

acutis plus minusve canescentibus et hirsutis; pappo mediocriter copioso sordido. — IDAHO: rather dry barren slopes, Sea Foam, Custer Co., Aug. 5, 1916, no. 3605 (TYPE, Gray Herb.).

Hieracium Howellii Gray is nearly this species but the single collection by which it is known has somewhat dentate leaves with tawny shaggy pubescence, tomentose stems and white pappus. The cinereous involucre suggests *H. cineritium* Nels. & Macbr. but it has numerous heads in a close corymbose cyme. The leaves, too, are denticulate.

V. A REVISION OF THE ERIGERONS OF THE SERIES MULTIFIDI

BY J. FRANCIS MACBRIDE AND EDWIN BLAKE PAYSON

THE nomenclature of the entirely homogenous group of *Erigeron* designated by Rydberg Fl. Colo. 359 (1906), as the *Multifidi* has always been more or less troublesome. This is largely due, doubtless, to the fact that mere variants have been proposed as new species, perhaps often because of the uncertainty of the character of type specimens, and by the fact that no consistent treatment of the group as a whole has ever been attempted.

The greatest development of species and varieties seems to be attained in the central Rocky Mountains of Colorado and Wyoming although representatives are exceedingly common on alpine slopes and meadows throughout western North America as far south as northern New Mexico and southeastern California. Though essentially alpine (or arctic) in habitat, individuals are often found descending to middle elevations on gravel bars and exposed stony slopes in mountain regions. Members of this section have been collected in Greenland and Spitzbergen as well as in the arctic portions of North America.

Three species are recognized and are distinguished by the manner in which the leaves are dissected, for this character seems to be fairly constant. The variation in the size of the heads, in the color of the rays and in the length and width of the leaf divisions, although often striking, constitute but formal differences. Most of the species and varieties that have been described in later years have been based on the presence or absence of pubescence

and ray flowers. In the present paper these characters have been considered as showing varietal differences only.

Theoretically every species might have four different varieties, two of which would be pubescent and two glabrous and of the two glabrous ones, one would be radiate and one discoid. Similarly there would be a radiate and a discoid variety of the pubescent pair. As a matter of fact all four combinations have been found in *E. compositus* and *E. trifidus*. In *E. pinnatisectus*, however, the pubescent character seems to be entirely lacking and so we find only two varieties — the radiate and the discoid.

Practically all individuals of *E. compositus* and *E. trifidus* develop cilia on the petioles and leaf margins and when a plant is spoken of as "glabrous" it is only the surface of the leaf-blades proper that are considered. Pubescent and glabrous forms merge but little and there is, in general, but little difficulty in separating them. Similarly, radiate and discoid varieties are easily separable, although forms appear that are intermediate. We have treated all forms as discoid in which the rays are not conspicuous. Specimens cited are in the Gray Herbarium unless followed by the abbreviation "R. Mt. Herb." indicating that they are in the Rocky Mountain Herbarium.

The only group-name which we know for this aggregation of species and varieties is the *Multifidi* of Rydberg, Fl. Colo. 359 (1906). Unfortunately the author has failed to indicate the status of this group in classification but from the fact that the name is given in the plural form and appears to be just above the rank of species it may well be considered as designating a series which may be defined as follows:

ERIGERON, series MULTIFIDI Rydberg, Fl. Colo. 360 (1906).

Perennial, caespitose, arctic and alpine herbs; leaves clustered on the very short stems; deeply ternately or pinnately dissected; petioles and leaf-margins generally ciliate (except in *E. pinnatisectus*); heads usually numerous, solitary on scapose peduncles, radiate or discoid: achenes pubescent.

KEY TO THE SPECIES AND VARIETIES OF THE SERIES MULTIFIDI

Leaves bi- or tri-ternately dissected.

Leaf-blades glabrous except for cilia on petioles or margins.

Heads radiate 1. *E. compositus*.

Heads eradiate 1a. var. *incertus*.

Leaf-blades hirsute.

Heads radiate 1b. var. *multifidus*.

Heads eradiate 1c. var. *petraeus*.

Leaves simply ternate or trifid.

Leaf-blades hirsute.

Heads radiate 2. *E. trifidus*.

Heads eradiate 2a. var. *discoideus*.

Leaf-blades glabrous.

Heads radiate 2b. var. *prasinus*.

Heads eradiate 2c. var. *deficiens*.

Leaves pinnately dissected, glabrous.

Heads radiate 3. *E. pinnatisectus*.

Heads eradiate 3a. var. *insolens*.

1. *E. COMPOSITUS* Pursh, Fl. Am. Sept. ii. 535 (1814). *E. compositus* Pursh, var. *glabratus* Macoun, Cat. Canad. Pl. ii, 231 (1883). *E. multifidus* Rydb., var. *nudus* Rydb., Mem. N. Y. Bot. Gard. i. 402 (1900). *E. Gormanii* Greene, Pitt. iv. 156 (1900). *E. compositus* Pursh, var. *nudus* (Rydb.) A. Nels. in Coulter & Nelson, New Man. R. Mt. Bot. 528 (1909). *E. compositus* Pursh, var. *breviradiatus* A. Nels. Bot. Gaz. liv. 416 (1912). — British Columbia and Alberta to southern Wyoming and Idaho. — ALBERTA: Devil's Lake, Banff, July 5, 1907, *Butters & Hollway*, no. 31; Squaw Mt., Banff, June 20, 1903, *Barber*, no. 273; near Banff, June 26, 1891, *Macoun*, no. 5221; vicinity of Lake Louise, July 7, 1915, *F. W. Hunnewell 2nd.*, no. 3869 (in herb. of collector). MONTANA: MacDougal Peak, July 31, 1908, *Mrs. Joseph Clemens* (in part). IDAHO: Upper Ferry, Clearwater River, near Lewiston, April 26, 1892, *Sandberg, MacDougal & Heller*, no. 48; Smoky Mts., Blaine Co., Aug. 13, 1916, *Macbride & Payson*, nos. 3760 & 3761; Custer, Custer Co., July 27, 1916, *Macbride & Payson*, no. 3455; Parker Mt., Custer Co., July 17, 1916, *Macbride & Payson*, no. 3248; Silver City, Owyhee Co., June 17, 1911, *Macbride*, no. 899 (type of var. *breviradiatus*). WYOMING: Golden Gate, Yellowstone Park, June 28, 1899, *A. Nelson & E. Nelson*, no. 5545 (R. Mt. Herb.); Big Horn Co., July 1906, *Worthley*, no. 112, in part (R. Mt. Herb.); Laramie Peak, Aug. 7, 1895, *A. Nelson*, no. 6112 (R. Mt. Herb.). BRITISH COLUMBIA: July 12, 1904, *Reuben T. Shaw*, no. 247; Chillinack Valley, Aug. 28, 1901, *Macoun*, no. 26441.

1a. *E. COMPOSITUS* Pursh, var. *INCERTUS* A. Nels. in Coulter & Nelson New Man. R. Mt. Bot. 528 (1909). *E. multifidus* Rydb., var. *incertus* A. Nels. Bot. Gaz. xxx. 198 (1900). *E. compositus* Pursh, var. *discoideus* A. Nels. in Coulter and Nelson New Man.

R. Mt. Bot. 528 (1909), not Gray, Am. Journ. Sci. ser. 2, xxxiii. 237 (1862). — British Columbia and Alberta to Wyoming and southern Idaho. — ALBERTA: Moraine Lake, July 8, 1915, *F. W. Hunnewell 2nd.*, no. 387c (in herb. of collector); near Banff, July 25, 1895, *Canby*; Devil's Lake, Banff, July 5, 1907, *Butters & Hollway*, no. 32. BRITISH COLUMBIA: Carbonate Draw, July 14, 1904, *Reuben T. Shaw*, no. 350. MONTANA: MacDougal Peak, July 31, 1908, *Mrs. Joseph Clemens*, in part. IDAHO: Antelope Mts., Blaine Co., near Martin, July 6, 1916, *Macbride & Payson*, no. 3061; alpine summit, Parker Mt., Custer Co., July 17, 1916, *Macbride & Payson*, no. 3260; slide rock, Smoky Mts., Blaine Co., Aug. 13, 1916, *Macbride & Payson*, no. 3762; Parker Mt., Custer Co., July 17, 1916, *Macbride & Payson*, no. 3306. WYOMING: Obsidian Creek, July 22, 1899, *A. Nelson & E. Nelson*, no. 6066; Canyon, July, 1904, *O. M. Oleson*, no. 138 (R. Mt. Herb.); Upper Basin, July 17, 1906, *W. S. Cooper*, no. 979 (R. Mt. Herb.).

1b. *E. COMPOSITUS* Pursh, var. **multifidus** (Rydb.), comb. nov. — *E. multifidus* Rydb., Mem. N. Y. Bot. Gard. i. 402 (1900). — Alberta to Colorado and southeastern California, thence north to Washington. — NORTH DAKOTA: near Minot, Aug. 2, 1903, *Waldron*, no. 1849 (R. Mt. Herb.). ALBERTA: Tunnel Mt., vicinity of Banff, June 30, 1915, *F. W. Hunnewell 2nd.*, no. 3871 (in herb. of collector). MONTANA: Red Lodge, July 28, 1893, *Rose*, no. 65 (R. Mt. Herb.); Bridger Mts., June 15, 1897, *Rydberg & Bessey*, no. 5089; near Missoula, June 12, 1901, *MacDougal*, no. 151. IDAHO: Silver City, Owyhee Co., June 26, 1911, *Macbride*, no. 988; Stevens Peak, Coeur D'Alene Mts., Aug. 5, 1895, *Leiberg*, no. 1468; Latah Co., April 18, 1896, *Henderson* (R. Mt. Herb.); Post Falls, May 17, 1909, *S. O. Johnson*, no. 85; Patterson, Lemhi Co., July 13, 1916, *Macbride & Payson*, no. 3197; Smoky Mts., Blaine Co., Aug. 13, 1916, *Macbride & Payson*, no. 3763; Parker Mt., Custer Co., July 17, 1916, *Macbride & Payson*, no. 3264; Lost River Mts., west of Clyde, Blaine Co., July 10, 1916, *Macbride & Payson*, no. 3140a. WYOMING: northwestern Wyoming, Aug. 9, 1893, *Rose*, no. 684 (R. Mt. Herb.); Snowy Range, Aug. 31, 1903, *Goodding*, no. 2066 (R. Mt. Herb.); Big Horn Co., 1906, *Worthley*, no. 138 (R. Mt. Herb.); Cooper Creek, June 5, 1898, *E. Nelson*, no. 4328 (R. Mt. Herb.); Golden Gate, June 2, 1899, *A. Nelson & E. Nelson*, no. 5545a (R. Mt. Herb.); Madison River, June 23, 1899, *A. Nelson & E. Nelson*, no. 5512 (R. Mt. Herb.). COLORADO: West Indian Creek, June 14, 1900, *Rydberg & Vreeland*, no. 5420 (R. Mt. Herb.); Rabbit Ear Mt., 1898, *Ruppert & Witter*, no. 55; Spicer, Larimer Co., July 10, 1903, *Goodding*, no. 1523; between Sunshine and Ward, Aug. 1902, *Tweedy*, no. 4917 (R. Mt. Herb.); Beaver Creek, Larimer Co., July 4, 1903, *Goodding*, no. 1445; Tolland, July 3, 1908, *Ramaley & Robbins*, no. 5209 (R. Mt. Herb.); Beaver Creek, July 4, 1896, no. 2891; 1906, *Johnson*, no. 324 (R. Mt.

Herb.); Boulder Park, Tolland, July 1, 1911, *Ramaley*, no. 8772 (R. Mt. Herb.); headwaters of Clear Creek and Crazy Woman River, July-Aug., 1911, *Tweedy*, no. 3009 (R. Mt. Herb.). UTAH: Marysville, July 23, 1905, *Rydberg & Carlton*, no. 7094 (R. Mt. Herb.); Big Cottonwood Canyon, Aug. 8, 1902, *Cooper*, no. 325 (R. Mt. Herb.); La Sal Mts., June 14, 1914, *Payson*, no. 417 (R. Mt. Herb.); Little Cottonwood Canyon, Aug. 11, 1906, *Garrett*, no. 1942 (R. Mt. Herb.); Big Cottonwood Canyon, June 28, 1905, *Garrett*, no. 1306; Uintah Mts., July 2, 1902, *Goodding*, no. 1234; La Sal Mts., July 7, 1911, *Rydberg & Garrett*, no. 8672 (R. Mt. Herb.). NEVADA: Jarbidge, July 8, 1912, *Nelson & Macbride*, no. 1988 (R. Mt. Herb.); near Deeth, Elko Co., July 29, 1908, *Heller*, no. 9177; Mt. Rose, Washoe Co., July 28, 1909, *Heller*, no. 9866. CALIFORNIA: Mt. Dana, Tuolumne Co., July 17, 1907, *Robert A. Ware*, no. 2619c; Farewell Gap, 1897, *Purpus*, no. 5273; near Mineral King, Aug. 10, 1891, *Coville & Funston*, no. 1576. OREGON: summit of Mt. Scott, Klamath Co., Aug. 19, 1896, *Applegate*, no. 86. WASHINGTON: Spokane, May, 1893, *Sandberg & Leiberg*; Mt. Ranier, Aug. 1895, *Piper*, no. 2144; Spokane, June, 1892, *Henderson*, no. 2306; Spokane, May 16, 1896, *Piper*, no. 2289. YUKON: Carcross, July 16, 1914, *Eastwood*, no. 701.

1c. *ERIGERON COMPOSITUS* Pursh, var. **petraeus**, var. nov., foliis ciliato-hispidis; capitulis discoideis. — British Columbia and Alberta to northwestern Wyoming and southern California. — ALBERTA: Devil's Lake, Banff, July 5, 1907, *Butters & Hollway*, no. 28; Banff, June 12, 1906, *Butters & Rosendahl*, 1377. MONTANA: Red Lodge, July 28, 1893, *Rose*, no. 65 (R. Mt. Herb.). IDAHO: Payette Forest Reserve, 1912, *Mains*, no. D-38 (R. Mt. Herb.); Mackay, Custer Co., July 31, 1911, *Nelson & Macbride*, no. 1482 (R. Mt. Herb.); Parker Mt., Custer Co., July 17, 1916, *Macbride & Payson*, no. 3247; Squaw Creek, Custer Co., July 23, 1916, *Macbride & Payson*, no. 3381; Bonanza, Custer Co., July 28, 1916, *Macbride & Payson*, no. 3494; Soldier Mts., Blaine Co., June 26, 1916, *Macbride & Payson*, no. 2900; Smoky Mts., Blaine Co., Aug. 13, 1916, *Macbride & Payson*, 3765; Lost River Mts. west of Clyde, Blaine Co., July 10, 1916, *Macbride & Payson*, no. 3140 (TYPE, Gray Herb.). WYOMING: Cloud's Peak, 1897, *W. C. Knight* (R. Mt. Herb.); Little Goose Creek Hills, July 16, 1896, *A. Nelson*, 2343 (R. Mt. Herb.); vicinity of Big Horn Mts., July-Aug., 1897, *Williams* (R. Mt. Herb.); Golden Gate, Yellowstone Park, June 28, 1899, *A. Nelson & E. Nelson*, no. 5538a (also no. 5538, in part). UTAH: La Sal Mts., July 17, 1911, *Rydberg & Garrett*, no. 9022 (R. Mt. Herb.); La Sal Mts., July 15, 1912, *Walker*, no. 278; Mount Barette, July 26, 1905, *Rydberg & Carlton*, no. 7224; Kimball's, June 3, 1908, *Mrs. Joseph Clemens*. CALIFORNIA: Mt. Tallac, July 25, 1897, *Blasdale* (R. Mt. Herb.); Castle Peak, Nevada Co., Aug. 3, 1903, *Heller*, no. 7103; Lassen's

Peak, Sierra Co., 1875, *Lemmon*; Mt. San Bernardino, June, 1879, *Wright*. OREGON: Steins Mts., July 5, 1896, *Leiberg*, no. 2492; Pine Creek, southeastern Oregon, July, 1893, *Mrs. Austin* (R. Mt. Herb.). BRITISH COLUMBIA: Spencer's Bridge, May 19, 1875, *Macoun*, no. 888.

This variety, although seemingly only a discoid form of var. *multifidus*, apparently is not found in Colorado, a region where it would be expected on account of the prevalence of the rayed state. Our no. 3140a, representing the var. *multifidus* was collected only a few feet from the type of the var. *petraeus*, and Dr. Butters informs us that his specimens of both forms were growing on the same alpine slope.

2. *E. TRIFIDUS* Hook. Fl. Bor. Am. ii. 17. t. 120 (1834). — *E. compositus* Pursh, var. *trifidus* (Hook.) Gray; Proc. Am. Acad. xvi. 90 (1880). — Colorado to southwestern Montana and eastern Oregon; also Greenland. — GREENLAND: Herb. Hort. Bot. Hafn., *Rink*. MONTANA: Gallatin Co., June 11, 1901, *Jones*, (R. Mt. Herb.); Great Falls, June 10, 1892, *Williams* (R. Mt. Herb.); Madison Co., June 26, 1899, *A. Nelson & E. Nelson*, no. 5458; near Woodruff's Falls, Aug. 2, 1883, *Canby*. WYOMING: Head of Pole Creek, May 18, 1895, *A. Nelson*, no. 1217 (R. Mt. Herb.); Sand Creek, Albany Co., June 1, 1900, *A. Nelson*, no. 7007, in part; Ft. Bridger, June 9, 1898, *A. Nelson*, no. 4614a (R. Mt. Herb.); Laramie Hills, June, 1893, *A. Nelson*, no. 3239 (R. Mt. Herb.); Pole Creek, May 12, 1894, *A. Nelson*, no. 3816; Tepee Creek, July 9, 1909, *Willits*, no. 274 (R. Mt. Herb.). COLORADO: Ward, July 20, 1907, *Ramaley, Dodds & Robbins*, no. 3152 (R. Mt. Herb.); Dutch Lake, June 14, 1908, *Ramaley*, no. 4660 (R. Mt. Herb.); west of Ward, June 26, and June 11, 1908, *Ramaley & Robbins*, nos. 5043 & 4643 (R. Mt. Herb.); Gilpin Co., June-July, 1903, *Tweedy*, no. 5812 (R. Mt. Herb.); Golf Links, June 14, 1901, *F. E. & E. S. Clements*, no. 89; west of Fort Collins, June 14, 1898, *Crandall* (R. Mt. Herb.); Larimer Co., May 4, 1895, *Baker*, no. 5241 (R. Mt. Herb.), also *Osterhout* (R. Mt. Herb.); Eldora, Aug. 14, 1912, *Ramaley*, no. 9338 (R. Mt. Herb.); Ward, July 19, 1912, *Ramaley*, no. 9139 (R. Mt. Herb.); Marshall Pass, Aug. 20, 1901, *Baker*, no. 868; White House Mts., 1873, *Coulter*. OREGON: 1886, *Cusick*, no. 1402. WASHINGTON: Olympic Mts., *J. M. Grant*, no. 30 (not typical).

This species in typical form, is confined to the central Rocky Mountains and Washington material heretofore placed here is largely referable to *E. compositus*, var. *multifidus*. We cite Grant's collection from the Olympic Mts. with great hesitancy.

Our specimen consists of a single small plant and more material may show it to represent an undescribed variety.

2a. *E. TRIFIDUS* Hook., var. *DISCOIDEUS* A. Nels. in Coult. & Nels. Man. R. Mt. Bot. 529 (1909). — WYOMING: Laramie Hills, June 4, 1899, *A. Nelson & E. Nelson*, no. 5400 (R. Mt. Herb.); Middle Fork of Powder River, July 19, 1901, *Goodding*, no. 324 (R. Mt. Herb.); Steamboat Mts., Sweetwater Co., June 10, 1900, *Nelson*, no. 7088.

✓ 2b. *E. TRIFIDUS* Hook., var. **prasinus**, var. nov., foliis laminis glabris, petiolis ciliato-hispidis; capitulis radiatis, ligulis albis. — Black Hills, South Dakota to northern Colorado. — SOUTH DAKOTA: Cave Hills, Harding Co., Aug. 1, 1910, *F. D. Fromme*, no. 3; rim of Spearfish Canyon, June 18, 1910, *John Murdoch Jr.*, no. 4101. WYOMING: Laramie Peak, July 12, 1900, *A. Nelson* (R. Mt. Herb.); Cheyenne, May 1, 1902, *A. Nelson*, no. 8842; Sand Creek, Albany Co., June 1, 1900, *A. Nelson*, no. 7007 in part. COLORADO: Estes Park, Aug. 9, 1916, *Cooper*, no. 78, (R. Mt. Herb.) also May 18, 1908, no. 15 (R. Mt. Herb.); Frances, Boulder Co., July 18, 1907, *Ramaley*, no. 3273 (R. Mt. Herb.); near Ward, July 30, 1907, *Ramaley & Robbins*, no. 3103 (R. Mt. Herb.); Blue Bird Mine and Silver Lake, July 1, 1905, *Ramaley*, nos. 1181 and 1241 (R. Mt. Herb.); Tolland, July 15, 1912, *Ramaley*, no. 9119 (R. Mt. Herb.); Spicer, Larimer Co., July 10, 1903, *Goodding*, no. 1509 (TYPE, R. Mt. Herb., duplicate Gray Herb.).

The type of *E. flabellifolius* Rydb. Bull. Torr. Club. xxvi. 545 (1899), has not been seen but it seems to be a form of this variety depending on leaves which are “never compound but simply cleft two thirds their length or less.”

✓ 2c. *E. TRIFIDUS* Hook., var. **deficiens**, nom. nov. *E. compositus* Pursh, var. *discoideus* Gray, Am. Journ. Sci. ser. 2, xxxiii. 237 (1862), not *E. trifidus* Hook., var. *discoideus* A. Nels. in Coulter & Nelson Man. R. Mt. Bot. 529 (1909). — COLORADO: alpine ridges lying east of Middle Park, 1861, *Parry*, no. 5 (type of *E. compositus*, var. *discoideus*); about Gray's Peak, July 30, 1885, *Patterson*, no. 62.

3. *E. PINNATISECTUS* (Gray) A. Nels. Bull. Torr. Club xxvi. 246 (1899). *E. compositus* Pursh, var. *pinnatisectus* Gray, Proc. Am. Acad. xvi. 90 (1881). — Colorado and southeastern Wyoming to northern New Mexico. — WYOMING: Medicine Bow Mts., Albany Co., Aug. 2, 1900, *A. Nelson*, no. 7854; La Plata Mines, Aug. 23, 1895, *A. Nelson*, no. 1816. COLORADO: west of Fort Collins, July 19, 1898, *Crandall* (R. Mt. Herb.); Boulder Co., 1896, *Mosely*, no. 307 (R. Mt. Herb.); near Breckenridge, Aug. 1901, *Mackenzie*, no. 32 (R. Mt. Herb.); Pagosa Peak, Aug. 6,

1899, *Baker*, no. 673 (R. Mt. Herb.); Mt. Garfield, July 15, 1901, *F. E. & E. S. Clements*, no. 497; Beaver Creek, July 4, 1896 and July 17, 1898, nos. 2897 and 2998; 1906, *Johnston*, no. 344 (R. Mt. Herb.); Estes Park, Aug. 2, 1906, *Cooper*, no. 38 (R. Mt. Herb.); Bald Mt., Boulder Co., July 20, 1907, *Ramaley, Dodds & Robbins*, no. 3237 (R. Mt. Herb.); near Ward, Boulder Co., July 30, 1907, *Ramaley & Robbins*, no. 3096; south of Ward, July, 1901, *Osterhout*, no. 2437 (R. Mt. Herb.); Long's Peak, July, 1905, *Johnston*, no. 74 (R. Mt. Herb.); Long's Peak, Aug. 3, 1904, *Cooper*, no. 221 (R. Mt. Herb.); Mt. Audubon, July, 19, 1908, *Dodds & Robbins*, no. 5858 (R. Mt. Herb.); Mosquito, 1873, *Wolf*; South Park, 1873, *Wolf & Rothrock*, no. 496; about Gray's Peak, July and Aug., 1885, *Patterson*, no. 60.

3a. *E. PINNATISECTUS* (Gray) A. Nels., var. **insolens**, var. nov., capitulis discoideis. — UTAH: above timber, La Sal Mts., July 15, 1912, *Walker*, no. 271 (TYPE, R. Mt. Herb., duplicate Gray Herb.); La Sal Mts., July 17 & 7, 1911, *Rydberg & Garrett*, nos. 8671 (R. Mt. Herb.) & 9023.

The typical form of the species has apparently never been collected west of the continental divide so this discoid variety, found, as yet, only in southeastern Utah, is exceedingly interesting.



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