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ADDITIONS TO THE FLORA OF COLORADO—IV[1]

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This installment of the series proposes four new combinations, and a series of items listed under the following topics: 1) additions to the flora, 2) verifications, and 3) rejected taxa. The first category concerns taxa which have not been previously reported for the Colorado flora. The second concerns taxa which were listed in the Manual[3] on the basis of an unchecked report and which the writer subsequently has been able to verify by study of the actual specimens or by the word of an acknowledged authority who vouches for the specimen. The third concerns taxa which were included in the flora on the basis of an unchecked report and which reports subsequently have been shown to rest on incorrect information, or on misidentification of specimens.

Many of the verification and rejection decisions have been made possible through a recent study visit to the herbaria of the New York Botanical Garden,

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[3]Harrington (1954).

which houses the important herbarium of Per Axel Rydberg, the Smithsonian Institution, and Gray Herbarium of Harvard University. The writer is very grateful to the curators of these herbaria for the use of their facilities and to the curators of other herbaria from which specimens have been borrowed.

The new records have been obtained largely through the writer's own field studies, but significant additions have been made through the work of a few students and resident amateur botanists. Among these, Mr. & Mrs. Bruce MacLeod and son, William, of Whisky Springs Ranch, Greystone, Colorado, have added significantly to our knowledge of the Moffat County flora through their collecting and hospitality to the writer in the field. Mr. James Erdman's studies of the flora of the Mesa Verde and the adjacent Four Corners region continue to add novelties to the flora. Dr. Url Lanham, who is pursuing entomological studies in the Boulder region, has detected several species new to the area or assumed to be extinct here for many years.

To the curators of the herbaria of our sister institutions, Dr. H. D. Harrington, Colorado State University, Dr. C. W. T. Penland, Colorado College, and Dr. C. L. Porter, University of Wyoming, I am continually in debt for free access to their institutional herbaria and for their permission to add their discoveries to these accounts. Dr. Doris Löve has been very helpful in providing translations of critical portions of the Flora USSR. The illustrations were made by Kent Pendleton, museum staff artist.

According to established custom, the herbaria housing the cited specimens are indicated by the abbreviations adopted by the International Association for Plant Taxonomy. Specimens unaccompanied by an herbarium reference are housed in the University of Colorado herbarium (COLO).

NEW NAMES AND NEW COMBINATIONS

Ipomopsis globularis (Brand) W. A. Weber, *comb. nov.*

Based on *Gilia globularis* Brand, Das Pflanzenreich, 27. Heft (IV. 250): 120. 1907.

Leucopoa kingii (S. Wats.) W. A. Weber, *comb. nov.*

Based on *Poa kingii* S. Wats., Bot. King's Exped., p. 387. 1871; *Hesperochloa kingii* Rydberg, Bull. Torr. Bot. Club 39: 106. 1912.

The monotypic genus *Hesperochloa* stands apart from its near relative *Festuca* by its dioecious habit, large, pale papery glumes and lemmas, and brushy stigmas. Herbarium material recently received from the Soviet Union was so like *Hesperochloa* that a comparison of our genus with the Asiatic counterpart, *Leucopoa,* was indicated. Study of the specimens and the descriptions and key in Flora USSR (Komarov, 1934) confirms our suspicion that the genera are synonymous. According to the Russian key and descriptions, *Leucopoa kingii* is most closely allied to *L. caucasica* (Hack.) V. Krecz. *et* Bobr.

Ptilagrostis porteri (Rydb.) W. A. Weber, *comb. nov.*

Based on *Stipa porteri* Rydberg, Bull. Torr. Bot. Club 32: 599. 1905.

Ribes inerme Rydb. *forma* **incisum** W. A. Weber, *form. nov.*

Folia anguste incisa lobis acuminatis vel attenuatis. Colorado. Boulder County: a single bush among many of the normal form, summit of Sugarloaf Mountain, along uppermost switchback of trail, foothills of the Front Range west of Boulder, ca. 8,000 ft. alt., 18 July 1965, *W. A. Weber & G. N. Jones 12,916a* (TYPE, COLO).

ADDITIONS TO THE FLORA

The following taxa have not been reported before in Colorado and are listed with their bibliographic citations, followed, in most instances, by reference to a modern description or figure. In certain instances, that portion of the key as given in Harrington (1954) is revised to include the species and its near relatives. Some species reported by others and apparently overlooked in the preparation of the Manual are listed here with their bibliographic citation.

ALLIARIA OFFICINALIS Andrz. *ex* DC., Syst. Veg. 2: 489. 1821; Hitchcock *et al.* (1964, p. 437, fig. p. 441) [Cruciferae]. El Paso Co.: mesa S. of Colorado Springs, Broadmoor area, 7 June 1958, 4 June 1952, *Penland 4,990, 4,285* (COCO). Adventive Eurasian weed.

ALOPECURUS PRATENSIS L., Sp. Pl., p. 60. 1753; Hitchcock (1950, p. 358) [Gramineae]. Larimer Co.: adventive along highway roadside fill, 10 miles S. of Virginia Dale, 9 June 1965, *Weber & Jones 12,385*. Distinguished by its large (4-5 mm.) spikelets and conspicuously ciliate glumes. Adventive Eurasian grass.

ALYSSUM DESERTORUM Stapf, Denkschr. d. Akad. Wiss. Math. Nat. Klasse Wien 51: 302. 1886; Tutin *et al.* (1964, p. 300) [Cruciferae]. Jackson Co.: sandy, disturbed soil of roadside borrow; primitive road between Rand and Spicer, North Park, 8,500 ft. alt., 21 June 1965, *Weber & Salamun 12,428*. Distinguished by the characters of the glabrous silicles, narrowly oblanceolate and densely appressed stellate pubescence, and style 0.5 mm. long. Previously known from Idaho and Wyoming.

ALYSSUM MINUS (L.) Rothmaler, Fedde Repert. 50: 77. 1941; Tutin *et al.* (1964, p. 300) [Cruciferae]. Elbert Co.: roadside pasture 2 miles E. of Kiowa, 6,500 ft., 31 May 1953, *Penland & Hartwell 4,373;* Jefferson Co.: denuded ground of gravel pit 3 miles E. of Golden, 5,600 ft. alt., 13 April, 18 May 1954, *Douglass 54-12*. New to North America, an adventive Eurasian weed. The following key will distinguish the three species now known from Colorado:

1a. Silicles glabrous ..... *Alyssum desertorum*
1b. Silicles stellate-pubescent ..... (2)
2a. Styles 0.5 mm. long; foliage and siliques closely and minutely stellate; sepals persistent; filaments filiform, with two basal filiform appendages ..... *Alyssum alyssoides*
2b. Styles 1.5-2.0 mm. long; foliage and siliques loosely coarse-stellate; sepals caducous; filaments narrowly papery-winged ..... *Alyssum minus*

AMSINCKIA LYCOPSOIDES Lehm. *ex* Fisch. & Mey., Ind. Sem. Hort. Petrop. 2: 2. 1836 [Boraginaceae]. Clear Creek Co.: locally abundant in vacant lots about the tumble-down houses of Silver

Plume, said to have first appeared about 1938-1939, 9,100 ft. alt., 2 Aug., 8 Sept. 1942, *Ewan 14,533; 14,-630.* Adventive here, native on the Pacific Coast.

AMSINCKIA MENZIESII (Lehm.) Nels. & Macbr., Bot. Gaz. 61: 36. 1916 [Boraginaceae]. Boulder Co.: weed in gravelly bare areas at Trojan Ranch, Gold Hill, 8,000 ft. alt., 30 Aug. 1953, *Weber 8,644;* Front Range Trail, 8,500 ft. alt., above Nederland, 4 July 1962, *G. N. Jones 34,045.* Also introduced from western U. S. A revised key to the Colorado species of *Amsinckia* is given below:

1a. Back of nutlets tessellate (like a cobblestone pavement); corolla-tube 20-nerved below the stamens; calyx-lobes unequal in width and at least two of them fused for some length. *A. tessellata* Gray (*A. rugosa* Rydb. of the Manual?)

1b. Back of nutlets not tessellate, the roughenings neither crowded nor forming a pavement; corolla-tube 10-nerved below the stamens; calyx-lobes various....(2)

2a. Corolla-throat constricted and nearly closed by intruding hairy, saccate processes; stamens inserted evenly below the constriction. *A. lycopsoides* Lehm. (This is the species reported in the Manual as being either *A. intermedia* or *A. douglasiana.*)

2b. Corolla-throat open and glabrous; stamens more or less irregularly inserted in the throat. *A. menziesii* (Lehm.) Nels. & Macbr.

AQUILEGIA PUBESCENS Coville, Contrib. U. S. Nat. Herb. 4: 56. 1893 [Ranunculaceae]. Boulder Co.: gravelly slope, edge of *Pinus contorta* forest between Nederland and Caribou, 9,500 ft. alt., 12 Aug. 1962, *G. N. Jones s.n.* (COLO 172,801). This Californian endemic apparently was introduced by casual roadside scattering of seed by local garden clubs in the interest of roadside beautification. Despite the fact that the plants were found far from any habitation, their occurrence can be explained in no other way. Munz (1946) states: "the species is sometimes offered by American dealers in native plants."

ARABIS LYALLII S. Wats., Proc. Amer. Acad. 11: 122. 1875 [Cruciferae]. Routt Co.: shore of Gilpin Lake, W. slope, Park Range E. of Slavonia, Routt Nat. Forest, 14 July 1952, *Ruth A. Nelson 6,575.* Related to *A. drummondii* A. Gray, from which it differs in having siliques with a single row of seeds, stems numerous from a cluster of caudices with many narrowly lanceolate basal leaves. The record extends the range southeastward from the Grand Tetons and represents the southernmost locality known.

ASCLEPIAS MACROSPERMA Eastw., Bull. Torr. Bot. Club 25: 172. 1898; *A. involucrata* var. *tomentosa* Eastw., Zoë 4: 120. 1893; Woodson (1954, p. 131) [Asclepiadaceae]. Montezuma Co.: very sandy dry wash leading into San Juan River at Four Corners, 16 May 1964, *Erdman 430.* Previously recorded from Utah, Arizona and New Mexico in the Four Corners area, this species resembles *A. involucrata* but has lower hoods and conspicuously crispate-tomentulose herbage.

ASTER PERELEGANS Nels. & Macbr., Bot. Gaz. 56: 477. 1913; Cronquist (1955, p. 93); Abrams & Ferris (1960, p. 325, fig. 5551) [Compositae]. Moffat Co.: Blue Mountain, on N.-facing slope of Round Top Mountain just below limestone rim rocks, 8,550 ft. alt., 30 July 1960, *W. A. J. MacLeod 52a.* In the Manual this species, which belongs to subgenus Eucephalus, keys to a point in the

vicinity of *Aster engelmannii.* The two can be separated by the following couplet:

Leaves large, mostly 15-35 mm. wide; ray-flowers white, turning pinkish in age; plants 6-15 dm. tall; phyllaries elongate, some with narrow and flexuous tips; heads (exclusive of pappus and rays) about 1 cm. high; forest openings ..... *A. engelmannii*

Leaves smaller, 3-15 mm. wide; ray-flowers deep violet; smaller plants, 3-6 dm. tall; heads (exclusive of pappus and rays) about 0.5 cm. high; open slopes and plateau summits ..... *A. perelegans*

This collection extends the southeastern limit of this intermountain species into Colorado. A report from Nebraska is often cited but has not been verified. The total distribution includes SW Montana, NE Oregon, Nevada, Utah, and NE Colorado.

ATRIPLEX GRACILIFLORA Jones, Proc. Calif. Acad. Sci., ser. 2, 5: 717. 1895 [Chenopodiaceae]. Reported by Barneby (1944) but evidently overlooked in the preparation of the Manual. Mesa Co.: alkaline clay knoll 16 miles N. of Loma, 4,950 ft. alt., *Barneby 5,471.* Vegetatively, *A. graciliflora* is almost identical with *A. saccaria* and has a similar ecology. The fruiting bracts, however, are large (10-15 mm.), orbicular or oblong, as in *A. hortensis,* but are united to the apex and they lack the appendages found in *A. saccaria.*

ATRIPLEX HETEROSPERMA Bunge, Mem. Sav. Étr. Petersb. 7: 448. 1854 [Chenopodiaceae]. Larimer Co.: Estes Park, 28 Aug. 1956, *G. N. Jones 21,-204.* Also a specimen from Montana: Powell Co.: prairie near Deer Lodge, 29 Aug. 1961, *G. N. Jones 36,594.* A weedy species of the southern U.S.S.R., apparently not reported previously from the United States. In its circular bracteoles *A. heterosperma* resembles *A. hortensis,* and in its opposite, hastate and coarsely dentate leaves it resembles *A. hastata* which, however, has triangular, toothed bracteoles. Unlike *A. hortensis,* the carpellate flowers are monomorphic, all with vertical seeds and two bracteoles. For a full description and key, see Tutin *et al.* (1964).

AXYRIS AMARANTHOIDES L., Sp. Pl., p. 979. 1753; Gleason (1952, Vol. 2, p. 94, fig. p. 95) [Chenopodiaceae]. Park Co.: roadside in mountain meadowlands along road from Jefferson to Lost Park, 9,000 ft. alt., 11 Aug. 1965, *Weber 12,934.* An adventive from Siberia, fairly close to *Kochia,* characterized by stellate pubescence, petiolate leaves, and calyx-lobes erect rather than curving over the fruit. The flowers are unisexual.

BARBAREA VULGARIS R. Br. in Ait., Hort. Kew. 2nd ed., 4: 109. 1812; Hitchcock & Cronquist (1964, p. 459, fig. p. 461) [Cruciferae]. Boulder Co.: Left Hand Creek near mouth of canyon, 6 June 1951, *Weber 6,129;* Grand Co.: Holzwarth Ranch 10 miles N. of Grand Lake, 8,900 ft. alt., 7 July 1961, *Douglass 61-204;* Gunnison Co.: between Crested Butte and Gothic, 9 July 1955, *Gentry 2,139. B. vulgaris* is distinguished from *B. orthoceras* by its long (2-3 mm.), narrowed, beak-like style which gives the silique a tapered appearance, and upper leaves which are merely toothed or lobed, not pinnatifid.

BOTRYCHIUM BOREALE Milde, Bot. Zeit., p. 478, 800. (1857) 1858 [Ophioglossaceae]. Larimer Co.: in small grassy plots on the dry cutbank of the horse trail one mile below The Loch, Rocky Mountain Nat. Park, 9,900 ft. alt., 27 Aug. 1960, *Willard & Porsild 6,062.* Verified by Warren H. Wagner.

CAMISSONIA MINOR (A. Nels.) Raven, Brittonia 16: 285. 1964; *Oenothera*

minor Munz, Bot. Gaz. 85: 238. 1928; *Sphaerostigma minor* A. Nels., Bull. Torr. Bot. Club 26: 130. 1899 [Onagraceae]. Moffat Co.: sandy soil, summit of ridge separating Conway drainage and Vermillion drainage, between Greystone and Gates of Lodore, 26 June 1965, *Weber and Salamun 12,-609*. A range extension from Utah and Wyoming.

CARDUUS ACANTHOIDES L., Sp. Pl., p. 821. 1753; Cronquist (1955, p. 114, fig. p. 117) [Compositae]. Pitkin Co.: along road between Aspen and Ashcroft, 28 Sept. 1952, *Penland 4,359* (COCO).

CAREX PRAECEPTORUM Mack., North American Flora 18 (2): 95. 1931 [as *'praeceptorium'*]; Mackenzie (1940, plate 95) [Cyperaceae]. Boulder Co.: E. face of Front Range, vicinity of Ward, 10,000 ft. alt., 15 Aug. 1961, *E. Dahl & F. J. Hermann s.n.;* edge of bog below outlet of Horseshoe Cirque, S.E. slope of Arapahoe Peaks, 16 July 1949, 10,500 ft. alt., *Weber 4,980;* marshy slope below Niwot Ridge, 11,000 ft. alt., 15 Aug. 1961, *F. J. Hermann 17,065;* Grand Co.: Paradise Park, 10,600 ft. alt., 14 Aug. 1961, *Willard 61,286; 61,294;* Larimer Co.: Loch Vale, Rocky Mt. Nat. Park, 27 Aug. 1960, *Willard & Porsild 6,-067;* Lawn Lake, 7 Aug. 1961, *Willard 61,194;* Fern Lake, 2 Sept. 1960, *Willard 6,073*.

The writer's earlier equation of *C. praeceptorum* with *C. lachenalii* Schkuhr (Weber, 1961, p. 3) was incorrect. *C. praeceptorum* is closely related to *C. canescens* L. Both *C. lachenalii* and *C. praeceptorum* are frequent in the alpine and upper subalpine zones of the Colorado Front Range.

CENTAUREA DIFFUSA Lam., Encycl. 1: 675. 1783; Cronquist (1955, p. 116, fig. p. 120) [Compositae]. Boulder Co.: roadside 4 miles above El Vado on Magnolia Road, 15 Sept. 1963, *Weber s.n.;* east entrance to Boulder Reservoir, 5 miles N.E. of Boulder, 28 Dec. 1962, *Weber 11,947;* Jefferson Co.: roadside between Old Tinytown road and Phillipsburg, 14 Sept. 1962, *Brunquist s.n.* Adventive Eurasian weed. The flowers are white or cream-colored and the phyllaries are fringed with small spines. They terminate in a short spine 1.5-4.0 mm. long.

CHENOPODIUM ACERIFOLIUM Andrz., Univ. Izv. (Kiev) 7-8:132. 1862 [Chenopodiaceae]. An eastern European weed. Plants referable to this species (cf. Tutin, *et al.* 1964) are locally abundant in the Boulder area: Boulder Co.: alkali flat just east of Boulder Reservoir, 19 Sept. 1965, *Weber 12,975;* between Boulder and Louisville, 5 Sept. 1951, *Weber 7,269*. This species is in the *C. album* group, and is characterized by strongly pitted seed-coat, broad three-lobed leaves turning red in age and inflorescence with interrupted clusters. Possibly the plant given in the Manual as *C. berlandieri* Moq.

CRYPTANTHA BREVIFLORA (Osterh.) Payson, Ann. Missouri Bot. Gard. 14: 318. 1927 [Boraginaceae]. Moffat Co.: Cold Springs Mountain, S.E.-facing slope in sagebrush, red sandy soil, 8,-200 ft. alt., 10 July 1965, *W. A. J. MacLeod 321*. Known previously from adjacent Utah, this species in section Oreocarya is distinguished by its uniformly muricate nutlets and short corolla.

DIANTHUS DELTOIDES L., Sp. Pl., p. 411. 1753; Gleason (1952, vol. 2, p. 144) [Caryophyllaceae]. Boulder Co.: roadsides between Nederland and Eldora, 8,500 ft. alt., 2 miles W. of junction of Eldora road with Peak-to-Peak highway, 3 Aug. 1961, *Wiens s. n.;* same locality, 29 July 1962, *G. N. Jones 34,141*. *Dianthus* differs from our other silenoid genera, *Saponaria, Silene* and *Melandrium,* in having the

calyx subtended by a pair of foliaceous, attenuate bracts. This adventive from Eurasia resembles a miniature rose-colored carnation.

ELEOCHARIS ELLIPTICA Kunth var. COMPRESSA (Sull.) Drap. & Mohl., Amer. Midl. Nat. 64: 502. 1960; *E. compressa* Sull. [Cyperaceae]. Svenson (1939, p. 66) reported this from Mt. Lincoln, Salida, and La Veta. The following additional records are noted. Boulder Co.: mesa S. of Boulder, June, Aug. 1906, *Robbins 1,550; 4,006;* Boulder, 5 June 1914, *Ramaley 9,847; 9,950.* Characterized by the flattened culm, frequently exceeding 1 mm. wide, and scales with conspicuous whitened, often bifid, acuminate tips.

ELYMUS JUNCEUS Fisch, Mem. Soc. Nat. Mosc. 1: 45. 1806; *Psathyrostachys juncea* Nevski [Gramineae]. Larimer Co.: adventive in road fill; roadside 10 mi. S. of Virginia Dale, outer foothills, 9 June 1965, *Weber & Jones 12,386.* An Asiatic perennial bunch grass with very short, curled basal leaves. The spikelets are 2-3 at a node, with glumes shorter than the spikelets, and glumes and lemmas pubescent. Commonly called Russian wild-rye. Determined by Alan A. Beetle.

ERAGROSTIS BEYRICHII J. G. Smith, Ann. Rep. Missouri Bot. Gard. 6: 117, plate 56. 1895 [Gramineae]. Larimer Co.: disturbed area, approach road to Hewes Kirkwood Inn and Long's Peak campground, 9,000 ft. alt., 2 Sept. 1935, *Kiener 3,192* (undoubtedly adventive here). A second collection from a native stand as follows: Baca Co.: open sandy ground, 17 miles E. and 28 miles S. of Campo, ¼ mile from Oklahoma line, 3,900 ft. alt., 28 July 1959, *Harrington 9,111* (FC).

ERIGERON UINTAHENSIS Cronquist, Bull. Torr. Bot. Club 70: 270. 1943; Brittonia 6: 151. 1947 [Compositae]. Moffat Co.: near Stuntz Reservoir, Blue Mt., 7,500 ft., *Boyd 79;* on top of high mountain just west of Hell Canyon, 8,300 ft., *Wolf & Dever 5,162;* north slope of Douglas Mountain near Greystone, *W. MacLeod 173A;* Dutch Oven Canyon, Blue Mt. near Greystone, *M. MacLeod 421.*

E. uintahensis, while a close relative of *E. speciosus* and *E. subtrinervis,* is very distinct from either, in Colorado at least, in its densely and minutely glandular leaves. The Moffat County specimens consistently show broader ovate-oblong, less acuminate, and more strongly clasping-truncate leaves than Colorado material of *speciosus* and *subtrinervis.*

ERIOGONUM WETHERILLII Eastwood, Proc. Calif. Acad. Sci. II. 6: 319. 1896 [Polygonaceae]. Montezuma Co.: Four Corners area above San Juan River, 5,000 ft. alt., 16 May 1964, *Erdman 442.* The Manual suggested that this species might occur in southwestern Colorado.

FORSELLESIA PLANITIERUM Ensign, Amer. Midl. Nat. 27: 509. 1942 [Celastraceae]. Las Animas Co.: low shrub, 1-1.5 ft. tall, Hwy. 160 ca. 18 miles E. of Trinidad, *Penland s.n.* (COCO).

GYPSOPHILA ELEGANS Bieb., Fl. Taur. Cauc. 1: 319. 1808?; Bailey (1963, p. 1,422) [Caryophyllaceae]. Moffat Co.: Whisky Springs Ranch, Douglas Mountain, 6 miles SW of Greystone, N.E.-facing slope with *Achillea* and grasses, in shade of *Symphoricarpos,* 7,500 ft. alt., 24 July, 1965, *M. MacLeod 427.* A garden escape of Asia Minor, resembling *Stellaria* but with truncate petals, calyx united halfway up, and the ovary with truncate apex and two styles. The plant is annual, about 20 cm. tall, with oblong-lanceolate leaves and flowers about the size of those of *Stellaria jamesiana.* Known from South Dakota.

JUNCUS BRYOIDES F. J. Hermann, Leafl. West. Bot. 5: 117. 1948

[Juncaceae]. Moffat Co.: spring-fed sandstone ledges, Whisky Springs Ranch, 4 miles above Greystone on Zenobia Peak road, S.W.¼ of S.E.¼, Sec. 3, T. 7 N., R. 101 W., 7,500 ft. alt., 25 June 1965, *Weber & MacLeod 12,-561.* Previously known from southern California and two localities in Utah. A diminutive species, not much over 1 cm. tall, annual, with many short, stiff, one-flowered stems simulating the setae and capsules of pottioid mosses.

JUNCUS TRACYI Rydb., Fl. Rocky Mts., 155, 1,061. 1917 [Juncaceae]. Archuleta Co.: Pagosa Springs, 7,000 ft. alt., 18 July 1893, *B. H. Smith 39;* Park Co.: 1862, *E. Hall s.n.;* Pitkin Co.: springy slope and roadside mire, Lower Snowmass Creek below the earthslide, 12-13 July 1962, *Weber 11,526.* In the Manual, this would come to *J. saximontanus,* but is distinguished by the couplet:

Heads hemispheric, dark purple-black; styles exserted; seeds prominently tailed ..... *J. tracyi*
Heads more nearly spherical, brown; styles not prominent; seeds not tailed ..... *J. saximontanus*

KOCHIA IRANICA (Hausskn. *et* Bornmueller) Litv., Exsic. Turk. No. 297, 405 *ex* Bornmueller, Bull. Herb. Boiss. 2 ser., No. 8: 546. 1908; *Salsola iranica* Hausskn. *et* Bornm. in Bornm. Exsic. Pers. Austro-orient., No. 5,072; 5,074; 5,074b; *Kochia alata* Bates, Amer. Botanist 24: 51-52. 1918; Aellen (1943) [Chenopodiaceae]. This is the plant discussed in Additions III (Weber, 1961, pp. 9-11). During a recent visit to Scandinavia, a search was made in the herbaria for a weedy annual *Kochia* of southeastern Europe or Asia with calyx-wings conforming to those of *K. alata. Kochia iranica* fits very well. As stated earlier, it was highly unlikely that an endemic American species of a wholly Eurasian section of the genus should appear on the Kansas wheatlands.

LONICERA UTAHENSIS S. Wats., U. S. Geol. Surv. 40th Parallel (Botany King's Exped.) 5: 133. 1871 [Caprifoliaceae]. La Plata Co.: floodplain of Animas River at Durango, 6,500 ft., *H. Owen 3.* Colorado was the only Rocky Mountain state in which the species had not been reported.

MINUARTIA STRICTA Hiern, Jour. Bot. 37: 320. 1899; *Spergula stricta* Swartz, Sv. Vet.-Akad. Handl. 20: 229. 1799; *Arenaria uliginosa* Schleich. *ex* Lam. & DC., Fl. Franc. 4: 786. 1805. [Caryophyllaceae]. Clear Creek Co.: in unstable sands along shore of Summit Lake; associated with *Phippsia algida* and *Koenigia islandica,* 12,700 ft. alt., Mount Evans, 30 July 1953, *Weber & Dahl 8,613* (a condensed form of very late snowbeds); Gunnison Co.: North Italian Mountain, 13,300 ft. alt., boulderfield, 1 Aug. 1949, *Langenheim 455 pr. p.;* Summit Co.: moist, grassy tundra slopes, Hoosier Ridge, 12,000 ft. alt., *Weber & Hultén 11,054a.*

This species has not been reported from the conterminous United States. Nannfeldt (1954) discussed the species in detail in connection with the typification of *M. rossii* R. Br. There seems to be ample justification for the recognition of *Minuartia* as a genus distinct from *Arenaria* despite the almost uncontested tendency of American authors to keep them together.

MYOSURUS CUPULATUS S. Wats., Proc. Amer. Acad. 17: 362. 1882 [Ranunculaceae]. Campbell (1952, p. 400) reports this from Montrose Co.: Naturita, without citing collector or herbarium. Its closest relative is *M. nitidus,* from which it differs as follows:

Scapes 5-20 per plant; beak of achene triangular in side view and extended 0.5-0.6 mm. beyond body of achene ..... *M. cupulatus*

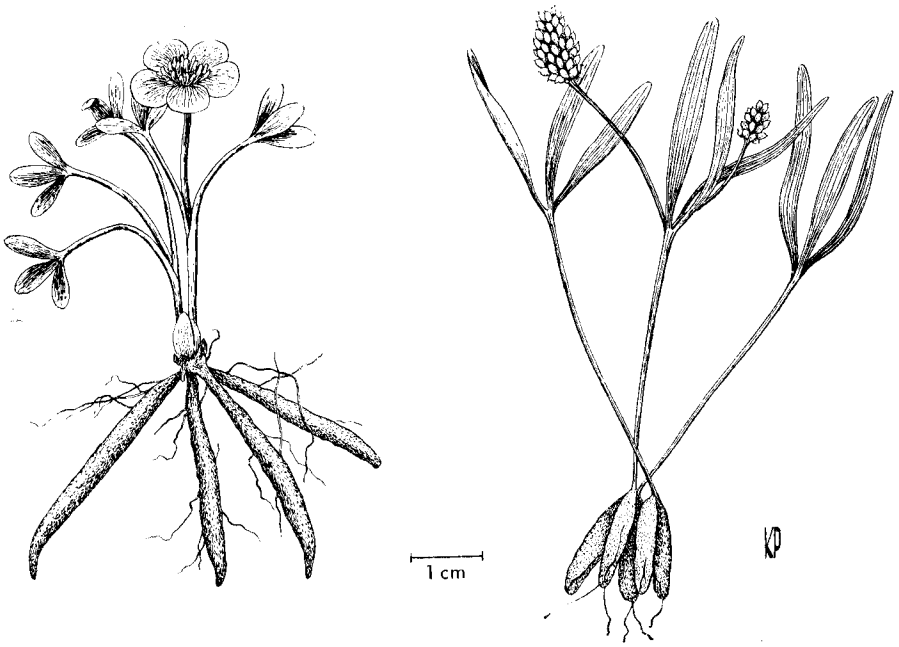

FIG. 1. *Ranunculus jovis*: left, flowering; right, fruiting specimen.

Scapes fewer than 4 per plant; beak of achene not triangular in side view and extended about 1 mm. beyond body.....*M. nitidus*

NAMA DENSUM Lemmon var. PARVIFLORUM (Greenm.) C. L. Hitchc., Amer. Jour. Bot. 20: 420. 1933: Hitchcock (1959, p. 153, fig. p. 156) [Hydrophyllaceae]. Moffat Co.: in sandy soil, summit of ridge separating the Conway from the Vermillion Drainage, between Greystone and Gates of Lodore, 26 June 1965, *Weber & Salamun 12,623;* grassy bench just N.E. of Gates of Lodore above Vermillion drainage, S. end of Brown's Park, 26 June 1965, *Weber & Salamun 12,641.*

RANUNCULUS JOVIS A. Nels., Bull. Torr. Bot. Club 27: 261. 1900; *R. digitatus* Hook., Kew Jour. 3: 124, plate 4. 1851, not Gilib. 1781 nor Willd. *ex* Ledeb. 1842; Benson (1948, p. 166-167) [Ranunculaceae]. Moffat Co.: 6 miles S.W. of Greystone, E. slope of Douglas Mountain on Whisky Springs Ranch, close to snowbank, 21 April 1961, *M. MacLeod 86b. Ranunculus jovis* is distinguished from its close relative, *R. glaberrimus,* by the massive cluster of long-tapering, fusiform roots, the three-parted basal leaves and slightly elongate cluster of achenes (Figure 1). The Colorado collection represents the southeasternmost record in a distributional area encompassing N.W. Wyoming, S.E. Idaho, N.E. Nevada and N.E. Utah.

RESEDA LUTEOLA L., Sp. Pl., p. 448. 1753 [Resedaceae]. Denver, 1888, *Alice Eastwood s.n.* An adventive species from Eurasia. It has not been collected for many years and may not have persisted in the flora.

SAXIFRAGA RIVULARIS L., Sp. Pl., p. 404, 1753 [Saxifragaceae]. Boulder Co.: protected sites under and in lee of boulders, subalpine meadows above N.

shore of Lake Isabelle, 18 July 1948, *Weber 4,277;* Clear Creek Co.: in mossy tufts along inlet stream of Summit Lake, Mt. Evans, 12,700 ft. alt., 30 July 1953, *Weber 8,611*, 22 July 1955, *9,266,* 15 Aug. 1960, *Weber, Porsild & Holmen 11,134;* crevices in boulderfields, trail from Stevens Mine to summit of Gray's Peak, 11 July 1950, *Weber 5,628;* El Paso Co.: Pikes Peak, 2 Aug. 1904, *Huestis s.n.;* Routt Co.: summit Mt. Zirkel, 18 July 1951, *Kelly s.n.;* San Juan Co.: falls and vicinity, 0.5 mi. S. of South Mineral campground, San Juan Mts., 10,200 ft. alt., 28 June 1954, *M. Douglass 54-420.*

Although not listed in the Manual, *Saxifraga rivularis* was reported for Colorado by Engler & Irmscher (1916, p. 282) from "Pikes Peak, about 4,300 meters alt., *M. E. Jones 712.*" Slightly earlier, Small and Rydberg (1905) treated the Saxifragaceae in North American Flora and reported this circumboreal species as far south as Montana. Although American authors have not credited *S. rivularis* to Colorado, a close relative, *S. debilis,* occurs in Wyoming, Utah, Colorado and Montana. Until recently, the writer tended to place all material resembling *rivularis* under *debilis* for want of sufficiently clear diagnostic characters. Small and Rydberg distinguished the species by characters which do not hold for either:

"Petals not abruptly narrowed into claws; leaf-blades thick, the lower ones mainly 3-lobed ..... *S. rivularis*

"Petals abruptly narrowed into claws; leaf-blades thin, the lower ones 5-7-lobed ..... *S. debilis*"

Bacigalupi (correspondence) noted that "more robust specimens of *rivularis* often have as many as five lobes to the basal leaves, and . . . sometimes . . . up to seven. The distinction, petals abruptly, *versus* not abruptly clawed, is no good either." He suggested that the nature of the petiole base furnished a better difference, *rivularis* having broad, often truncate bases sheathing the stem and *debilis* having tapering, non-sheathing petiole-bases. The writer has not found this character very satisfactory although in a large series of specimens a division might be made.

In recent years plants clearly referable to *S. rivularis* have been collected at Summit Lake, Mount Evans, their identity attested to by several European Arctic workers who know the species in its proper area. If their opinions are correct, then it becomes imperative to determine whether *rivularis* is indeed distinct from *debilis.* A close examination of our material now shows that *S. debilis* and *S. rivularis* differ by a number of characters which have not been mentioned by previous writers. Although the plants grow close enough together to have been gathered simultaneously by many collectors, this does not alter the fact that here we have two good species. The diagnostic characters are tabulated below (See also Figure 2):

	debilis	*rivularis*
Inflorescence:	Strict, the pedicels forming a narrow angle with the main axis.	Loose, the pedicels forming a wide angle with the main axis.
Calyx:	Subcylindric, the sides forming a narrow angle from the base; lobes often shorter than the tube, seldom exceeding it.	Campanulate, the sides forming a wide angle from the base; lobes usually longer than the tube, rarely shorter.
Pubescence of pedicels:	Short (0.12-0.13 mm.), straight gland-tipped trichomes.	Long (0.5-0.6 mm.), often crumpled and bent white trichomes, many of them not obviously glandular.

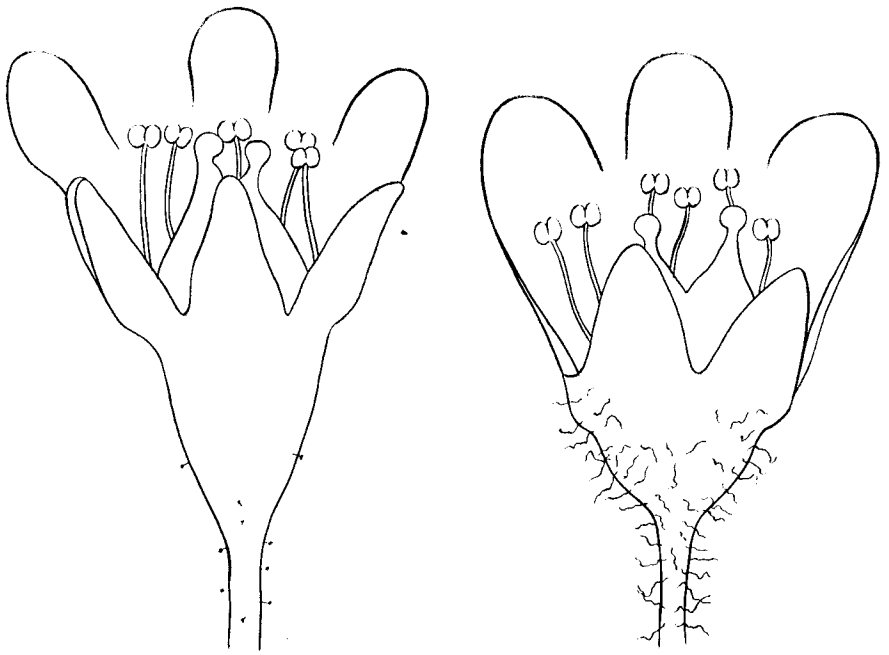

FIG. 2. Flowers of *Saxifraga*: left, *S. debilis;* right, *S. rivularis,* showing shape of hypanthium and nature of glandular pubescence.

In subalpine sites the variation of the leaves runs more or less parallel in both species. However, the plants from the mossy inlet of Summit Lake have uniformly small leaves which are usually trilobate, rarely 5-lobed, conforming to the situation in *S. rivularis* f. *hyperborea* (R. Br.) Hook. The European literature usually gives this form specific rank, and, according to Sørensen, in Jørgensen *et al.* (1958) *S. hyperborea* is diploid, 2n=26, while *S. rivularis* is tetraploid, 2n=52. Sørensen feels that the species differ conspicuously in the presence of "runners" in *rivularis,* and lack of these in *hyperborea.* The so-called "runners" consist of extremely elongated stems with elongated petioles and only rudimentary blades. They are best developed in extremely wet sites where the plants develop creeping or floating stems. The Colorado material is inconclusive on this score, since proper attention has not yet been paid to the matter in the field.

Jørgensen also found that *S. rivularis* and *S. hyperborea* differed in the size of their pollen grains, *rivularis,* the tetraploid having grains measuring 27-31μ, and *hyperborea,* the diploid, having grains 22-26μ. Examinations of the Colorado forms show a similar pattern, with *S. debilis* also falling into the size range of the diploid. Stomatal sizes show similar differentiation.

rivularis	*hyperborea*	*debilis*
Voucher		
Douglass 54-420	*Weber 9266*	*Weber 3437*
grain size		
27-30μ	21-24μ	21-24μ
stomatal length		
37μ	27-30μ	32μ

It is hoped that chromosome studies may soon be undertaken with the purpose of determining whether or not these measurements are accurate reflections of the chromosomal situation. For the time being, therefore, the status of *S. hyperborea* in Colorado is left open.

SCIRPUS CAESPITOSUS L. var. CALLOSUS Bigel., Fl. Bost., ed. 2, p. 21. 1824; Beetle (1947, p. 494) [Cyperaceae]. "Rocky Mountains," *Hall & Harbour 583 in part.* Britton (1892), commenting on this collection, which was distributed widely under the name *Scirpus pumilus* and correctly so (Webber 1961, p. 6), wrote: "Hall & Harbour No. 583 is mixed, for Mr. [C. B.] Clarke informs me that the number in Herb. de Candolle is *S. caespitosus.*" It is of some interest to note that Gray (1863), enumerating the Hall and Harbour collections, listed No. 583 under *S. caespitosus* although the specimen at Harvard now is *S. pumilus.*

SISYMBRIUM LOESELII L., Cent. Pl. 1: 18. 1755; Hitchcock & Cronquist (1964, p. 541, fig. p. 544) [Cruciferae]. El Paso Co.: roadside weed, Crystola Gulch, 16 July 1956, *Penland 4,747;* Rio Blanco Co.: dry fork, Piceance Creek, 6,200 ft. alt., 15 Aug. 1958, *W. McKean s.n.* Differs from *S. altissimum* by having shorter siliques and pedicels more slender than the siliques. Adventive Eurasian weed.

SITANION JUBATUM J. G. Smith, Bull. U. S. Div. Agrost. 18: 10. 1899; Wilson (1963, p. 319) [Gramineae]. Moffat Co.: Whisky Springs Ranch, Douglas Mountain, 6 miles S.W. of Greystone, 7,500 ft. alt., 25 June 1965, *Weber & MacLeod 405.* An extension eastward from Utah. Wilson (1963) recently revised the genus. With the addition of the present species, three species are now known from Colorado, only one of which was listed in the Manual. A key to the species now known follows:

1a. Lowermost floret of one or both spikelets at each rachis node sterile and reduced to a subulate or lanceolate structure, giving the appearance of extra glume segments ..... (2)

1b. Lowermost floret of each spikelet fertile, not reduced ..... *S. longifolium*

2a. Glumes entire or bifid ..... *S. hystrix*

2b. Glumes 3-many-cleft ..... *S. jubatum*

STELLARIA SIMCOEI (Howell) C. L. Hitchcock, Vasc. Pl. Pac. N.W. 2: 310. 1964; *Alsine simcoei* Howell, Fl. N.W. Amer., p. 83. 1897; *Stellaria calycantha* var. *simcoei* Fernald, Rhodora 42: 255. 1940 [Caryophyllaceae]. Pitkin Co.: with *S. calycantha* and *S. longipes,* in willow thickets of a spring bog just above the highway between Lincoln Gulch and Lost Man Campground, Roaring Fork Valley between Aspen and Independence Pass, 9,500 ft. alt., 9-13 July 1963, *Weber 12,085;* Routt Co.: beaver dams off Diamond Park road 1.5 miles N. of Seedhouse Guard Station, North Fork of Elk River, 28 miles N. of Steamboat Springs, 8,000 ft. alt., 18 July 1951, *Weber 6,793.*

Superficially, *S. simcoei* resembles *S. calycantha* but it differs in its copiously pilose stems, ciliate leaves and almost or quite vestigial corolla. Its taxonomic status may be considered somewhat doubtful because intermediates occur, which have highly papillose stems and leaf-margins but no multicellular hairs except on the leaf bases. Nevertheless, there is a good argument for recognition at the specific level because of the geographic distribution (Washington, Idaho, Oregon, Montana, Colorado) and because of the sympatric occurrence of the two species without intergradation, in Colorado at least.

VERBASCUM X PTEROCAULON Franchet, Fl. Loir. - et- Cher, p. 413. 1885; *V. blattaria* L. X *V. thapsus* L., sterile F_1 hybrid [Scrophulariaceae]. Boulder Co.: adventive along right-of-way, Boulder-Denver turnpike just east of Superior; plants over 2 meters tall, with virgate panicle branches, yellow flowers, 29 July 1963, *Weber 12,055*. The two parents grew in the immediate vicinity of three or four hybrid individuals. These exceeded by several decimeters the height of the tallest plants of either species. They did not appear during succeeding seasons. Dr. C. E. Hubbard, Royal Botanic Gardens, Kew, has examined the material and found the pollen to be completely sterile and the capsules without seeds.

VERONICA BILOBA L., Mantissa 2: 172. 1771; Hitchcock *et al.* (1959, p. 421, fig. p. 422) [Scrophulariaceae]. Boulder Co.: disturbed soil of outwash floodplain of Bear Canyon, S. of Boulder, 23 May 1965, *Lanham & Weber 12,381*. An adventive from southeastern Europe and Asia Minor.

VERIFICATIONS

The following taxa were included doubtfully by Harrington (1954) because he had not seen specimens which validated published reports. These are here definitely added to the flora on the basis of a specimen by the writer (indicated by !) or cited by a monographer. Following the name of the taxon are 1) the family, 2) the source of the report when known, 3) collection data of the specimen and 4) the herbarium housing it and the authority for the determination.

ABUTILON PARVULUM A. Gray [Malvaceae]. Rydberg (1906, p. 231). There are three specimens: Fremont Co.: Canyon City, 30 Sept. 1873, *E. L. Greene s.n.;* same locality, July 1892, *Alice Eastwood s.n.;* same, 1873, *T. S. Brandegee 865* (! NY).

ALLIONIA INCARNATA L. [Nyctaginaceae]. Rydberg (1906, p. 124), under *Wedelia*. Fremont Co.: Soda Spring Ledge, Canyon City, *T. S. Brandegee* in 1874, No. 896 (! NY).

ALOPECURUS CAROLINIANUS Walt. [Gramineae]. Hitchcock (1950, fig. 507). Washington Co.: Akron, 24 June 1909, *H. L. Shantz 977* (! US).

AMARANTHUS PUBESCENS (Uline & Bray) Rydb. [Amaranthaceae]. Standley (1917, pp. 115-116). El Paso Co.: 22 Sept. 1895, *S. L. Clarke 64* (! NY).

CHEILANTHES WOOTONII Maxon [Polypodiaceae]. Wherry (1938, p. 131). Baca Co.: crevices in N.-facing sandstone ledges, large canyon tributary to Carrizo Creek, 9 miles by road S. of Kirkwell (about 7 miles N.E. of S.W. corner of Colorado), 14 Aug. 1937, *Wherry s.n.* (! COLO, PH); Prowers Co.: Bristol, April 1917, *Duce s.n.* (! COLO).

CHENOPODIUM CHENOPODIOIDES (L.) Aellen var. DEGENIANUM Aellen [Chenopodiaceae]. Rydberg (1906, p. 115) as *C. humile* Hook. Gunnison Co.: 7,680 ft. alt., 27 Aug. 1901, *C. F. Baker 935* (! NY, determined by H. A. Wahl).

ELEOCHARIS ATROPURPUREA (Retz) Kunth [Cyperaceae]. Svenson (1929,

p. 227). Weld Co.: La Poudre River at Greeley, *E. L. Greene s.n.* (cited by Svenson, *l. c.*).

ELEOCHARIS MONTEVIDENSIS Kunth [Cyperaceae]. Svenson (1939, p. 220). Larimer Co.: Fort Collins, *C. F. Baker* in 1893 (P).

ELEOCHARIS WOLFII A. Gray [Cyperaceae]. Svenson (1939, p. 18). El Paso Co.: Black Forest, *J. H. Christ, 1,029* (CU).

HABENARIA SPARSIFLORA S. Wats. [Orchidaceae]. Correll (1950, p. 109). El Paso Co.: Big Jack Brook, Minnehaha, 8,400 ft. alt., *Penland 170* (! COCO); Garfield Co.: between Carbondale and Redville, 23 June 1941, *Killip 36,477* (! COCO); Pitkin Co.: 10 miles N. of Redstone on Crystal River, 7 July 1947, *Penland 3,597* (! COCO); Rio Blanco and Montrose counties (Correll, *op. cit.*).

HAPLOPAPPUS LINEARIFOLIUS ssp. INTERIOR (Coville) H. M. Hall [Compositae]. Hall (1928, p. 158). Surface Creek, Grand Mesa, June 1892, Payson [error for *Purpus*] (Z, cited by Hall, *op. cit.*).

HAPLOPAPPUS PLURIFLORUS (A. Gray) H. M. Hall [Compositae]. Rydberg (1906, p. 343) reports this from "on the Arkansas." This is the collection made on Major Long's Expedition. The specimen at NY (!) reads "Colo." in a later handwriting. Rydberg also reported *Isocoma wrightii Rydb.* [= *H. pluriflorus, fide* Hall] from southwestern Colorado. The specimen is "San Juan Valley, Brandegee" (! NY). There is a possibility that the latter specimen may have been collected in Utah.

IPOMOPSIS GUNNISONII (T. & G.) V. Grant, Aliso 3: 361. 1956. *Gilia gunnisonii* T. & G. [Polemoniaceae]. This species was reported very doubtfully in the Manual, with an added statement that it "intergrades with *G. pumila* Nutt. to some degree and may be only a variety of it." We now have good material from Montezuma County: Four Corners, above the San Juan River, 5,000 ft. alt., on dry slopes, 16 May 1964, *Erdman and Watson 434. Ipomopsis gunnisonii* is amply distinct from *I. pumila,* but it is so poorly known that few treatments have had to grapple with its characteristics. Kearney & Peebles (1960, p. 689) and Harrington (1954) make the separation wholly on the basis of the tendency to entire leaves (*gunnisonii*) or pinnatifid leaves (*pumila*). Since the largest leaves of *gunnisonii* may have a few shallow teeth, the distinction is not clear to the reader. The flowers and indument provide much better characters. In *I. gunnisonii* the corolla lobes are about as long as the tube so that the tube itself is relatively inconspicuous. The stem, especially above, is only sparsely arachnoid-pubescent but very glandular, the glandulosity most pronounced on the peduncles and bracts. The flower cluster is dense, with many flowers blossoming at once, giving the effect of a capitate cluster.

In *I. pumila* the upper stem is densely arachnoid and only sparsely and inconspicuously glandular. The corolla tube is long and narrow, exceeding the lobes and becomes very conspicuous in the herbarium preparation. The flowers bloom a few at a time and the cluster has a cuneate base, not appearing capitate.

KALLSTROEMIA BRACHYSTYLIS Vail [Zygophyllaceae]. Harrington (1954, p. 357). = *K. californica* var. *brachystylis* (Vail) Kearney & Peebles. Otero Co.: Rocky Ford, 20-30 Aug. 1898, *L. R. Moyer s.n* (! NY); Pueblo Co.; common along railroad track near depot, 19 June 1898, *Baker, Earle & Tracy 4* (! NY, 2 specimens).

LACTUCA GRAMINIFOLIA Michx. [Compositae]. Rydberg (1906, p. 410). Ouray Co.: along Uncompahgre River

near Ouray, 10 Sept. 1901, 2,300 m. alt., *L. M. Underwood & A. D. Selby s.n.* (! NY).

LISTERA BOREALIS Morong [Orchidaceae]. Rydberg (1906, p. 89). Clear Creek Co.: Silver Plume, 7 July 1912, collector? (! NY).

MERTENSIA ARIZONICA Greene var. GRAHAMII Greene [Boraginaceae]. The type collection is from Colorado: *Graham 9,667*, canyon at head of west fork, Douglas Creek, 7,000 ft. alt., 16 July 1935 (MO). A second collection from the type area is: Garfield Co.; 36 miles N. of Loma, 8,000 ft. alt. along brook among aspens, 28 May 1943, *Ripley & Barneby 5,485* (! NY).

MONOLEPIS PUSILLA Torr. [Chenopodiaceae]. Rydberg (1906, p. 116). Mesa Co.: Grand Junction, May 1892, *Eastwood 6,106* (! NY).

MYOSURUS NITIDUS Eastw. [Ranunculaceae]. The type locality is Montezuma Co.: Mancos, June 1891, *Eastwood s.n.* (! COLO, May 1891 collection).

NAMA DICHOTOMUM (R. & P.) Choisy [Hydrophyllaceae]. Rydberg (1906, p. 284) as *Marilaunidium angustifolium;* Hitchcock (1933, p. 528): Fremont Co., *Brandegee 1,046; 5,275.* El Paso Co.: Colorado Springs, Aug.-Sept. 1872, *John Torrey s.n.* (! NY); Alamosa Co.: Alamosa, 20 July 1896, *C. L. Shear s.n.* (! NY).

NAMA HISPIDUM A. Gray [Hydrophyllaceae]. Hitchcock (1933, p. 523). "S.W. Colorado, not common, 1875," *Brandegee 5,277* on Hayden's Geol. Survey (MO, annotated by C. L. Hitchcock).

PENNELLIA MICRANTHA (A. Gray) Nieuwland [Cruciferae]. Rydberg (1906, p. 167) *as Thelypodium micranthum.* El Paso Co.: rocky cliffs, Mountain View, Pikes Peak, July 1901, *F. Clements s.n.* (! NY). This locality is along the cog railway on the south slope of Pikes Peak above Halfway house.

SATUREJA VULGARIS L. var. NEOGAEA Fernald [Labiatae]. Rydberg (1906, p. 299), as *Clinopodium vulgare.* Routt Co.: Sierra Madre, Steamboat Springs, 10,000 ft. alt., *J. M. Coulter s.n.,* 7 Aug. 1873, Hayden Surveys (! NY); same locality, July 1891, *Alice Eastwood* (COLO).

SCIRPUS SUPINUS L. var. HALLII A. Gray [Cyperaceae]. Fernald (1901, p. 251, as *S. hallii*); *S. saximontanus* Fernald. Weld Co.: banks of the Poudre River, Greeley, 20 Sept. 1872, *E. L. Greene s.n.* (! GH).

THAMNOSMA TEXANA Torr. [Rutaceae]. Rydberg (1906, p. 221). Fremont Co.: Soda Spring Ledge, Canyon City, *Brandegee s.n.* Although the specimen has not been examined, there is no reason to doubt the citation.

THELLUNGIELLA SALSUGINEA (Pallas) O. E. Schulz, Pflanzenreich IV. 105. Vol 86: 252. 1924. Syn.: *Sisymbrium salsugineum* Pallas; *Arabidopsis salsuginea* N. Busch [Cruciferae]. This rare species, known from a handful of boreal American localities, was reported by Payson (1922) from a collection made by T. C. Porter in South Park, 24 July 1872 (! NY). Subsequently the colony was rediscovered by Penland: Park Co.: alkaline area between Hartsel and Antero Junction, 8,900 ft. alt., 2 Sept. 1957, *Penland 4,949* (COCO) and collected in 1965 at the same locality by the writer. The species is evidently a winter annual which drops its rosette leaves before the flowering stems mature. Flowering stems thus appear to be delicate annuals, growing incongruously in the typical halophytic community of the alkaline flat, associated with *Suaeda, Triglochin* and *Salicornia.*

REJECTED TAXA

The following taxa were included in the Manual, but for reasons discussed below under each entry, these should be deleted from the list until further evidence justifies their inclusion.

AGROSTEMMA GITHAGO L. [Caryophyllaceae]. This report is evidently not based upon a published record nor an herbarium specimen.

AMARANTHUS PALMERI S. Wats. [Amaranthaceae]. Rydberg (1906, p. 121) reported this from "Clear Creek Canyon above Golden, alt. about 6,000 ft." The specimen could not be located at NY and probably had been reclassified. Sauer (1955) does not cite nor map the species north of New Mexico.

ANCHUSA OFFICINALIS L. [Boraginaceae]. Cited by Rydberg (1906, p. 289) from "Fort Collins." The specimen (! NY) belongs to *Anchusa italica* Retz. (*A. azurea* Mill.), a garden escape common in the Denver-Fort Collins area. *A. italica* has linear-lanceolate bracts and calyx-lobes, a larger corolla, and faucal appendages in the corolla throat that bear a tuft of stiff brown hairs (see Fernald, 1950, p. 1,199, and Johnston, 1924, p. 9, for keys and descriptions, and Guzuleac, 1929, for nomenclature).

AQUILEGIA FLAVESCENS S. Wats. [Ranunculaceae]. Munz (1946, p. 101) cited this without locality in his monograph: "W. C. Sturgis, July 19, 1902, and H. B. Meredith, June 17, 1895." Payson's earlier monograph (1918) mentions no Colorado specimens. Unfortunately, Munz did not cite the herbarium location for any of the above. If the species were present in Colorado, it would be expected near the Utah boundary.

AQUILEGIA TRITERNATA Payson [Ranunculaceae]. Payson (1918), in proposing this species, listed its major area as southern Arizona and western New Mexico as far north as the Sandia Mountains. He also cited one specimen from Colorado (*Osterhout No. 1,951* from Glenwood Springs). Munz (1948) accepted the Payson record but discussed only the Arizona-New Mexico specimens. Later, Munz (1949) described *A. barnebyi* from the same general area, Rio Blanco Co.: Piceance Creek, 3 miles below Rio Blanco, *Ripley & Barneby 9,179. Aquilegia barnebyi* and the Colorado material of *A. triternata* are identical. It seems reasonable to apply the working hypothesis that the Colorado material should all be called *A. barnebyi* and be considered endemic in the small range from Glenwood Springs to Rio Blanco, and that the name *triternata* be restricted to the Arizona-New Mexico material.

ARTEMISIA MICHAUXIANA Besser [Compositae]. Rydberg (1906, p. 387), reported this (*sub A. discolor* Dougl.) from Lake City. The specimen, *F. N. Pease, s.n.* June 26, 1878, has simply pinnatifid leaves and conforms to *A. ludoviciana* ssp. *incompta* (Nutt.) Keck. Keck (1946) does not allow *A. michauxiana* in Colorado.

ASCLEPIAS VERTICILLATA L. [Asclepiadaceae]. Woodson's monograph (1954), does not substantiate earlier reports of the species in Colorado although the species does occur not far from the eastern border.

CALOCHORTUS MACROCARPUS Dougl. [Liliaceae]. Rydberg (1906, p. 85) reported this (*sub C. acuminatus*) from

Mancos. Several Mancos collections are cited by Ownbey (1940) including those available to Rydberg, under *C. nuttallii,* and he does not allow *C. macrocarpus* in Colorado. The Rydberg report appears to be based on a misidentification.

CHAENACTIS ANGUSTIFOLIA Greene [Compositae]. Stockwell (1940, p. 115) gives the distribution as including western Wyoming and adjacent Montana, Idaho, Utah, and Colorado, but he cited no Colorado material, nor did he include Colorado localities on the distribution map. The central Colorado specimen reported by the Manual is not *C. angustifolia* but a form of *C. douglasii.*

CRYPTANTHA PATTERSONII (A. Gray) Greene [Boraginaceae]. The type (GH) and an isotype (COLO) have been examined. The only character serving to separate this from the closely related *C. fendleri* (Gray) Greene is the very slight tendency to heteromorphy of the odd nutlet. Examination of a large series of *C. fendleri,* a species abundant in and around the type area (Fair Grounds, Denver), suggests that the character is not a valid one and that there is considerable variation around the very minor difference shown in the type collection.

CRYPTANTHA TORREYANA (Gray) Greene [Boraginaceae]. Rydberg (1906, p. 289) reports this from Idaho Springs. The specimen is "Idaho Springs, 29 Aug. 1895, herb. P. A. Rydberg" (! NY). It is annual, with nutlets 4, all alike, smooth and shining, broadly lanceolate, the groove central and margins obtuse. This is *Cryptantha fendleri* (Gray) Greene.

DITHYREA WISLIZENII Engelm. [Cruciferae]. Rydberg (1906, p. 154) cites "valley of the San Juan, *Brandegee.*" No specimen was found at NY, and it is likely that the specimen was actually collected in adjacent Utah. Payson's monograph (1918a) does not allow the species in Colorado.

ERIOGONUM CHRYSOCEPHALUM A. Gray [Polygonaceae]. Rydberg (1906, p. 106) reported this from "southern Colorado, *Brandegee.*" No material under this name or under the relevant synonymy was found at NY. Rydberg evidently did not see a specimen and was merely quoting a report.

ERIOGONUM WRIGHTII Torr. [Polygonaceae]. Rydberg (1906, p. 107) reported this from "Colorado," *Thurber.* The specimen (! NY) has the label, "Herb. Geo. V. Nash, 'Colo' ex herb. Dr. Thurber, leg. S. Hayes, May 17, 1858." This is the specimen cited by Rydberg, but the collection is in all probability from Arizona, where Thurber was active. No "S. Hayes" is known to have collected in Colorado.

FORSELLESIA SPINESCENS (A. Gray) Greene [Celastraceae]. Rydberg (1906, p. 226) reported this from Grand Junction and Hovenweep Castle. Ensign (1942) maintains *F. spinescens* as a species of S. New Mexico, S. Arizona and W. Texas. The western Colorado species is *F. meionandra* (Koehne) Heller.

GERANIUM MARGINALE Rydb. [Geraniaceae]. Jones and Jones (1943, p. 41) are responsible for the report of this species in the Colorado flora. Neither the original description nor the later work of Rydberg (1922), which they cite, mentioned the plant outside of Utah. Since the authors did not cite any specimens, it must be concluded that the statement is erroneous.

HAPLOESTHES GREGGII A. Gray [Compositae]. Rydberg (1906, p. 387) reported this from "southeastern Colorado, exact locality not given." This implies that Rydberg was quoting

another source and did not have a specimen in hand. None was found in his herbarium at NY.

HELIANTHUS SALICIFOLIUS A. Dietr. [Compositae]. Rydberg (1932, p. 841) cited "e. Colo." but did not refer to specimens. Nor are there any earlier reports. All of the *H. salicifolius* at NY was revised in 1958 by W. D. Martin. There is no material under that name at present which might have been available to Rydberg.

IPOMOEA PURPUREA (L.) Lam. [Convolvulaceae]. Rydberg (1922, p. 676, and 1932, p. 649) simply cited "Colo." No specimens were located at NY, and Rydberg cited none.

JUGLANS RUPESTRIS Engelm. [Juglandaceae]. The writer is unable to locate any source for the Colorado report. The species is not allowed for Colorado by Little (1953) and there are no specimens at US or at NY. Colorado is quite out of range for the species.

LITHOSPERMUM CANESCENS (Michx.) Lehm. [Boraginaceae]. Rydberg (1906, p. 293) reported this from "Boulder." The specimen is *Tweedy 5680,* "plains and foothills near Boulder, June 1903" (! NY). The determination is in Rydberg's hand, but above the label Rydberg put two question marks. The plant is *L. multiflorum.*

LYCOPSIS ARVENSIS L. [Boraginaceae]. The record rests on the bald citation "Colo." by Johnston (1924, p. 8). In the absence of any additional documentation the record is rejected.

MIMULUS NANUS H. & A. [Scrophulariaceae]. Reported by Grant (1924, p. 295) from "Graymont [Clear Creek Co.], without date, *Letterman* (M)." The report is so far out of range and inconsistent with evidence from modern exploration in the area that this should be regarded as a transposed label. The species comes no closer to Colorado than southwestern Idaho.

PARTHENICE MOLLIS A. Gray [Compositae]. Rydberg (1906, p. 371) reports this from "southern Colorado." The only material at NY is from southernmost Arizona and New Mexico. Rydberg evidently was quoting from another source and had no first-hand information. The species is far out of range for Colorado and should be rejected.

PHYLA LANCEOLATA (Michx.) Greene. [Verbenaceae]. The record stems from Moldenke (1942, p. 11). However, on p. 76, Moldenke states that the record was erroneous and should be deleted. In his later work (Moldenke, 1949) the species is not recorded from Colorado.

PHYLLODOCE EMPETRIFORMIS (Benth.) D. Don [Ericaceae]. Rydberg (1906, p. 260) reported this from "Grizzly Gulch, near Gray's Peak." The collector was Alice Eastwood. Alfred Russel Wallace (1905, pp. 180-184) described the excursion with Miss Eastwood and mentioned collecting this species. However, the Eastwood specimen (COLO, as *Bryanthus empetriformis*) is *Kalmia polifolia.* Unless another specimen is located, the report must be assumed to be a misidentification.

PIPTOCHAETIUM FIMBRIATUM (H. B. K.) Hitchc. [Gramineae]. The specimen in question, "Colorado, *George Vasey,* 1889" (! US) is suspect, having come second hand to Smithsonian in 1901, from the herbarium of Chas. Mohr, Mobile, La. The data are not original but transcribed onto the Mohr herbarium label. Since all other collections are from S. Arizona, S. New Mexico, and S. Texas, it is likely that the writer of the label (not Vasey) erred in the transcribing. The Ginter

report given in the Manual must be regarded as hearsay.

PHYSALIS PRUINOSA L. [Solanaceae]. Waterfall (1958, p. 167) indicates that the taxon passing under this name in the older works is *P. pubescens* L. var. *grisea* Waterfall, for which he lists no Colorado records. Most likely *P. pruinosa* and *P. neomexicana* of Rydberg (1906) both belong to *P. foetens* Poir. var. *neomexicana* (Rydb.) Waterfall.

PHYSALIS PUMILA Nutt. [Solanaceae]. Waterfall (1958, p. 138) limits this species to W. Missouri, E. Kansas, E. Oklahoma, and adjacent Texas. Older Colorado reports are erroneous.

POLYGALA ACANTHOCLADA A. Gray [Polygalaceae]. The Colorado record hinges upon interpretation of the precise location of the type station. The original description states: "growing on a bluff side near the San Juan River in Utah, not far from the Colorado boundary." An isotype (! NY) reads: "near the Colorado and Utah lines, San Juan Valley, Aug. 1875, *T. S. Brandegee 1,172*". There seems to be no real evidence that the collection was made in Colorado.

PYCNANTHEMUM VIRGINIANUM (L.) Dur. & Jacks. [Labiatae]. Grant and Epling (1943) show on their distribution map a dot near Denver. There is no citation or statement of range to substantiate this. The report is assumed to be an error.

QUERCUS PUNGENS Liebm. [Fagaceae]. Rydberg (1906, p. 99) reports this from "Canyon City; Arkansas Canyon." Muller (1951) excludes Colorado from the range, which extends from W. Texas to New Mexico and Arizona, southward into Mexico.

RANUNCULUS FASCICULARIS var. APRICUS (Greene) Fernald [Ranunculaceae]. A specimen at NY bears Benson's annotation. There are three small specimens on the sheet. The label is headed "Ex Herbarium of Dartmouth College: *Anemone parviflora* Michx. — coll. W. F. Flint — S. W. Colorado (received from the herbarium of George W. Nash)." The data accompanying the specimens are too scant to be convincing, the original determination *Anemone* suggests that the labels might have been switched, and the specimen has obviously passed through several hands. Ewan (1950) does not list Flint among the Rocky Mountain collectors.

RANUNCULUS MICRANTHUS Nutt. [Ranunculaceae]. Rydberg (1906, p. 145) reported this from Twin Lakes. Benson, who has reviewed the American material thoroughly, does not allow the species in Colorado. There are, furthermore, no specimens from Colorado in the Rydberg herbarium at NY.

SPIRANTHES PORRIFOLIA Lindl. [Orchidaceae]. Rydberg (1906, p. 89) reported this from Camp Harding near Pikes Peak. Correll (1950) considers *S. porrifolia* to be the Pacific Coast race of *S. romanzoffiana*. The specimen in question could not be located at NY.

SPOROBOLUS PYRAMIDATUS (Lam.) Hitchc. [Gramineae]. According to Harrington (personal communication), a letter from Agnes Chase stated that there was a specimen at NY, labeled "Colorado, 1886, *Vasey*." A search of the collections there was fruitless. This record probably stands in the same class with that of *Piptochaetium fimbriatum*, which see.

STEPHANOMERIA VIRGATA Benth. [Compositae]. Rydberg (1906, p. 403) reported this from Grand Junction. I am indebted to Mr. Rupert Barneby, who has studied the specimen: Grand Junction, 15 June 1900, *Susan G.*

Stokes (NY), and identifies it with *Stephanomeria exigua* Nutt. *S. virgata* is a species of the Pacific coast states and Nevada.

SYMPHORICARPOS ORBICULATUS A. Gray [Caprifoliaceae]. Manitou, Sept. 1, 1892, *A. Isabel Mulford* (as *S. occidentalis*), annotated by Rydberg and reported by him (1906, p. 324) as *S. symphoricarpos* (! NY). The specimen was probably from a cultivated plant. It has not been collected again.

TRIDENS MUTICUS (Torr.) Nash [Gramineae]. The statement in the Manual that the record is apparently based on a misdetermination is correct. The following specimens (! US) have since been redetermined by Chase as *T. elongatus*: Fremont Co.: *Shear 972, S. M. Tracy* in 1887, and *M. E. Jones* in 1878.

VERBENA CANADENSIS (L.) Britton [Verbenaceae]. The record is based on two specimens collected by Mrs. Lucy J. Brewster (COLO) determined by Moldenke in 1948. Unlike most of the Brewster collections, which have a stated locality such as "Lone Cone" or "western Colorado," these merely give: "Locality: Minn. to Kans." Mrs. Brewster came to San Miguel Co., Colorado, from Baxter Springs, Kansas. There is, therefore, a good possibility that the specimens came from Kansas, which is in range for the species, rather than from western Colorado, which is quite out of range.

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