

A REVISIONAL STUDY OF THE SPECIES *ERIGERON FOLIOSUS* NUTT.

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This paper presents an attempt to work out the varieties which may be recognized in *Erigeron foliosus* Nutt., a species which shows remarkable variation with great intergradation between its varieties, but for the most part distinct from other species. It does intergrade with *E. Breweri* Gray, especially in those forms where the corymbs become reduced. In general the specific diagnostic characters used by Jepson (Man. Fl. Pls. Calif., 1051. 1925) are quite satisfactory.

In making this study there has been available material from the following herbaria: University of California (C), Pomona College (P), Rancho Santa Ana (Sa), and United States National Herbarium (U. S.). The letters indicated above after the herbarium names are those used in citing specimens. I am greatly indebted to Dr. Herbert L. Mason of the University of California, Dr. C. B. Wolf of the Rancho Santa Ana Herbarium, and Dr. William R. Maxon of the United States National Herbarium for their kindness in lending material for study.

Erigeron foliosus Nutt., Trans. Am. Philos. Soc., ser. 2, 7: 309, 1841.

Stems simple below, corymbosely branched in inflorescence, erect, arising from a branching root-crown, equably leafy with leaves somewhat reduced above; leaves sessile, more or less strigose-hispidulous, filiform to oblanceolate; heads corymbosely arranged, hemispherical; involucre bracts in 3 series; rays about 30 to 40; achenes usually pubescent.

KEY TO VARIETIES

Achenes glabrous; stems 3-4 mm. thick; leaves linear, stiff-canesc. San Luis Obispo and northern Santa Barbara Cos.

.....6. var. *Blochmanae*

Achenes pubescent.

Stems flexuous, slender, retrorse-hispidulous; leaves linear to spatulate, 1-2 cm. long, 1-5 mm. wide; corymb very open. Owens Valley, Calif. and adjacent Nevada.

.....5. var. *porphyreticus*

Stems straight, the hairs not retrorse.

Leaves oblong to oblanceolate, with stiff hairs distinctly widened at the base; stems hispidulous.

Plant green, more or less hispid-pubescent but not canescent. Widespread through California.1. var. *typicus*

Plant canescent with extremely stiff, coarse, almost lanceolate hairs. Southwestern and western Mohave Desert.

.....2. var. *Covillei*

Leaves linear, or if broader with hairs not noticeably widened at base; stems usually subglabrous.

Stems slender, usually 1-2 mm. thick; leaves plane, the hairs not noticeably widened at base. San Luis Obispo Co., Calif. to Ore.4. var. *Hartwegii*

Stems 3-5 mm. thick; leaves inrolled, the hairs widened at base. L. Calif. to San Francisco.3. var. *stenophyllus*

✓ 1. *Erigeron foliosus* Nutt. var. *typicus* n. nom. *E. foliosus* Nutt., Trans. Am. Philos. Soc. ser. 2, 7:309. 1841.

Stems 3-6 or more dm. tall, 3-5 mm. thick; leaves linear-oblong to oblanceolate, 2-4 cm. long, 2-4 or more mm. wide, reduced above; herbage rough-hispid; pubescence usually general over involucre, stem and leaves.

Type locality, Santa Barbara, California. Ranging through cismontane California into Lower California. Material studied.—CALIFORNIA: Van Duzen R., *Tracy 1241* (C); Mad R., *Chestnut and Drew in 1888* (US); Little Chico, *Bruce 1990* (P); Lone, *Braunton 1019* (US); Duncan's Mills, *Jones in 1882* (P); Marin Co., *State Survey 2387* (C); San Francisco, *Jones in 1883* (P); Mt. Diablo, *Abrams 7501* (P); Saratoga, *Davy 329* (C); Yosemite Valley, *King in 1907* (C), *Keck 179* (P); North Fork of Kings R., *Hall and Chandler 557* (C); Sequoia Nat. Park, *Munz 1526* (P); Paso Robles, *Blochman in 1893* (C); Santa Barbara, *Abrams 4111* (P); Painted Cave Ranch, *Eastwood 71* (C); Santa Rosa Islands, *Brandege in 1888* (C); Santa Catalina Island, *Trask in 1898* (US); Head of Sheep Creek, San Gabriel Mts., *Munz 4561* (P); Head of Evey Canyon, *Johnston in 1924* (P); San Antonio Canyon, *Baker 3658* (C, P); Mountain Home Canyon, San Bernardino Mts., *Hall 7502* (C, P); Santa Ana R., *Munz 6332* (C, P); Baldwin Lake, *Munz 10744* (P); Mill Creek, *Munz 7586* (P); San Bernardino, *Parish 3673* (C); Bloomington, *Parish 11267* (C, P); Griffith Park, *Braunton 539* (C, US); Idyllwild, *Wright in 1929* (P); Chalk Hill, *Hall 2055* (C); Eastern base San Jacinto Mts., *Hall 1889* (P); near Cuyamaca Lake, *Abrams 3956* (P); Descanso, *Wolf in 1931* (Sa); Campo Hills, *Abrams 3730* (P); Doane Valley, *Munz 8303* (P). LOWER CALIFORNIA, Guadalupe, *Brandege in 1893* (C).

✓ 2. *Erigeron foliosus* var. *Covillei* (Greene) n. comb. *E. Covillei* Greene, *Erythea* 3:20. 1895.

Similar to var. *typicus* but more grey with a very dense pubescence of coarse, hispid, almost lanceolate hairs.

Type locality, "Crystal Spring," Coso Mts., Inyo Co., Calif. Ranging in western Mohave Desert. Material studied. CALI-

FORNIA: Victorville, *Johnston in 1920* (P); Hesperia, *Spencer 400* (P); Phelan, *Peirson in 1922* (P), *Munz 6885* (P); Deadman's Point, *Parish 10777* (C, P); Keyes Ranch, Little San Bernardino Mts., *Munz and Johnston 5291a* (P).

None of the cismontane material of *typicus* is quite so stiff and greyish-hispid as the plants from the Victorville region. The specimen cited from Keyes Ranch, *Munz and Johnston 5291a*, has unusually narrow leaves.

✓ 3. *Erigeron foliosus* var. *stenophyllus* (Nutt.) Gray, Bot. Calif. 1:330. 1876.

E. stenophyllus Nutt. Pl. Gamb., 21. 1848.

E. foliosus var. *tenuissimus* Gray, Syn. Fl. 1, pt. 2:215. 1881.

E. tenuissimus Greene, Pitt. 3:25. 1896.

E. Nuttallii Heller, Bull. Torr. Bot. Club 25:628. 1898.

E. Setchellii Jeps., Fl. W. Mid. Calif. 568. 1901.

E. fragilis Greene, Bull. So. Calif. Acad. 1:39. 1902.

Habit of *E. foliosus* var. *typicus* but with stems subglabrous; leaves linear to filiform, 1-3 mm. wide, often contorted, with large lanceolate, appressed hairs along margins.

Type locality given by Nuttall as "In California, (Montrey?)" but probably Santa Barbara or San Diego. Ranging from San Luis Obispo Co. south to L. Calif. Material studied—CALIFORNIA: McGinnes, 25 miles N. E. of San Luis Obispo, *Palmer 176½* (C); Walker Basin, *Grinnell 383* (US); Foot Tejon, *de Vasey 41* (US); Santa Cruz Island, Smuggler's Cove, *Abrams and Wiggins 181* (C); Santa Barbara, *Jones 229* (P); Frazier Mt., *Baldwin 101* (C); Santa Susana Pass, *Howell 1024* (Sa); Lancaster, *Elmer 3737* (P); Pine Mt., San Gabriel Mts., *Johnston 1682* (C, P); Blue Ridge, Swartout Valley, *Munz 783* (C, P); Mt. Wilson, *Grinnell 898* (C); Little Green Valley, San Bernardino Mts., *Hall 29* (C); Cushenberry Canyon, *Munz 1093* (P); Santa Monica Canyon, *Barber in 1897* (C); Little Santa Anita Canyon, *Abrams 2644* (P); Trabuco Canyon, *Hall 1330* (C); Temecula Canyon, *Munz 7133* (C, P); San Jacinto, *Spencer 2214* (P); near Poppet Flat, *Munz and Johnston 8840* (P); Van de Venter's, *Hall in 1899* (C); Jacumba, *Abrams 3657* (P); Pala grade, *Munz 10374* (P); Oriflame Canyon, *Abrams 3927* (P); Fallbrook, *Munz and Harwood 3892* (P); Laguna Mts., *Randall in 1918* (P); Vallecito Canyon, *Munz 9722* (P). Lower CALIFORNIA: Hanson's Ranch, *Orcutt 1000* (C); San Rafael, *Orcutt in 1884* (C).

In his "Compositae of Southern California" (U. Calif. Pub. Bot. 3:91. 1907), Hall maintained *tenuissimus* as a variety distinct from *stenophyllus* on the basis of shorter leaves and smaller heads, but I have been unable to maintain such distinction.

✓ 4. *Erigeron foliosus* var. *Hartwegii* (Greene) Jepson, Man. Fl. Pls. Calif. 1056. 1925.

E. Hartwegii Greene, Erythea 3:21. 1895.

E. confinis Howell, Erythea 3:25. 1895.

E. foliosus var. *confinis* (Howell) Jeps. l. c.

E. Blasdalei Greene, Erythea 3:124. 1895.

Stems slender, usually 1-2 mm. thick, 1-2 (5) dm. high, subglabrous; leaves linear, usually ascending, 0.5-1.5 mm. wide, sparsely or quite pubescent with slender, generally appressed, evenly distributed, and not very stiff hairs; heads frequently solitary.

Type locality "foothills of the Sierra Nevada." Ranging from southern Oregon to Monterey and Merced Cos. Calif. Material studied—OREGON: Gold Beach, *Henderson in 1929* (C); Mt. Jefferson, *Nelson 2868* (C); Siskiyou Mts., *Cusick 2916* (C), *Howell 1507*, type collection of *confinis* (C). CALIFORNIA: Granite Peak, *Baker 241a* (C); Russian Creek, *Butler 949* (C); Hoopa Valley, *Davy and Blasdale 5713* (C); Klamath R., *Chandler 1427* (C), *Goddard 176* (C); Francis Range, Humboldt Co., *Davy and Blasdale 5886* (C); Bear R., Placer Co., *Hall 10154* (C); American R., *Bolander 4536* (US); Ione, Amador Co., *Braunton 1319* (C); McCormic's Bridge, Calaveras Co., *Blasdale in 1895* (C); Milton, *Davy 1320* (C), *Davy 1319* (C); So. Fork, Merced R., *Hall 8847* (C); San Carpojo, Monterey Co., *Condit in 1912* (C), *Unangst 901* (C).

This variety, as here constituted, is exceedingly variable, but is characterized by its fine pubescence as compared with that of *typicus*. It intergrades with *typicus* in leaf-shape and general habit, for example: Grasshopper Ridge, Canoe Creek, Humboldt Co., *Tracy 4756* (C); near Lincoln, Placer Co., *Heller 12749* (C); New York Falls, Amador Co., *Hansen 1425* (C). *Unangst 901*, above cited, approaches *stenophyllus*.

In general, plants from the coast ranges are lower than those from the foothills of the Sierra Nevada, and it seemed for a while as if two varieties, *confinis* and *Hartwegii*, should be maintained, but such plants as *Chandler 1427*, *Goddard 176*, *Condit in 1912*, and *Davy and Blasdale 5886* break the distinction altogether.

✓ 5. *Erigeron foliosus* var. *porphyreticus* (Jones) n. comb. *E. porphyreticus* Jones, Contr. West. Bot. 8:33. 1898.

Stems slender, 1.5-2.5 mm. thick, 2-3 dm. tall, leafy, branched, flexuous; leaves linear to spatulate, 1-2 cm. long, 1-5 mm. wide; stems densely pubescent with short, stiff, retrorse hairs; heads in open corymb, often on rather long branches.

Type locality, Hawthorne, Nevada. Ranging through Owens Valley, Calif. and adjacent Nevada. Material studied—NEVADA: Hawthorne, *Jones in 1897*, type coll. (P, US). CALIFORNIA: Benton Station, *Jones in 1927* (P); Lone Pine, *Jones in 1897* (P); Soda Springs, Upper Kern R., *Hall and Babcock 5328* (C).

This variety has heretofore usually been treated as a species (cf. Jepson, *Man. Fl. Pls. Calif.*, 1056. 1925), but apparently intergrades freely with *E. foliosus*. Two collections from Nevada: Reno, *Hillman in 1894* (P) and Franktown, *Hillman in 1893* (P), have leaf-shape and spreading hairs much like *typicus*; *Coville and Funston 1604* from No. Fork of Kern R., Calif. (US) has the leaves of *stenophyllus* and the hairs on the stem are not retrorse.

- ✓ 6. *Erigeron foliosus* var. *Blochmanae* (Greene) Hall, Univ. Calif. Pub. Bot. 3:91. 1907.
E. Blochmanae Greene, Pitt. 3:25. 1896.

Stems stout, 3-4 mm. thick, 3.5-5 dm. tall; leaves linear, 2-4 cm. long, 1-1.5 mm. wide, more or less contorted, stiff-canescens; heads in dense corymbs; achenes nearly or quite glabrous.

Type locality "Sandy beaches, northern part of Santa Barbara Co.", ranging in sand dunes along coast of San Luis Obispo and northern Santa Barbara Cos. Material studied—CALIFORNIA: Coast Hills, San Luis Obispo Co., *Summers 416* (C); Oceano, *Condit in 1910* (C); Santa Maria, *Eastwood 784* (C); Surf, *Wolf 2306* (Sa).

This is quite a distinct variety of limited range.

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A CORRECTION

In the September-December, 1933, issue of the BULLETIN on page 122 occurs a typographical error.

In the bottom line, referring to *Opuntia acanthocarpa*, the word "distinction" occurs. This should be deleted and the word "distribution" substituted for it.