

ADDITIONS TO THE FLORA OF COLORADO — III¹

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This third paper of the series contains a number of additions to the Flora of Colorado both in the indigenous flora and in the adventive (foreign weed) flora. A few species are re-evaluated, and noteworthy extensions of range are reported. Attention is drawn to some taxonomic problems which deserve study but which the writer has not had sufficient time nor resources to pursue. For the sake of brevity, Dr. H. D. Harrington's *Manual of the Plants of Colorado* (1954), the standard work for the area, is hereinafter referred to as "The Manual". Taxa which are not listed in the Manual are marked with one asterisk. When full descriptions and illustrations of the plants discussed are available in the standard American works, the reader is referred to these for further information. Descriptions and illustrations are provided only in instances in which a good description is not easily available elsewhere.

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I wish to thank Dr. Joseph Barrell, Mr. Bernard Braun, Dr. H. D. Harrington, Dr. Frank Hawksworth, and Dr. Jean Langenheim for drawing my attention to several of the novelties, and to Lorin I. Nevling, Jr., Gray Herbarium of Harvard University, for the loan of several Colorado specimens of the Hall & Harbour collections. I also wish to thank Dr. Erling Porsild, National Museum of Canada, and Prof. Eric Hultén, Riksmuseum, Stockholm, whose great experience with the boreal flora and whose keen observation in the field alerted me to many potential discoveries of Arctic and alpine species.

SPERMATOPHYTA — GYMNOSPERMAE PINACEAE

A SECOND NORTHEASTERN COLORADO STATION FOR PINYON PINE

An unusually isolated colony of *Pinus edulis* Engelm. occurs on limestones of the Ingleside formation in Owl Canyon, about 30 miles north of Fort

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Collins. This is presumed to be the only population of the species in eastern Colorado north of Colorado Springs, where it occurs in the Garden of the Gods. Dr. Frank Hawksworth, Rocky Mountain Forest and Range Experiment Station at Fort Collins, recently discovered a single sapling in Rist Canyon about 15 miles west of Fort Collins.¹

We visited the site together in December, 1959, to collect specimens and to note the circumstances of occurrence. The single tree, very young and only three feet tall, grows on a steep south-facing slope in the shade of a *Pinus ponderosa* stand, on the granitic rubble of an old stabilized talus. The plant is heavily infected with rust and is situated only a few feet away from the rim of a high road-cut on private land subject to random cutting of Christmas trees. It is highly unlikely that the plant will survive to maturity under these threats to its welfare. This single sapling probably grew from seed transported by birds or small mammals from the Owl Canyon stand.

SPERMATOPHYTA — MONOCOTYLEDONEAE
CYPERACEAE

**CAREX LACHENALII* Schkuhr, Riedgr. p. 51 (1801) pl. Y fig. 79.

Carex bipartita *sensu* Mackenzie in North Amer. Flora 18: 88. 1931.

BOULDER CO.: edge of bog below outlet of Horseshoe Cirque, southeast slope of Arapahoe Peaks, 10,500 ft., 16 July 1949, *Weber 4980*. PARK CO.: snow-patch melt bog on south side Hoosier Ridge, east of Hoosier Pass, 12,000 ft., 18 Aug. 1960, *Weber, Porsild, & Holmen 11,124*.

New to Colorado, previously reported in Montana. *Carex lachenalii* is a characteristic species of the Arctic in both hemispheres and occurs also in the mountains of southern Europe and Asia.

Carex lachenalii belongs to the Section Heleonastes. In the Manual it would fall into the *Carex brunnescens*-*C. canescens* portion of the key (No. 49). From these two species, *Carex lachenalii* is distinguished by the small number of spikes (1 to 4), these closely approximate, the scales chestnut- or reddish-tinged; the lower bract is shorter than the spikes, and often abruptly narrowed into a short awn.

A comparison of these species from the detailed descriptions in Mackenzie does not reveal any clear-cut distinctions. *Canescens* is usually taller (10-80 cm. as against 10-15 cm.); the spikes are more numerous (4-8 as against

¹ LARIMER CO.: under *Pinus ponderosa*, Rist Canyon, 100 ft. north of the main Rist Canyon road near the section line between sections 28 and 29, T. 8 N., R. 70 W., 28 Dec. 1959, *Hawksworth & Weber 11,109*. As this paper goes to press, Mr. Roger Peterson, Colorado State University, kindly informs me that a second tree, much older than the first, having at least 95 annual rings, has been found about 100 yards upslope from the sapling reported above.

2-4); the lower spikes are usually remote (but in Scandinavian specimens of *lachenalii* this is commonly the case also); the staminate flowers, conspicuous in *lachenalii*, are "usually" inconspicuous in *canescens*. Furthermore, the Scandinavian manuals report hybrids between most of the species of this group.

My studies of specimens and descriptions of *Carex praeceptorium* Mackenzie lead me to suspect that this is hardly distinct on any grounds from *C. lachenalii*. Whether the closely congested inflorescence of *C. lachenalii* is correlated in any way with its alpine habitat as contrasted with the open inflorescence of *C. canescens* of lower altitudes remains the subject of future field study.

CAREX LIMOSA L., Sp. Pl. 2: 977. 1753.

The Manual lists *Carex limosa* as having been reported for Colorado, but the author saw no authentic specimens. Some reports may have referred to plants which were later designated as *C. paupercula* Michx. (= *C. magellanica* Lam.). The following collection is the first clearly typical one of *C. limosa* L. which I have seen from Colorado.

GUNNISON CO.: small pool, subalpine zone, ca. 11,000 ft., Peeler Basin, on north flank of Mount Emmons, near Crested Butte, 31 Aug. 1960, *Joseph Barrell 266-60, 267-60*: two sheets, including plants from the pond shore as well as individuals collected from a floating, completely aquatic mat.

The close relationship between *C. limosa* and *C. magellanica* demands a critical study of their differences. The plates in Mackenzie (1940) imply a major distinction in the shape of the scales of the carpellate spikes, those of *limosa* being very broad, obtuse, and merely mucronate, those of *magellanica* narrower and acute or acuminate from the base, often with a lateral tooth. The character is very clear when extreme individuals are chosen for illustration, but unless a large series is available, it is often difficult to place certain individuals. Although *C. limosa* does not appear to vary in the direction of *magellanica*, the scales of one carpellate spike of *magellanica* may vary in the direction of *limosa*. In fact, individual plants of *magellanica* show considerable variability in the width and shape of the scales. Fernald's variety *brevisquama*, in fact, is so close to the condition of *C. limosa* that Fernald (1950) suggests that this is "perhaps a hybrid" of the two species.

The longer length of the scale relative to the perigynium in *C. magellanica* may be a more reliable character than shape alone. In *limosa* the scale is about the same length as the perigynium and fully as broad, while in *magellanica* the scale is often half again as long as the perigynium, and it projects outward from the mass of perigynia, giving a ragged appearance to the spike.

Hultén (1941–1950) separated these species on the basis of the shape of the lowest principal bract of the inflorescence, claiming it to be subulate in *limosa* and leaflike in *magellanica*. This character does not appear to be reliable, since both types are found in authentic *limosa* from Scandinavia, even on the same plant. Reduced, subulate bracts are found frequently in *magellanica* also. While large series of specimens do show a tendency toward a hiatus, bract shape as a key character is not trustworthy.

Fernald (1950) distinguishes *limosa* as being less caespitose than *magellanica*. Our material, unfortunately, is inconclusive on this point. The relative number of culms from the nodes may be correlated with the degree of submersion; at least in the Colorado material the deeply submerged plants had only a single culm at each node, while the plants occurring on shore tended to have two or three. *Limosa* is said to be glaucous, with involute or corrugated leaves, whereas *magellanica* is said to have flat leaves, scarcely glaucous. Decisions on this basis must be in some measure subjective although probably useful as one gains experience with the group.

The present collection is typical *limosa* in all details; the plant spreads by prolonged loosely forking rhizomes bearing long, unbranched felt-covered roots. The culms arise singly or a few together, are sharply angled, rough above, and the leaves are involute and corrugated. The scales of the carpellate spikes are pale brown, very broad, obtuse, with a very short mucro, and the lowest bract is reduced and subulate. The specimens match authentic Scandinavian material in the herbarium.

**CAREX STANS* Drejer in Nat. Tidsk. 3: 458. 1841.

Carex aquatilis Wahlenb. var. *stans* (Drej.) Boott

PARK CO.: south side of Hoosier Ridge, 12,000 ft., 18 Aug. 1960, Porsild, Holmen & Weber 11, 112.

In the Manual this would key to *Carex aquatilis*. In fact, the tendency of most American authors has been to give it no more than varietal status under that species. Hultén (1941–1950) also claimed complete continuity between typical *stans* and *aquatilis*. However, more recent papers dealing with the Arctic flora (Porsild 1957, Holmen 1957) restore full specific status to *Carex stans*. Jørgensen, Sørensen & Westergaard (1958) also mention a chromosome number difference, *C. stans* having $2n = 76$, *C. aquatilis* having $2n = 84$. Whatever the final disposition of the taxon, it is very interesting to note that typical *Carex stans*, previously reported only from the Arctic, dominates the snow-patch melt bog inhabited by *Eutrema penlandii*, *Armeria maritima*,

and other pronounced Arctic-alpine species on the south side of Hoosier Ridge.

Carex stans is distinguished morphologically from *C. aquatilis* by the following characters: lower stature (usually less than one foot tall), usually strongly curved culms, bracts and leaves usually exceeding or at least equaling the culm, more club-shaped spikes, and the culms arising several in a cluster from the stout rhizomes.

**KOBRESIA SIMPLICIUSCULA* (Wahlenb.) Mack. in Bull. Torr. Bot. Club 50: 349. 1923.

Carex simpliciuscula Wahlenb.

Hultén (1958, p. 232) writes: "The report of *K. simpliciuscula* seems doubtful. Fernald repeatedly reports it from Lat. 40° in Colorado but it is lacking both in Rydberg's and in Harrington's Colorado Floras. The basis is a specimen from the Harlan-Hall [*sic*, should read Hall & Harbour] collection in Gray Herb. labelled Colorado lat. 39°-41°".

I have recently studied the specimen in question (Hall & Harbour No. 599) and find Fernald's diagnosis correct. The specimen, furthermore, is an excellent one, consisting of eight fertile culms in fruiting condition, 25-30 cm. tall. There is no question, then, that the plant belongs to the Colorado Flora. But where was it collected?

The Hall & Harbour collections are notorious for their lack of collection data; not only do the labels contain no more than the approximate latitude, but the specimen numbers bear no relation to the time-sequence of collection. Even the itinerary of the collectors has been difficult to reconstruct from the available literature.

In connection with another matter, I happened upon what appears to be the authentic itinerary of the Hall & Harbour expedition. This is cited incidentally in an article by Engelmann (1868) entitled "Altitude of Pikes Peak and other points in Colorado Territory, based on barometric observations made by C. C. Parry". That Parry accompanied Hall & Harbour on their journey is made clear by his statement in the same journal (p. 272) but in another article by Parry himself, as follows: "The large collection of indigenous plants made in the summer of 1862 by the joint labors of E. Hall, J. P. Harbour, and the writer, comprised the characteristic flora of a considerable section of the Rocky Mountains, extending from Pikes Peak on the south to the headwaters of Clear Creek on the north".

Engelmann's paper, while dealing with the altitudes of the high peaks, happens to contain a point-by-point itinerary of the Hall, Harbour and Parry

route from the village of Mt. Vernon, 12 miles southwest of Denver westward along the route which in modern times traverses the area from Morrison to Jefferson, a village at the north end of South Park, *via* Conifer ("Dr. Casto's Ranch"), Schaffers Crossing ("Elk Creek"), Crow Hill ("summit of hill leading down to the Platte"), Bailey, the valley of the North Fork of the South Platte, and Kenosha Pass ("Lake-House, on the Divide leading down to the South Park"). From Jefferson, clearly mentioned on the itinerary, the party struck out northwestward and crossed the "Snowy Range" (Continental Divide) at Georgia Pass, which is at the head of Michigan Creek. The entire route is still open to travel, the Morrison-Jefferson portion being U. S. Hwy. 285. The road to Georgia Pass is unpaved and ends at the summit. Jeep tracks continue beyond the divide.

That Hall & Harbour collected several exciting alpine species, particularly at the western end of their itinerary, comes as no great surprise to us now, for this is the very area in which such remarkable disjuncts as *Primula egalikensis*, *Armeria maritima*, *Braya humilis*, *Eutrema penlandii* and *Saussurea weberi* occur.

A few days after writing the above, I had an opportunity to go into the field in the same general area with Drs. Porsild and Holmen, and, having been alerted to the *Kobresia simpliciuscula* problem, we succeeded in finding the species in two widely separated localities: CLEAR CREEK CO.: frost-push hummocks of small ponds near the outlet of Summit Lake, 12,800 ft., Mt. Evans, 15 Aug. 1960, *Weber, Porsild & Holmen 11,131*; PARK CO.: in snow-patch bog with *Eutrema penlandii*, south side of Hoosier Ridge, 12,000 ft., 18 Aug. 1960, *Weber, Porsild & Holmen 11,123*. A specimen was also found in the herbarium, collected at Summit Lake by Leon Kelso in 1953, No. 6824 (COLO).

**Scirpus pumilus* Vahl, Enum. 2: 243. 1805, *sensu* Beetle in N. Amer. Flora 18: 495. 1947.

S. rollandii Fernald in *Rhodora* 45: 282. 1943.

The record is based on a collection of Hall & Harbour, 1862, No. 583, in Gray Herbarium, originally cited by Gray (1863, p. 77) as *Scirpus caespitosus* L. The label bears the annotation "S. alpinus Gaud. = S. pumilus Vahl *fide* C. B. Clarke", and the sheet was annotated by Fernald "*Scirpus rollandii* Fern."

As I pointed out in the discussion of *Kobresia simpliciuscula*, this species was most likely collected somewhere in South Park between Jefferson and Georgia Pass.

GRAMINEAE

**ANDROPOGON BARBINODIS* Lag., Gen. et Sp. Nov. 3. 1816.

MESA CO.: locally frequent on rubbly talus at base of steep cliffs in Dolores River Canyon near the covered spring between Uravan and Gateway, 22 Aug. 1955, *Weber 9526* (COLO).

Andropogon barbinodis differs from its nearest Colorado relative, *A. saccharoides*, by having a short main inflorescence axis with the individual spikes assuming a closed fan-shaped cluster, and by its larger spikelets (5–6 mm. long; about 4 mm. long in *saccharoides*). The spikes in *saccharoides* are usually well-exserted, but in *barbinodis* many of the inflorescences on a plant will be partly hidden in the upper leaf-sheaths. *A. saccharoides* is found only in the southeastern corner of Colorado, while *A. barbinodis* is southwestern in distribution.

**FESTUCA BAFFINENSIS* Polunin in Bull. Nat. Mus. Canada 92: 91, tab. 3. 1940.

SUMMIT CO.: dry tundra slopes, with *Armeria maritima*, north side of Hoosier Ridge east of Hoosier Pass, 12,000 ft., 18 Aug. 1960, *Weber, Porsild, & Holmen 11,117*; PARK CO.: wet snow-patch meadow, south side of Hoosier Ridge east of Hoosier Pass, 12,000 ft., 18 Aug. 1960, *Weber, Porsild & Holmen 11,114*.

First described from the Arctic (Baffin and Ellesmere Is.), *Festuca baffinensis* now is known to occur across Arctic Canada, in northern Greenland, Spitzbergen, Novaya Zemlaya, and Alaska. It was also recently discovered in the Canadian Rocky Mountains and in August 1960 on the Beartooth Plateau of Wyoming-Montana (Porsild unpublished).

Festuca baffinensis superficially resembles *F. brachyphylla* Schultes. It is easily recognized, however, by its dense, one-sided inflorescence with a strong reddish-tinge and by the densely short-pubescent culms, especially just below the inflorescence. In *F. brachyphylla* these are glabrous or only slightly scabrous.

Immediately upon returning to the herbarium with this exciting find, we discovered an old specimen of *Festuca baffinensis* in the herbarium, collected a half-century before the species was described. This is a specimen obtained through the distribution of duplicates from the Academy of Sciences of Philadelphia; "*Festuca rubra* Linn.? — Platte River near Denver, August 10, 1871, Dr. Smith." This specimen was cited by Porter & Coulter (1876) as *Festuca ovina* L. var. *brevifolia* Watson, no mention being made of the pubescent culms.

Dr. Kjeld Holmen, who collected cytological material of the Hoosier Ridge collections, has given me permission to publish the chromosome count, $2n =$

28, for *Festuca baffinensis*. This is the same number as that previously reported from Arctic collections (Jørgensen et al, 1958).

FESTUCA SCABRELLA Torr. ex Hook. ssp. **HALLII** (Piper) W. A. Weber
comb. nov.

Festuca hallii (Vasey) Piper in Contr. U. S. Nat. Herb. 10: 31. 1906.

Melica hallii Vasey in Bot. Gazette 6: 296. 1881.

In the summer of 1956, Mr. G. D. Pickford, then supervisor of the Roosevelt National Forest, showed me a stand of mature *Kobresia myosuroides* tundra on the north slope of Cameron Mountain which contained a species of *Festuca* as a co-dominant. This in itself was most unusual because the *Kobresia* characteristically produces a very dense closed stand. The *Festuca* was a rhizomatous, sod-forming perennial species with broad reddish basal sheaths, strongly contracted panicles and few-flowered, awnless spikelets.

This is the plant which has been called *Festuca hallii* (Vasey) Piper. The type specimen, collected by Hall & Harbour, "Rocky Mountains, lat. 39°-41°" (US) exactly matches our collection. Presumably it is on the basis of this taxon that *Festuca scabrella* is said to be rarely rhizomatous (Hitchcock & Chase 1950, p. 70).

The type material of *F. scabrella* Torr. was a Drummond collection from the Canadian Rocky Mountains. The concept of this species currently held as to the plants of northwestern United States is that of a perennial bunch-grass with spreading panicle branches, resembling the northern *F. altaica* enough to cause the two to be united by some authors. The alpine race of the Colorado Rockies is at least as different from *F. scabrella* as the latter is from *F. altaica*; in fact, I feel that the combination proposed is possibly too conservative. However, the entire *F. altaica* group deserves a thorough world-wide study before the question of the relationships of *F. altaica*, *F. scabrella*, *F. thurberi*, and *F. arizonica* can be resolved.

But regardless of the taxonomic status of the taxon, it is most interesting to discover this new element in the *Kobresia* stand. This fact alone should stimulate ecologists to investigate the extent and importance of this phytosociological phenomenon. As far as I am aware, the alpine race is the only representative of *F. scabrella* occurring in Colorado. Therefore, the statement in the Manual of its distribution — "Prairies, hillsides and open woods" (page 49) is incorrect.

LARIMER CO.: in climax *Kobresia* stand, east face of Cameron Mt., Medicine Bow Range, 2.5 mi. N. W. of Chambers Lake, 12,000 ft., 25 Aug. 1956, W. A. Weber & G. D. Pickford 9694.

**HORDEUM GLAUCUM* Steud., Syn. Pl. Glum. 352. 1855.

Hordeum stebbinsii Covas in Madrono 10: 17. 1949.

BOULDER CO.: abundant street weed throughout the floodplain area of Boulder Creek in the city of Boulder, 5,300 ft., 17 June 1959, *Weber* 10, 898.

According to Dr. G. L. Stebbins (*voce*) *Hordeum stebbinsii* is a synonym of *H. glaucum*, an adventive species from Eurasia.

JUNCACEAE

**JUNCUS PLATYPHYLLUS* (Wiegand) Fernald in Rhodora 47: 124. 1945.

Juncus dichotomus var. *platyphyllus* Wiegand

BOULDER CO.: drying shores of Baseline Lake, 3 miles east of Boulder, 5,300 ft. alt., very consistently dwarf in habit. 11 Oct. 1954, *Weber* 8957.

Dr. F. J. Hermann (correspondence) states: "*Juncus platyphyllus* is by no means restricted to the Atlantic states as Fernald supposed, but is one of the most widespread species. I have it from Guatemala and Salvador, many collections from the Great Lakes states and one from Arkansas, but yours is the westernmost in this country so far. It differs from *J. tenuis* in its purple, firmer sheaths which lack prolonged auricles."

The late summer flora of the temporary reservoirs at the eastern base of the Rocky Mountains is most interesting because it is a mixture of obviously introduced Eurasian weeds and native prairie species which may have been disappearing from relict mesic areas before the advent of irrigation. Several of these species have capitalized upon the extension of potential habitats by irrigation practices. A few salt-marsh species, such as *Juncus gerardi* and *Ruppia maritima*, may have been introduced into these areas by conservationists or by migrating waterfowl. Different reservoirs have quite different floras, possibly dependent upon depth, fluctuation, alkalinity, and other factors, and only a few of the reservoirs have been investigated. They are the only Colorado habitats for many rare species, including *Bergia texana*, *Bacopa rotundifolia*, *Gerardia tenuifolia*, *Lindernia anagallidea*, *Heteranthera limosa*, *Eleocharis parvula*, *Hemicarpha micrantha* and species of *Riccia*.

SPERMATOPHYTA — DICOTYLEDONEAE CHENOPODIACEAE

**KOCHIA ALATA* BATES, A DUBIOUS TAXON

Kochia scoparia (L.) Schrad. is one of the most abundant late summer city-street weeds in Colorado. It is extremely variable in size, mode of branching,

pubescence, color of leaves and stems, and it derives some of this variability from its response to mowing and clipping. According to most keys and descriptions, the species has small calyx wings, in contrast to the situation in the native perennial species found in western Colorado, *K. americana* S. Wats., which has prominent wing development.

Nevertheless, examination of almost any population of *Kochia* in the region shows that the development of prominent wings does take place in *K. scoparia* and that this is variable on individual plants. There are individuals which never develop wings, some in which almost all of the flowers develop wings, and others in which the wing development follows a seasonal pattern. In such plants the flowers produced early in the season do not develop wings, but those produced later on develop wings at a very early stage. Thus it is very curious that mature flowers at the base of the axis of inflorescence do not have wings, but immature flowers near the tips of the branches already show well-developed wings which go on at maturity to become broad and papery.

These winged individuals were described as early as 1918 by J. M. Bates, who proposed the species *Kochia alata* Bates in Amer. Bot. 24: 51. 1918, from the type collection from Hastings, Nebraska. Other specimens were reported from Missouri and Colorado. Aellen (1943) enlarged upon Bates' description and figured the very strikingly different types of calyx found in the two "species". In *K. alata* the calyx lobes are dilated into prominent flabellate veiny chartaceous wings which are often much larger than the lobes themselves at maturity.

The heterogeneity of *Kochia* populations in Colorado suggests that there may, in fact, be two distinct species here but that the discreteness of the populations may be obscured by introgressive hybridization. Our dilemma arises from the fact that there are no indigenous American species of the annual group to which *K. scoparia* belongs, *K. scoparia* itself being an adventive weed from Eurasia. Aellen maintained that *K. alata* was more closely related to *scoparia* than to the perennial section to which *K. americana* belongs, a conclusion with which I agree.

The possibility remains, however, that *K. scoparia* may have picked up the alate condition through contamination with *K. americana* while at the same time retaining its essential genetic integrity. This possibility should be investigated cytotaxonomically. But there is another faint possibility that *Kochia alata* is a second Eurasian species which has invaded America from some obscure area where it is as yet unrecognized as a taxon distinct from *K. scoparia*. Search of the available literature and indices fails to reveal anything resembling *K. alata* elsewhere in the world.

Since *Kochia scoparia* is now so well established over North America it would be enlightening to know whether or not the variation pattern which we find in Colorado is present in other areas, such as California or the industrial Eastern States. Examination of the extensive series of the species in European herbaria would also be in order.

POLYGONACEAE

NEW RECORDS OF KOENIGIA ISLANDICA L.

Shortly after I reported *Koenigia islandica* from Summit Lake on Mount Evans (Weber 1955), Dr. A. E. Persild mentioned seeing a specimen collected by Ove Paulsen, the Danish botanist, at Seven Lakes on Pikes Peak, elev. 3,300 m., 19 August 1913, during the International Phytogeographical Excursions. During my visit to Copenhagen in 1958 I was able to examine Paulsen's collection, which consists not alone of ample herbarium material, but also a large quart jar of preserved plants. The species must have been extremely abundant at the Seven Lakes locality. It is significant that the first two collections of this inconspicuous Arctic-alpine species should have been discovered by sharp-eyed Scandinavian botanists spending only a minimal amount of time in our alpine region.

On an excursion of the Ninth International Botanical Congress in 1959, we observed *Koenigia* at its only station in the Canadian Rockies: Jasper Park; trail to Angel Glacier, Mt. Edith Cavell. After this excursion, Miss Beatrice Willard of the University of Colorado Institute of Arctic and Alpine Research returned to her field station in Rocky Mountain National Park and promptly discovered *Koenigia* on Trail Ridge Road. Following this discovery, search along the ridge has yielded two additional stations, all of them easily accessible to the paved highway. Citations follow.

LARIMER CO.: Rocky Mountain National Park: Trail Ridge Road, 0.5 mi. E. of Rock Cut, 12,000 ft., 9 Sept. 1959, *Weber 11,103*; bottom of Fall River Cirque, 12 Sept. 1959, *Willard 5950*; ¼ mile below saddle separating Sundance Mt. from Rock Cabins N. of Forest Canyon Overlook, 8 Aug. 1959, *Willard 5924*.

CARYOPHYLLACEAE

PARONYCHIA SESSILIFLORA Nuttall ssp. **PULVINATA** (Gray) W. A. Weber, **comb. nov.**

Paronychia pulvinata Gray in Proc. Acad. Sci. Phila. 1863: 58. 1864.

Paronychia sessiliflora Nutt. replaces *Paronychia pulvinata* Gray (a depressed cushion plant of the alpine tundra) in the semi-arid intermountain

basins of central Colorado. The latter characteristically has extremely fore-shortened nodes and thick woody branches barely extending above the surface of the ground, and elliptic or oblong leaves. Good herbarium specimens of *P. pulvinata* are almost impossible to prepare because of the rigid stems and small amount of foliage.

In connection with studies on the physiology of alpine plants, Dr. Eric Bonde transplanted clones of *P. pulvinata* from the alpine of the Colorado Front Range to the greenhouse at Boulder. After several weeks it was observed that these plants responded to the change in habitat by producing elongate internodes and the elongate, linear-subulate leaves typical of *P. sessiliflora*. The experiment was repeated, and herbarium specimens were prepared representing a division of the clone as taken from the alpine. The remaining portion of the division was then grown for a month under greenhouse conditions, with the same result. The plants after this period were indistinguishable from *P. sessiliflora* Nutt. Seedlings develop in a similar manner.

Since there are no other characteristics available to separate the two taxa, *P. pulvinata* may be regarded as an ecad, or environmental modification, of *P. sessiliflora*. However, I am adopting for the time being a more conservative viewpoint because this situation is one which lends itself to further close study using the tools of cytotaxonomy. The combination proposed at least draws attention to the very close relationship of the two taxa.

**STELLARIA IRRIGUA BUNGE IN AMERICA*

GUNNISON CO.: trail along Copper Creek to summit of Conundrum Pass, Elk Mts., ca. 10 mi. N. E. of Gothic, 12,000 ft., in trail and on fine scree, 4-5 August 1955, *Weber & S. Shushan 9388*; near the summit of Mt. Bellevue, directly above Schofield Pass, in alpine scree, close to contact between igneous and sedimentary rock, 12,000 ft., 3 Aug. 1960, *Joseph Barrell 171-60*. SAN MIGUEL CO.: near Trout Lake, 12,000 ft., on dirt slides, 21 Aug. 1924, *E. B. & L. B. Payson 4202* (distributed as *Alsine polygonoides* Greene).

According to Boivin (1956) this species belongs to the *Stellaria umbellata* complex, distinguished from that species by the presence of petals. Boivin, however, had not seen any material of *S. irrigua* Bunge, which was thus far known only from the type.

In the field this species differs from *Stellaria umbellata* by the dark coloration of the foliage (*umbellata* is usually pale green), the fleshy leaves with very narrow hyaline margins, the very short internodes, short and condensed inflorescence which evidently does not greatly elongate beyond the upper leaves at maturity, and most significantly by the well-developed, uniform,



PLATE 1

A. Type specimen of *Stellaria irrigua* Bunge (herb. Leningrad); one of three individual stems on the type sheet.

B. *Stellaria irrigua* Bunge from Colorado (Barrell 171-60, COLO).

and very deeply bifid linear petals. Specimens were examined by Dr. A. E. Porsild and by Dr. Eric Hultén, both of whom have worked intensively with the boreal *Stellariae*, and both agreed that the plants did not belong to *Stellaria umbellata*. However, they could not place them elsewhere in the genus.

The original description (Bunge, Al. v. 1835. Verzeichniss der im Jahre 1832, im östlichen Theile des Altai-Gebirges gesammelten Pflanzen. Ein Supplement zur Flora Altaica. Mem. L'Acad. Imp. d. Sci. de St. Petersburg, par. div. savans. Tome II. p. 548. 1835), follows:

* 135. *Stellaria irrigua* Bge. nov. sp. (Larbrea).

St. glabra, caule humili simplici, foliis ovato-oblongis basi attenuatis sessilibus obtusis, pedunculis terminalibus subumbellatis filiformibus demum elongatis reflexis, petalis minutissimis bifidus, sepalis ovato-lanceolatis margine membranaceis acutiusculis.

Legi hanc plantulam pusillam in muscosis humidis scaturiginum in summis alpibus ad fluvium Tschuja. Julio mense florentem.

Affinis *Larbreae uliginosae* (*Stellariae Alsini*); sed differt statura minuta, floribus subumbellatis, pedunculis tenuissimis filiformibus, petalis vix conspicuus subabortivus. Sepalis latioribus. Tota vix pollicaris.

Professor Hultén has kindly provided a translation of the more recent description in Russian, from Flora U.S.S.R. Vol. VI: 409. 1936.

Stellaria irrigua Bunge. Perennial; stem 2-3 cm. high, simple, glabrous, leaves lance-ovate, blunt, somewhat narrower at the base; inflorescence terminal, condensed, nearly umbellate, with 3-several flowers; pedicels filiform, somewhat longer at maturity, reflexed. Bracts membranaceous, sepals ovate-lanceolate, acute. Petals very small, 0.5 mm. long, two-parted with filiform parts. Stamens 10, nearly as long as sepals. Flowers in July. Alpine on mossy tundra, west Siberia Altai endemic. Described from mountains at Tschuja River. Type in Paris.

Professor Hultén attempted to obtain the type specimen from Paris but was informed that it was not there. Dr. A. E. Porsild, who was about to visit the Soviet Union at the time this investigation was under way, promised to search for the type at Leningrad. This he succeeded in doing. Moreover, he obtained excellent photographs of the three individual plants comprising the type. These photographs, together with the information from the various descriptions, clearly show the identity of Bunge's plant with the Colorado material. See Plate 1.

A full description of the Colorado collections follows:

Perennial from white filiform underground stems; stems up to 3 cm. tall, simple or branched from the lower nodes; internodes shorter than the leaves or rarely exceeding them; leaves dark green or reddish, up to 7 mm. long, 2-3 mm. wide, elliptic-oblong, sessile, the enlarged leaf-bases of the pairs slightly connate, sparingly ciliate; inflorescence a highly reduced dichasium, little exceeding the terminal leaves; flowers three, rarely more,

the terminal flower of each cyme with reflexed pedicel soon after anthesis; sepals 5, acute or slightly cucullate at tip, 3 mm. long, 1 mm. wide; petals present, filiform, deeply bifid to the base, 1.8–2.0 mm. long, the segments 0.25 mm. wide; filaments 1.5 mm. long, arising from an abruptly broadened base (gland?), 0.4 mm. wide and high; anther sacs 0.3 mm. long, 0.1 mm. broad, yellow; gynoecium (in anthesis) globose, 1 mm. diam., the ovules numerous, 0.3 mm. diam.; styles 4–5. See Figure 1.

Having established the identity of our material with *S. irrigua* we are faced with such an enormous discontinuity in distribution, in both areas of which the closely related *S. umbellata* occurs, that we must consider the relationship of *S. irrigua* and *S. umbellata*.

Our experience with this group in the field demonstrates abundantly that *S. umbellata* Turcz. is an extremely plastic species which is collected most often in its shade form with elongate internodes, pale foliage, and elongate pedicels. There is also a high-sun form found in gravels of frost scars in the alpine zone with short internodes and shorter pedicels. Boivin minimized the environmental effect in his revision of the groups and chose to erect two new species from the Colorado material, calling the shade form *S. gonomischa* Boiv. ("Inflorescence à entreneouds bien développés; capsule 1½ fois aussi longue que la calyce") and the reduced alpine form *S. weberi* Boiv. ("Entreneouds de l'inflorescence complètement télescopés; bractées agglomérées"). *Stellaria irrigua* he segregated on the basis of the presence of petals, and *S. umbellata sensu stricto* he excluded from the American flora.

In view of the plasticity of *S. umbellata* apparent in the field, I find it impossible to maintain these extremely weak segregates, which to me appear to be merely ecads. Thus I regard *S. gonomischa* and *S. weberi* to be without taxonomic significance.

Stellaria irrigua, on the other hand, appears to be distinct at all times by its uniformly well-developed petals of two filiform divisions, the shorter inter-

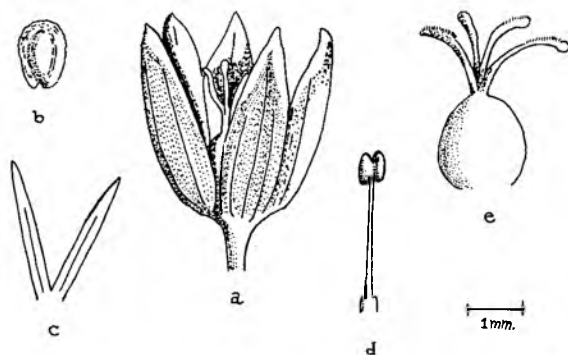


FIGURE 1. *Stellaria irrigua* Bunge, drawn from Payson & Payson 4202: a, calyx, b, seed, c, petal, d, stamen, e, gynoecium.

nodes with much congested inflorescence, and the dark green or usually purplish, fleshy leaves, which are much wrinkled in drying. The species also occupies a different ecological niche. It is found on dry gravelly scree slopes rather than on the perpetually wet frost scars inhabited by the alpine ecad of *S. umbellata* (*S. weberi* Boivin). Although the original description of *S. irrigua* mentions "mossy tundra", one does not know whether this was direct field observation of the species or merely description of a general site. Modern observations of the plant in its type locality would be instructive.

CRUCIFERAE

**BERTEROA INCANA* (L.) DC. Syst. 2: 291. 1821.

JEFFERSON CO.: Bear Creek Canyon, along roadside four miles west of Evergreen, 17 Aug. 1957, M. Walter Pesman (*comm.* Harrington). ARAPAHOE CO.: Littleton, 1935, *Leslie Paull*.

Reference: Gleason, 1952, Vol. 2, p. 221; fig., p. 220.

ROSACEAE

**COMARUM PALUSTRE* L., Sp. Pl. 1: 502. 1753.

Potentilla palustris (L.) Scop., Fl. Carn. ed. II. i. 359.

GUNNISON CO.: trail from Ohio Creek Guard Station to Floresta and summit of Ohio Peak, Anthracite Range, 9,500 ft., locally abundant on the margin of a small pond in sedge zone, 16 July 1955, *Weber & Barrell 9363*; also found on margin of Copeley Lake and Lily Lake in the same general area (*Barrell, voce*).

Reference: Gleason, 1952, vol. 2, p. 298; fig., p. 299.

This collection represents the southernmost locality for the species in western United States. Among the historic Colorado collections distributed by the Philadelphia Academy of Sciences is a specimen from "Ohio Pass, Elk Mts., T. S. Brandege, 1881", bearing a note that this was examined by P. A. Rydberg for his Revision of the North American Potentilleae.

**POTENTILLA HOOKERIANA* Lehm. in Add. ad Ind. sem. hort. bot. Hamburg 1849, p. 10 No. 16, *sensu* Hultén in Bot. Notiser 1945, p. 138-140.

P. hookeriana Lehm. ssp. *hookeriana sensu* Bøcher, Holmen & Jakobsen 1957.

P. nivea ssp. *hookeriana* (Lehm.) Hiitonen

SUMMIT CO.: locally abundant on upper side of screes, north slope of Hoosier Ridge, 12,000-13,000 ft., east of Hoosier Pass, 18 August 1960, *Weber, Holmen & Porsild 11,130*.

According to the Manual, page 301, this species would key down along with *P. nivea* L. However, as the authors cited above have pointed out, the two species differ strikingly in the pubescence of the petioles. *P. nivea* has uniformly woolly-tomentose petioles without any spreading straight pilose trichomes, while *P. hookeriana* possesses long spreading trichomes as well as shorter puberulence. Both species occur together on Hoosier Ridge without intergradation, and they are easily separable in the field. *P. hookeriana* has not been reported previously south of Yukon Territory.

LEGUMINOSAE

**ASTRAGALUS CIBARIUS* Sheldon in Bull. Geol. & Nat. Hist. Surv. Minnesota 9: 149. 1894.

Xylophacos cibarius (Sheldon) Rydberg

MOFFAT CO.: sagebrush hillsides 17 mi. south of Craig; flowers pink; 10 May 1952, *Weber 7338* (det. R. C. Barneby).

Perennial with caespitose caudex; stems 1.5-3.0 dm. high, decumbent and spreading, striate, sparingly strigose; leaves 6-9 cm. long; stipules large, ovate or deltoid, ciliate, erect; leaflets 11 to 17, obovate-oblong to orbicular, obtuse to retuse, glabrate above, strigose beneath, 5-10 mm. long; peduncles 8-11 cm. long; racemes 8-12-flowered, short; bracts lanceolate, scarious, 5 mm. long; calyx black-hairy, the tube 5 mm. long, the teeth subulate, 2 mm. long; corolla ochroleucous and purple, about 15 mm. long; banner obovate, strongly bent at the middle, slightly retuse; wings slightly shorter, the blades oblanceolate-oblong, with a large rounded auricle; keel-petals broadly lunate, rounded at the apex; pod lanceolate in outline, acute at each end, 2.5-4.0 cm. long, about 1 cm. wide, sparingly strigose or glabrate in age, cross-reticulate, arcuate, obcompressed and often sulcate on the lower suture.

The distribution of this species, according to Barneby (correspondence) is as follows: "The species is most abundant in the foothills surrounding Salt Lake Basin in northwest Utah and northeastern Nevada and perhaps equally so around the east end of the Snake River Plains in southeastern Idaho. It extends sparingly south along the west slope of the Wasatch into southern Utah, east to Yellowstone Park and the Grand Tetons. Then it has a small area around Missoula, Montana, and has been traced quite recently by C. L. Porter east to the Green and North Platte Rivers in southern Wyoming. The nearest station yet known to the Colorado line is in the Aspen Mountains south of Rock Springs, about 100 miles to the northwest of Craig. It is apparently lacking in the Uinta Basin".

ASTRAGALUS FRIGIDUS (L.) A. Gray var. *AMERICANUS* (Hook.) S. Wats. in Smithsonian Misc. Coll. 258: 193. 1878.

Astragalus americanus (Hook.) M. E. Jones, Contrib. Western Bot. 8: 8. 1898.

This species was collected by Hall and Harbour, No. 137 and so reported by Porter and Coulter (1874). However, it was evidently overlooked by Porter (1951) in his treatment of Colorado Astragali. Although the collection lacks precise locality data, the plants should be expected in the region of the north end of South Park.

In the Manual, *A. frigidus* var. *americanus* would key down to *A. aboriginum* Rich. in section *Atelophragma*, page 341. *A. frigidus*, however, may be easily distinguished from *A. aboriginum* by its large green foliose stipules which are reflexed.

**ASTRAGALUS HUMILLIMUS* Gray in Brandegee, Fl. S. W. Colorado, Bull. U. S. Geol. Surv. Terr. 2: 235. 1876.

This species was overlooked in Dr. C. L. Porter's treatment of the Colorado Astragali for the Manual. The original collection was by Brandegee, No. 1087, "Rocks, Mesa Verde, 6,000 ft. alt." (G).

This rather distinct species has not been collected again. In the hope of stimulating collectors to rediscover the species, the original description is reproduced below:

Caespitoso-depressus, condensatus; caudice lignescente; caulibus vix pollicaribus stipulis scariosis coalitus imbricato-tectis, petiolis persistentibus hystricosis; foliolis 3-5-jugis oblongis canescentibus margine revolutis (lineam longis) demum deciduis; pedunculis brevibus 1-3-floris; calycis dentibus subulatis tubo oblongo-campanulato dimidio brevioribus; corolla pallida; legumine ovato-coriaceo albo-pubescente parvo (lin. 2 longo) uniloculari 9-ovulato fere monosperma, suturis extus prominulis.

Habit of *A. jejunus* Watson, but more dwarf and condensed; petioles and rachis more spinose and persistent; pod decidedly different. — Asa Gray.

Growing upon sandstone rock of the Mesa Verde, near the edge of the Mancos Canyon.

**DESMODIUM RIGIDUM* (Ell.) DC., Prodrum 2: 330.

COUNTY UNSPECIFIED. "Denver", Aug. 1871, B. H. Smith.

This specimen came to us among the historical collections distributed by the Philadelphia Academy of Sciences. Smith's specimens attributed to Colorado were all unquestionably Colorado species, and the addition of *Desmodium* to the Colorado Flora adds significantly to the list of relict prairie species persisting at the base of the Front Range. The specimen is a poor one with the inflorescence immature, but the genus and species group seem clear. Whether or not the specimen belongs to *D. rigidum* or to a close relative cannot be decided definitely without better material.

**Vicia angustifolia* L., Amoen. Acad. 4: 105. 1759.

ALAMOSA CO.: bottomlands, Alamosa, 30 July 1926, *Ramaley 15,759a*.
COSTILLA CO.: frequent in sandy soil in irrigated meadow near San Luis, 21 July 1929, *Ramaley 12,235*.

Reference: Hermann, F. J. 1960. Vetches of the United States, native, naturalized, and cultivated. Agriculture Handbook No. 168, U. S. D. A. 84 pages.

ELATINACEAE

**Elatine triandra* Schkuhr, Bot. Handb. 1: 345. 1791.

GUNNISON CO.: East River Valley, ca. 3 miles south of Gothic; submerged, but in portion of kettle pond which dries out later in the summer; occurs with *Limosella aquatica*, 5 July 1959, *Jean H. Langenheim 4492*.

Muenschner (1944, map 287) credited this species to Colorado, but Dr. Harrington was unable to locate a specimen and listed the occurrence as hypothetical.

I follow Fernald (1941) in his separation of *E. triandra* Schkuhr from *E. americana* (Pursh) Arnott. In the Colorado material the axile placenta is well developed and the seeds are horizontal in the capsule. By its interior montane locality, *E. triandra* belongs in the group of circumboreal species while *E. americana*, known in Colorado only from the Denver area, belongs to the eastern and central North American element. Mason (1957) maintains that true *Elatine triandra* does not occur in America and that material referred to this species belongs to *Elatine rubella* Rydb. The latter species differs from *triandra* in having sepals that are unequal in size.

Elatine superficially resembles species of *Callitriche*, but the leaves of *Elatine* are sparingly glandular-dotted, the capsule is soft and fragile-inflated, and the seeds are numerous in the capsule, oblong and finely reticulate on the surface, contrasting with the firm, one-seeded nutlets into which the capsule of *Callitriche* fragments at maturity.

UMBELLIFERAE

**Lomatium juniperinum* (M. E. Jones) Coult. & Rose in Contr. U. S. Nat. Herb. 7: 235. 1900.

Peucedanum juniperinum M. E. Jones in Contr. Western Bot. 8: 29. 1898.

MOFFAT CO.: steep slopes of consolidated talus, Harpers Corner, Dinosaur National Monument; abundant here as on neighboring summits in the area; flowers yellowish; 2 June 1956, *Weber & S. Welsh 9630* (det. L. Constance).

Plants acaulescent or short-caulescent, 1.2–2.2 cm. high, from a long slender taproot, the stems purplish below, puberulent; leaves broadly ovate in general outline, excluding the petioles 3–6 cm. long, 1–2-ternate or quinate, then 2–3-pinnate, the ultimate divisions crowded, filiform to linear, 1–4 mm. long, 0.5–1 mm. broad, entire, apiculate; petioles 1.5–3.0 cm. long, wholly sheathing; peduncles exceeding the leaves; involucre of filiform-subulate, scarious bractlets, about equalling the flowers; rays 8–20 (the fertile 3–8), ascending, 1–5 cm. long, unequal; pedicels 5–10 mm. long, the umbellets many-flowered; flowers yellowish, the ovaries glabrous; fruit oblong, 5–8 mm. long, 3–4 mm. broad, glabrous, the wings about one half the width of the body; oil-tubes 2 or 3 in the intervals, 4 on the commissure.

Reference: Mathias, Mildred E., and Lincoln Constance. 1944. Umbelliferae (*pars*) in North American Flora 28B (1): 43–295. 1944–1945.

This record represents the southeastern limit of the range of the species, which was known previously from northern Utah and adjacent Idaho and Wyoming.

***OREOXIS ALPINA** (A. Gray) Coult. & Rose, subspecies **PUBERULENTA** W. A. Weber subsp. nov.

Similis speciei sed foliis et caulibus dense puberulentibus.

Similar to the species, but having the leaves and stems densely puberulent.

GUNNISON CO.: sagebrush hillside 3 mi. north of Almont on road to Crested Butte, 8,500 ft., 2 Aug. 1955, *Weber 9379* (TYPE, COLO), distributed in error as *O. bakeri* C. & R.: Sapinero, 1898, *H. N. Wheeler 468*. JACKSON CO.: The Bluffs, Spicer, 10 July 1903, *Goodding 1506*. MINERAL CO.: near Wason, 8,500 ft., 17 June 1939, *B. K. Stewart 145*. SAGUACHE CO.: volcanic ash deposits, Cochetopa Park, just south of summit of Cochetopa Pass, 9,000 ft., 10 Aug. 1955, *Weber 9420a*; road to Stone Cellar G. S., 4 mi. W. of Cochetopa Pass, 9,700 ft., 28 July 1950, *Weber 5797*.

As presently defined, the genus *Oreoxis* consists of three exclusively alpine species. However, the new subspecies occurs well below timberline and evidently is isolated from the alpine subspecies by the subalpine timbered region. Judging from the localities at which it has been collected, ssp. *puberulenta* probably occurs in most of the lower intermontane basins on a line drawn from North Park to the vicinity of Creede. In the Gunnison Basin and in Cochetopa Park the plants grow on bare dry ash deposits or in open sagebrush communities. They are so densely puberulent that one has difficulty reconciling them at all with *O. alpina*, which is almost totally glabrous. However, alpine plants from the inner ranges do show a slight tendency to puberulence of the leaves, there being no absolute hiatus between the races. The leaves of ssp. *puberulenta* are dull gray-green, probably a consequence of the pubescence, and the leaflets are thickish and crowded, with the tips curved

upward and inward. In the typical alpine subspecies the leaves are glossy and the leaflets are essentially plane and shining. The ssp. *puberulenta* matures fruit more readily, probably in response to the longer growing season at the lower altitudes.

GENTIANACEAE

WHAT IS GENTIANA FREMONTII TORR.?

In the Section Chondrophylla of the genus *Gentiana*, two taxa have been accepted as distinct species throughout Colorado's floristic history. These are *Gentiana prostrata* Haenke, a circumboreal species, and *Gentiana fremontii* Torr., a Rocky Mountain endemic. Both are low annual (biennial?) plants with minute entire opposite leaves having hyaline margins, stems branched only at the base, each stem bearing a single flower which is blue, sensitive to air movements, the flower closing when breathed upon. The plants grow on tundra slopes as well as along cold streamlets in the subalpine meadows.

Gentiana fremontii is distinguished from *G. prostrata* by having "capsules at maturity long-stipitate and trumpet-shaped, long-exserted from the corolla-tube (stipe to 2 cm. long); leaves and calyx-lobes with conspicuous white margins, and flowers whitish to greenish-purple" (Manual, page 427-428). In *prostrata* the capsule is sessile, the leaves and calyx-lobes only slightly scarious-margined, and the flowers blue. The distribution patterns within Colorado are identical.

While the flower color and amount of scarious margin on the vegetative parts is a matter of degree and interpretation, especially with dried specimens, the presence of a stipitate gynoecium is so striking a character that it is small wonder that these taxa have been maintained. However, I was disturbed to find the remark of Hult n (1947) in his Flora of Alaska and Yukon, "*G. prostrata* is very variable in Alaska as well as in most other places. The specimens are small and unbranched, or strongly branched and large; *the capsule is long-cylindrical, long-stipitated in all mature specimens*" [italics mine]. In other words, *Gentiana prostrata* is characterized by the very attribute by which we have recognized *G. fremontii* as distinct from *prostrata*.

A study of our herbarium material bears out my growing suspicion that *Gentiana fremontii* is, in fact, merely a more mature stage of *G. prostrata* with mature and exploded capsules. All of the other characteristics are likewise correlated with maturity: the fading of the flowers to greenish or pale violet following anthesis, and the increase of scarious margins of the leaves and calyces toward the termination of their growth cycle. Furthermore, the distribution patterns of the two taxa make no sense whatever. It is my opinion, therefore, that *Gentiana fremontii* Torr. is to be regarded as a synonym of the circumboreal *G. prostrata* Haenke.

ASCLEPIADACEAE

**ASCLEPIAS OENOTHEROIDES* Cham. & Schlecht. in *Linnaea* 5: 123. 1830.

Asclepias longicornu Benth., Pl. Hartw. 24. 1839.

LAS ANIMAS CO.: rocky hillside canyon in south side of Mesa de Maya about 10 miles southeast of Troy, 7 June 1948, *C. Marvin Rogers 5907* (MICH).

A striking species because of the very elongate hoods which flare upwards, about equalling in length the reflexed petals. The Colorado record marks the northernmost locality for this species, whose principal range is in Central America north to north-central Texas and southern Arizona and New Mexico. This collection was reported by Rogers (1953) as *A. longicornu* Benth. See Woodson (1954) for description and plates.

PRIMULACEAE

**LYSIMACHIA NUMMULARIA* L., Sp. Pl. 148. 1753.

Ray (1956) cites a Colorado collection: "Boulder Co.: in mountains above Boulder, *Graves 1925* (MO)." The species may have been an escape from cultivation in one of the mining towns. It has not been found in recent years and cannot be regarded as a member of the indigenous flora.

POLEMONIACEAE

GILIA PENSTEMONOIDES M. E. Jones in *Zoe* 4: 279. 1893.

GUNNISON CO.: cliffs, rimrock of Blue Mesa, 6 miles southwest of Sapinero on old Lake City 'cut-off' road, ca. 8,000 ft., 27 July 1955, *Weber 9356*.

The Manual erred in placing this species in synonymy under *Gilia haydenii* Gray. *Gilia penstemonoides* is a narrow endemic limited to the region of the type locality. It is the only Colorado species which inhabits deep, narrow crevices of vertical cliffs. The plants are perennial, caespitose, with linear-oblongate, simple or sparsely pinnatifid leaves becoming marcescent in age. The corolla is sky-blue, with exserted stamens. I am indebted to Dr. Reed C. Rollins, who pointed out to me the exact locality of this rare species which he had collected some years earlier.

LABIATAE

**SALVIA AETHIOPIS* L., Sp. Pl. 1: 27. 1753.

BOULDER CO.: weed in pastures, alfalfa and other fields on the J. I. Gilbert farm 9 miles west of Longmont, 5,300 ft., 20 June 1957, *H. D. Harrington 8661*. This showy biennial species is well established in an extensive local area

and apparently has been so for some years. I am indebted to Dr. Harrington for drawing my attention to this record.

Reference: Robbins, W. W., Margaret K. Bellue and Walter S. Ball, 1951. Weeds of California, p. 375, Fig. 241. Reported by these authors as a "troublesome and rapidly spreading pest on pasture lands".

RUBIACEAE

**GALIUM VERUM* L., Sp. Pl. 1: 107. 1753.

GUNNISON CO.: along fencerows, meadows between Almont and Gunnison, 9 July 1955, *Weber 9135*.

The Yellow Bedstraw is an introduced European species, characterized by pyramidal cymes of yellow flowers and linear leaves tending to be somewhat fasciculate.

CAMPANULACEAE

CAMPANULA APARINOIDES Pursh, Fl. Amer. Sept. 159. 1814.

The Manual states that this species is "reported from near Denver but no specimens seen by the writer". There is an excellent specimen comprising at least seven plants of *Campanula aparinoides* in Gray Herbarium, collected by Hall and Harbour, Rocky Mountain Flora, Lat. 39°-41°, collected in 1862, No. 361. The specimen was cited by Gray in the enumeration of Hall and Harbour's plants. Although the locality is not given, I would suggest that the specimen was probably collected in the outer foothills region between Morrison and Bailey, since the species clearly belongs to the group of eastern North American relicts occurring in the area, examples of which are *Rubus pubescens*, *Pedicularis canadensis*, *Aralia nudicaulis* and *Viola selkirkii*.

COMPOSITAE

**ARTEMISIA ANNUA* L., Sp. Pl. 2: 847. 1753.

BOULDER CO.: adventive, in alley in the city of Boulder between 14th and 15th Streets near Broadway, one large plant seven feet tall, 25 Sept. 1959, *B. H. Braun*.

This is the first report for Colorado of a species naturalized from Europe and established in some localities in the Eastern States.

Reference: Gleason (1952) Vol. 3, p. 392-393 (description and figure).

**CHRYSANTHEMUM PARTHENIUM* (L.) Bernh., Syst. Verz. Erf. 145.

BOULDER CO.: adventive in recently excavated area for new buildings, University of Colorado campus, 27 June 1957, *Weber 10, 563*.

A native of Europe, occurring in America purely as a weed or as an escape from cultivation.

Reference: Gleason (1952) Vol. 3, p. 386-387 (description and figure).

HAPLOPAPPUS DRUMMONDII (T. & G.) Blake in Contr. U. S. Nat. Herb. 23: 1491. 1926.

Linosyris drummondii T. & G., Fl. N. Am. 2: 233. 1842.

MONTEZUMA CO.: ranch near Cortez, 6,200 ft., 25 Aug. 1957, *F. Fitzsimmons s.n.* (comm. H. D. Harrington).

The original report of this species for Colorado was cited by Hall (1928): "near the Utah line, southwestern Colorado, *Brandeggee 1208* (UC)". It was also reported from adjacent Arizona: "Navajo Indian Reservation near north end of Carrizo Mts., *Standley 7434* (UC, G)".

According to Hall, *H. drummondii* falls in the section *Isocoma*, characterized by having the involucre imbricate, the plants perennial, woody at the very base, and pappus of coarse brownish bristles, the disk corollas ventricose with slender tube and abruptly dilated throat, and the heads discoid. A detailed description is found in Hall (1928, p. 241).

*SCORZONERA LACINIATA L., Sp. Pl. 2: 791. 1753.

BOULDER CO.: a weed in alfalfa, Donaldson farm near Hygiene, 5,200 ft., 30 June 1954, *H. D. Harrington 7500* (Det. L. Smith); street weed, 17th and University, Boulder, 17 June 1959, *Weber 10897*.

Annual (or biennial?) with vertical taproot; juice milky; leaves mostly basal, pinnatifid, petiolate, about 10 cm. long, 2 cm. broad, the segments up to 1 cm. broad, obtuse, glabrous; flower heads solitary on elongate peduncles from the lower leaves, with a number of linear or narrowly oblanceolate reduced leaves progressively smaller upwards; flowers all ligulate, yellow; phyllaries biseriate, the outer series about half as long as the inner, all becoming sharply reflexed after the shedding of the fruits; outer phyllaries 5-8 mm. long, ovate-lanceolate; inner phyllaries narrower, 15-20 mm. long; cypsela 10 mm. long, the lower 2-3 mm. broader than the upper part, the whole deeply ribbed longitudinally, four-angled; pappus plumose, the bristles about 10 mm. long, tawny. See Figure 2.

An accidental introduction, native to the Mediterranean region and southern Europe. Except for the pinnatifid leaves, this plant reminds one of a small-headed species of *Tragopogon*.

Five years after the original discovery, this species has "exploded" in the Boulder area and now is one of the most common and, by reason of its fruiting heads, most conspicuous of the early summer weeds in fallow fields and disturbed areas in town. To my knowledge the species is not yet reported in North American literature.

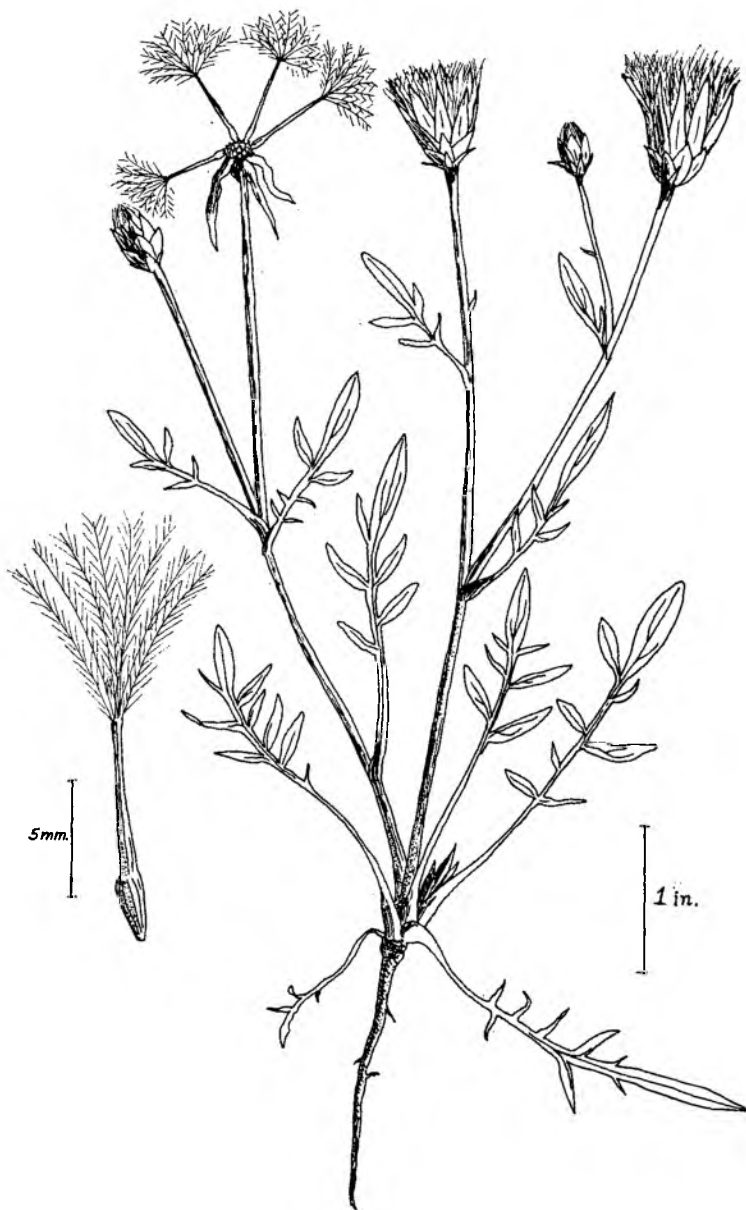


FIGURE 2. *Scorzonera laciniata* L. Habit sketch and enlargement of one cypsel (lower left).

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