

A REVISION OF THE WESTERN NORTH AMERICAN
SPECIES OF THE GENUS SENECIO ALLIED
WITH SENECIO INTEGERRIMUS NUTTALL

by

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INTRODUCTION

This study includes those perennial species of SENECIO which have a single stem arising from a very short, erect, fibrous-rooted caudex; a basal tuft of petiolate, not deeply incised leaves that become progressively smaller up the stem, and are native to western North America. The obviously distinct species, SENECIO BIGELOVII Gray, has been excluded. With the possible exception of S. CRASSULUS Gray, the species included in this study constitute a wholly natural group.

SENECIO INTEGERRIMUS and its allies are naturally distributed from Minnesota to the Pacific States, and from south-central Alberta and adjacent British Columbia to central California. The greatest amount of variation occurs from the Cascade Mountains of Washington and Oregon to central Idaho, where four of the species and all but three of the varieties of S. INTEGERRIMUS occur.

In 1903, the late Dr. J. M. Greenman published the first part of his "Monograph of the North and Central American Species of the Genus Senecio" (6). Until his work was begun, the only general treatments of the genus of which I am aware were DeCandolle's Prodromus -- (3), Torrey and Gray's Flora of North America (12) and Gray's Synoptical

Flora (4), the latter published in 1884. Between 1884 and the time of Greenman's publication, the great number of new species described, particularly from western America, made a comprehensive treatment very desirable. Greenman's publication of 1903 contained his key to sections, of which he recognized twenty-two, and a tentative list of the species belonging to each section. In succeeding years he published monographic treatments for the first eight sections. The ninth section, COLUMBIANI, is the one in which he included SENECIO INTEGERRIMUS and its allies.

De Candolle (1837) was aware of only two species which definitely belong to the SENECIO INTEGERRIMUS group (3, p. 340-437). Torrey and Gray (1843) recognized four species and two varieties (12, p. 436-446) and Gray (1884) recognized six species and three varieties in the group (4, p. 383-394). Coulter's Manual of Rocky Mountain Botany (1, p. 206-211) followed very closely the treatment in Gray's Synoptical Flora. Thomas Howell's pioneer work Flora of Northwest America (1901) lists five species (7, p. 374-379). This was the last publication in which the treatment of SENECIO centers around the writings of Asa Gray.

In 1900, P. A. Rydberg published his Catalogue of the Flora of Montana, in which eleven species of this group are recognized for Montana alone (10, p. 437-447).

The greatest number of species included in a regional flora is in Rydberg's Flora of the Rocky Mountains and Adjacent Plains (1917), where eighteen species are recognized (11, p. 982-1001). Contemporaneously with Rydberg, E. L. Greene was describing many new species in the area of central California. In his flora of that region, Flora Franciscana (1897), seven species referable to this group are recognized (5, p. 464-472).

Both Greene and Rydberg had species concepts which are much narrower than the species concepts held by the majority of contemporary botanists. Consequently, many of the species names published by these two men have been relegated to synonymy.

Arthur Cronquist's recent treatment in Vascular Plants of the Pacific Northwest, Part V (1955) is quite realistic for the area covered. Five species, with one of them divided into four varieties, are recognized (3, p. 282-301).

In the present treatment the writer recognizes five species, with two varieties of one and six varieties of another. Since Gray's Synoptical Flora, this is the first attempt at covering SENECIO INTEGERRIMUS and its allies for their entire range.

Gross morphological structure has furnished the basic taxonomic criteria. With the exception of the involucral

bracts, the inflorescence is too uniform to yield good characters. On the other hand, the vegetative portion of the plant is extremely variable. The most consistent characters have been found in the presence or absence of parts, and relative size and number of parts. The presence or absence of pubescence on the mature plants divides the group into two natural divisions. Ray flowers are consistently absent in one variety of *SENECIO INTEGERRIMUS* and only occasionally present in *SENECIO ARONICOIDES* De Candolle. The size and shape of the involucral bracts has been found distinctive in some instances, as has the number of bracts present. Leaf size and shape furnish characters of secondary importance.

The species are defined by more or less consistent morphological characters, and are supported by ecological differences, and in one instance, by geographic restriction. The varieties are separated on less consistent morphological criteria and are supported by geographic distribution. There is a definite intergradation between the varieties in areas of overlapping ranges. Even between species, occasional intermediates are found.

Little is known cytologically about this group. A thorough cytologic investigation coupled with breeding and transplanting experiments should yield a much more accurate systematic treatment.

In the course of this study, more than 4200 specimens were examined. Those which were annotated are cited following the descriptions of the proper entity. Most of the field work was done in southeastern and central Oregon, as there was a definite lack of data and material from those areas.

Following is a list of herbaria from which specimens for this study were borrowed. The corresponding symbols are used in the specimen citations in accordance with Lanjouw & Stafleu, Index Herbariorum, Part I

University of California	UC
Gray Herbarium, Harvard University	GH
University of Idaho	ID
Missouri Botanical Garden	MO
Montana State College	MONT
New York Botanical Garden	NY
Oregon State College	OSC
Philadelphia Academy of Natural Sciences	PH
Rocky Mountain Herbarium,	
University of Wyoming	RM
State College of Washington	WS
University of Washington	WTU

SYSTEMATIC TREATMENT

Key

1a Plants glabrous, or at most only minutely pubescent in the leaf axils and at the base, sometimes lightly floccose when young.

2a Heads few, up to ten or twelve, but most frequently five or six; cauline leaves 6-8 cm. long, occasionally as short as 3 cm. or as long as 15 cm.; plants not tall, usually 20-30 cm. tall, although sometimes taller; larger leaves not confined to basal parts of stem; stems solid. Plants of upland areas.

1. *SENECIO CRASSULUS*

2b Heads few to many; cauline leaves generally greatly reduced; plants usually 30-120 cm. tall, stem hollow, basal part of stem sometimes reddish. Plants most commonly of wet areas.

3a Herbage glaucous; leaves somewhat fleshy; plants often over 100 cm. tall, occasionally much taller, leaf margins generally entire, but occasionally denticulate. Plants of swamps,

tolerant of standing water.

2. *SENECIO HYDROPHILUS*

- 3b Herbage not glaucous; plant seldom over 100 cm. tall; leaves commonly toothed; sometimes sub-entire, not fleshy. Plants of wet hillsides and wet meadows, but not of swamps.

3. *SENECIO FOETIDUS*

- 4a Inflorescence loose and open; eight or five rays nearly always present; stems arising singly. Eastern Washington and adjacent Oregon, central Idaho and Montana.

3a. S. F. var.

HYDROPHILOIDES

- 4b Inflorescence congested: rays often absent or occasionally five present; stems arising singly or loosely clustered. Central Washington and Idaho, south to California.

3b. S. F. var.

FOETIDUS

- 1b Plants pubescent, at least when young; the hairs most frequently long and jointed.

- 5a Heads rayless, or occasionally with one or

two short rays, small, usually with fifteen to twenty flowers and about eight or thirteen bracts; involucral bracts 0.4 - 0.8 cm. long; leaves varying from ovate to oblanceolate, nearly always with an irregular margin ranging from repand-denticulate to laciniate or even sub-entire. A variable species of the California area.

4. *SENECIO ARONICOIDES*

5b Ray flowers present (except in var. *VASEYI*); involucral bracts usually 0.7 - 1.2 cm. long; most frequently about twenty-one, sometimes only thirteen, occasionally reduced in size and number, leaves various, margins most often sub-entire. A polymorphic, widely distributed species.

5. *SENECIO INTEGERRIMUS*

6a Ray flowers white or ochroleucous; basal leaves most frequently ovate, with a definite petiole. Northern Idaho, to the Cascades in Washington, and south in the Cascades to Oregon.

5a. S. I. var. *OCHROLEUCUS*

6b Ray flowers, when present, yellow; basal leaves ovate to lanceolate and oblanceolate, with or without a distinct petiole.

7a Pubescence normally scanty at flowering time; involucral bracts usually subulate, minutely, if at all, black-tipped. Great plains phase, commonly found from Minnesota to the eastern base of the Rocky Mountains, south to Colorado.

5b. S. I. var. INTEGERRIMUS

7b Pubescence normally more abundant at flowering time, although sometimes scanty; involucral bracts usually not conspicuously awl-shaped, except in var. MAJOR.

8a Heads 1.0 - 1.5 cm. tall, seldom more than six lower leaves almost linear, 0.5 - 2.0 cm. wide, 8-10 cm. long; plant pubescent, involucral bracts slightly, if at all, black-tipped.
Central Montana.

5c. S. I. var. SCRIBNERI

8b Heads 0.6 - 1.2 cm. tall, rarely larger; inflorescence with many heads, sometimes few in var. MAJOR; involucral bracts with or without black tips.

9a Ray flowers absent; central Washington and occasionally southward in the Cascades in Oregon.

5d. S. I. var. VASEYI

9b Ray flowers present.

10a Heads 1.0-1.2 cm. tall; plant commonly quite pubescent; involucral bracts narrow, linear-subulate, slightly, if at all, black-tipped. California area.

5e. S. I. var. MAJOR

10b Heads 0.5-1.0 or rarely 1.2 cm. tall; plant lightly pubescent to densely so; involucral bracts most frequently broader, not awl-shaped, conspicuously black-tipped. Widespread and common.

5f. S. I. var. EXALTATUS

1. *SENECIO CRASSULUS* Gray, Proceedings of the American Academy 19:54. 1883.

Senecio semiamplexicaulis Rydberg ("semimplexicaulis")
Memoirs of the New York Botanical Garden I:440. 1900.
Glabrous: stem 20-50 cm. tall, exceptionally up to 70 cm. or as little as 15 cm. tall, rising from a short, erect, or weakly spreading caudex that is frequently branched and bearing several stems: leaves broadly ovate to spatulate in outline, entire to sharply dentate, 3-15 cm. long and 1.5-5 cm. wide; lower caudine and basal leaves petiolate, becoming more or less sessile and clasping up the stem; middle caudine leaves frequently larger than the basal leaves; inflorescence generally open, heads several or occasionally only one; terminal head rarely conspicuously foreshortened, involucral bracts.

mostly 0.5 - 0.9 cm. long, usually linear oblong, with a blackish, slightly villous, triangle-shaped tip, commonly about thirteen or twenty-one in number, but frequently only eight; ray corollas yellow, 0.5 - 1.2 cm. long, about eight or thirteen present.

Northern New Mexico to Montana, west to northeastern Oregon, reputedly in South Dakota. In dry to moist open woodlands and meadows from the foothills to rather high elevations in the mountains.

SENECIO CRASSULUS is of uncertain affinity with *SENECIO INTEGERRIMUS*. The sizeable rootstocks, which may be definitely woody, are unlike the underground parts of *SENECIO INTEGERRIMUS*; and equally foreign is the habit in *SENECIO CRASSULUS* of producing cauline leaves of a larger size than the basal leaves. However, some specimens of *SENECIO CRASSULUS* look sufficiently like *SENECIO INTEGERRIMUS* to warrant the inclusion of *SENECIO CRASSULUS* in this study.

At higher elevations (7000'-9000') in Idaho, the typical phase appears to be replaced by a small-headed form with involucral bracts 0.3 - 0.4 cm. long, and with the tips only minutely darkened.

The name *SENECIO CRASSULUS* var. *CUSICKII* (Piper) Greenman appears in Peck's Manual of the Higher Plants

of Oregon, page 780, (9). Apparently the name is based upon SENECIO CUSICKII Piper, a name which appears on specimens in the herbarium of the State College of Washington, but which was never validly published as a species. Greenman's use of the name with verietal status appears to have been published first in Peck's Manual, but without Latin diagnosis. The name, therefore, is invalid.

Specimens Seen:

Type: COLORADO. Lat. 39° - 41° ; Parry 24 (GH)

COLORADO. Boulder Co.: Arapahoe Peak, Clokey 3197 (UC, WTU); Jenny Lake, Hall 10475 (UC); Ward, Osterhout 2443 (NY, PH). Chaffee Co.: Manassas Creek, Clokey 3464 (GH, NY, UC, WS); Chalk Creek, Rollins 1382 (GH, NY).

Fremont Co.: Brandegee 733 (UC). Grand Co.: Lulu Pass, Clokey 4386 (NY, PH, UC, WS). Gunnison Co.: Kebler Pass, Egleston 5892 (GH). Jackson Co.: Rabbit Ears Pass, Ownbey 896 (WS); Rabbit Ears Pass, Williams 2424 (GH, UC, WS).

Lake Co.: Mt. Elbert, Clokey 3466 (GH, NY, UC); Independence Pass, Waterfall 11563 (UC). Larimer Co.: Loch Vale, Clokey 3968 (GH, NY, PH, UC, WS, WTU); Rabbit Ears Pass, Gooodding 1548 (GH, NY, PH, UC); North Park, Osterhout s.n. (NY). Mineral Co.: Wolf Creek Pass, Wolf 3006 (GH, UC); Rio Grande Nat. Forest, Murdock, Jr. 4580 (NY). Rocky Mt. National Park: Milner Pass, Kaufman s.n. (MONT);

Flat Top Mt., Pennell & Schaeffer, 24429 (PH); Trail Ridge, Smith s. n. (UC) Routt Co.: Summit of North Park Range, Goodding 1804 (GH, NY, PH, UC); North Fork Elk River, Weber 6781 (WS, WTU) San Miguel Co.: Trout Lake, Payson & Payson 4144 (GH). Summit Co.; Ida Bell Mine, Clokey 2893 (GH, UC) County not indicated. Cameron Pass, Baker s. n. (NY, UC); Little Kate Mine, Baker 514 (GH, NY); Pagosa Peak, Baker 704 (GH, NY); above Ouray, Baker 738 (GH); Gunnison water-shed, Baker 744 (GH, NY); Baker 992; Mt. Lincoln, Coulter s. n. (PH); Denver, Coulter s. n. (PH); Sierra Madre, Coulter S. N. (PH); Trappins Lake, Crandall s. n. (NY); Boreas, Crandall 3045 (NY, WS); Berthoud Pass, Degener & Peiler 16778 (NY); Mt. "Flora", Gray s. n. (GH); Gray's Peak, Hooker & Gray s. n. (GH); Berthoud Pass, Johnston 141 (GH); Gray's Peak, Letterman s. n. (PH); Arapahoe National Forest, Nelson & Nelson 4481 (UC); Latitude 39°-41°, Parry 24 (GH); near Empire, Patterson 239 (GH, NY, PH, UC); Silver Plume, Shear 4612 (NY); Mt. Harvard, Shear 3829 (NY); North Park, Sheldon s. n. (PH); Gray's Peak, Torrey (PH); Eldora to Baltimore, Tweedy s.n. (NY); Rocky Mts. (Colorado?), Hall & Harbour 318 (GH, NY, PH,).

IDAHO: Adams Co. Black Lake, Christ 8695 (NY).

Bear Lake Co.: Bloomington Lakes, Baker 9401 (ID, NY); west of Bloomington, Christ & Christ 18684 (NY);

Bloomington Lake, Davis 1629 (NY, UC, WS). Blaine Co.; Alpine Creek, Cronquist 3747 (GH); Twin Lakes, Hitchcock & Martin 5748 (WTU); Alpine Creek, Hitchcock & Mahlick 10522 (NY); Boulder Creek Canyon, Thompson 14067 (GH, NY, PH, UC, WTU). Boise Co.; Ardeth Lake, Morton 8651 (NY). Bonneville Co.; Swan Valley, Baker 9687 (NY); southeast of Swan Valley, Christ & Christ 18936 (NY); Caribou Mt., Payson & Armstrong 3600 (GH, PH). Custer Co.: Toxaway Lake, Hitchcock & Martin 5775 (NY, UC, WS, WTU); Ryan Peak, Hitchcock & Muhlick 10609 (WTU); Josephus Lakes, Macbride & Payson 3536 (GH, NY); Stanley Lake, Mann & Worley s. n. (ID); Stanley Lake, Worley 36-218 (WS). Elmore Co.: Trinity Pass, Baker 11236 (ID); Atlantic, Hitchcock & Muhlick 10093 (GH, NY, UC, WS, WTU); Big Roaring River Lake, Meyer & Meyer 2278 (NY). Franklin Co.: Franklin Basin, Christ 16237 (NY); Hillyard Creek, Davis 3986 (WS). Fremont Co.: under Targhee Peak, Christ & Christ 19069 (NY); Henry Fork, Pennell & Schaeffer 23497 (NY). Idaho Co.: Seven Devils Camp, Baker 12033 (ID); Orogrande Summit, Baker 12528 (ID, NY); Hump Lake, Baker 12702 (ID); Concord, Christ 11686 (ID, NY); Heavens Gate, Christ 12565 (ID, NY); War Eagle Mt., Christ & Ward 14590 (NY); War Eagle Mt., Christ & Ward 14593 (NY); Hump Lake, Daubenmire (WS); Bernard Lakes, Davis 2323 (WS); west of Riggins, Kruckeberg 3185 (NY, OSC, UC, WS, WTU); Dry Diggins,

Mullen & St. John 8456 (UC, WS); Dry Diggins, Packard 441 (WS). Owyhee Co.: Sawpit Summit, Baker 7912 (ID); Quicksilver Mt., Baker 8203 (ID, NY). Valley Co.: Monumental Summit, Baker 11900 (ID); Bruce Spring, Baker 12322 (ID, OSC); Elk Summit, Davis 2661 (UC); Brundage Mt., Davis 2934 (UC). County not indicated: Sawtelle, Christ s.n. (NY); Trail Creek, Christ 5035 (NY); Teton Range, Coulter s.n. (NY, PH); Peacock Mine, Casick 2345 (ORE, WS); Horse Heaven, Nelson & Nelson 2934 (GN, UC); Mt. Chauvet, Rydberg & Bessey 5243 (MONT, NY).

MONTANA. Carson Co.: September Morn Lake, Cronquist 8109 (NY); Gallatin Co.: Bozeman, Cotner s.n. (WTU).

Lewis & Clark Co.: Donaher Ranger Station, Hitchcock 18763 (WTU). Madison Co.: Koek Peak, Hitchcock & Muhlick 15202 (NY, WTU); Black Butte, Hitchcock 16910 (NY, WS, WTU). Park Co.: Cooke City, Hitchcock & Muhlick 13613 (GN, MONT, NY, PH, WS, WTU); Tweedy 339 (MONT, NY); Cooke Guard Station, Witt 1348 (NY, WS, WTU). Stillwater Co.: Mt. Haystack, Hitchcock & Muhlick 13415 (NY). Sweetgrass Co.: Blue Lake, Hitchcock & Muhlick 13235; (NY, PH, WS, WTU). County not indicated: Mt. Bridger, Blankinship s.n. (GN); Porcupine Creek, Blankinship s.n. (GN); Mt. Hyalite, Blankinship s.n. (GN); Lane Mt., Blankinship 297 (PH); Boulder Divide, Brandegee s.n. (UC); Bridges Mts. Floodman 814

(NY); Lake Abundance, Hawkins s. n. (MONT); Cedar Mountain, Rydberg & Bessey 5349 (NY).

NEW MEXICO: Pecos River National Forest: Truchas Peak, Standley 4794 (NY).

OREGON: Baker Co.: Lakes Ranger Station, Peck 5034 (WS); Anthony Lakes Region, Thompson 13437 (GH, MO, NY, PH, UC, WTU); Harney Co.: Steens Mts., Hansen 968 (NY); Steens Mts., Henderson 8600 (ORE); Steens Mts., Train s. n. (OSC); Grant Co.: Strawberry Mt., Cronquist 7723 (GH, NY, WS); County not indicated, Blue Mts., Cusick 1776 (WS); Strawberry Mt., Cusick 3540 (GH, NY, UC, WS, WTU); Blue Mts., Hopkins 52 (WS).

UTAH: Duchesne Co.: Mirror Lake, Graham 10226 (GH). Grand Co.: Mt. Hobbs, Maguire 17791 (GH); Salt Lake Co.: Mt. Millicent, Garrett 1523 (GH, NY, PH); Big Cottonwood Canyon, Garrett 1542a (GH); Cottonwood Canyon, Watson 661 (GH). Summit Co.: Lamotte Peak, Goodman 2012 (GH, MONT, NY); Uintah Mts., Greenman & Greenman s. n. (GH); Bald Mt., Maguire 4323 (GH, UC). Unita Co.: Unita Mts., Garrett 4029 (NY). County not indicated: Alta Jones 1157 (GH, NY, PH); Alta, Jones 1526 (NY); Horse Gulch, Rydberg & Garrett 8956 (NY); Great Basin Experiment Station C29568 (GH).

WYOMING: Albany Co.: Brooklyn Lake, Kauffman &

Kanouse s. n. (MONT); Nash's Fork, Nelson 7745, 7749 (GH, NY); Centennial, Nelson 8709 (GH, NY); Medicine Bow Mts., Ownbey 128 (WS); Brooklyn Ridge, Reed & Reed 2431 & 2435 (WS); Carbon Co.: west of Encampment, Porter 3730 (GH, UC, WTU); Battle, Tweedy 4124 (NY); Copperton, Tweedy 4126 (NY). Lincoln Co.: east of Smoot, Payson & Armstrong 3694 (GH, PH). Park Co.: Beartooth Lake, Hitchcock 16654 (NY, WS, WTU); Clay Butte, Porter & Porter 5920 (GH, PH, UC); Clark's Fork, Porter 5926 (GH, PH, UC, WTU); Muddy Creek, Williams & Williams 3743 (GH, NY). Sublette Co.: Brosventre Mts., Payson & Payson 3020 (GH, NY, PH); Piney Lake, Meyer & Meyer 2367 (NY). Teton Co.: Teton National Forest, Reed & Reed, 2892 (WS); Two Ocean Lake, Williams 1647 (WS). Teton National Park: Skyline Trail, Wehmeyer 5454 (GH, NY); Cascade Creek, Pennell 24152 (PH). Yellowstone National Park: Canyon Jct., Beetle 5192; Burgelhaus s.n. (WTU); Yellowstone Lake, Hawkins 711 (MONT); Canyon Junction, Langdon 38 (OSC); Beaver Lake, Nelson & Nelson 6120 (GH); East De Lacy's Creek, Rydberg & Bessey 5251 (GH, PH); near Canyon, Thompson 14160 (GH, WTU). County not indicated: Buffalo Fork, Curtis, (NY); Cliff Creek, Curtis s. n. (NY); Bridger forest, Klondike Ridge, McDonald s. n. (ID); Union Pass Hill, Nelson 809 (GH, WS); Battle Lake,

Nelson 4152 (MONT); Beaver Lake, Nelson & Nelson 6120 (NY); Brooklyn Lake, Nelson 9239 (GH, NY, UC); Union Peak, Nelson 1027 (GH, NY); La Plata Mines, Nelson 1770 (NY); Teton Pass, Payson & Payson 2098 (GH, NY); Little Bear Creek, Pennell 24023 (PH); Indian Creek, Tweedy 592 (NY); Two Gwo Tee Pass, Williams 945a (MONT).

2. SENEPIO HYDROPHILUS Nuttall, Transactions of the American Philosophical Society. II. 7:411. 1841.
Senecio hydrophilus var. pacificus Greene, Pittonia. 1:220. 1880.

Senecio pacificus Rydberg, Flora of the Rocky Mts. and Adjacent Plains. 998. 1917.

Herbage glabrous, rather glaucous, seagreen in color: stem stout, hollow, rising 40-100 cm. or occasionally more, from a cluster of fleshy, fibrous roots: leaves thickened, entire or denticulate; basal and lower caudine leaves petiolate, with narrowly elliptic to oblanceolate blades, 10-30 cm. long and 1-10 cm. wide, or larger on well developed specimens; middle and upper caudine leaves strongly reduced, becoming sessile: heads usually quite numerous, in a large, loose inflorescence; involucral bracts narrow, 0.5 - 0.8 cm. long, frequently black-tipped; rays, when present, yellow, short, 0.3 - 0.8 cm. long, few in number.

Central California, north to British Columbia, east to Montana and Colorado, reputedly as far east as South Dakota. Swampy places in the lower foothills and valleys, tolerant of standing water. Quite common in its habitat.

Throughout the range the form with discoid heads is interspersed among those which have rays. The name *SENECIO HYDROPHILUS* var. *PACIFICUS* Greene has been applied to the discoid form.

Specimens Seen:

Type: (not seen)

BRITISH COLUMBIA. Mouth of Salmon River: Macoun 64999 (GH, NY).

CALIFORNIA. Contra Costa Co.: near Martinez, Davy 6669 (UC); Fresno Co.: Mono Hot Springs, Grant 1483 (MO). Lake Co.: Kelseyville, Stokes, s.n. (MO); Vasey (PH). Madera Co.: Red's Meadow, Hoffman s. n. (GH). Marin Co.: Laguna in Chileno Valley, Rose 46280 (GH, NY, UC). Modoc Co.: Alturas, Fuller 29 (GH); Lessions Swamp, Manning 325 (UC). Mono Co.: Bridgeport Meadows, Alexander & Kellogg 4595 (UC); Hot Creek Fish Hatchery, Ferris & Lorraine 11099 (GH, UC, WTU); northwest of Bridgeport, Graham 201 (OSC, UC) Whisky Creek,

Pierson 10737 (UC). Monterey Co.: Castroville, Abrams s.n. (UC); Carmel Bay, Elmer 4051 (CH, MO). Nevada Co.: Donner Lake, Heller s.n. (MO). Plumas Co.: Lassen Buttes, Brown s.n. (MO, MONT, NY); Dentens, Ewan 8168 (UC); Mrs. Martin s.n. (GH). San Luis Obispo Co.: San Luis Obispo, Palmer 265 (NY). Santa Clara Co.: Palo Alto, Baker 1715 (MO, NY, UC, WS); Stanford University, Elmer 3421 (MO, NY); Alviso, Richardson s.n. (MO). Siskiyou Co.: Oro Fino, Butler 236 (UC). Solano Co.: Suisun Marshes, Howell 13976 (MO, WTU); Suksdorf 600 (MO, WS). Tuolumne Co.: Eagle Meadow, Hoover 4179 (UC). Yosemite National Park: near Devils Postpile, Hall 11888 (UC). County not indicated: Goose Lake, Austin s.n. (UC); Fall River Lake, Baker s.n. (UC); Cache Creek, Bolander 2616 (GH, UC): Mono pass, Bolander 6177 (GH); Suisun, Brandegee s.n. (UC); Prattville, Brandegee s.n. (UC); Mt. Shasta, Brown 606 (UC); Berkeley, Edwards s.n. (NY); Mt. Shasta, Engleman s.n. (MO); Berkeley, Greene s.n. (PH, NY, UC); Vallejo, Greene 228 (GH); Sissons, Jones s.n. (NY); "Central California", Palmer s.n. (NY); Clark's Creek, Palmer 265 (MO); Lake Tahoe, Redfield 192 (MO, NY); Evergreen, Smith s.n. (UC); Donner Lake, Sonne 3 (GH, UC); Lower Sacramento, Capt. Wilkes 1358 (NY).

COLORADO. Jackson Co.: Cowdrey, Ownbey 383 (WS).
Larimer Co.: North Fork, Goodding 1923 (GH, NY, PH, UC).
County not indicated: Upper Laramie River, Baker s.n. (NY); Lat. 39° - 41°, Parry s.n. (GH); Middle Park, Ramaley & Robbins 3554 (UC); Montrose, Shear 4847 (NY); Yampa, Shear & Bessey 4028 (NY); near Wolcott, Shear & Bessey 5296 (NY); Evergreen, Williamson s.n. (PH); Rocky Mts., Middle Park, Vasey 336 (GH).

IDAHO. Elaine Co.: Carey Lake, Christ 2992 (NY).
Boise Co.: Squaw Butte, Clark 275 (GH, MONT, NY, UC, WS, WTU). Bonner Co.: Idlewild, Christ 11532 (ID); Pend Orielle Lake, Muenescher 11305 (WS, WTU). Bonneville Co.: Grays Lake, Christ 18963 (NY). Canyon Co.: Falk's Store, Macbride s.n. (GH). Fremont Co.: Henrys Lake, Christ 5520 (NY). Idaho Co.: Harpster, Christ 10104 (NY).
Kootenai Co.: Idlewile, Christ 11532 (NY); Spokane Bridge, Heller 924 (PH); Hope, Heller 938 (PH); Lake Pend Orielle, Sandberg 938 (GH, WTU, NY). Oneida Co.: American Falls, Nelson & Macbride 1392 (GH). Owyhee Co.: Riddle, Baker 8499 (ID, NY); Triangle, Baker 8566 (ID, NY); Boulder Creek, Macbride 502 (GH, NY, UC, WS, WTU). Power Co.: Bannock Creek, Christ & Ward 8814 (NY). Teton Co.: Victor, Christ 5321 (NY). County not Indicated: Sandpoint, Christ 2029 (ID, NY); Hope, Dunkle s.n. (ID);

Trestle Creek, Dunkle s. n. (ID); Dingle Swamp, Harris s.n. (GH); mouth of Pack River, Henderson 2999 (GH); Lake Pend Orielle, Leiberg s.n. (ORE, PH); Clark's Fork, Leiberg 1665 (GH, UC).

MONTANA. Beaverhead Co.: Red Rock Lake, Booth 52490 (MONT); Red Rock River, Jennison s.n. (MONT); Hayden Ranch, Jennison (MONT). Madison Co.: Ennis, Blankinship s.n. (GH). County not Indicated: Three Forks, Blankinship s.n. (GH); Bozeman, Blankinship 293 (PH); Gallatin River, Canby s.n. (GH); Gallatin, Canby s.n. (NY); Madison Valley, Hayden s.n. (PH); Bozeman, Shear 5256 (NY); Mud Springs, Porter s.n. (NY).

NEVADA. Elko Co.: Deeth, Heller 10552 (GH, NY, UC); Deeth, Heller 9126 (NY, PH); north of Wells, Holmgren s.n. (NY, GH); southeast of Elko, Holmgren 1112 (UC); Deeth, Pennell & Schaeffer 23423 (PH); south of Prunty Ranch, Train 568 (NY); Gardner Ranch, Train 922 (UC); Rio Tinto, Wilson s.n. (UC, WS, WTU). Humboldt Co.: Taylor & Richardson 6 (UC). Lander Co.: Kingston Canyon Ranger Station, Sevy 66 (NY). Nye Co.: Mohawk Ranger Station, Train 3374 (NY, UC, WTU). Horse Heaven Mountain, Train 4506 (NY). White Pine Co.: east of Ely, Hitchcock 4654 (GH, UC, WTU); Cave Creek Meadows, Train 1020 (NY). County not Identified:

Carson City, Anderson 138 (GH); Camp Halleck, Palmer s.n. (GH, PH, UC); near Idavada, Palmer s.n. (GH); Dannville Canyon, Phillips & Sargent s.n. (GH); Ruby Valley, Watson 664 (NY).

OREGON. Baker Co.: Baker, Wellman s.n. (NY, OSC). Crook Co.: Prineville, Ingram B866 (OSC). Harney Co.: Squaw Butte Experiment Station, Cooper s.n. (OSC); Steens Mt., Griffiths & Morris 573 (NY); Burns, Henderson, 8593 (ORE); southeast of Burns, Peck 25400 (WS); Whitehorse Ranch, Peck 25621 (WS). Hood River Co.: Columbia River, Howell 4792 (OSC). Jackson Co.: Woodruff Meadows, Pendleton s.n. (OSC). Klamath Co.: Klamath Falls, Abrams 9703 (MO); Klamath Falls, Kuehner s.n. (OSC); Lake Euwana, Lawrence 2140 (OSC); Klamath Marsh, Leiberg 630 (GH, MO, NY, ORE, WS); Crescent, Peck 9579 (GH, MO, NY). Malheur Co.: west of McDermitt, Peck 21735 (ORE, UC). Union Co.: Cusick s.n. (GH, NY). County not Indicated: Deschutes National Forest, Detling s.n. (ORE); near Paisley, Elder 139 (OSC); Crater National Forest, Evinger s.n. (OSC); Columbia River near the Cascades, Howell s.n. (NY, OSC, PH, UC, WS); near Cape Horn, Howell s.n. (GH); Drew's Valley, Leiberg 2771 (ORE); Spanish Peak, Leiberg 5172 (ORE).

UTAH. Sevier Co.: Fish Lake, Maguire 17801 (GH, WTU). Summit Co.: East Canyon, Garrett 6670 (UC); near

Bear River, Greenman & Greenman 4683 (GH). County not Indicated: Kimball's, Parley's Park, Clemens s.n. (NY, UC); west of mouth of Red Canyon, Harris C29148 (UC); Salt Lake City, Jones 1598 (NY); Kingston, Jones 5982 (UC); Kingston, Jones 6982 (NY); Parry 55 (NY); Gilbert's Meadows, Porter s.n. (PH); Fish Lake, Rydberg & Carlton 7549 (NY); Rabbit Valley, Ward, 633 (PH).

WASHINGTON. Benton Co.: Kennewick, Jones 371 (WS). Klickitat Co.: Falcon Valley, Suksdorf 5854 (WS). Spokane Co.: Spokane, Elmer 863 (MO, NY, WS); Spokane, Kreager 556 (GH, NY, UC, WS, WTU), Spokane, Piper s.n. (GH, NY, WS, WTU); Suksdorf 12881 (WS). County not Indicated: Falcon Valley, Suksedorf 419 (GH, WS).

WYOMING. Albany Co.: Laramie, Nelson 8089 (GH, NY), Laramie Hills, Nelson 9563 (UC). Grand Teton National Park: Cottonwood Creek, Williams 1043 (GH, MONT, NY). Yellowstone National Park: Old Faithful, Beetle 5113 (WS); upper Madison Canyon, Rydberg & Bessey 5257 (GH, MONT, NY, UC), Mammoth Hot Springs, Burglehaus 6109 (WTU); Stevenson's Island, Hayden (or Porter?) s.n. (PH); Old Faithful, Davis 4894 (WS); Gibbon River, Hawkins s.n. (MONT); Mammoth Hot Springs, Mulford s.n. (NY); Snake River, Nelson & Nelson 6434 (GH, NY); Nez Perce Creek, Williams 26 (NY). County not Indicated:

Teton Forest Reservation, Brandegee s.n. (UC); near Moran, Bartley & Pontius 661 (NY); Head of DuNoir River, Curtis s.n. (NY); Hams Fork and LaBarge, Curtis s.n. (NY); Snake & Lower Hoback Rivers, Curtis s.n. (NY); Black's Fork, McCosh s.n. (NY); Buffalo River, Merrill & Wilcox 1094 (GH, NY); Bacon Creek, Nelson 915 (GH, NY); Green River, Nelson 1037 (GH); Hutton's Lake, Nelson 5291 (MONT); Teton Forest Reserve, Tweedy 588 (NY).

3. *SENECIO FOETIDUS* Howell, Flora of Northwest America.

377. Aug. 1900.

Herbage glabrous or occasionally lightly pubescent in very young plants: stems 30-100 cm. tall or occasionally taller, green or sometimes reddish below, rising singly or loosely clustered from a tuft of fibrous roots: leaves somewhat thickened but not distinctly succulent; margins sharply but not deeply dentate; basal and lower caudine leaves long petiolate, elliptic to broadly oblanceolate, 6-25 cm. long and 2-7 cm. wide; upper caudine leaves few, strongly reduced, progressively becoming sessile: inflorescence either congested or loose and open; heads rather numerous or occasionally as few as eight or ten; involucral bracts 0.4 - 0.9 cm. long, linear-subulate, minutely to conspicuously black tipped; rays, when present, few, five to eight, yellow, 0.5 - 1.0 cm. long.

From the Sierra Nevada in California north to Washington, east through Idaho to western Montana. Rather common around marshy lake shores and wet meadows at middle elevations. Not found in alkaline situations.

The two varieties of *S. FOETIDUS* are not well defined. Morphologically they are somewhat distinct and their ranges are different although overlapping. Historically they have been treated as two separate species.

3a. *SENECIO FOETIDUS* var. *HYDROPHILOIDES* (Rydberg) comb. nov.

Senecio hydrophiloides Rydberg, Memoirs of the New York Botanical Garden. 1:440. Oct. 1900.

Senecio pereziifolius Rydberg, Memoirs of the New York Botanical Garden. 1:440. 1900.

(?) Senecio lapathifolius Greene, Plantae Bakerianae. 3:25. 1901.

Stems arising singly: inflorescence loose and open, corymbiform, with many heads; rays usually eight or five in number, rarely, if ever, absent.

Northwest Oregon, central and eastern Washington, and east through Idaho and into Montana.

In Peck's Manual of the Higher Plants of Oregon the name *SENECIO EXALTATUS* var. *RAMMI* (Greene) Greenman is used with reference to this entity (9. p. 781). Apparently

it is based on *SENECIO RAMMII* Greene, a name appearing on herbarium specimens, but unpublished. The occurrence of the name in Peck's Manual seems to be the place of original publication, but as there is no latin diagnosis, the name is not validly published.

Occasional herbarium specimens bear the name *SENECIO EXALTATUS* var. *HYDROPHILOIDES* (Rydberg) Greenman, but I believe that this combination was never published.

Specimens Seen:

Type: IDAHO. Nez Perce Co.; Heller & Heller 3474 (NY)

IDAHO. Adams Co.: south of New Meadows, Hitchcock & Muhlick 13919 (NY, UC, WS, WTU); Bonner Co.; Cocolalla, Christ 10551 (NY); north of Nordman, Christ 18060 (ID); Priest River, Daubenmire 43232 (WS). Boundary Co.:

north of Nordman, Christ s.n. (NY). Butte Co.: between Craters of the Moon and Picabo, Cronquist 2405 (GH).

Custer Co.: southeast of Cape Horn Lodge, Baker 10633 (ID, NY). Idaho Co.: White Bird, Constance 1941 (GH, UC, WS, WTU); Grangeville, Christ & Ward 7731 (NY); Hoodoo Lake, Christ 12803 (NY); Grangeville, Jones 242 (GH, ID, NY, WTU); Selway Falls, McMullen 1532 (ID). Kootenai Co.: Harrison Flats, Christ s.n. (ID). Latah Co.: Thatuna Ridge, Daubenmire 46265 (WS); Moscow, Davis 288-37 (WS); Moscow, DeSaints s.n. (ID). Nez Perces Co.: Big Potlatch

River, Sandberg 363 (GH, NY, WTU). Owyhee Co.: southwest of Grandview, Christ 14075 (NY); near Oregon border, Davis 2127 (NY, WS); House Creek, Nelson & Macbride 1795 (NY). Shoshone Co.: mouth of Bullion Creek, Baker 13508 (ID, NY). Twin Falls Co.: Cottonwood Creek, Christ & Ward 799r (NY). Valley Co.: west of Donelly, Baker 9124 (NY); Warm Lake, Hitchcock & Muhlick 14045 (NY, WS, WTU). County not Indicated: Fernan Lake, Christ 386 (NY); Carey Lake, Christ 2992 (ID); Nez Perces Indian Reservation, Henderson 2782 (GH); Clark's Fork, Leiberg 1665 (NY); Mac Abee's Ranch, MacDougal 32 (NY); Grangeville, St. John s.n. (MONT, WS).

MONTANA. Beaverhead Co.: west of Mono Creek, South s.n. (MONT). Gallatin Co.: West Yellowstone, Moldenke 7220 (NY). Glacier Co.: Kennedy Creek, Lynch 6316 (WS). Glacier National Park: north of Fish Creek, Maguire 5616 (GH, UC); Divide Lake, Maguire & Piranian 15734 (GH); north of Fish Creek Ranger Station, Maquire 15736 (GH). Lake Co.: Charlo, Hitchcock 17784 (ID, UC, WS, WTU). Lincoln Co.: west of Kalispell, Hitchcock 17681 (UC, WS, WTU). Mineral Co.: west of Saltese, Cronquist (NY, WS, WTU); Lolo Hot Springs, Hitchcock & Muhlick 14607a (NY, WTU). County not Indicated: Lolo Springs, Kirkwood s.n. (NY); Lolo, Kirkwood 1303 (GH); Columbia Falls, Williams

935 (MONT, NY)

OREGON. Umatilla Co.: Meacham, Peck 6781 (GH); Langdon Lake, Peck 22235 (NY). Union Co.: Moffitt Meadows, Lawrence WF166 (OSC). Wheeler Co.: Mitchell, Gilkey s.n. (OSC).

WASHINGTON. Douglas Co.: Badger Mt., Thompson 14657 (GH). Lincoln Co.: Wilbur, Thompson 11677 (GH, MO, NY, PH, WTU). Okanogan Co.: between Tonasket and Republic, Thompson 7116 (OSC, PH, WTU). Spokane Co.: Clark's Springs, Beattie & Chapman 2005 (WS); West Medical Lake, Gohrman 23 (WS); Clark's Springs, Kreager 55 (GH, WS, WTU); Ramm s.n. (GH); Suksdorf s.n. (GH, MO, NY, WS); Rock Creek, Suksdorf 12878 (WS); Mt. Spokane, Thompson 9202 (MO, NY, WTU). Whitman Co.: Pullman, Elmer 119 (MO); Pullman, Gibson s.n. (NY); Colfax, Hafercamp 10 (WS); Pullman, Weber 2214 (WS, WTU); Rock Lake, Weitman 125 (WS). County not Determined: Pullman, Phelps s.n. (MO); Pullman, Piper 1608 (WTU); Oakdale, Suksdorf 8852 (WS); Spangle, Suksdorf 8886 (WS); Crab Creek, Suksdorf 12858 (WS); Crab Creek, Suksdorf 12860 (WS).

3b. *SENECIO FOETIDUS* var. *FOETIDUS*

Stems arising singly or frequently loosely clustered; inflorescence generally closely congested; rays about five in number, or often absent.

California to central Washington, east to north-eastern Oregon and Idaho. More abundant in wet areas in the foothills and meadows along the western edge of the range. Intergrading with var. *HYDROPHILOIDES* in eastern Idaho.

In the original description of this plant Howell mentions that it has a strong odor and that even after twenty years in the herbarium, the odor is still to be detected. Howell's type specimen is over sixty years old and does not now have any characteristic odor, but this may be due to age. However, none of the other specimens of this entity, as I understand it, possess any odor as apparently the type did. The type does not look like the majority of individuals in the entity to which I am applying the name, but it falls easily within the expected latitude of variation.

Specimens Seen:

Type: WASHINGTON. Klickitat Valley, Howell s.n. (ORE).

BRITISH COLUMBIA. Sheep Creek, between Kettle and Columbia Rivers, Macoun 64998 (NY).

CALIFORNIA. Lassen Co.: Doyle Station, Eggleston 6753 (GH, NY); east of Westwood, Heller 15192 (MO, NY, UC, WTU). Nevada Co.: Dog Valley, Heller 10895 (GH, MO, NY,

PH, UC). Plumas Co.: Red Clover Valley, Heller & Kennedy 8878 (MO, NY, PH, UC); northeast of Grizzly Peak, Sawyer 179 (OSC, UC). Siskiyou Co.: Goosenest Mt., Butler 956 (UC); Goosenest foothills, Butler 1581 (MO, UC).

IDAHO. Bonner Co.: Colburn, Christ 6348 (NY). Custer Co.: Little Redfish Lake, Baker 10572 (ID, Ny); Stanley Lake, Hitchcock & Mulick 9605 (GH, MONT, NY, PH, UC, WS). Elmore Co.: Toll Gate Ranch, Macbride & Payson 2866 (GH, NY, UC). Idaho Co.: Sheep Creek Swamp, Christ 12717 (NY). Valley Co.: Landmark, Baker 11881 (ID); Elk Creek, Davis 2729 (UC). County not indicated: Harrison, Christ 1495 (NY).

OREGON. Baker Co.: Cornucopia, Thompson 13338 (MO, NY, PH, WTU). Crook Co.: Indian Creek, Cronquist 7432 (GH, ID, NY, OSE, UC, WS); east of Prineville, Peck 15974 (PH). Grant Co.: Austin, Henderson 5277 (GH, ORE). Harney Co.: Burns, Peck 25815 (WS); West Myrtle Creek, Thompson 12055 (NY, WTU); Steens Mt., Train s.n. (OSC). Klamath Co.: Bonanza, Peck 15193 (PH); Lake-of-the-Woods, Peck 16687 (NY). Lake Co.: Lake View, Constance s.n. (ORE); Hart Mt. Jet., Detling 4207 (UC, WS, WTU); Hart Mt., Henderson 15754 (ORE); upper end of Warner Canyon, Reeder & Merkle 114 (OSC). Morrow Co.: between Spray and Hardman, Cronquist 6629 (ID, NY, OSC, WS, WTU). Umatilla Co.: east of Weston, Pyeatt 34 (WS). Union Co.: Frye Meadows,

Lawrence WF 51 (OSC); Imbler, Thompson 4831 (PH); Umatilla National Forest, Yingst 3 (WS). Wallowa Co.: head of Horse Creek, Sheldon 8345 (NY). Wheeler Co.: east of Mitchell, Cronquist 7293 (GH, NY, UC, WS, WTU). County not indicated: Blue Mts., Griffiths & Byron Hunter 148 (NY); Hall 306 (MO); Ochoco Forest, Peck 17036 (UC).

WASHINGTON. Azotin Co.: Anatone Butte, Cronquist 5925. Chelan Co.: Wenatchee Mts., Thompson 11757 (GH, MO, MONT, NY, WS, WTU). Columbia Co.: Godman Springs, Constance & Clarke 1286 (MO, WS). Garfield Co.: Squaw Spring Trail, Darlington 85 (WS). Kittitas Co.: Ellensburg, Thompson 8364 (GH, NY, UC, WTU); Cle Elum, Thompson 9023 (NY, WTU); Swank Creek, Thompson 11609 (GH, MO, NY, PH, UC, WTU). Klickitat Co.: north of White Salmon, Meyer 1503 (GH, MO, UC, WS); Falcon Valley, Suksdorf 138 (WS); Holmes Creek, Suksdorf 7344 (WS); Hog Prairie, Suksdorf 10936 (WS); Falcon Valley, Suksdorf 12885 (WS). Okanogan Co.: Oak, Fiker 879 (MO, WTU); Crawfish Lake, Fiker, 2431 (WS); Wauconda summit, Thompson 10942 (WTU). Walla Walla Co.: Piper s.n. (WS). Yakima Co.: Goose Prairie, Nelson 1640 (WS). County not indicated: Toppenish, Henderson s.n. (WS); Waitsburg, Horner R262B300b (GH); (eastern Washington), Howell s.n. (NY); north of

Goldendale, Peck 7 (WS); Wenatchee, Whited 1181 (OSC, WS); Ellensburg, Whited 304 (WS).

4. SENEPIO ARONICOIDES DeGandolle, Prodromus 6:436. 1837.

Senecio exaltatus var. uniflorculosus Gray, United States War Department, Pacific Railway Report 4:111. 1856.

Senecio rawsonianus Greene, Pittonia 2:166. 1891.

Senecio leptolepis Greene, Flora Franciscana 468. 1897.

Herbage varying from loosely and sparsely arachnoid pubescent to finely tomentose: stems arising singly from a cluster of fibrous roots, 30-90 cm. tall: basal and lower caudine leaves varying from ovate to oblanceolate or oblong, 8-30 cm. long and 2-12 cm. wide; margins irregularly and variously dissected, ranging from repand-denticulate to laciniate or even sub-entire; upper caudine leaves reduced, irregularly toothed or rarely entire, sometimes auricled at the base: inflorescence few to many headed, loose, or occasionally tightly congested; involucral bracts 0.4 - 0.8 cm. long, oblong-lanceolate to lanceolate, with or without black tips, eight or thirteen in number; heads generally few (fifteen-twenty) flowered, but occasionally more; rays absent, or rarely one or two present.

In the Coastal Mts. of California from the San

Francisco Bay area north to the vicinity of Mt. Shasta, and south from Mt. Shasta along the western slope of the Sierra Nevada to about Fresno County. Rather dry places in open forest areas in the foothills and lower mountains.

In the vicinity of the San Francisco Bay and northward along the western slope of the Coastal Mts., *SENECIO ARONICOIDES* is most frequently sparsely pubescent, large, robust, with deeply and irregularly incised leaves, and with many small heads in the inflorescence. On the east side of the Coastal Mts., in the vicinity of Mt. Shasta, and south in the Sierra Nevada, the plant is more pubescent, even densely so, shorter, the leaves less irregularly incised, even sub-entire, and with fewer, larger heads. In the southern part of its range in the Sierra Nevada, *SENECIO ARONICOIDES* intergrades to some extent with *SENECIO INTEGERRIMUS* through extreme forms of *SENECIO INTEGERRIMUS* var. MAJOR.

SENECIO ARONICOIDES could be reduced to a variety of *SENECIO INTEGERRIMUS*, but it is much more distinct over most of its range than are other varieties of *SENECIO INTEGERRIMUS*.

Specimens Seen:

Type: (Not Seen)

CALIFORNIA. Alameda Co.: Berkeley Hills, Hall s.n. (UC); Centerville, King s.n. (UC); Berkeley, Mason 900 (GH, UC); Mission San Jose, Smith 3 (UC). Amador Co.: Agriculture Station, Hansen 417 (MO). Butte Co.: Jonesville, Copeland s.n. (UC); Jonesville, Copeland 498 (UC); Jonesville, Copeland 1254 (UC); Edwards s.n. (NY); Stirling, Hall s.n. (UC); Chico Meadows, Heller 11967 (GH, MO, MONT, NY, OSC, WTU); Stirling, 13171 (GH, MO, PH). El Dorado Co.: Kyburz, Ramaley 11283 (UC); Camino, Robbins 1033 (UC); Placerville, Robbins 1905 (UC); Rescue, Wolf s.n. (WS). Fresno Co.: Ockenden, Bullard 132 (OSC, UC); Huntington Lake, Carter 24 (UC, WS); Pine Ridge, Hall & Chandler 116 (NY, UC); Pine Ridge, Hall & Chandler 5350 (MO); Pickinpak s.n. (UC); Huntington Lake, Quibell & Quibell 12 (NY); Huntington Lake, Quibell 1150 (NY). Glenn Co.: Bennet Spring, Heller 12013 (GH, MO, NY, OSC, PH, UC, WTU); Plaskett Meadows, Ownbey & Ownbey 1714 (GH, MO, NY, WS). Humboldt Co.: South Fork Mt., Chesnut & Drew s.n. (UC). Lake Co.: Cache Creek, Abrams 12487 (NY); Upper Adobe Creek, Blankinship s.n. (MO); Cleveland s.n. (UC); Lower Lake, Eastwood & Howell 5576 (MO, WTC); Mt. Hull, Hall 9559 (MO, UC); Mt. Sanhedrin, Heller s.n. (PH, UC); Adams Springs, Hoover 4975 (UC); Jordan Park, Jussel s.n. (MO); Bendmore Valley, Wieslander 456 (UC). Lassen Co.: Lassen National Forest, Fischer F-253 (UC); Fredonyer

Pass, Heller 15143 (NY, UC); Fredonyer Forest Public Camp-ground, Munz 11861 (NY). Madera Co.: Cold Spring Meadow, Constance 2360 (GH, NY, UC), Peckinpobs Mill, Smiley 553 (GH); Camino Creek, Sweet 281 (GH); Marin Co.: Saucelito, Edward s.n. (NY); Woodacre, Hoover 5003 (UC); Point Reyes, Mason 4161 (UC); Big Rock Ridge, Robbins 1528 (UC); Bolinas Ridge, Setchell s.n. (UC). Mariposa Co.: Crescent Lake, Congdon 176 (GH, UC). Modoc Co.: Davis Creek, Austin 2368 (UC); Forestdale, Baker s.n. (UC); Alturas, Hitchcock 6711 (GH, NY, WS, WTU). Placer Co.: Baxter, Hitchcock 6337 (MO, NY, UC, WS, WTU); Blue Canyon, Walker 1224 (UC). Plumas Co.: Sawmill Tom Creek, Eggleston 21552 (NY), Silver Lake, Merrill s.n. (NY, UC). San Francisco Co.: San Francisco, Bigelow s.n. (GH, NY); Lake Merced, Eastwood s.n. (UC); San Francisco, Hartweg s.n. (NY); Mission Hills, Kellogg s.n. (GH); Lake Merced, Rose 35115 (UC, WTU), 47090 (GH, NY); Sutro Woods, Walker 1069 (UC). San Mateo Co.: Redwood, Abrams 2398 (MO); Woodside, Baker 746 (GH, MO); San Bruno Hills, Baker 1900 (GH, MO, NY, UC); Crystal Springs, Davy 1069 (UC); San Bruno Hills, Elmer 4508 (MO, NY, UC); Lake Merced, Heller 8448 (GH, MO, NY, PH); Lake Merced, Pendleton 607 (UC). Santa Clara Co.: Mt. Hamilton, Sharsmith 775 (UC, WS), 1037 (UC). Shasta Co.: Baird 1823 (MO); Goose Valley,

Eastwood 766 (NY). Siskiyou Co.: Mt. Shasta, Cooke 11013 (OSC, UC); Mt. Shasta, Cooke 11213 (OSC); Mt. Shasta, Cooke 11675 (GH); Mt. Shasta, Cooke 13530 (NY); Mt. Shasta, Cooke 16096 (MO, PH); Mt. Shasta, Cooke 17522 (WS, WTU); Medicine Lake, Eastwood 10881 (UC); Sisson, Eastwood 11888 (NY); Medicine Lake, Ferris & Lorraine 10505 (UC, WS); Sisson, Heller 8029 (GH, MO, NY, PH, UC); Mt. Shasta, Tofsrud & Tucker 1763 (UC). Solano Co.: Collin's Camp, Jepson s.n. (UC); Mt. Hood, Heller s.n. (PH). Sonoma Co.: Bodega Bay, Heller & Brown 5264 (GH, MO, NY, PH); Samuels 131 (GH). Tehama Co.: Whitlock Camp, Baker 12841 (UC); Childs Meadows, Heller s.n. (WTU); Mineral, Heller 14593 (MO, NY); Bowsell Ridge, Kellogg 13 (UC). Tuolumne Co.: Twain-Harte, Alexander & Kellogg 3601 (MO, NY); Chestnut & Drew s.n. (UC). Tulare Co.: Headquarters of General Grant National Park, Rose 48200 (WTU). Yosemite National Park: Abrams 4447 (NY); Glacier Point, Blake 10077 (GH); Lake Tenaya, Epling & Robison s.n. (WTU); Evans s.n. (UC); Little Yosemite, Hall & Babcock 3437 (UC); Little Yosemite, Smith s.n. (PH, UC); Camp Curry, Stone s.n. (PH); Yosemite Valley, Torrey s.n. (NY). County not indicated: Sierra National Forest, Abrams 4957 (GH); Grass Valley, Bigelow s.n. (GH); Mt. Diablo, Bioletti s.n. (UC); Gerpers, Bolander s.n.

(GH); Sequoia Mills, Brandegoo s.n. (UC); Lassen's Peak, Bruce s.n. (MO); Angel Island, Davy s.n. (UC); Shasta National Forest, Dayton 237 (GH); Lake Tahoe, Eastwood 463 (NY); Lassen Butte, Eastwood 1819 (MO); Napa River Basin, Jepson s.n. (UC); Kelsey s.n. (NY); Lassen's Peak, Jones s.n. (MO); Angel Island, Kellogg s.n. (UC); Berkeley, Olsen s.n. (PH); Castella, Piper 6383 (GH); Berkeley, Rodin 162 (UC).

5 *SENECIO INTEGRIMUS* Nuttall, Genera of North American Plants 2:165. 1818

Herbage arachnoid-villous with jointed, crisp hairs, occasionally tomentose, frequently becoming glabrate in age, or in one variety, early glabrate but usually at least slightly pubescent among the heads in the inflorescence and in the leaf axils; stems solitary, 20-70 cm. tall, rising from a cluster of fibrous roots; leaves thin or somewhat thickened, margins entire to variously and irregularly dentate, petiolate, but sometimes indistinctly so, ranging in shape from narrowly oblanceolate to nearly cordate, 6-25 cm. long and 1-6 cm. wide; upper caudine leaves strongly and progressively reduced upwards, becoming sessile; inflorescence of few to numerous heads, loose, open, or frequently congested;

involucral bracts 0.7-1.2 cm. long or occasionally as short as 0.5 cm., commonly about twenty-one but sometimes only thirteen present, variously shaped from subulate to lanceolate or even oblong, generally black tipped but frequently slightly so or not at all; rays present in all but var. *VASEYI*, yellow (yellowish-white or white in var. *OCHROLEUCUS*), 0.6-1.5 cm. long.

From central California north to British Columbia, and east to Minnesota, encompassing the ranges of the allied species. Moderately dry to moist areas in open forests and prairies from lower valleys to near timberline.

SENECIO INTEGERRIMUS is highly variable, adapting in its range to many ecological niches. The six varieties intergrade in areas of overlapping ranges.

In addition to the varieties recognized here, there may be another entity worthy of varietal distinction in west central Colorado and adjacent Utah. From this area at least some of the specimens referable to *SENECIO INTEGERRIMUS* have pubescent achenes. *SENECIO INTEGERRIMUS* and allies as defined in this study have glabrous achenes, while pubescent achenes are characteristic of *SENECIO SPHAEROCEPHALUS* Greene. More field work is necessary before the best disposition of the specimens with pubescent achenes can be determined.

5a. *SENECIO INTEGERRIMUS* var. *OCHROLEUCUS* (Gray)

Cronquist, Leaflets of Western Botany, 6:48 1950.

Senecio lugens var. ochroleucus Gray, Synoptical Flora 1 (2): 388. 1884.

Senecio cordatus Nuttall, Transactions of the American Philosophical Society II. 7:411 1841.

Senecio leibergii Greene, Leaflets of Botanical Observation & Criticism 1:221 (1906).

Senecio exaltatus ssp. ochraceus Piper, Contributions from the United States National Herbarium 11:600. 1906.

Senecio ochraceous Piper in Piper & Beattie, Flora of the Northwest Coast, 389. 1915.

Basal leaves most often with subcordate to deltoid or ovate blades, sometimes narrower, usually distinctly petiolate: ray flowers white or ochroleucous (cream colored), occasionally up to 1.5 or even 2.0 cm. long.

Northern California to British Columbia, east to Montana. Most frequently occupying rather moist habitats in forested areas, seldom, if ever, extending into the open valleys.

Some specimens from South Baldy, Pend Oreille County, Washington (St. John 8817) have yellow rays, but the label indicates that there are occasional

yellow-rayed individuals in white-rayed populations. The collector estimated the abundance of the yellow-rayed specimens to be about one in one hundred.

Specimens Seen:

Type: (not seen)

BRITISH COLUMBIA. Sproat, Macoun s.n. (GH); Chilliwach Valley, Spreadborough s.n. (WS).

CALIFORNIA. Siskiyou Co.: Humbug Mt., Butler 1263 (MO); Loy Lake, Butler 1526 (MO); Yreka, Greene s.n. (GH); Dry Lake Lookout, Ownbey & Ownbey 1756 (MO).

IDAHO. Bonner Co.: Priest River, Baker 8972 (ID, NY); Priest River, Christ 12991 (ID, NY); Priest River Experimental Forest, Daubenmire 44224 (WS); Priest River, Daubenmire 44266 (WS). Clearwater Co.: Greer, Christ 7450 (NY). Kootenai Co.: Spokane River, Christ 10916 (ID, NY); Fernan Lake, Christ & Christ 19189 (ID); Newport, Spiegelberg 500 (WS). Latah Co.: Moscow, Abrams 600 (UC). Lemhi Co.: Salmon, Payson 1859 (NY). Owyhee Co.: Riddle, Larrison & Jollie s.n. (ID). County not indicated: French Gulch, Christ 742 (ID, NY); between Priest River and Newport, Christ 1022 (NY); Emida, Christ 1514 (NY); Continental Mt., Christ 1670 (NY); Siwash Peak, Moore 429 (WS).

MONTANA. Beaverhead Co.: Wisdom, Berghuis 22 (WS).

Lake Co.: Macdonald Lake, Hitchcock 18236 (WS). Lewis and Clark Co.: South Gibson Lake, Hitchcock 18000 (NY).

Yellowstone Co.: Laurel, Wright & Wright s.n. (MONT).

County not indicated: near Missoula, Kirkwood s.n. (NY); MacDougal 507a (NY).

OREGON. Douglas Co.: Diamond Lake, Peck 19282 (MO).

Hood River Co.: Bald Butte, Armstrong 457 (NY); Hood River, Brandt s.n. (GH); Hood River, Henderson s.n. (MO, OSC), 383 (MO); Hood River, Thompson 795 (WTU); Hood River, Whited 1089 (WS). Jackson Co.: Abbott Butte, Thompson 13072 (MO). Josephine Co.: Grants Pass, Cusick 4611 (WS); Perham Creek, Detling 7273 (ORE). Lane Co.: Cottage Grove, Gilkey s.n. (OSC). Wallowa Co.: Enterprise, Baker 6041 (WTU). Wasco Co.: Siwash Flat, Gale 103 (MO); Point Lookout, Jones 4103 (MO, OSC, UC, WTU); Friend, Lawrence 310 (OSC). County not indicated: Crater Lake, Anderson & Simpson 134 (OSC); Mt. Ashland, Henderson s.n. (OSC, WS); Dalles, Luckley s.n. (GH); Mt. Grayback, Piper 6213.

WASHINGTON. Chelan Co.: White River Valley, St. John 4824 (WS); Leavenworth, Thompson 6499 (PH); Tumwater Mt., Thompson 10482 (NY, WTU); Stuart Ridge, Thompson 11729 (GH, PH). Columbia Co.: Indian Corral,

Darlington s.n. (WS). Ferry Co.: Kettle Falls, Rogers 423 (GH, MO, NY, UC, WS, WTU). Garfield Co.: Pomeroy, Meyer 304 (MO). Kittitas Co.: Wenatchee Mts., Cotton 1196 (GH, WS); Cle Elum, Hitchcock & Martin 4684 (NY, WS, WTU). Klickitat Co.: western part, Suksdorf 23 (GH, MO, NY, PH, UC, WS); High Prairie, Suksdorf s.n. (GH); Falcon Valley, Suksdorf 10022 (MO, NY, PH, UC, WS), 12864 (WS); Bingen, Suksdorf 12940 (WS); High Prairie, Suksdorf 1620 (WS). Okanogan Co.: T36N R29E, Otis 519 (WS); Sawtooth Ridge, St. John 3827 (WS). Pend Oreille Co.: Round Top Mt., St. John 6395 (UC, WS, WTU); South Baldy, St. John 8816 (GH, MO, NY, OSC, UC, WS, WTU), 8817 (WS, WTU), 8845 (GH, NY, UC, WS, WTU), 8846 (MO, UC, WS, WTU). Pierce Co.: Mt. Wow, Thompson 12592 (MO, WTY). Skamania Co.: Rands, Hitchcock & Marsh 3296 (UC, WS), Dog Creek, Suksdorf 10781 (WS); Pringle, Suksdorf 11698 (WS). Spokane Co.: Mt. Spokane, Clarke s.n. (WS); Spokane, Milburge s.n. (WTU); Eloika Lake, St. John 7046 (GH, MO, NY, UC, WS,); Mica Peak, Suksdorf 8828 (WS); Mt. Spokane, Thompson 9196 (NY). Whitman Co.: Wawawai, Meyer 106 (MO). Yakima Co.: Bernath 114F (WS); Signal Peak, Heidenreich 154 (WS); Boulder Cave, Knox s.n. (WS); Bald Mt., St. John 7787 (GH); Mt. Adams, Suksdorf 4141 (WS); Wodan Valley, Suksdorf 12942 (WS).

County not indicated: Goat Mts., Allen 230 (GH, MO, NY, UC, WS); Mt. Tacoma, Flett 2167 (WS); Mt. Hamilton, Gorman 4529 (WS); near Goldendale, Howell s.n. (NY, PH); Ellensburg, Piper s.n. (WS); High Prairie, Sprague s.n. (OSC); Brown's Mt., Stillinger 361 (UC); Bingen, Suksdorf 6575 (WS); Pend Oreille River, Lyall s.n. (GH).

5b. *SENECIO INTEGERRIMUS* var. *INTEGERRIMUS*

Pubescence deciduous and usually scanty by flowering time except for inconspicuous amounts among the heads in the inflorescence and the leaf axils; inflorescence with terminal head not distinctly foreshortened; involucral bracts narrowly subulate, minutely, if at all, black-tipped.

Characteristic of the Great Plains, ranging from Minnesota to the eastern base of the Rocky Mts. from Colorado to Canada.

Specimens Seen:

Type: (not seen)

ALBERTA. Craigmyle District, Brinkman 5396 (GH); Whisky Gap, Moss 1135 (GH).

ASSINIBOIA. Crane Lake, Macoun 5084 (GH).

COLORADO. Boulder Co.: Boulder, Tweedy 5772 (NY); Boulder Canyon, Wiegan & Wiegan 2615 (GH); Elbert Co.:

Elbert, Ownbey 1268 (GH, NY, WS). Jefferson Co.:
Wyman, Clokey 3072 (NY). Gilpen Co.: Eldora, Tweedy
5773 (NY). Larimer Co.: Beaver Creek, Gooodding 1439
(GH); Owl Camp, Osterhout 2390 (NY). Rocky Mountain
National Park: Churchill s.n. (GH). County not indicated:
Bear Creek Canyon, Clokey 3043 (NY); Boulder Canyon,
Coulter s.n. (NY); Soldier Canyon, Crandall 3100 (NY,
WS); Soldier Canyon, Crandall 3116 (NY); Henry 64 (PH);
Estes Park, Mall s.n. (GH); Palmer Lake, Nelson 10547
(GH); Leadville, Osterhout s.n. (PH); Veta Pass, Rydberg
& Vreeland 75529 (NY); headwaters of Sangre de Christo
Creek, Rydberg & Vreeland 5531 (NY); Callianm Saunders
s.n. (NY).

IOWA. Harrison Co.: Logan, Burgess s.n. (GH).
Palo Alto Co.: Lost Island Lake, Hayden 9791 (GH, NY, PH,
UC, WTU); Pammel 150 (GH, NY).

MANITOBA. Manitoba Lake, Macoun 21 (GH).

MINNESOTA. Meeker Co.: Litchfield, Frost s.n.
(NY). Otter Tail Co.: Perham, Chandonnet s.n. (GH).
County not indicated: Granit Falls, Moyer s.n. (GH);
Montevideo, Moyer 29-117-40 (NY, UC); Cannon Falls,
Sandberg s.n. (WTU); Cannon Falls, Scofield s.n. (GH).

MONTANA. Park Co.: Boulder River Canyon, Hitch-
cock 16362 (WTU). County not indicated: Westley, Larsen

11 (GH).

NEBRASKA. Cherry Co.: Valentine, Talstead s.n.
(GH). County not indicated: Whitney, Bates s.n. (GH);
Oconto, Bates s.n. (GH); Ainsworth, Bates 1331 (NY);
Callaway, Bates 2203 (GH); Pinca, Clements 2527 (NY);
Hay Springs, MacDougal 67 (NY); War Bonnet Canyon,
Williams 182 (GH).

NORTH DAKOTA. Benson Co.: Butte, Lunell s.n.
(NY); Leeds, Lunell s.n. (GH, NY, PH); Lake Ibsen,
Lunell s.n. (WTU). County not indicated: Grenora,
Larsen s.n. (GH).

SASKATCHEWAN. Palliser's Expedition, Bourgeau s.n.
(GH, NY).

SOUTH DAKOTA. Lawrence Co.: Deadwood, Palmer
37153 (GH). Walworth Co.: Moyer s.n. (NY). Washa-
baugh Co.: Turtle Creek, Oliver 2020 (WTU). County
not indicated: Northville, Brenkle 41-14 (GH, NY);
Medary, Carter s.n. (NY); Aberdeen, Griffiths s.n.
(GH); Cement Hills, Hapeman s.n. (NY); Brookings,
Lawrence s.n. (WS); Bald Hills, Murdock 4079 (GH, NY);
Hot Springs, Rydberg 825 (NY); Hermosa, Rydberg 826
(GH, NY); Brookings, Starring s.n. (MONT); Brookings,
Thornber s.n. (WS).

WYOMING. Albany Co.: Centennial Valley, Nelson

1305 (PH); Crow Creek, Nelson 8906 (PH); Rock River, Nelson 9326 (WTU); Centennial Valley, Reed & Reed 352 (WS); Sheep Mt., Reed & Reed 600 (WS); Centennial, Rollins 921 (NY, WS). Crook Co.: Hulett, Ownbey 615 (GH, WS). County not indicated: Pole Creek Hills, Nelson s.n. (GH); Laramie, Nelson 9563 (WTU); Arlington, Nelson 10144 (GH); Pole Creek, Nelson 1333 (UC, WS); Laramie, Wilcox s.n. (WTU).

5c. *SENECIO INTEGERRIMUS* var. *SCRIBNERI* (Rydb.) comb. nov.

Senecio scribneri Rydberg, Memoirs of the New York Botanical Garden. 1:441. 1900.

Distinctly pubescent: leaves narrow, 0.2-2.0 cm. wide and 8-10 cm. long: heads few, about six or occasionally more in number; involucral bracts 1.0-1.5 cm. long, rarely black-tipped; rays numerous, light yellow.

Apparently restricted to the plains of east-central Montana.

Extensive field work will be necessary to determine the best taxonomic position for the specimens referable to this entity.

Specimens Seen:

Type: MONTANA. near Livingston, Scribner 123b (GH)

MONTANA. Carbon Co.: Dry Creek Road, Cash s.n. (MONT); Red Lodge, Cash s.n. (MONT). Custer Co.: Miles City, Payne s.n. (MONT). Liberty Co.: Joplin, Anderson & Scharff s.n. (MONT). Musselshell Co.: Roundup, Wright & Wright s.n. (MONT); Melstone, Wright s.n. (MONT). Park Co.: Livingston, Wright 43 (MONT). Petroleum Co.: Winnett, Wright & Wright 71 (MONT). Rosebud Co.: east of Melstone, Wright s.n. (ID, MONT). County not indicated: Melville, Cotner s.n. (MONT); Livingston, Gay s.n. (MONT); Broadview, Scharff s.n. (MONT); Great Falls, Williams 427 (MONT); Nihill, Young s.n. (MONT).

5d SENECIO INTEGERRIMUS var. VASEYI (Greenman) Cronquist, University of Washington Publications in Biology 17 (5):293.

Senecio vaseyi Greenman Contributions from the United States National Herbarium 11:600. 1906.
Rays absent.

Central Washington in the Wenatchee Mt. area and adjacent Cascades, south as far as Klamath County, Oregon, and east into the Wallowa Mts. Apparently not abundant.

Specimens Seen:

Isotype: Washington. Vasey 558 (NY).

OREGON. Klamath Co.: Vidie Falls, Baker 7130 (NY).

Wallowa Co.: east of Imnaha, Baker 9078 (NY).

WASHINGTON. Chelan Co.: Chumstick Mt. Hitchcock 17278 (WS); Chumstick Mt. Thompson 8511 (NY). Douglas Co.: Moses Coulee, Daubenmire 5337 (WS). Kittitas Co.: Liberty, Hitchcock 3611 (UC, WS); Swauk River Valley, Sharples 271 (GH); Table Mt., Thompson 9800 (MO, NY, UC, WTU), 14872 (NY, UC, WS). Klickitat Co.: Cascades Mts., Henderson s.n. (WS). Okanogan Co.: Muckamuck Lookout, Thompson 6976 (WTU). Yakima Co.: Toppenish, Knox 7 (WS). County not indicated: Chiwaukum, Whited 2532 (WS).

5e. *SENECIO INTEGERRIMUS* var. MAJOR (Gray) Cronquist
ined.

Senecio eurycephalus var. major Gray, United States War Department, Pacific Railway Expedition 4:111. 1856.

Senecio mendocinensis Gray, Proceedings of the American Academy 7:362. 1868.

Senecio whippleanus Gray, Proceedings of the American Academy 19:54. 1884.

Senecio caulanthifolius Davy, Erythea 3:117. 1895.

Senecio sonnei Greene, Flora Franciscana 467. 1897.

Senecio majus Heller, Muhlenbergia 1:118. 1905.

Senecio mesadenia Greene, Leaflets of Botanical Observation & Criticism. 2:227. 1912.

Senecio fondinarum Greene, Leaflets of Botanical Observation & Criticism. 2:228. 1912.

Pubescent: leaves entire to variously dentate or lanciniate, but never deeply incised: heads frequently large; involucral bracts 1.0 - 1.2 cm. long, narrow, linear-subulate, or rarely broader, often with a dark, thickened, dorsal rib, and with sub-scarious margins, rarely black-tipped, and then only minutely so; rays distinctly yellow.

In the Sierra Nevada from Inyo County north to the Siskiyou region, and just barely extending across the state line into Oregon. Most abundant in open forested areas at middle and higher elevations.

Specimens Seen:

Isotype: CALIFORNIA. Murphys, Bigelow s.n. (NY)

CALIFORNIA. Alpine Co.: Cable's Lakes, Harrison 4178 (MO); Alpine Lake, Tracy 16652 (UC). Amador Co.: Armstrong's Station, Hansen 1149 (UC). Butte Co.: Jonesville, Copeland 498 (NY). Calaveras Co.: Calaveras Big Trees, Brandege s.n. (UC); Calaveras Big Trees, Greene s.n. (NY); Calaveras Big Trees, Herman s.n. (NY); Avery, Stanford 379 (OSC). El Dorado Co.: Upper Echo Lake, Beetle 4078 (NY); Kyburz, Robbins

1117 (UC); Camp Creek Ridge, Robbins 1728 (UC); Velma Lakes, Robbins 2051 (UC). Humboldt Co.: Nager, Blankinship s.n. (UC); Harris, Chandler 1086 (UC); Harris, Davy & Blasdale 5368 (UC); Trinity Summit, Davy & Blasdale 5846 (UC); Laribee Valley, Parks & Tracy 879 (UC); Eureka, Tracy & Babcock 3632 (UC); Buck Mts., Tracy 4160 (UC); Kneeland Prairie, Tracy 7480 (UC); Trinity River Valley, Tracy 8429 (GH, UC); McKay Camp, Tracy 9046 (UC); Corral Prairie, Tracy 10430 (UC); Grouse Mt., Tracy 12703 (UC); Trinity Summit, Tracy 14326 (UC).

Inyo Co.: Independence, Alexander & Kellogg 3236 (UC); Mosquito Flats, Halperin 586B (MO). Mendocino Co.: Noyo, Bolander 4734 (NY); Sherwood Valley, Davy & Blasdale 1052 (UC); State Survey 4734 (UC). Nevada Co.: Bierstadt Peak, Davy 3187 (UC); Donner Lake, Heller 6949 (GH, MO, PH, UC); Castle Peak, Heller 7068 (GH, MO, PH, WTU); Emigrant Gap, Heller 15175 (MO, UC, WTU); Bierstadt Peak, Sonne s.n. (UC); Mt. Stanford, Sonne s.n. (UC).

Placer Co.: Cisco, Hall 8729 (UC); Cisco, Heller 12691 (GH, MO, MONT, NY, PH, UC); Soda Springs, Jorgensen s.n. (WTU); Squaw Valley, Sonne s.n. (UC); Cisco, Walker 1303 (UC). Plumas Co.: Red Clover Valley, Heller & Kennedy 8742 (GH, MO, PH); Woodleaf, Rose s.n. (UC).

Sierra Co.: Loyalton, Babcock & Stebbins 1680 (UC).

Siskiyou Co.: Jackson Lake, Kellogg s.n. (UC); Loy Lake,

Butler 1526 (UC); Marble Mt., Chandler 1606 (MO, UC); northwest of Dry Lake Lookout, Ownbey & Ownbey 1756 (GH, WS). Trinity Co.: Miller Spring, Baker 11509 (UC); Mad River, Ferris & Lorraine 11683 (UC, WTU); Dorleska, Hall 8577 (UC); Hobo Gulch Public Camp, Munz 17856 (NY); South Fork Mt., Parks & Tracy 11597 (UC). Tuolumne Co.: Dardanelle, Alexander & Kellogg 3758 (GH, MO, UC); Hetch-Hetchy, Congdon s.n. (UC); Huckleberry Lake, Hoover 5581 (UC); Dodge Experimental Logging Area, Quick s.n. (UC); Cow Creek, Quick 1801 (MO); Toulumne Meadows, Rose 41348 (MO); Dog Lake Trail, Sharsmith 283 (UC); Strawberry Lake, Wiggins 6854 (GH, UC). County Not Indicated: General Grant National Forest, Brandegee s.n. (UC); Hupa Indian Reservation, Chandler 1274 (GH, MO, NY, UC); Anthony Peak, Eastwood & Howell 9847 (GH); Lake Tahoe, Fetters s.n. (UC); Lake Tahoe, Hall & Chandler 4606 (UC); Trinity Summit, Manning s.n. (UC); Coldstream, Sonne s.n. (UC); Pyramid Peak, Yates 3959 (OSC).

OREGON. Jackson Co.: near Ashland Peak, Whittaker 239 (WS). Klamath Co.: Pine Ridge, Rose 1695 (MO).

5f. SENEPIO INTEGERRIMUS var. EXALTATUS (Nuttall) Cronquist, Leaflets of Western Botany. 6:48. 1950. Senecio exaltatus Nuttall, Transactions of the American Philosophical Society. II. 7:410. 1841.

Senecio hookeri Torrey & Gray, Flora of North America. 2:438. 1843.

Senecio lugens var. exaltatus (Nuttall) D. C. Eaton, Botany of the King Expedition. 188. 1871.

Senecio lugens var. hookeri (Torrey & Gray) D. C. Eaton, Botany of the King Expedition. 188. 1871.

Senecio lugens var. foliosus Gray, Botany of California. 1:413. 1880.

Senecio columbianus Greene, Pittonia. 3:170. 1897.

Senecio condensatus Greene, Pittonia. 3:298. 1898.

Senecio arachnoideus Rydberg, Memoirs of the New York Botanical Garden. 1:442. 1900.

Senecio atriapiculatus Rydberg, Memoirs of the New York Botanical Garden. 1:442. 1900.

Senecio dispar A. Nelson, Bulletin of the Torrey Botanical Club. 27:272. 1900.

Senecio latus Rydberg, Memoirs of the New York Botanical Garden. 1:442. 1900.

Senecio perplexus var. dispar (A. Nelson) A. Nelson, New Manual of Botany of the Rocky Mts. 580. 1909.

(?) Senecio lugens var. parryi D. C. Eaton, Botany of the King Expedition. 5:188. 1841.

(?) Senecio flintii Rydberg, Bulletin of the Torrey Botanical Club. 23:167. 1906.

Pubescent with long, jointed hairs, seldom glabrate: stems solitary, most often robust: basal leaves generally oblanceolate to elliptic, rarely sub-cordate as in var. OCHROLEUCUS: inflorescence varying from densely congested to open and loose, terminal head usually on a shortened peduncle; involucral bracts greatly variable in shape, black-tipped, rays yellow.

From Fresno County, California, north through the Sierra Nevada and Cascade Mts. to British Columbia, and east to the eastern limits of the Rocky Mts. Present in almost every habitat from the lower foothills to high above the timberline, abundant and widespread.

SENECIO INTEGERRIMUS var. EXALTATUS is the most variable entity involved in this study. Through this variety are connected the other varieties of S. INTEGERRIMUS, and a specimen about which one is not certain may best be placed here rather than in the typical var. INTEGERRIMUS.

The outline and shape of the leaf margin is particularly variable, as is the shape of the involucral bracts. In the appendix are three plates illustrating the frequently encountered variations.

Specimens Seen:

Type: (Not Seen)

ALBERTA. West of Bertha Lake, Breitung 17494 (NY, UC); SW 27.32.16.W.4, Brinkman 4396 (OSC); headwaters of the Saskatchewan & Athabasca Rivers, Brown 1333 (GH); Banff, Hunnewell 6367 (GH); Banff, McCalla 2048 (NY).

BRITISH COLUMBIA. Vernon, Anderson 673 (WS); Lillooet, Anderson 752 (WS); Lillooet, Anderson & Anderson s.n. (WS); Sproat, Macoun s.n. (NY, WTU); Sophie Mt., Macoun 64995 (GH, NY); near International Boundary between Kettle and Columbia Rivers, Macoun 64996 & 64997 (GH); Mt. St. Thomas, Macoun 65000 (GH); near International Boundary between Kettle and Columbia Rivers, Macoun 65001 (GH, NY); Skagit Valley, Macoun 69363 (GH, NY); Whipsaw Creek, Macoun 69364 (GH); Skagit Valley, Macoun 69365 (GH); Sidley, Macoun 69366 (GH); Grizzly Peak, McCabe 2291 (UC); between Pinantan and Prichard, McCabe 2333 (UC); Anarchist Mt., McCabe 5948 (UC); north of Crowsnest Pass, McCabe 6466 & 6502 (UC); west of Needles, McCabe 6637 (UC); Prairie Hills, Shaw s.n. (NY); Prairie Hills, Shaw 422 (GH); Depot Creek, Spreadborough 76983 (NY); near Lake Boolahnie, Thompson & Thompson 124 (NY, UC, WTU); Bluster Mt., Thompson & Thompson 419.

CALIFORNIA. Alpine Co.: Twin Lakes, Hansen 417 (UC); Hope Valley, Miller 92 (UC); Carson Pass,

Yates 3867 (UC); west of Carson Pass, Yates 3959 (UC).

Butte Co.: Jonesville, Copeland 498 (ORE). Eldorado Co.: near Fallen Leaf Lake, Blake 10253 (GH). Fresno Co.: Pinto Creek, Frey s.n. (UC); Nellie Lake, Smiley 607 (GH). Inyo Co.: Big Pine Creek, Alexander & Kellogg 2576 (MO, UC); Flower Lake, Alexander & Kellogg 3236 (GH, WTU); Bishop Creek, Davidson 2596 & 2607 (UC); Mosquito Flat, Howell 22242 (UC). Modoc Co.: Eagleville, Alexander & Kellogg 4671 (UC); north end of Warner Mts., Alexander & Kellogg 4838 (UC); Benton Meadow, Alexander & Kellogg 5019 (UC); Dry Valley, Austin s.n. (UC); Davis Creek, Austin & Bruce 2368 (NY, UC); Lost Lake, Howell 12158 (MO); Mt. Bidwell, Manning 117 (UC); Lost Lake, Schreiber 1165 (UC). Mono Co.: Sonora Pass Road, Alexander & Kellogg 3774 (MO, UC); Masonic Mt., Alexander & Kellogg 3827 (UC); western side of Sweetwater Canyon, Alexander & Kellogg 3952 (MO, UC); Deep Creek, Alexander & Kellogg 3996 (NY), 4033 (GH, MO, NY, UC); Timberline Station, Clausen 1105 (UC); Sonora Pass, Eastwood & Howell 7542 (UC); Tamarack Mine, Jones 48-13 (WS); near Bridgeport, Munz 11808 (NY); Crooked Creek, Roos & Roos 5870 (NY); Lake Mary, Rose 42153 (GH, NY); east of Saddlebag Lake, Wolf 5364 (WS). Placer Co.: Truckee River, Davy 3249 (UC); Truckee, French 434 (OSC, UC); Yuba River near Chico, Heller 12691 (OSC);

Truckee, Miehener s.n. (UC); Washoe Mt., Sonne s.n. (UC).

Plumas Co.: Indian Valley, Ames s.n. (NY); Austin s.n. (WS); Red Clover Valley, Heller & Kennedy 8742 (NY, UC); west of Portola, Heller 16146 (MO, UC, WTU); north of Chilcoot, Munz 11841 (NY, RM); Sierraville, Sawyer 11 (OSC, UC). Shasta Co.: Lassen Volcanic National Park, Anderson s.n. (UC). Siskiyou Co.: Humbug Mt., Butler 1263 (UC); Butler 1345 (UC); Tracy, Chandler 1606 (GH); Castle Lake, Condit s.n. (UC); Yreka, Greene 782 (GH, MO, PH); Dry Lake Lookout, Ownbey & Ownbey 1756 (NY).

Tulare Co.: Five Lakes Basin, Ferris & Lorraine 10900 (WS); Olancha Mt., Hall & Babcock 5279 (UC); Beltnap Creek, Hall & Hall 8366 (UC). Tuolumne Co.: Eagle Meadow, Hoover 5504 (UC); Mt. Conness, Mason 11279 (UC); Mt. Dana, Sharsmith 2055 (NY, PH, UC, WS); Snow Peak, Sharsmith 3715 (WS); Emigrant Lake, Wiggins 10124 (WS, WTU). Yosemite National Park: Dark Hole, Evans s.n. (UC); Lake Tenya, Hall & Babcock 3530 (UC); Mt. Lyall, Hall & Babcock 3563 (UC); Sentinel Dome, Schreiber 1725 (UC).

County Not Indicated: Mt. Tallac, Abrams 4853 (NY); Lake Tahoe, Blasdale s.n. (UC); Soda Springs, Bolander 5079 (GH); Alta Meadows, Brandegee s.n. (UC); Jonesville, Brandegee s.n. (UC); Shasta Forest, Dayton s.n. (NY); Summit, Edward s.n. (NY); Alta Meadows, Grant 5322 (UC); Mt. Goddard, Hall & Chandler 681 (UC); Portola, Heller

16146 (NY); Lemmon 159 (NY); Yosemite Valley, McLean s.n. (UC); Sonora Pass, Middleton s.n. (NY); Lake Tahoe, Pendleton & Reed s.n. & 1046 (UC); Lake Tahoe, Setchell & Dobie s.n. (UC); Tuolumne Meadows, Smiley 754 (GH); Truckee, Sonne 81 (UC); Carson Pass, Yates 3867 (OSC); Willow Creek, Young s.n. (MONT).

COLORADO. Chaffee Co.: Grizzly Peak, Clokey 3442 (GH, NY, UC). Eagle Co.: Wolcott, Osterhout 2101 (NY). Elbert Co.: southwest of Elbert, Ownbey 1268 (RM). El Paso Co.: Manitou Springs, Ehlers 7555 (GH). Gilpin Co.: Tolland, Palmer 31383 (PH). Grand Co.: Rabbit Ears Pass, Pennell & Schaeffer 22421 (PH). Jefferson Co.: Wyman, Clokey 3072 (UC); Apex Canyon, Clokey 3073 (UC); Golden, Ehlers 7995 (GH). Lake Co.: Tennessee Pass, Osterhout 2189 (NY). Larimer Co.: Beaver Creek, Goodding 1439 (PH, NY, UC). Mesa Co.: Fruita Ranger Station, Pennell & Schaeffer 22984 (PH); Mesa, Rollins 2180 (GH). Mineral Co.: Goose Creek, Murdoch 4613 (UC). Moffat Co.: west of Youghall, Graham 9131 (UC); Douglas Mt. region, Porter 3890 (GH, WTU). Routt Co.: north of Steamboat Springs, Weber 6673 (WS). County Not Indicated: Cimarron, Baker 44 (GH, NY, UC, WS); Bob Creek, Baker 150 (GH, NY); Chicken Creek, Baker 666 (GH, NY); Los Pinos, Baker 709 (GH, NY); Crested Butte, Booth 49C31 (MONT); Sawatch

Range, Brandegee s.n. (GH); Elk Mts., Brandegee s.n. (UC); Mt. Harvard, Clements 4 (NY); Boulder Canyon, Coulter s.n. (PH); Sierra Madre, Coulter s.n. (PH); Taylor, Coulter s.n. (PH); Soldier Canyon, Crandall 3116 (WTU); Gail s.n. (ID); Golden City, Greene s.n. (GH); Estes Park, Hall s.n. (GH); Argentine Pass, Jones s.n. (NY); Estes Park, Johnston 755B (NY); South Park, Meehan s.n. (NY, PH); Palmer Lake, Nelson 10547 (UC); Tolland, Overholts s.n. (NY); Gray's Peak, Patterson & Beaty s.n. (NY, UC); near Empire, Patterson 199 (NY); Tabegauche Basin, Payson 470 (GH, MONT, WS); Lake City, Pease s.n. (NY); Sangre De Christo Creek, Rydberg & Vreeland 5524 (NY); Veta Mt., Rydberg & Vreeland 5525 (NY); Ojo, Rydberg & Vreeland 5528 & 5530 (NY); Veta Mt., Rydberg & Vreeland 5532 (NY); Robinson, Shear 3481 (NY); Gray's Peak, Smith s.n. (PH); divide between Arkansas and South Platte, Woodward s.n. (GH).

IDAHO. Ada Co.: Boise, Christ 3740 (NY). Adams Co.: Goose Lake, Baker 11696 (ID); New Meadows, Ward 7233 (ID, NY); Tamarack, Christ 9214 (NY); New Meadows, Meyer 1483 (WS). Bannock Co.: Swanlake, Christ & Ward 7178 (ID, NY); Fish Creek Pass, Christ 12346 (NY); City Creek near Pocatello, Cronquist 2287 (GH). Bear Lake Co.: Bloomington Canyon, Davis 998 (UC). Blaine Co.: Galena Summit, Baker 10718 (ID, NY); Ketchum, Christ & Christ 17636 (NY);

Ketchum, Cronquist 2437 (GH); north of Sun Valley, Hitchcock & Muhlick 8796 (MONT, NY, UC, WS, WTU); Norton Peak, Hitchcock & Muhlick 10693 (GH, MONT, NY, UC, WS, WTU); Corral, Macbride & Payson 2876 (GH, NY, UC); Smokey Mts., Macbride & Payson 3775 (GH, NY, UC).

Boise Co.: Idaho City, Aten s.n. (ID); Spring Valley, Boone 115 (ID); Spring Valley, Christ 6424 (NY); Clear Creek Divide, Christ 11263 (ID); Grandjean, Christ & Christ 16783 (NY); east of Lowman, Hitchcock & Muhlick 8602 (GH, NY, UC, WS, WTU); headwaters of S. Fork Payette River, Hitchcock & Muhlick 9345 (NY, UC, WS, WTU); Pilot Peak, Hitchcock & Muhlick 9912 (NY, UC, WS, WTU); Squaw Creek, Macbride 846 (GH, ID, MONT, NY, UC, WS). Bonner Co.: Daubenmire 43130 (WS); Looking Glass Ridge, Daubenmire s.n. (WS). Bonneville Co.:

Caribou Mt., Payson & Armstrong 3509 (GH, PH). Butte Co.: Bear Creek, Hitchcock & Muhlick 8819 (NY, UC, WS, WTU).

Camas Co.: Fairfield, Christ 2993 (NY). Canyon Co.: Caldwell, Taylor s.n. (ID). Cassia Co.: Mt. Harrison, Baker 9208 (ID, NY); Sublett Dam, Christ 12289 (NY); southwest of Oakley, Christ & Christ 19623 (ID).

Clark Co.: Christ 2766 (NY); Dubois, Young s.n. (ID).

Clearwater Co.: Orofino, Christ 7382 (NY); Orofino Grade, Christ 7523 (NY); Lolo Trail Road, Joslyn 940-942 (ID).

Custer Co.: Double Springs Summit, Christ 10459 (ID, NY);

northeast of Mackay, Christ & Christ 17857 (NY); Lolo Creek Forest Camp, Cronquist 2761 (GH); Railroad Ridge, Davis 638 (WS); between Dickey and Challis, Hitchcock & Muhlick 8909 (NY, WTU); Oyler Ranch, Hitchcock & Muhlick 9372 (GH, MONT, NY, RM, UC, WS, WTU); Stanley Lake, Hitchcock & Muhlick 9605 (WTU); Stanley Lake, Hitchcock & Muhlick 9639 (NY, UC, WS, WTU); Cape Horn, Hitchcock & Muhlick 9653 (NY, UC, WS, WTU); Ryan Peak, Hitchcock & Muhlick 10583 (NY, WS, WTU); head of Mahogany Creek, Hitchcock & Muhlick 11030 (NY, UC, WS, WTU); E. Fork Pahsimeroi River, Hitchcock & Muhlick 11065 (NY, UC, WS, WTU); head of W. Fork Pahsimeroi, Hitchcock & Muhlick 11173 (NY, UC, WS, WTU); Dickey, Hitchcock 15580 (NY, WS, WTU); Josephus Lakes, Macbride & Payson 3578 (GH). Elmore Co.: Atlanta, Christ 14389 (NY); Trinity Mt., Christ 14430 (NY); north of Fall Creek, Christ & Christ 20056 (ID); Pine, Hitchcock & Muhlick 8712 & 8737 (NY, WTU); Bald Mt., Hitchcock & Muhlick 10249 (NY, WS, WTU), 10279 (NY, UC, WS, WTU); Trinity Lakes, Hitchcock & Muhlick 10353 (NY, UC, WS, WTU). Fremont Co.: Sawtelle, Christ 5708 (NY); St. Anthony, Quayle 52 (NY). Gem Co.: Squaw Butte, Tucker 603 (NY). Idaho Co.: Christ 2986 (NY); east of Seven Devil's Camp, Christ 12517 (NY); Heaven's Gate, Christ 12567 (ID, NY); Hoodoo Lake, Christ 12802 (ID); Frenchman Butte,

Daubenmire 4536 (WS); Red River Ranger Station, Davis 3347 (WS); Powell Ranger Station, Davis 3637 (UC, WS); Pilot Rock, Elwood 28 (NY, UC, WS, WTU); Sesesh Peak, Henderson 3031 (WS), southeast of Elk City, Jones 43 (GH, NY, WS, WTU); Heaven's Gate, Jones 223 (GH, ID, WS, WTU); Squaw Creek Trail, Moore 76 (WS); Granite Creek, Packard 212 (WS); North Fork of Little Granite Creek, Packard 287 (WS). Kootenai Co.: Fernan Lake, Christ 22 (NY); Coeur d'Alene, Christ 1000 (NY); Christ 2987 (NY); Leiberg s.n. (ORE); Wiessner's Peak, Sandberg 609 (NY); Carlin Bay, St. John 4241 (WS). Latah Co.: Moscow, Abrams 600 (NY); Moscow Mt., Baker 5776 & 5826 (ID, NY, WTU); Kendrick, Baker 7422 (ID, WTU); Tomer's Butte, Baker 7431 (ID, WTU); Cedar Mt., Beattie 4305 (WS); Moscow Mt., Chichester 105 (ID); northeast of Moscow, Chichester 247 (ID); Potlatch, Christ 3932 (NY); Genesee, Daubenmire 37267 (WS); upper Crumarine Creek, Dillon 560 (WS); Moscow, Harris 207 (WS); Moscow, Henderson 2783 (GH); Mt. Tomer's School, Johnson 44 (ID), Moscow Mt., Jones 1953 (WTU); Moscow, Mohan 37 (ID); Tomer's Butte, Mohan 88 (ID). Lemhi Co.: Christ 6144 (NY); Big Hole Pass, Christ 12170 (NY); North Fork, Christ 12258 (NY); head of Eight Mile Creek, Hitchcock & Muhlick 9257 (GH, NY, UC, WS, WTU); Salmon, Payson & Payson 1808 (GH, NY, UC), 1859 (GH). Lewis Co.: Nez Perce,

Christ 7543 (NY); Nez Perce, Torrell 80 (ID).

Nez Perce Co.: Culdesac, Christ 4112 (NY); Lewiston, Heller & Heller 3100 (NY, UC); Lake Waha, Heller & Heller 3252 (NY, PH, UC, WTU); mouth of Big Potlatch River, Sandberg 109 (GH, NY). Owyhee Co.: Silver City Range, Florida Mt., Baker 7922 (ID, NY); Silver Creek, Baker 13102 (ID); Bruneau, Christ 4536 (NY); Mary's Creek, Larrison & Jollie s.n. (ID); White Rock Mts., Larrison 412 (ID); Silver City, Macbride 957 (GH, MONT, NY, UC); House Creek, Nelson & Macbride 1786 (GH, ID, NY, WTU). Power Co.: Bannock Peak, Bond & Rush 5 (NY).

Shoshone Co.: Skyline, Christ 4308 (NY); southeast of Pinehurst, Christ & Christ 19270 (ID); Coeur d'Alene National Forest, Sharsmith 3599 (GH, UC, WS); Little Baldy Lookout, Witt 1050 (NY, UC, WS, WTU). Valley Co.: south of Warm Lake, Baker 11816 (ID); McCall, Christ 6376 (NY); Stibnite, Christ & Ward 14615 (NY); Brundage Mt., Constance & Pennell 1963 (UC, WS, WTU); west of McCall, Hitchcock & Muhlick 8511 (UC, WS, WTU); Landmark, Hitchcock & Muhlick 14058 (NY, UC, WS, WTU); Gold Fork Lookout, Thompson 13746 (GH, NY, PH, UC); S. Fork of Blackmare Creek, Wick JW9 (NY). Washington Co.: east of Weiser, Baker 10081 (ID); Midvale, Christ 9343 (NY); Midvale, Christ & Christ 17265 (NY). County Not Indicated: Orymo, Albertson s.n. (ID); Collins,

Beattie 4155 (WS); Clear Creek, Bjorenson s.n. (ID); Harrison Flats, Christ 709 (ID, NY); Coeur d'Alene, Christ 1000 (ID); Newport-Priest River, Christ 1022 (ID); Harrison, Christ 1495 (ID); Genesse, Dunkle s.n. (ID); Hope, Dunkle 439 (ID); Salmon Forest, Elsvin 38 (OSC); Lemhi Forest, Johnson s.n. (ID); Coeur d'Alene Mts., Leiberg 1234 (GH, NY, UC); Oxford, Leonard 32 (GH, UC); near Moscow, Lewis s.n. (ID); Montpelier, Macbride 214 (GH); Snake Plains, Palmer 93 (GH); Lolo Trail, Piper 4015 & 4102 (WS); Beaver Canyon, Rydberg s.n. (NY); Clearwater, Shattuck & Fenn s.n. (ID); Beaver Canyon, Shear 3023 (NY).

MONTANA. Beaverhead Co.: Wisdom, Hitchcock & Muhlick 9191 (WTU); Oreamnos, Hitchcock & Muhlick 12756 (NY, PH, RM, WS, WTU); between Sheep and Black Lion Mts., Hitchcock & Muhlick 12955 (PH); Black Lion Mt., Hitchcock & Muhlick 12970 (NY, PH, RM, WS, WTU); Odell Lake, Hitchcock & Muhlick 14943 (NY, UC).
Broadwater Co.: between Townsend & White Sulphur Springs, Hitchcock & Muhlick 11853 (NY, WS, WTU); Townsend, Wright 5458 (MONT). Carbon Co.: Rock Creek, Pennell 23789 (PH). Cascade Co.: Fort Shaw, Metcalf s.n. (MONT).
Deerlodge Co.: Twin Lakes, Pennell 23696 (NY). Fergus Co.: south of Lewistown, Hitchcock 16036 (NY, WS, WTU).
Flathead Co.: Columbia Falls, Rogers & Rogers 962 (NY, WS).

Gallatin Co.: Bozeman, Blankinship s.n. (GH); Bozeman, Cotner s.n. (MONT); Bozeman, Jones s.n. (GH); Bozeman, Moore s.n. (UC); Spanish Basin 5254 (NY, WTU); Wallrock Basin, Suksdorf 345 (WS). Glacier National Park: Booth s.n. (MONT); Sperry Glacier, Christ 1320 (NY).

Jefferson Co.: Boulder, Booth 54276 (ID, MONT). Lake Co.: McDonald Lake, Hitchcock 18236 (UC, WTU); Polson, Wright s.n. (MONT). Lewis & Clark Co.: Gibson Lake, Hitchcock 18000 (ID, UC, WS, WTU). Madison Co.: Crockett Lake, Hitchcock & Muhlick 12505 (GH, NY, PH, WS, WTU); Black Butte, Hitchcock 16876 (WS, WTU).

Meagher Co.: west of Castle City, Hitchcock & Muhlick 12095 (GH, NY, PH, RM, UC, WS, WTU); Harley Park, Hitchcock & Muhlick 12309 (NY, WS, WTU); Baldy Mt., Hitchcock & Muhlick 12376 (NY, WTU). Missoula Co.: Spring Creek Trail, Hitchcock & Muhlick 14588 (NY, WS, WTU); Missoula, Rose 67 (WS). Park Co.: Silver Pass, Hitchcock 16363 (NY, UC, WS); Beartooth Lake, Hitchcock 16656 (NY, WTU); Livingston, Scharff s.n. (MONT).

Powder River Co.: northwest Broadas, Booth s.n. (MONT). Powell Co.: Helmville, Hitchcock & Muhlick 11731 (NY, WS, WTU); Shale Mt., Hitchcock 18580 (WS), 18583 (WTU); Gordon Mt., Hitchcock 18896 (UC, WS, WTU).

County Not Indicated: Belt Mts., Anderson s.n. (NY); Anderson 217 (UC); Monita, Blankinship s.n. (GH);

Bozeman, Blankinship 294 (PH, UC); Sour Dough, Bobart s.n. (MONT); Specimen Creek; F. B. C. s.n. (MONT); Clark's Fork River, Cotner s.n. (MONT); Bozeman, Gordon 116-Compositae, 90-Senecio (MONT); Absarokee, Hawkins s.n. & 37361 (MONT); Bozeman, Jones s.n. (MONT, UC); Helena, Kelsey s.n. (NY); Missoula, Kirkwood 1306 (ORE, UC), 2423 (GH, NY); Westby, Larsen 11 (PH); Old Sentinel Mt., MacDougal 160 (NY); Sin-yale-a-min Peak, MacDougal 339 (NY); MacDougal's Peak, MacDougal 608 (NY); Bozeman, Nutting 678 (MONT); Beaverhead Forest, Ramsey s.n. (ID); Bridger Mts., Rydberg & Bessey 5256 (GH, NY), 5258 (GH); Sunset, Scheuber s.n. (MONT); Livingston, Scheuber s.n. (NY, UC), 298 (NY); Lima, Shear 3432 (NY); Midvale, Umback 82 (NY); near Mt. Stuart, Whited 810 (ORE, OSC); Columbia Falls, Williams s.n. (GH, MONT, NY); Upper Grand Coulee, Williams 850 (MONT, NY); Columbia Falls, Williams 1065 (MONT); Beartooth Forest, Williamson s.n. (ID); Grapevine Mt., Wright & Anderson s.n. (MONT).

NEVADA. Elko Co.: near Deeth, Heller 9178 (MO, NY, PH), 9238 (GH, NY, PH); Furguson Springs, Holmgren & Lund 92 (RM); Railroad Canyon, Holmgren 800 (UC); Izzenhood Ranch, Hudspeth 13 (WS); southeast of Wells, Maguire s.n. (GH); Burnt Creek, Maguire 17003 (WTU); Cave Creek P. O., Mason 4754 (GH, UC); Boulder Creek, Train 3632 (WTU); Harrison Pass, Tucker 2402 (UC).

Esmeralda Co.: Chiatovich Creek, Duran 3063 (GH, NY, ORE, UC, WS, WTU); Shockley 453 (GH); Sugar Loaf Peak, Train 4013 (UC). Eureka Co.: Emmigrant Pass, Mason 4613a (GH, UC). Douglas Co.: Lake Tahoe, Archer 6181 (NY). Humboldt Co.: Martin Creek, Munz 16148 (WTU); Head of Big Creek, Taylor & Richardson 5 (UC); Toiyabe National Forest, Robertson 315 (NY); Hinkey Summit, Train 301 (UC). Nye Co.: Cherry Creek, Maguire & Holmgren 25431 (GH, NY, OSC, UC, WS, WTU); Mohawk Canyon, Maguire & Holmgren 25435 (GH, NY, UC); north of Toiyabe Dome, Maguire & Holmgren 25940 (GH, NY, UC); Indian Valley, Sevy 20 (NY). Ormsby Co.: King's Canyon, Baker 890 (NY); King's Canyon, Baker 922 (NY, UC, WS). Pershing Co.: Star Creek, Alexander & Kellogg 4609 (UC). Washoe Co.: east of Eagleville, Cal., Alexander & Kellogg 4653 (UC); south of Reno, Archer 5139 (UC); Mt. Rose, Archer 5993 (NY); southwest of Reno, Archer 6095 (UC, WTU), 6360 (WS, WTU); Tahoe Meadows, Archer 6434 (PH); Galena Creek, Heller s.n. (NY); Peavine Mt., Heller 9730 (GH, NY, PH); Hunter Creek Canyon, Heller 10468 (GH, MO, NY); Slide Mt., Heller 10963 (NY, PH); Tahoe Meadows, Henrichs 507 (NY, UC); Reno, Tillotson 60 (OSC, UC); Vya Spring, Train 2780 (NY, UC); Wimer Reservoir Canyon, Train 2916 (WTU). White Pine Co.: Ely, McKnight & McMillan 61 (NY); Success Summit,

Pennell & Schaeffer 23035 (PH); Becky Mt., Train 3878 (NY). County Not Indicated: Emmigrant Pass, Eastwood & Howell 216 (NY); Dinsmore Camp, Hunter Creek Canyon, Kennedy 1618 (UC); Palasade, Stokes s.n. (UC); Steamboat Creek, Stretch 60 (NY); East Humboldt Mt., Watson 622 (NY).

NEW MEXICO. Colfax Co.: Johnson Mesa, Ewan 13190 (RM).

OREGON. Baker Co.: Eagle Creek, Gustafson s.n. (OSC); Whitney, Peck 10357 (NY). Benton Co.: MacDonald Forest, Baker 3955 (OSC); Corvallis, Cooke 10752 (OSC); Forrest s.n. (OSC); Corvallis, Gilbert 364 (OSC); Mary's Peak, Gilbert 1211 (OSC); Mary's Peak, Jackson s.n. (OSC); Mary's Peak, Merkle 47-62, 47-98, 47-77, 47-156 (OSC); Corvallis, Nelson 3682 (PH). Crook Co.: Marks Creek, Farnham 44 (OSC); Ochoco National Forest, Kruckberg 2159 (ID, WS); Bear Buttes, Leiberg 333 (MO, NY, ORE); Whited 673 (GH). Curry Co.: Bear Camp Lookout, Leach 1585 (WTU); Marial, Nelson 1389 (MO); Snow Camp Mt., Thompson 12896 (MO, NY, PH, WS). Deschutes Co.: northwest of Sisters, Baker 4065 (OSC); Indian Ford, Detling 4770 (ORE); Hampton, Farnham 117 (OSC); Desert Prairie, Gilkey s.n. (OSC). Douglas Co.: Roseburg Quadr., Cusick 3908 (WTU); Cole's (?) Creek Canyon, Gorman 5683 (WS). Grant Co.: Fields Creek summit, Cronquist 7108 (GH, NY, WS, WTU); Dixie Mts.,

Henderson 4281 (GH); Bates, Henderson 5278 (GH, ORE).

Harney Co.: Poison Creek, Cronquist 7063 (NY, WS); Burns, Gilkey s.n. (OSC); Squaw Butte, Gilkey s.n. (GH, OSC); Silver Creek, Henderson s.n. (ORE); Sawtooth Creek, Henderson s.n. (ORE); Steins' Mt., Henderson 8592 (ORE); Fish Lake, Lawrence 4284, 4291 (OSC); Burns, Peck 19387 (UC); West Myrtle Creek, Thompson 12055 (MO). Jackson Co.: near Wimer, Hammond s.n. (MO), 232 (MO, NY, WTU); Brownsboro, Heckner s.n. (PH); Siskiyou Summit, Kildale 8353 (OSC); northeast of Butler Butte, Kruckberg 2011 (ID, NY, RM, UC, WS); Lincoln, Radcliffe s.n. (WS); Herschberger Mt., Sipe s.n. (OSC); Abbott Butte, Thompson 13072 (NY, WS, WTU); Lake-of-the-Woods, Thompson 13134 (WTU); Big Red Mt., Whittaker 307 (WS); Wimer Glades, Whittaker 365 (WS), 366 (ID).

Jefferson Co.: Camp Sherman, Baker 769 (SC). Josephine Co.: Grants Pass, Howell 1442 (MO); Bolan Lake, Kruckeberg 1942 (RM, UC, WS); Illinois Valley, Meola 42 (OSC); Mt. Elijah, Roest s.n. (OSC); Sexton Mt., Thompson 10207 (MO, NY, WTU); Grayback Area, Whittaker 95 (WS). Klamath Co.: Swan Lake Valley, Applegate 262 (GH); Klamath Falls, Applegate 3501 (UC); Vidae Falls, Baker 6120 (ID, WTU); Fort Klamath, Constance s.n. (UC); Bonaza, Peck 15179 (PH); Klamath Falls, Small 46 (ORE); Lake-of-the-Woods, Thompson 13134 (MO, NY). Lake Co.:

Abert Rim, Andrews 469 (ORE); Lakeview, Detling 4250 (UC, WTU); Bullard Canyon, Eggleston 6972 (NY); Hart Mt., Henderson 15750 (ORE), 15756 (OSC); Bull's Prairie, Loveless 135 (ORE, PH, UC); Hampton, Peck 18911 (MO); Warner Canyon, Reeder & Merkle 105 (OSC). Lane Co.: Fairview Mt., Baker 4129 (OSC); Fairview Lookout, Gilkey s.n. (OSC). Morrow Co.: Blue Mts., Cronquist 6616 (NY, WS, WTU). Umatilla Co.: Milton, Booth s.n. (WS); Bear Wallow Guard Station, Winn s.n. (OSC). Union Co.: Cusick 747 (PH); Kamela, Heller s.n. (UC); Summit Ranger Station, Reid & Penrose 436 (ORE). Wallowa Co.: north of Enterprise, Baker 6041 (ID, NY); Hideway Springs, Baker 9087 (ID); Eureka Creek, English & Hardin 939 (WS); mouth of Little Minam River, Hanna 1647 (WTU); Hat Point, Gilkey s.n. (OSC); Sacajawea Camp, Kruckberg 2469 (ID, NY, UC, WS). Wasco Co.: Meyer Park, Dana s.n. (OSC); The Dalles, Gorman 6084 (WTU); Mt. Hood National Forest, Jones 4103 (WTU); The Dalles, Peck 14594 (NY); The Dalles, Sheldon 9102 & 10103 (ORE); southeast of The Dalles, Thompson 4230 (WTU); between Mosier and The Dalles, Thompson 4339 (GH, PH); The Dalles, Thompson 10375 (MO, NY, WTU); Washington Co.: Forest Grove, Lloyd s.n. (NY, WTU); David's Hill, Thompson 760 (MO); Forest Grove, Thompson 4276 (MO, PH). Wheeler Co.: Mitchell, Cronquist 7294 (GH, UC, WS); Mitchell, Lawrence 3014 (OSC).

Yamhill Co.: McMinnville, Nelson 2220 (GH). County Not Indicated: Grants Pass, Canby 47 (OSC); Troy, Cantwell s.n. (WS); Cusick 1824 (MO, UC, WS), 3908 (WS); Steens Mts., Dahle & Powell 20 (OSC); Bridal Veil, Drake & Dickson s.n. (GH); Paisley, Elder 6 (OSC); Mosier, Gorman s.n. (WTU); Hall 306 (GH, MO, NY, PH); Crater Lake, Hawkins s.n. (MONT); Grants Pass, Henderson 550 (NY); Selma, Henderson 5707 (MO), Grants Pass, Howell s.n. (ORE), 1445 (UC); Blue Mts., Hug s.n. (OSC); Owyhee, Leiberg 2182 (NY, ORE, UC); Brown's Valley, Leiberg 4288 (ORE); Marial, Nelson 1389 (GH); Burns, Parsell & Powell 106 (OSC); between Ashland and Klamath Falls, Peck 9262 (GH); Dairy Creek, Peck 15464 (PH); Grants Pass, Prescott 5 (GH, WTU); Powder River Mts., Piper s.n. (WS); Squaw Butte, Robins s.n. (OSC); Fish Lake, Scullen s.n. (OSC); Irrigon 246 (OSC); junction of Cottonwood and Horse Creeks, Sheldon 8070 (NY); Devil's Peak Trail, Sipe s.n. (OSC); Spencer s.n. (OSC); Elgin, Sprague s.n. (OSC); north of Enterprise, Sprague s.n. (OSC); Ochoco National Forest, Warg & Warg 11 (OSC); headgate of Col. So. Tumalo ditch, Whited 617 (WS); Summer Creek, Williams s.n. (ID); Rowena, Wynd s.n. (OSC).

UTAH. Box Elder Co.: Cold Water Canyon, Williams 627 (GH, NY). Cache Co.: Pine Canyon, Maguire & Burke 3162 (UC); Logan Canyon, Maguire 3888 (GH, UC);

Spring Hollow, Maguire 13806 (GH); Logan Canyon, Muenscher & Maguire 2456 (UC); Smithfield Sugar Factory, Muenscher 2457 (GH, UC); Logan, Muenscher & Muenscher 15466 (WS); Wellsville, Smith 2212 (GH); Mendon, Smith 2136 (GH); Hyde Park, Smith 2358 (NY). Daggett Co.: Unitah Mts., Williams 562 (GH, MONT, NY, WTU). Davis Co.: Muelber Park, Garrett 8534 (UC). Duchesne Co.: Big Park, Graham 8012 (GH). Iron Co.: Orderville, Cottam 4261 (UC); between Cedar Breaks to Duck Creek, Munz 16946 (WS). Salt Lake Co.: Salt Lake City, Garrett s.n. (GH); Mt. Wolverine, Garrett F 738 (NY); Silver Lake, Rydberg & Carlton 6430 (WTU). San Juan Co.: Elk Ridge, Maguire & Redd s.n. (GH). Sanpete Co.: between Ephraim and Orangeville, Ripley & Barneby 9227 (NY). Summit Co.: La Motte Peak, Goodman 2013 (UC); upper Provo River, Harrison 11007 (UC); Tyal Lake, Maguire & Piranian 12554 (GH); Park City, Williams & Williams 2144 (WS). Washington Co.: Oak Groves Camp Grounds, Deming s.n. (GH). County Not Indicated: Wolf Creek, Adair s.n. (OSC); Red Butte, Clemens s.n. (PH); Cedar Breaks, Degener & Peiler 16426 & 16451 (NY); Salt Lake, Garrett s.n. (PH); Dyer Mine, Gooodding 1240 (UC); Fish Lakes, Gooodding 1398 (GH, NY, UC); near Cedar City, Goodman & Hitchcock 1617 (GH, NY); east of Cedar City, Graham 8690 (UC); head of Saline Canyon, Jones 3423 (NY, UC); American Fork Canyon,

Leonard, s.n. (GH, NY); Salt Lake City, Meehan s.n. (PH); Westville, Mulford s.n. (NY); Dixie Forest, Olsen s.n. (ID); Stillwater Canyon, Pammel & Blackwood 4290 (GH); Salt Lake, Porter s.n. (PH); Uinta Mts., Porter, s.n. (PH); Red Rock Canyon, Rydberg 6087 (NY); divide between Cottonwood Canyon and Heber Valley, Rydberg & Carlton s.n. (NY); Silver Lake, Rydberg & Carlton 6373, 6413, 6429, 6430, 6443, 6490 (NY); La Sal Mts., Rydberg & Garrett 8618 (NY); American Fork Canyon, Shoemaker s.n. (ID); Weber River, Capt. Stansbury's Exped. s.n. (NY), near Salt Lake City, Stokes s.n. (NY, UC); Glenwood, Ward s.n. (GH); Cove Mt., Ward 128 (PH); Cottonwood Canyon, Watson 671 (NY).

WASHINGTON. Asotin Co.: Anatone, Baker 6740 (ID, NY, WTU); west of Anatone, Gessell s.n. (WS); Asotin, Hitchcock & Samuel 2551 (MONT, OSC, WS); Anatone Butte, Jones 1920 (WS, WTU); Anatone, Jones 2853 (WTU); Blue Mts., Jones 2896 (WTU); Anatone, Onstot s.n. (WS); opposite Zindel, St. John & Brown 4152 (WS); Anaconda Creek, St. John 4409 (WS); Anatone, St. John & Palmer 9608 (WS); south of Asotin, Samuel 2551 (OSC, PH).

Chelan Co.: Mt. Ingalls, Eyerdam s.n. (MO, UC, WS); Blewett Pass, Hitchcock 17249 (WTU); north of Cashmere, Hitchcock 17278 (ID, NY, UC, WTU); Stuart Pass, Krukeberg 2655 (ID, NY, UC, WS); Snow Creek Glacier,

Long 39 (WS); Doctor Creek, Seely 68 (WTU); Wenatchee Mt., St. John & Thayer s.n. (WS); Chelan, St. John 9413 (WS); Chiwaukum, St. John 9442 (WS); near Berne, Thompson 6432 (GH, OSC, PH, WTU); near Leavenworth, Thompson 6446 (GH, PH, WTU); Tumwater Mt., Thompson 6499 (WTU); head of Beverly Creek, Thompson 6616 (PH, WTU); Leavenworth, Thompson 8267 (WTU); Chumstick Mt., Thompson 8511 (GH); Camas Land, Thompson 10792 (WTU); mouth of Colockum Creek, Ward 312 (WS); Tumwater Canyon, Ward 361 (NY, WS); Lake Creek (NY, WS); near Colockum Pass, Ward 406 (NY, WS).

Columbia Co.: East Oregon Butte, Darlington s.n. (WS); Tallen Flat, Darlington 244 (WS); Godman Springs, Hungate s.n. (WS); west fork of Tauchet River, St. John 7027 (WS); Wildcat Spring, St. John & Smith 8310 (OSC, WS); Stayawhile Spring, St. John & Smith 8367 (WS).

Douglas Co.: Badger Mt., Daubenmire 5250 (WS); Badger Mt., Hitchcock 17428 (UC, WS, WTU); Badger Mt., Thompson 14657 (WS, WTU). Garfield Co.: Stentz Spring, Constance & Clements 1724 (GH, WS, WTU); south of Pomeroy,

Courtney s.n. (WS); Pomeroy, Hitchcock & Muhlick 8250 (NY, UC, WS, WTU); Clear Fork Ranger Station, Hitchcock & Muhlick 8323 (GH, NY, RM, UC, WS, WTU); between Central Ferry & Dodge, Lang 365 (WS); Clearwater Ranger Station, Peters 365 (UC, WS).

Grant Co.: west of Coulee City, Gaines & Schaeffer 362 (GH, NY, UC, WS); near Alkali Lake,

Jones 1840 (WTU); Grand Coulee Dam, Rogers 376 (GH, MO, NY, UC, WTU); upper Grand Coulee, Schaeffer s.n. (WS); Coulee City, Thompson 6129 (GH, MO, OSC, PH, WTU).

Kittitas Co.: Cotton 1196 (WTU); Ellensburg, Eyerdam 1381 (MO, UC, WS); Liberty, Hitchcock 2611 & 3591 (WTU); west of Cle Elum, Hitchcock & Muhlick 4684 (UC), 8120 (NY, WS, WTU); Fish Lake, Hitchcock 7973 (UC, WS, WTU); Teanaway-Turnpike Basin Trail, Kruckeberg 2621 (WS); Scatter Creek, Kruckeberg 2938 (RM, UC, WS); Paddy-Go-Easy Trail, Kruckeberg 2986 (OSC, UC, WS); Swauk River, Sharples 271 (MO, NY); Colockum Pass, Smith 1207 (WTU); Ellensburg, Thompson 6212 (OSC, PH, WTU); Teanaway Valley, Thompson 6314 (GH, OSC, PH, WTU), 6349 (OSC, PH, WTU); Beverly Creek, Thompson 6609 (WTU); Mt. Stuart, Thompson 6636 (PH, WTU); Iron Mt., Thompson 6844 (PH, WTU); Salmon La Sac, Thompson 10475 (GH, MO, NY, WTU); Table Mt., Thompson 14872 (GH, PH, UC, WTU); Klickitat Co.: Columbia Highway, Eyerdam 1507 (UC); High Prairie, Suksdorf 1620 (MO, NY, UC); Falcon Valley, Suksdorf 12863 (WS). Lincoln Co.: mouth of Spokane River, Rogers 391 (GH, MO, NY, UC, WS, WTU). Mt. Rainier National Park: Chinook Pass, Eyerdam s.n. (WTU). Okanogan Co.: Pogue Flat, Fiker s.n. (WS); Omak, Fiker 61 (MO, WTU), 1000 (WTU); Tiffany Lake Pass, Fiker 2031 (WS); Sawtooth Ridge, St. John 3828 (WS); Valley of Myers Creek,

St. John 5206 (GH, MO, NY, WS, WTU); Burch Mt., Thompson 10830 (MO, NY, WTU). Pend Oreille Co.: Daubenmire 43133 (WS); Sprague 680 (WS); north of Newport, Spiegelberg 503 (WS); Kings Lake, Witham 319 (WS). Pierce Co.: Owyhigh, Piper 3260 (WS); Yakima Park, Thompson 7229 (PH, WTU); Mt. Wow, Thompson 12592 (NY, WTU); Mt. Rainier National Park, Warren & Diettert s.n. (WS, WTU); Sunrise Park, Warren 1466 (WS); Mt. Rainier, Warren 1611 & 1730 (WTU); Skamania Co.: near Rands, Hitchcock & Marsh 3296 (WTU). Spokane Co.: Liberty Lake, Bonser 2020 (WTU); Mt. Spokane, Clarke s.n. (MO); south of Spokane, Daubenmire 47200 (WS); north of Spokane, Kreager 55 (UC); Mt. Carleton, Kreager 242 (GH, NY, UC, WS, WTU); Spokane, Henderson s.n. (WTU); Moran Mt., Jones s.n. (WS); Mt. Spokane, Milburge 497 (WTU); Hangman Creek, Sandberg & Leiberg 66 (GH, NY, UC); Bonnie Lake, St. John s.n. (WS); near Spangle, Suksdorf 8735 & 12870 (WS); Mt. Spokane, Thompson 9196 (WTU). Stevens Co.: Springdale, Lackey s.n. (WS); Colville, Spiegelberg 501 (WS); Old Dominion Mine road, Spiegelberg 502 (WS); Colville, Sprague 586 (WS). Whatcom Co.: Deer Park, Muenscher 10057 (WTU). Whitman Co.: Riparia, Baker 6566 (ID, WTU); Rock Lake, Beattie & Lawrence 2343 (UC, WS); Pullman, Clemier s.n. (WS); Colfax, Daubenmire 37201 (WS); Pullman, Elmer 119 (NY), 1385 (MO); head of Hatwai Creek, English 993 (PH); Pullman, Hunt 35 (WS);

Pullman, Jones 1838 (WTU), 1839 (WS, WTU), 1847, 1849, 2058 (WTU); Pullman, Lingenfelter 344 (WS); west of Pullman, Meyer 154 (MO), 173 (GH, MO, WS); south of Pullman, Ownbey & Ownbey 2045 (GH, MO, NY, ORE, OSC, UC, WTU); west of Colfax, Parker 398 (WS); Pullman, Pickett 281 (WS); Pullman, Piper s.n. (NY, WTU), 1608 (GH, NY, WS, WTU); Wawawai, St. John 5921 (MO, NY, WS); Palouse Falls, St. John 6119 (WS). Walla Walla Co.: Hill s.n. (WS); Blue Mts., Piper 2434 (GH, WS). Yakima Co.: Boulder Cave, Booth s.n. (WS); Klickitat River, Flett 1098 (WTU); Wide Hollow Creek, Hoover 5752 (NY, UC); Bald Mt., St. John 7787 (WS); Chinook Pass, Thompson 9850 (MO, NY, WTU); Cleman Mt., Thompson (GH, MO, NY, PH, UC, WS, WTU). County Not Indicated: Goat Mts., Allen 230 (NY, WTU); Beattie, Kamiack Butte (WS); Husum, Beattie 3859 (WS); Yakima Region, Brandegee 85 (MO), 921 (GH); Clearwater Ranger Station, Constance & Clements 1724 (MO); Klickitat River, Flett s.n. (WS); Owyhigh, Flett 3260 (MO); Sprague, Henderson s.n. (WS); Upper Ashtanum River, Henderson 2311 (GH); Waitsburg, Horner R326 B 300 a (GH); Timberwolf Lookout, Javete s.n. (OSC); Yakima Park, Jones s.n. (GH); Spokane, Nelson & Nelson 625 (MO); Cheney, Schuerman s.n. (OSC); west of Anatone, Sprague s.n. (OSC); Colville, Sprague 578 (WS); Chesaw, St. John 5206 (UC); Grand Coulee, Stillinger 354 (UC); Falcon Valley, Suksdorf s.n. (NY); near Cascades, Vasey s.n.

(WS); Wenatchee, Whited 88 (WS); Cle Elum, Whited 622 (OSC).

WYOMING. Albany Co.: Pole Mt., Beetle 4728 (OSC, UC); Medicine Bow Mts., Cain 145 (NY); Centenial, Clark 190 (WTU); Medicine Bow Mts., Collins 970 (NY); Sand Creek, Nelson 6969 (GH, NY); Chug Creek, Nelson 7298 (GH); Laramie, Nelson 8835 (GH, NY); Crow Creek, Nelson 8906 (GH, NY, UC); Rock River, Nelson 9326 (GH); Pole Mt. region, Porter 3065 (NY, UC, WTU); west of Laramie, Porter 3538 (GH, RM, UC, WTU); Medicine Bow Mts., Rollins 970 (WS); Happy Jack Canyon, Williams 1760 (WS); Laramie, Williams 2184 (GH, WS). Big Horn Co.:

Medicine Mt., Williams & Williams 3248 (GH, NY, WS).

Carbon Co.: junction of Haggerty and Battle Creeks, Beetle 10325 (WS); Hanna, Payson & Payson 1682 (GH, NY); Seminoe Mts., Porter 4149 (GH, PH, WTU); Como Bluffs, Reed & Reed 393 (RM, WS); Fort Steele, Tweedy 4129 (NY); Encampment, Tweedy 4127 (NY). Crook Co.: Hulett, Ownbey 615 (NY). Fremont Co.: Two Ocean Mt., Reed & Reed 2948 (WS). Grand Teton National Park: Bradley Lake, Williams 767 (GH). Johnson Co.: Ten Sleep Creek, Williams 2341 (GH, WS). Lincoln Co.: headwaters of Hoback River, Williams 1248 (ID, OSC). Niobrara Co.: north of Lusk, Porter 3559 (GH, UC, WTU). Park Co.: Beartooth Butte, Williams & Williams 3654 (GH, NY). Sheridan Co.:

Big Horn Mts., Tweedy 2086 (NY). Sublette Co.: Newfark Lake area, Larsen 44 (RM). Surveyor Co.: Wyoming Forest, McKee s.n. (ID). Sweetwater Co.: Steamboat Mt., Nelson 7068 (NY). Teton Co.: Double Diamond Ranch 868 (GH, NY); Bryan Flats, Williams & Pierson 1086 (ID, OSC); mouth of Hoback River, Williams 2167 (GH, WS). Uinta Co.: Evanston, Nelson s.n. (GH); Kemmerer, Nelson 9008 (UC); Unita Mts., Rollins 2373 (GH). Washakie Co.: West Ten Sleep Creek, Ownbey 826 (WS). Yellowstone National Park: Lowe Geyser Basin, Blankinship s.n. (GH); Hall s.n. (NY); Hawkins 518 (MONT); Mammoth Hot Springs, Mearns 761 (NY); Glen Creek, Nelson & Nelson 4469 (GH); Yellowstone River, Nelson & Nelson 5754 (GH, NY); Mt. Washburn, Smith 23 (WS). County Not Indicated: Medicine Bow Mts., Barth 281x (MONT); Pole Mt., Beetle 4728 (PH); Lower Five Hole Basin, Coulter s.n. (PH); Laramie, Facinelli 284x (MONT); Reliance, Hanna 104 (PH); Centenial, Hobbs 56 (GH, PH); Bighorn Mts., Little Bald Mt., Jack s.n. (GH); Medicine Bow Range, Kemp s.n. (NY); Unita Mts., Leidy s.n. (NY); Leucite Hills, Merrill & Wilcox 702 (GH, NY); Pole Creek Hills, Nelson 128 (PH); Centennial Hills, Nelson 1246 (GH); Evanston, Nelson 2972 (MONT, UC); Allen Junction, Nelson 3139 (NY); Yellowstone River, Nelson 5754 (NY); Laramie Hills, Nelson 9563 (GH); Arlington, Nelson 10144 (NY, UC); Gillette, Rydberg & Bessey 5255

(MONT, NY); Bradley Lake, Williams 767 (NY); Continental Divide, Two-Gwo-Tee Pass, Williams 945 (MONT, NY); headwaters of Tongue River, Tweedy 9 (NY); Breccia Peak, Tweedy 593 (NY); northwestern part of state, Wehmeyer 5114a (NY).

STATE UNDETERMINED. Canada: Brown 1333 (PH); Macoun 65023 (CH, NY). Rocky Mts.: Geyer s.n. (NY); Hall & Harbour 316 (PH).

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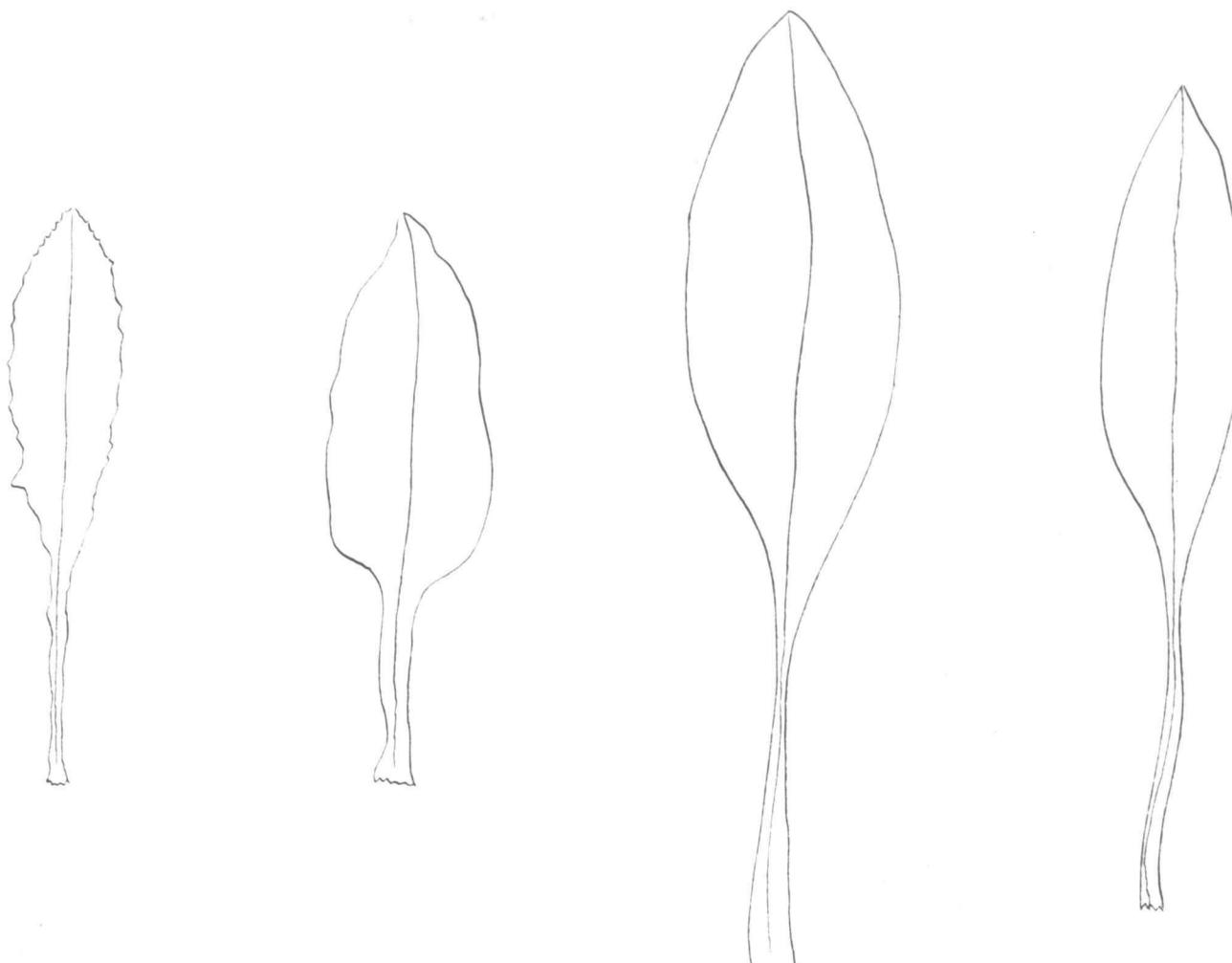
APPENDIX

Variations in the Involucral
Bracts of *SENECIO INTEGERRIMUS*
var. *EXALTATUS*



1 cm.

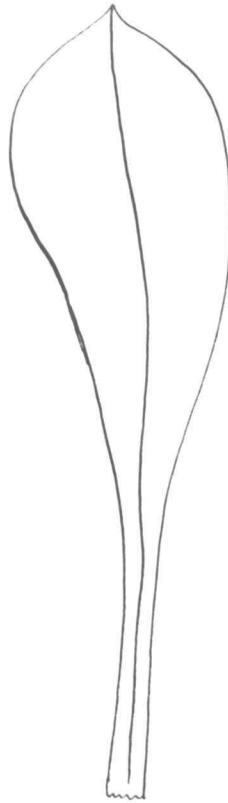
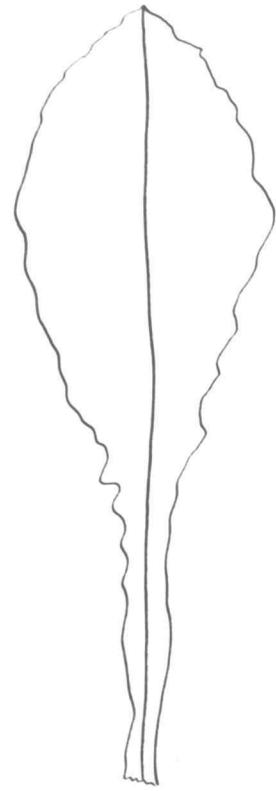
Variations in the Leaf Shape
of *SENECIO INTEGERRIMUS* var.
EXALTATUS I



— 5 cm —

84a

Variations in the Leaf Shape
of *SENECIO INTEGERRIMUS* var.
EXALTATUS II



— 5 cm —

85a



Type of *SENECIO CRASSULUS* Gray. Colorado, C.

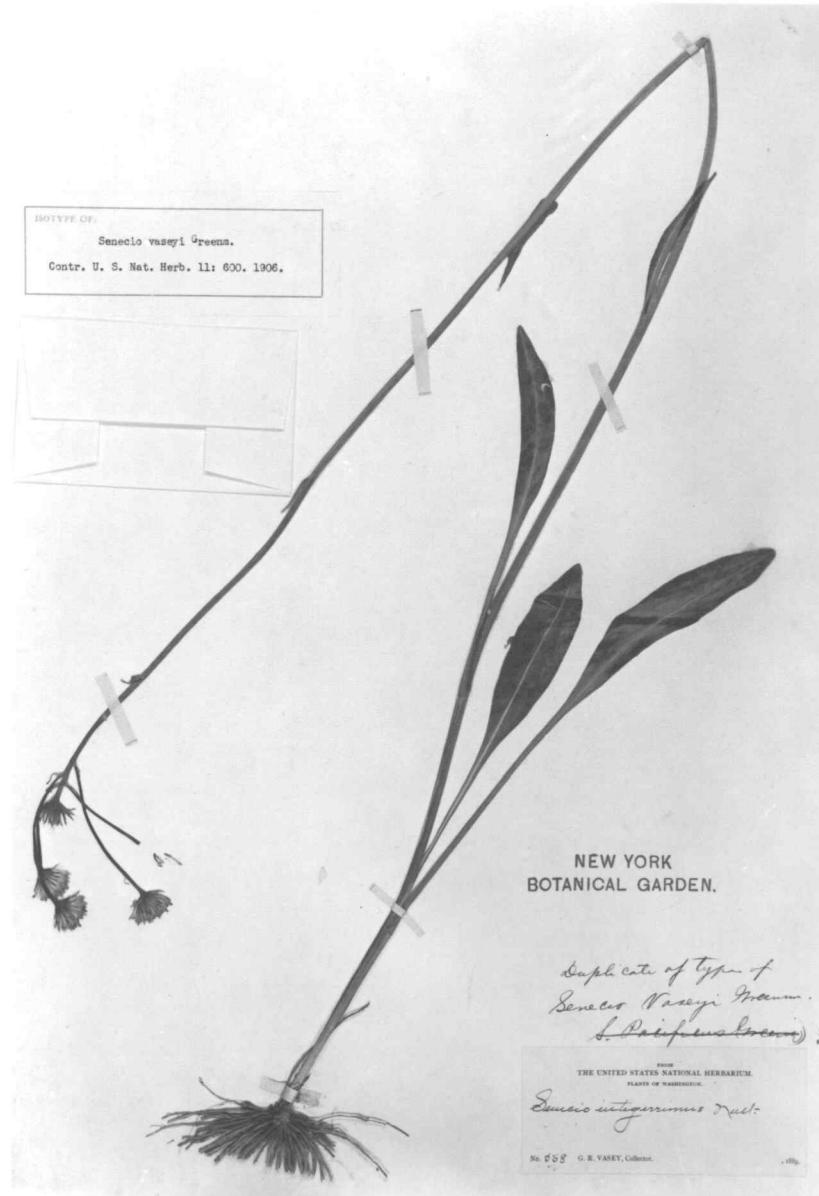
C. Parry 24 (GH)



Type of SENECIO FOETIDUS var. HYDROPHILOIDES
(Rydberg) comb. nov. Nez Perce County, Idaho, A.
A. & E. Gertrude Heller 3474 (NY)



Type of SENECIO INTEGERRIMUS var. SCRIBNERI
 (Rydberg) comb. nov. Near Livingston, Montana, F.
 S. Scribner 123b (GH)



Isotype of *SENECIO INTEGERRIMUS* var. *VASEYI*
 (Greenman) Cronquist. Washington, G. R. Vasey 558
 (NY)



Isotype of *SENECIO INTEGERRIMUS* var. *MAJOR* (Gray)
 Cronquist ined. Murphys (Calaveras Co.) California,
 J. M. Bigelow s.n. (NY)



SENECIO INTEGERRIMUS var. EXALTATUS (Nuttall)

Cronquist. Union County, Oregon, W. C. Cusick s.
n. (GH)