood* 2624 (holotype: BRY).
4. *Oreocarya barnebyi* (I. M. Johnst.) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Cryptantha barnebyi* I. M. Johnston, *J. Arnold Arbor.* 29: 240. 1948.—TYPE: U. S. A. Utah: Uintah Co., 30 mi east of Ouray, 17 Jun 1947, *H. D. D. Ripley & R. C. Barneby* 8748 (holotype: GH).
5. *Oreocarya compacta* (L. C. Higgins) R. B. Kelley, comb. nov. Basionym: *Cryptantha compacta* L. C. Higgins, *Great Basin Naturalist* 28: 196–197. 1968.—TYPE: U. S. A. Utah: Millard Co., ca. 8 mi west of Desert Range Experimental Station Headquarters along Hwy 21, 100 m west of pass at north end of the Needle Range, 18 Jun 1968, *L. C. Higgins* 1613 (holotype: BRY; isotypes: GH, LL, MO, NY, RSA, UTC).
6. *Oreocarya crassipes* (I. M. Johnst.) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Cryptantha crassipes* I. M. Johnston, *J. Arnold Arbor.* 20: 397. 1939.—TYPE: U. S. A. Texas: Brewster Co., 6.5 miles east of Agua Fria Springs, 13 Apr 1936, *V. L. Cory* 18613 (holotype: GH).
7. *Oreocarya creutzfeldtii* (S. L. Welsh) R. B. Kelley, comb. nov. Basionym: *Cryptantha creutzfeldtii* S. L. Welsh, *Great Basin Naturalist* 42: 203. 1982.—TYPE: U. S. A.: Utah, Emery Co., T21S, R6E, S22, ca 1.5 mi nw hwy 10, along dirt road at Muddy Creek historical marker, on slope S of canal, 6,400 ft, 14 May 1981, *S. L. Welsh* 20470 (holotype: BRY; isotypes: CAS, NY, RSA, UC).
8. *Oreocarya fulvocanescens* (S. Wats.) Greene var. *nitida* (Greene) R. B. Kelley, comb. nov., stat. nov. Basionym: *Oreocarya nitida* Greene, *Pl. Baker.* [Greene] 3: 21. 1901.—TYPE: U. S. A.: Colorado, Mesa County, Gunnison Watershed, Deer Run, 11 Jun 1901, *C. F. Baker* 95 (holotype: RSA; isotypes: E, MO, NY, RM, UC, US).
9. *Oreocarya grahamii* (I. M. Johnst.) R. B. Kelley, comb. nov. Basionym: *Cryptantha grahamii* I. M. Johnston, *J. Arnold Arbor.* 18: 23. 1937.—TYPE: U. S. A. Utah: Uinta Co., bench west of Green River north of mouth of Sand Wash, 4,500 ft, 28 May 1933, *E. H. Graham* 7924 (holotype: GH).
10. *Oreocarya hypsophila* (I. M. Johnst.) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Cryptantha hypsophila* I. M. Johnston, *J. Arnold Arbor.* 20: 395. 1939.—TYPE: U. S. A. Idaho: Blaine Co., crest of high ridge, head of Boulder Creek, Sawtooth National Forest, Sawtooth Mountains, 11,000 ft, 6 Aug 1937, *J. W. Thompson* 14129 (holotype: GH; isotype: WTU).
11. *Oreocarya johnstonii* (L. C. Higgins) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Cryptantha johnstonii* L. C. Higgins, *Great Basin Naturalist* 28: 195. 1968.—TYPE: U. S. A. Utah: Emery Co., from Woodside to Castle Dale, 25 May 1968, *L. C. Higgins* 1310 (holotype: BRY; isotypes: CAS, GH, NY).
12. *Oreocarya ochroleuca* (L. C. Higgins) R. B. Kelley, comb. nov. Basionym: *Cryptantha ochroleuca* L. C. Higgins, *Great Basin Naturalist* 28: 197–198. 1968.—TYPE: U. S. A.: Utah: Garfield Co., on outcrop 100 m south of Red Canyon Campground in southwestern Garfield Co., 21 Jul 1968, *L. C. Higgins* 1788 (holotype: BRY; isotypes: GH, NY).
13. *Oreocarya roosiorum* (Munz) R. B. Kelley, Hasenstab, and M. G. Simpson, comb. nov. Basionym: *Cryptantha roosiorum* Munz, *Aliso* 3: 124. 1955.—TYPE: U. S. A.: California: Inyo Co., crest of Inyo Mts., 3 mi east of Badger Flat, 10,600 ft, 13 Aug 1953, *J. C. Roos & A. R. Roos* 6015 (holotype: RSA; isotypes: CAS, GH).
14. *Oreocarya schoolcraftii* (Tiehm) R. B. Kelley, comb. nov. Basionym: *Cryptantha schoolcraftii* Tiehm, *Brittonia* 38(2): 104. 1986.—TYPE: U. S. A.: Nevada, Washoe Co., Yellow Hills area, 1 road mile N of Bernards Corral, 23 Jun 1984, *A. Tiehm* 8775 (holotype: NY; isotypes: CAS, MO, RSA).
15. *Oreocarya semiglabra* (Barneby) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Cryptantha semiglabra* Barneby, *Leafl. W. Bot.* 3: 197. 1943.—TYPE: U. S. A. Arizona: Coconino Co., 2 miles E of Fredonia, 5 Jun 1942, *Ripley and Barneby* 4829 (holotype: CAS; isotype: GH).
16. *Oreocarya shackletteana* (L. C. Higgins) R. B. Kelley, comb. nov. Basionym: *Cryptantha shackletteana* L. C. Higgins, *Great Basin Naturalist* 29: 28. 1969.—TYPE: U. S. A.: Alaska, Southeast Fairbanks Co., on steep south-facing slope of Eagle Bluff, about 1 mile northwest of Eagle, 26 July 1968, *S. L. Welsh and G. Moore* 8629 (holotype: BRY).
17. *Oreocarya sobolifera* (Payson) R. B. Kelley, comb. nov. Basionym: *Cryptantha sobolifera* Payson, *Ann. Missouri Bot. Gard.* 14: 305. 1927.—TYPE: U. S. A.: Montana, Glacier Co., upper Marias Pass, 6,000 ft, 10 Sep 1909, *M. E. Jones s. n.* (holotype: RSA; isotype: GH).
18. *Oreocarya subcapitata* (Dorn & Lichvar) R. B. Kelley, comb. nov. Basionym: *Cryptantha subcapitata* Dorn & Lichvar, *Madroño* 28(3): 159. 1981.—TYPE: U. S. A.: Wyoming: Fremont Co.; Just west of Boysen Dam, 23 Jun 1980, *R. D. Dorn* 3459 (holotype: RM; isotype: NY).
19. *Oreocarya suffruticosa* (Torrey) Greene var. *arenicola* (L. C. Higgins & S. L. Welsh) R. B. Kelley, comb. nov. Basionym: *Cryptantha cinerea* (Greene) Cronquist var. *arenicola* L. C. Higgins & S. L. Welsh, *Great Basin Naturalist* 46: 255. 1986.—TYPE: USA: Utah. Kane County. T41S, R5W, S26, Johnson Canyon, Lone Pine Point, 1,830 m, 6 Jun 1984, *L. C. Higgins* 14296 (holotype: BRY).
20. *Oreocarya suffruticosa* (Torrey) Greene var. *laxa* (J. F. Macbr.) R. B. Kelley, comb. nov. Basionym: *Oreocarya multicaulis* (Torr.) Greene var. *laxa* J. F. Macbr., *Contr. Gray Herb.* 48: 35. 1916.—TYPE: MEXICO: Chihuahua, near Paso del Norte, 20 Sep 1886, *C. G. Pringle* 776 (holotype: GH; isotypes: E, LL, MICH, MO, NY, PHIL, US).
21. *Oreocarya suffruticosa* (Torrey) Greene var. *pustulosa* (Rydb.) R. B. Kelley, comb. nov., stat. nov. Basionym: *Oreocarya pustulosa* Rydb., *Bull. Torrey Bot. Club* 40: 480. 1913.—TYPE: USA: Utah. Hammond Canyon, Elk Mountains, 31 Jul 1911, *P. A. Rydberg* 9320 (holotype: NY).

22. *Oreocarya suffruticosa* (Torrey) Greene var. *setosa* (M. E. Jones) R. B. Kelley, comb. nov. Basionym: *Krymitzchia multicaulis* var. *setosa* M. E. Jones, Contr. W. Bot. 13: 4. 1910.—TYPE: U. S. A.: Utah, near Fort Cove, 27 Jun 1901, M. E. Jones s. n. (holotype: RSA).
23. *Oreocarya welshii* (K. H. Thorne & L. C. Higgins) R. B. Kelley, comb. nov. Basionym: *Cryptantha welshii* K. H. Thorne & L. C. Higgins, Great Basin Naturalist 42(2): 196. 1982.—TYPE: U. S. A.: Nevada, Nye County, ca. 2.1 miles from Sunnyside, down Hot Creek Campground Road, 5 Jun 1979, K. H. Thorne 578 (holotype: BRY; isotypes: NY, WTU).
- JOHNSTONELLA Brand, Repert. Spec. Nov. Regni Veg. 21: 249. 1925.
- Johnstonella* consists of plants with nutlets that are usually triangular or ovate (rarely lance-ovate) in shape, usually have a “knife-like,” sharply angled, and often narrowly-winged (rarely rounded) margin, the nutlets of most species are heteromorphic in size and shape. The nutlet sculpturing often consists of prominent, regularly spaced, whitish tubercles, although in some taxa the tubercles are smaller and more numerous. Two species, one with two varieties, have existing names in *Johnstonella*: *J. racemosa* (I. M. Johnston) Brand (designated the type for the genus; see Johnston 1925) and *J. inaequata* (Watson) Brand (Brand 1925). *Johnstonella racemosa* is perennial in duration, which is rare in the Cryptanthinae outside of *Oreocarya*. (A variety of this species, *J. racemosa* var. *lignosa* (I. M. Johnston) Brand, has not been recognized as different in recent treatments.) New combinations are needed for eleven species (one with three varieties), recognized here as members of this genus (see earlier discussion).
24. *Johnstonella angelica* (I. M. Johnston) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Cryptantha angelica* I. M. Johnston, Proc. Calif. Acad. Sci. ser. 4, 12: 1143. 1924.—TYPE: MEXICO. Baja California: Angel de la Guarda Island, opposite Pond Island, 30 Jun 1921, Johnston 4221 (holotype: CAS; isotypes: CAS, GH, UC, US).
25. *Johnstonella angustifolia* (Torrey) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Eritrichium angustifolium* (Torrey) Greene, Pacif. Rail. Rep. 5: 363. 1857.—TYPE: U. S. A. Arizona: Yuma Co., Fort Yuma, 1853, Thomas (holotype: NY).
26. *Johnstonella costata* (Brandegee) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Cryptantha costata* Brandegee, Bot. Gaz. 27: 453. 1899.—TYPE: U. S. A. California: San Diego Co., Borrego Springs, 18 Apr 1859, J. S. Brandegee (holotype: UC).
27. *Johnstonella diplotricha* (Phil.) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Eritrichium diplotrichum* Phil., Anales Mus. Nac., Santiago de Chile 1891: 57.—TYPE: ARGENTINA. Los Andes: between Antofagasta and Calalaste, Jan 1885, F. Philippi (holotype: MS; isotypes: GH).
28. *Johnstonella echinosepala* (J. F. Macbr.) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Cryptantha echinosepala* J. F. Macbr., Contr. Gray Herb. 56: 57. 1918.—TYPE: MEXICO. Lower California [Baja California Sur]: Magdalena Island, 1 Mar 1913, C. R. Orcutt 15 (holotype: GH).
29. *Johnstonella fastigiata* (I. M. Johnston) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Cryptantha fastigiata* I. M. Johnston, J. Arnold Arbor. 20: 388. 1939.—TYPE: MEXICO. Baja California Norte [Baja California], Las Animas Bay. 3 Mar 1921, I. M. Johnston 3505 (holotype: GH).
30. *Johnstonella grayi* (Vasey & Rose) Hasenstab & M. G. Simpson var. *cryptochaeta* (J. F. MacBr.) Hasenstab & M. G. Simpson, comb. nov., Basionym: *Cryptantha micromeres* (A. Gray) Greene var. *cryptochaeta* J. F. Macbr., Contr. Gray Herb. 1916. n. ser. 48: 46.—TYPE: MEXICO. Baja California [Sur]: San Jose del Cabo, Jun 1897, A. W. Anthony 347 (holotype: GH).
31. *Johnstonella grayi* (Vasey & Rose) Hasenstab & M. G. Simpson var. *grayi*, comb. nov. Basionym: *Krymitzchia grayi* Vasey & Rose, Proc. U. S. Natl. Mus. 11: 596. 1888.—TYPE: MEXICO. Baja California [Sur]: Lagoon Head, 6–15 Mar 1889, E. Palmer 801 (holotype: NY; isotype: GH, UC).
32. *Johnstonella grayi* (Vasey & Rose) Hasenstab & M. G. Simpson var. *nesiotica* (I. M. Johnston) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Cryptantha grayi* (Vasey & Rose) J. F. Macbr. var. *nesiotica* I. M. Johnston, Proc. Calif. Acad. Sci. ser. 4, 12: 1146. 1924.—TYPE: MEXICO. Baja California Sur: San Francisco Island, 30 May 1921, I. M. Johnston 3947 (holotype: CAS; isotypes: GH, UC, US).
33. *Johnstonella holoptera* (A. Gray) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Eritrichium holopterum* A. Gray, Proc. Amer. Acad. Arts 12: 81. 1877.—TYPE: U. S. A. Arizona: La Paz Co., Ehrenberg, 1876, Palmer (holotype: GH).
34. *Johnstonella micromeres* (A. Gray) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Eritrichium micromeres* A. Gray, Proc. Amer. Acad. Arts 19: 90. 1883.—TYPE: U. S. A. California: Santa Cruz Co., Santa Cruz, M. E. Jones 2472 (holotype: GH).
35. *Johnstonella parviflora* (Phil.) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Eritrichium parviflorum* Phil., Fl. Atacam. 39. 1860.—TYPE: CHILE. Caldera, Dec 1853, Philippi (holotype: MS).
36. *Johnstonella pusilla* (Torrey & A. Gray) Hasenstab & M. G. Simpson, comb. nov. Basionym: *Eritrichium pusillum* Torr. & A. Gray, Pacif. Rail. Rep. 2: 171. 1856.—TYPE: U. S. A. Texas: Midland Co., Llano Estacado, 30 Mar 1852, Pope (holotype: NY).

A KEY TO THE GENERA OF THE CRYPTANTHINAE

A key to the genera of the Cryptanthinae is presented here, modified (in part) from Kelley (2012) and Kelley et al. (2012). We note that the genus *Plagiobothrys* s. l. is polyphyletic in our study and will likely require segregation into separate genera in the future.

1. Nutlets spreading 2
2. Calyx lobes in fr unequal, upper 2 >> others, partly fused, arched over 1 nutlet, with 5–10 stout spines each with hooked bristles; nutlets *Harpagonella*