

TAXONOMIC INVESTIGATION OF THE GENUS DRABA (BRASSICACEAE)
IN THE WHITE CLOUD PEAKS AND BOULDER MOUNTAINS, IDAHO

by

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ABSTRACT

This study began as a field investigation of the distribution and abundance of Draba daviesiae (Davies whitlow-grass), a Forest Service Sensitive Species, in the White Cloud Peaks and Boulder Mountains of central Idaho. Our field study was confounded by (1) the recent revelation that specimens identified as Davies whitlow-grass from Idaho were incorrectly identified, and (2) the study area is relatively rich in drabas, and many are difficult to tell apart in the field. For these reasons we decided to undertake a review of the taxonomic status of drabas in the White Cloud Peaks and Boulder Mountains. This investigation was a Challenge Cost-share project between the Challis and Sawtooth National Forests and the Idaho Department of Fish and Game's Natural Heritage Program.

Fifty-two Draba specimens collected from high elevations in the White Clouds and Boulders were examined and identified at the University of Idaho Herbarium. These collections represented seven Draba taxa, however, no specimens of Davies whitlow-grass were identified from the study area. Two species with limited distribution in Idaho, however, were represented by specimens from the study area: Draba apiculata and D. incerta. Draba apiculata is here reported from Idaho for the first time, which represents about a 200 mile disjunction west from the main range of this heretofore Central Rocky Mountain endemic. Draba incerta is a species infrequently collected in Idaho, known from four widely spaced localities around the state.

Descriptions of the seven Draba species are provided, along with a key to aid in their identification. Recommendations are made to drop Davies whitlow-grass from the Region 4 Sensitive Species List, but add D. apiculata.

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INTRODUCTION

This study began as a field investigation of the distribution and abundance of *Draba daviesiae* (Davies whitlow-grass) in Idaho. Davies whitlow-grass is a U.S. Forest Service Region 4 Sensitive Species (USDA Forest Service 1988), where in Idaho it was thought to occur at only three localities on the Challis and Sawtooth National Forests.

Davies whitlow-grass was first described as a variety of *D. apiculata* (Hitchcock 1964), but was later elevated to specific rank (Rollins 1984). Hitchcock (1964) and Rollins (1984) both describe it as being restricted to Montana, while Hitchcock and Cronquist (1973) describe it from the Bitterroot Mountains of Idaho and Montana. Henderson (1981) evaluated Davies whitlow-grass (as *D. apiculata* var. *daviesiae*) as part of the Idaho rare plant project of the Idaho Natural Areas Council. He determined that there was no evidence that it occurred in Idaho, and rejected it from conservation consideration in the state. During floristic work in the White Clouds during July, 1980, Ron Taylor discovered what he considered Davies whitlow-grass from the Railroad Ridge area (Taylor n.d.). Later collections by Doug Henderson and Bob Moseley in 1984, from the Jerry Peak area, were also identified as Davies whitlow-grass. These collections formed the basis for its inclusion on the Region 4 Forest Service Sensitive Species List (USDA Forest Service 1988) and the Sensitive category of the Idaho Native Plant Society's state rare plant listing (Idaho Native Plant Society 1990; Moseley and Groves 1990).

Meanwhile, as part of ongoing taxonomic research on western North American drabas at the University of Idaho Herbarium, Lawton Fox questioned whether the above mentioned specimens of Davies whitlow-grass from Idaho were correctly identified. Largely because of these dubious identifications, we decided to undertake a review of the taxonomic status of drabas in the White Cloud Peaks and Boulder Mountains. Another confounding factor in our field investigation was that this region is relatively rich in drabas, and that many are difficult to tell apart in the field. This investigation was a Challenge Cost-share project between the Challis and Sawtooth National Forests and the Idaho Department of Fish and Game's Natural Heritage Program.

STUDY AREA

Our study area includes the Boulder Mountains and White Cloud Peaks, as defined by Lopez (1990), in Custer and Blaine Counties, Idaho (Figure 1). We focused on the high elevations of this area, above about 8,000 feet, because all Idaho specimens previously identified as Davies whitlow-grass were from these two

Figure 1. White Cloud Peaks and Boulder Mountains study area.

ranges and because of the relatively high diversity of Draba species. The higher elevations of the two ranges are administered largely by the Sawtooth (as the Sawtooth National Recreation Area) and Challis NFs. In addition, a portion of the northern Boulder Mountains, from Jerry Peak north, is administered by the Salmon District, Bureau of Land Management.

METHODS

On August 13 - 17, 1990, Michael Mancuso and Bob Moseley, botanists with the Idaho Natural Heritage Program, made extensive collections of drabas in the White Clouds and Boulders. We also borrowed several Draba specimens from the Sawtooth National Recreation Area herbarium in Stanley. All these specimens were given or loaned to the University of Idaho Herbarium, where many more Draba collections from the study area are also located.

Fifty-two Draba specimens collected from high elevations in the White Cloud and Boulder Mountains were examined and identified by Lawton Fox, Research Associate at the University of Idaho Herbarium. Mr. Fox has extensive knowledge of the genus, both in the field and in the herbarium, as part of his ongoing Ph.D. research.

RESULTS

Summary

The 52 Draba specimens from high elevations of the White Clouds and Boulders represented seven taxa. No specimens of Davies whitlow-grass were identified from the study area. The purported Davies whitlow-grass specimens mentioned in the Introduction were determined to be either one of two species: Draba densifolia or D. apiculata. Two species with limited distribution in Idaho, however, were represented by specimens from the study area: Draba apiculata and D. incerta.

The specimens identified as Draba apiculata in this study are the first reported for the species from Idaho. It was found at two sites, both in an alpine fellfield habitat along the crest of the White Cloud Peaks; one on the divide between Big Boulder Creek and Warm Springs Creek south of Snow Lake, the other on Peak 10,815 southwest of Railroad Ridge. See Appendix 1 for location and habitat data for D. apiculata in Idaho, Appendix 2 for mapped locations in the White Clouds, and Appendix 3 for slides of its habit and habitat in the White Clouds.

These Idaho locations of Draba apiculata represent about a 200 mile disjunction west from the main range of this heretofore Central Rocky Mountain endemic. It was previously known only from

the Uinta Mountains of northwestern Utah, western and southcentral Wyoming, and the Beartooth Plateau of southwestern Montana (Welsh *et al.* 1987). *Draba apiculata* is considered to be of conservation concern in both Montana (Lesica *et al.* 1984; Shelly 1989) and Wyoming (Wyoming Natural Diversity Data Base 1990).

Draba incerta is a species infrequently collected in Idaho. Five widely spaced collections are known from Idaho, including Boundary County in the extreme northern part of the state, the Beaverhead Range and Henrys Lake Mountains in eastern Idaho, and the Jerry Peak area of the Boulder Mountains. In addition, Hitchcock (1941) reports a rather vague location north of Dickey, which may be in the Lost River Range, although Brunsfeld (1983) did not report this species in his treatment of the alpine flora of that range. See Appendix 1 for location and habitat data for *D. incerta* populations in Idaho, and Appendix 2 for the mapped location of the Jerry Peak population. *Draba incerta* ranges from Alaska and the Yukon, south to Washington, Idaho, and Utah (Welsh *et al.* 1987). There has been a question as to whether this species is disjunct in Idaho, but considering that the collection locations all fall within the range of the species circumscribed by Welsh *et al.* (1987), it should not be so considered. *Draba incerta* is considered rare in Utah (Utah Natural Heritage Program 1990).

The ranges of three central Idaho endemic drabas, *Draba trichocarpa*, *D. argyraea*, and *D. sphaerocarpa*, lie just to the west of our study area. Populations of these taxa are known from the Stanley Basin and Sawtooth Range, but none were found in the White Clouds and Boulders. In addition, the only known Idaho population of *Draba fladnizensis* occurs in upper Kane Creek, just south of the study area in the Pioneer Mountains. This species was not observed in the White Clouds and Boulders, even though suitable habitat was present, especially in the White Clouds.

Following are descriptions of the seven drabas from the study area, along with distribution, habitat, and taxonomic notes, specimens examined, and herbaria where the specimens are deposited (ID = University of Idaho Herbarium; Sawtooth NRA = Sawtooth National Recreation Area Herbarium at Stanley). A key to the seven taxa is provided at the end of this section.

Drabas of the White Cloud Peaks and Boulder Mountains

Draba apiculata Hitchc.

Plants perennial and caespitose, sometimes mat-forming. Scapes leafless and glabrous. Corolla yellow, petals ca. 4 mm long. Leaves thick, ciliate with short stiff hairs and often apiculate with a short stiff hair, otherwise glabrous; silicles lanceolate to obovate, 3-6 x 2-3.5 mm, glabrous, styles 0.2-0.5 mm.

Draba apiculata is thought to be closely related to *D. daviesiae*,

which is sometimes considered a variety of *D. apiculata*. The collections from the study area that had previously been identified as *D. daviesiae*, were found to be members of other taxa, most often *D. apiculata*. One collection placed in *D. apiculata* appears to be intermediate between *D. apiculata* and *D. densifolia* (Taylor 7042).

D. apiculata specimens from the study area were found between 10,200 and 10,825 feet, mostly in alpine fellfield habitats (Appendix 1 and 2).

Specimens examined: Moseley 950, 2127, 2136 (ID); Mancuso 482 (ID); Taylor 7042 (Sawtooth NRA).

Draba crassifolia R. Grah.

Biennial or perennial with simple or branched crowns and leaves that are mostly basal. Scapes are leafless or with 1-2 leaves near the base and pubescent with simple to stellate trichomes or glabrous. Corollas yellow fading to white, petals 2-3 mm long. Leaves linear-spatulate to oblanceolate, 10-25 x 2-4 mm, ciliate, surface pubescence of simple, forked, or stellate trichomes. Siliques elliptic, 5-12 x 2-3 mm, glabrous, style lacking.

Within the study area *Draba crassifolia* has been collected in both the White Clouds and Boulders from gravelly, volcanic and granite substrates, in meadows, and in exposed habitats. Collection elevations range from 9,200 to 10,200 feet. The size of individual plants varies greatly in the study area.

Specimens examined: Henderson and Cholewa 6632 (ID); Moseley 2137, 2186 (ID).

Draba densifolia Nutt.

Plants ranging from compact cushion habit to looser mat-forming habit. Scapes glabrous or with simple, forked, stellate, or multibranching trichomes. Flowers yellow, petals 2-6 mm. Leaves not fleshy, linear to oblanceolate with prominent midrib especially on dry, marcescent specimens; 0.5-3 mm wide, 2-9 mm long; glabrous or with a few simple, forked or stellate trichomes; prominent, straight, simple cilia along margins. Silicles glabrous or with simple, forked, stellate, or multibranching trichomes; 2-7 x 2-3.5 mm, style 0.5-1 mm.

Draba densifolia was the most frequently collected *Draba* in the study area. There are two forms of *D. densifolia* among the specimens examined in this study. One group of plants has a rather compact habit with relatively small, tightly imbricate leaf rosettes. The other group presents a more open habit with longer,

less tightly imbricate leaves. No other consistent morphological or distributional differences between these groups were noted.

This species is found throughout the White Cloud Peaks and Boulder Mountains on alpine ridges at elevations ranging from 9,200 to 11,500 ft.

Specimens examined: Atwood and Moseley 11447, Atwood et al. 12994 (Sawtooth NRA); Brown CGB 73-363 (ID); Henderson and Cholewa 6625, 6631 (ID); Mancuso 227, 232, 473, 481; Moseley 321, 323, 663, 911, 1072, 1073, 2145, 2149 (ID); Phillips s.n. (Sawtooth NRA); RJT 7114, 7153 (Sawtooth NRA); Taylor 7236, 7039 (Sawtooth NRA); Wellner 1542 (ID).

Draba incerta Pays.

Plants form loose cushions. Scapes 1-20 cm, pubescent with stellate or multibranching trichomes. Flowers yellow, petals 4-5 mm long. Leaves linear to lanceolate, 3-15 x 0.75-3 mm, pubescent with a mixture of stalked doubly pectinate and multibranching trichomes. Silicles ovate, ovate-lanceolate, or elliptic, 4-12 x 1.5-3 mm, pubescent with simple or forked trichomes, style 0.4-1 mm.

Draba incerta is represented in the study area by a single collection from volcanic substrates in the Jerry Peak area of the Boulder Mountains.

Specimen examined: Moseley 325 (ID).

Draba lonchocarpa Rydb.

Plants perennial and caespitose. Stems (scapes) naked or with 1-2 reduced, sometimes denticulate leaves, glabrous to finely pubescent with mostly stellate trichomes. Corolla white, petals 2.5-5 mm. Leaves linear to oblanceolate, 5-15 x 1-5 mm, densely pubescent with tiny stellate trichomes. Fruits linear to elliptic, plain or twisted, 7-12 x 1-2 mm, glabrous to stellate pubescence, style 0.2-0.5 mm.

Draba lonchocarpa is the only white-flowered species in the study area. It is found in relatively sheltered, sites that are moist and cool such as northern exposures on slopes, in shaded crevasses of rock walls, in cracks among rocks, and at cliff bases. Within the study area, specimens were collected from both the White Cloud Peaks and Boulder Mountains at elevations from 10,600 to 11,400 ft.

Specimens examined: Mancuso 224 (ID); Moseley 879, Moseley et al. 946 (ID); Taylor 7220 (Sawtooth NRA).

Draba oligosperma Hook.

Plant of varied habit ranging from tight cushion forms to loose mat-forming representatives. Scapes 1-10 cm, sometimes pubescent with doubly pectinate trichomes. Flowers yellow, sometimes drying to cream or white, petals 3-5 mm. Leaves linear to slightly spatulate, 3-15 x 0.75-3.5 mm, pubescent with sessile trichomes, predominantly two-rayed doubly pectinate in form and often oriented parallel to the midrib of the leaf, mixtures of multibranching trichomes also seen; silicles ovate, elliptic, or oblong-ovate in shape, 2.5-8 x 2-4 mm, pubescent with simple, retrorsely appressed trichomes or mixture of simple and forked trichomes; style 0.1-1.0 mm.

Draba oligosperma can be quite varied in habit and elevation, but the presence of doubly pectinate trichomes on the leaves is a reliable diagnostic feature of this taxon in the study area. It is found throughout the White Clouds and Boulders on granitic and volcanic substrates at elevations ranging from 6,800 to 11,500 ft.

Specimens examined: Atwood and Moseley 11448 (Sawtooth NRA); Henderson and Cholewa 6630 (ID); Mancuso 227, 481; Moseley 298, 322, 664, 893, 932 (ID); B.J. Olson 335 (ID); Phillips s.n. (Sawtooth NRA); Taylor 7127 (Sawtooth NRA).

Draba paysonii Macbride var. treleasii (Schulz) Hitchc.

A caespitose matted perennial. Scapes leafless and pubescent with multibranching trichomes. Corolla yellow, petals 2-4.5 mm long. Leaves imbricate, linear to oblanceolate or spatulate, 4-14 x 0.75-1.25 mm, ciliate with long simple and multibranching trichomes, leaf surface pubescent with a tangled mixture of multibranching, forked, and simple hairs. Silicles ovate, 3-8 x 2.5-4.5 mm, pubescent with simple and branched trichomes, styles 0.5-1 mm.

Draba paysonii var. treleasii was found in alpine habitats in both the White Clouds and Boulders at elevations between 10,200' and 11,600'. Pubescence in this taxon is somewhat variable and there are specimens with pectinate leaf trichomes and fruit pubescence suggestive of D. oligosperma (Mancuso 472). In addition, one specimen (Ertter 2518) has rather spatulate leaves with round apices similar to those of D. daviesiae (Hitchc.) Rollins.

Specimens examined: Ertter 2518 (ID); Mancuso 472 (ID); Moseley 2123, 2136, 2139, 2160 (ID); RJT 7161 (Sawtooth NRA).

Key to the drabas of the White Cloud Peaks and Boulder Mountains

1A. Flowers white D. lonchocarpa

1B. Flowers yellow.

2A. Style lacking or less than 0.1 mm D. crassifolia

2B. Style 0.1 mm or longer

3A. Leaf surfaces pubescent with trichomes which include doubly pectinate types.

4A. Leaf surfaces pubescent with sessile, doubly pectinate trichomes often parallel to the leaf midvein D. oligosperma

4B. Leaf surfaces pubescent with a mixture of stalked doubly pectinate and multibranched trichomes D. incerta

3B. Leaf surfaces glabrous or lacking doubly pectinate trichomes.

5A. Leaf surfaces glabrous, margins ciliate with short, stiff trichomes D. apiculata

5B. Leaf margins ciliate with relatively long, flexible simple or branched trichomes.

6A. Leaves ciliate with simple, forked, or multibranched trichomes, leaf surfaces pubescent with tangled mixture of multibranched, forked and simple trichomes D. paysonii var. treleasii

6B. Leaves ciliate with flexible, simple trichomes, leaf surfaces glabrous or pubescent with a few simple, forked or stellate trichomes; midribs of leaves prominent D. densifolia

RECOMMENDATIONS

1. Because Draba daviesiae is no longer considered to occur in Idaho, it should be removed from the Region 4 Sensitive Species List.

2. The three populations of Draba apiculata reported here, represent a significant disjunction for this heretofore Central Rocky Mountain endemic. Also, it is considered to be of conservation concern in two of the three other states from which it is known. In light of these data, we recommend that it be added to the Region 4 Sensitive Species List for the Sawtooth NF. It was added to the Idaho Native Plant Society's Sensitive list at the Idaho Rare Plant Conference, February, 1991.

3. The one population of Draba incerta from the study area, occurring on Salmon BLM lands, is one of five reported from Idaho. The reported locations are widely spaced in Idaho, and the possibility exists that more will be found in intervening areas. It was added to the Idaho Native Plant Society's Sensitive list at the Idaho Rare Plant Conference, February, 1991.

4. This investigation clarifies the taxonomy and identification of drabas from the White Cloud Peaks and Boulder Mountains. It should be used to facilitate further inventories of the White Clouds and Boulders for Draba apiculata and D. incerta. Draba apiculata should be searched for along the west slope and at the northern end of the White Clouds on the Sawtooth NF, while the Jerry Peak area of the Challis NF and Salmon BLM may prove fruitful for additional D. incerta populations.

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Appendix 1.

Location and habitat data for Draba apiculata and
D. incerta in Idaho.

DRABA APICULATA

Heritage Program Data Base Occurrence Number: 001

Location: Custer County, White Cloud Peaks, Sawtooth National Recreation Area, ca. 17 miles ESE of Stanley, unsurveyed.

Habitat: Alpine fellfield; nearly level or slight slope to E; gravelly soil derived from granite substrate. Associated with Draba densifolia, Oxytropis viscida, Phlox pulvinata, Carex elynoides, Astragalus kentrophyta, and Smelowskia calycina. Elevation 10,815 feet.

Population data: Common but local.

Collections: Moseley 2127, 2136 (ID); Mancuso 482 (ID); Taylor 7042 (Sawtooth NRA).

Last Observed: 1990

Heritage Program Data Base Occurrence Number: 002

Location: Custer County, crest of White Cloud Peaks, Sawtooth National Recreation Area, ca. 18 miles SE of Stanley, unsurveyed.

Habitat: Dry ledges; northeast-facing. Associated with Silene acaulis and Eriogonum ovalifolium. Elevation ca. 10,200 feet; granite substrate.

Population data: Common but local.

Collection: Moseley 950 (ID).

Last Observed: 1986

DRABA INCERTA

Heritage Program Data Base Occurrence Number: 001

Location: Custer County, Boulder Mountains, Salmon District BLM land, ca. 12 miles west of Chilly,

Habitat: Artemisia tridentata ssp. vaseyana/Festuca idahoensis habitat type, 50% northwest-facing slope, moderately deep, gravelly, moist soil. Associated with Phlox pulvinata, Cymopterus bipinnatus, Sedum lanceolatum, Delphinium glaucescens, and Potentilla diversifolia. Elevation 9,600 feet; substrate Challis volcanics.

Population data: Common but local.

Collection: Moseley 325 (ID)

Last Observed: 1984

Heritage Program Data Base Occurrence Number: 002

Location: Lemhi County, Beaverhead Mountains, Salmon National Forest, ca. 13 miles ENE of Leadore,

Habitat: Alpine fellfield community with shallow, rocky soil. Associated with Geum rossii, Arabis lemmonii, Phlox pulvinata, Eritrichium nanum, Draba oligosperma, Synthyris pinnatifida, Potentilla ovina, Draba densifolia, Douglasia montana, Lomatium cous, Smelowskia calycina, Townsendia condensata, and Potentilla diversifolia. Elevation 10,100 feet; quartzite substrate.

Population data: "Scattered"

Collection: Moseley 338 (ID)

Last Observed: 1984

Heritage Program Data Base Occurrence Number: 003

Location: Custer County, on slope east of pass, 7 mile N of
Dickey. [Presumably Doublespring Pass, Lost River Range,
Challis National Forest.]

Habitat: Limestone outcrop; above timberline. Elev. 8,700 feet

Population data: None.

Collection: Hitchcock et al. 3789a (WTU)

Last Observed: ?

Heritage Program Data Base Occurrence Number: 004

Location: Fremont County, base to summit of mountains northeast of
lake, Henry Lake. [Presumably Henrys Lake Mountains,
Targhee National Forest.]

Habitat: Rocks. Elevation 8,500 feet.

Population data: None.

Collection: Payson and Payson (RM)

Last Observed: ?

Heritage Program Data Base Occurrence Number: 005

Location: Boundary County, summit of Fisher Peak. [Presumably in
the Selkirk Mountains, Kaniksu National Forest.]

Habitat: Rocks. Elevation 7,000 feet.

Population data: None.

Collection: Baker 13834 (ID)

Last Observed: ?

Appendix 2.

Mapped locations of Draba apiculata and D. incerta in the White Cloud Peaks and Boulder Mountains.

- Map 1. Draba apiculata 001 population in the Railroad Ridge area, White Cloud Peaks. Portion of 1964 Livingston Creek 7.5' quadrangle.
- Map 2. Draba apiculata 002 population south of Snow Lake, White Cloud Peaks. Portion of 1964 Boulder Chain Lakes 7.5' quadrangle.
- Map 3. Draba incerta 001 north of Jerry Peak in the Boulder Mountains. Portion of the 1967 Jerry Peak 7.5' quadrangle.

Appendix 3.

Slides of Draba apiculata and its habitat from the White Cloud Peaks.