

Rare Plant Status Review: *Orobanche ludoviciana* var. *arenosa*

Proposed Deletion from California Rare Plant Rank 2B.3, G5T5 / S2

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Changes to the original text are in blue font

Background and Taxonomy

Orobanche ludoviciana Nutt. var. *arenosa* (Suksd.) Cronquist is an achlorophyllous perennial herb in the Orobanchaceae. It was added to the *CNPS Inventory of Rare and Endangered Plants of California* in 2001 and is a California Rare Plant Rank 2B.3 taxon (CNPS 2001, 2023). This variety was first described in 1906 from Washington state as *Aphyllon arenosum* (Susksdorf 1906). The combination *O. ludoviciana* var. *arenosa* was first published in 1959 in the *Vascular Plants of the Pacific Northwest* (Cronquist 1959). Var. *arenosa* was included in Munz and Keck's *A California Flora and Supplement* as *O. multiflora* var. *arenosa* (Munz and Keck 1968), but neither var. *arenosa*, *O. ludoviciana*, nor *O. multiflora* were included in the 1993 Jepson Manual (Heckard 1993). Since 2001, there has been a note in the *Jepson Interchange* indicating that *Orobanche ludoviciana* Nutt. var. *arenosa* probably does not occur in California (Rosatti 2001). Currently, New World *Orobanche* taxa are placed in the genus *Aphyllon* (Schneider 2016). Variety *arenosa* is no longer considered a distinct taxon and is placed in synonymy with *Aphyllon ludovicianum*, a species that does not occur in California (Collins 2023 pers. comm., Schneider 2023 pers. comm., NRCS 2023). *Aphyllon ludovicianum* is not included in the recent *Jepson eFlora* treatment of California *Aphyllon* (Schneider and Colwell 2023).

In the California Natural Diversity Database, there are five historical estimated occurrences for *Orobanche ludoviciana* var. *arenosa* (CNDDDB 2023). Two (EO 2 and EO 3) are based on unvouchered reports by Glenn Clifton from Lassen County which cannot be reidentified (actually one unaccessioned voucher does exist at UC Davis and is discussed below). Three are based on Dean Taylor specimens from Mono and Inyo County. The record from Inyo County (EO 4) is based on a Calflora record that cites the Dean Taylor herbarium and a collection date of 25 October 1981; this record no longer exists in Calflora (Calflora 2023), but the specimen is in the CCH2 as Dean Taylor Herbarium *Taylor 7941B* and is not currently available for reidentification (CCH2 2023). The two Mono County records (EO 1 and EO 5) are based on *Taylor 16990* which has been reidentified as *Aphyllon californicum* (CCH2 2023) and *Taylor 16178* which has been reidentified as *Aphyllon parishii* (Collins 2023 pers. comm.).

During the Forum comment period, the following information was received from Alison Colwell:

"I concur with L. Turner Collins' assessment of the range and history of *O. ludoviciana* var. *arenosa*. I have studied that entity (molecular results unpublished) in the Columbia River Valley and it is genetically related to the *O. ludoviciana* & *O. riparia* of the Great Plains, but not closely genetically related to California entities in this genus, or morphologically, as pointed out by L. Turner Collins. I do not believe it occurs in California either.

What then, are the specimens attributed to it?

There are sporadic collections of *Aphyllon* species on the east side of the Sierra Nevada in Mono, Inyo and desert counties. These are primarily *Aphyllon*

franciscanum (on *Eriogonum* spp), *Aphyllon cooperi* (on *Encelia farinosa* & *Ambrosia dumosa*), *Aphyllon fasciculatum* (on *Artemisia tridentata*), *Aphyllon corymbosum* (on *Artemisia tridentata*) and occasionally *Aphyllon pinorum* (on *Holodiscus microphyllus*). Due to variability in color and shape of the above-ground inflorescences, these are sometimes given erroneous names. In some cases, this has been *O. ludoviciana*.

However, there is at least one unnamed taxon that occurs on the east slope that are none of these. The unknown taxa are not extremely rare, as quite a few reports over the basin and range region and CA-FP are likely attributable to them, but are instead overlooked due to occurring in under-visited habitats and having unreliable summer bloom time in hot areas. However, no *Aphyllon* on the eastside is common, even those with large ranges as these appear to have. Therefore, it may be worth reviewing these in the future when research on these is completed.

One is a pallid flowered, erect, spikelike inflorescence in alkaline valley bottoms, primarily on *Chrysothamnus nauseosus* host, blooming July, has been labeled *O. parishii* sp. nov. or *O. parishii* subsp. *nevadensis* by Larry Heckard and *O. ludoviciana* var. *arenosum* by Dean Taylor. This entity has been collected by me in the company of Dean Taylor in Adobe and Long Valleys and analyzed genetically by me (results unpublished) and it appears to be a hybrid derived from *Aphyllon cooperi* (or relative) and *A. californicum*. CNDDDB EO 1 and 5 belong to this entity. These populations are large and have been observed nearly every year since reported by Taylor.

A second entity, rose-pink to pallid, variable inflorescence, with notably long, curly calyx lobes, is reported on *Iva axillaris* in drying flats (sometimes seeps, sometimes lake borders, sometimes margins of irrigated alfalfa fields) in montane or high desert regions of California and Nevada, and possibly also on *Baccharis pilularis*, may be related to *Aphyllon californicum*, possibly a range expansion of *A. californicum* subsp. *jepsonii*. Few plants are typically seen on this one. Glenn Clifton has pointed out several Nevada populations to me and I agree that it appears to be distinct from currently named taxa. It may range from Lassen County in the North (possibly to British Columbia, if related to *A. corymbosa* subsp. *mutabilis*) to Ventura County in SW and San Bernardino County Mojave Desert in southeast. CNDDDB EO 2 and 3 likely belong to this entity.

Lastly, The collection that led to CNDDDB EO 4 may now be at UC/JEPS (Dean Taylor collection) but is not yet processed and examined by me, so I withhold diagnosis on that specimen for now."

Summary

Based on the available information, CNPS and CNDDDB recommend deleting *Orobanche ludoviciana* var. *arenosa* from California Rare Plant Rank 2B.3 of the CNPS Inventory and placing it on the Considered But Rejected list. If knowledge on the distribution, threats, and rarity status of *Orobanche ludoviciana* var. *arenosa* changes in the future, we will re-evaluate its status at that time.

Recommended Actions

CNPS: Change *Orobanche ludoviciana* var. *arenosa* from CRPR 2B.3 to CBR

CNDDDB: Delete *Orobanche ludoviciana* var. *arenosa* from G5T5 / S2

Original CNPS Inventory Record

Orobanche ludoviciana Nutt. var. *arenosa* (Suskd.) Cronq.

Suksdorf's broom-rape

Orobanchaceae

USDA Plants Symbol: PDORO04073

Synonym(s)/Other Name(s): none

CRPR 2B.3

Counties: Inyo (INY), Lassen (LAS), Mono (MNO)

States: Arizona (AZ), California (CA), Idaho (ID), Nevada (NV), Oregon (OR), Utah (UT), Washington (WA), Wyoming (WY)

Quad name (code): Constantia (3912081), Independence (3611872), Indian Meadows (3711886), Kearsarge Peak (3611873), River Spring (3711885), Shaffer Mtn. (4012043), Whitmore Hot Springs (3711867)

General Habitat: Great Basin scrub

General Micro Habitat Notes: none

Micro Habitat: none

Elevation: 1600-1600 meters

Life form: perennial herb (achlorophyllous)

Blooms: Jun-Sep (Oct)

Notes: Known in CA from only three occurrences. Parasitic on *Ericameria* and *Iva* spp. Similar to *O. parishii* ssp. *parishii*; separation between them blurred in Great Basin. See *University of Washington Publications in Biology* 17(4):431 (1959) for revised nomenclature, and *Bulletin of the Torrey Botanical Club* 57:623 (1930) for taxonomic treatment.

Revised CNPS Inventory Record

Orobanche ludoviciana Nutt. var. *arenosa* (Suskd.) Cronq.

Changed from 2B.3 to CBR on 2023/03/15

CBR Reason: Does not occur in California.

Selected References:

- [CNPS Status Review, change to CBR on 3/15/2023](#)
- Original Description: *Allgemeine Botanische Zeitschrift für Systematik, Floristik, Pflanzengeographie* 12(2): 26–27 (1906)
- Revised Nomenclature: *Vascular Plants of the Pacific Northwest*, Vol. 4. (1959); *Phytokeys* 75: 10–118 (2016).

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[CCH2] Consortium of California Herbaria Portal 2. 2022. Data provided by the participants of the Consortium of California Herbaria and the California Phenology Thematic Collections Network (CAP-TCN). Regents of the University of California, Berkeley and Cal Poly, San Luis Obispo. Website <http://www.cch2.org/portal/index.php> [accessed January 2023].

[CNDDDB] California Department of Fish and Wildlife, Natural Diversity Database. 2022. RareFind 5 [Internet application] and CNDDDB Maps and Data, Version 5.2.14. Available at: <https://www.wildlife.ca.gov/Data/CNDDDB/Maps-and-Data> [Government Version, January 2023].

[CNPS] California Native Plant Society, Rare Plant Program. 2001. *Inventory of Rare and Endangered Plants of California*. California Native Plant Society, Sacramento, California.

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Munz, P. A. and D. D. Keck. 1968. *A California Flora and Supplement*. University of California Press, Berkeley, California.

[NRCS] U.S. Department of Agriculture, Natural Resources Conservation Service. 2023. PLANTS Database. Website <http://plants.usda.gov/> [accessed January 2023].

Rosatti, T. 2001. Comment on *Orobanche ludoviciana* var. *arenosa* in the Jepson Interchange for California Floristics, Jepson Flora Project. Available at: https://ucjeps.berkeley.edu/cgi-bin/get_cpn?62681&expand=1 [accessed January 2023].

Schneider, A. C. 2016. Resurrection of the genus *Aphyllon* for New World broomrapes (*Orobanche* s.l., *Orobanchaceae*). *Phytokeys* 75: 10–118. [Revised nomenclature]

Schneider, A. and A. Colwell. 2023. *Aphyllon*, in Jepson Flora Project (eds.) *Jepson eFlora*, Revision 11, https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=103351 [accessed January 2023].

Susksdorf, W. 1906. Washingtonische Pflanzen. II. *Allgemeine Botanische Zeitschrift für Systematik, Floristik, Pflanzengeographie* 12(2): 26–27. [Original description]

Personal Communications

Collins, Turner. 2023. Professor emeritus, Evangel University and expert on *Aphyllon*. Email correspondence about distribution of *A. ludoviciana* and identification of *Dean Taylor 16178*. Personal communication 13 January 2023.

Schneider, Adam. 2023. Assistant Professor, University of Wisconsin, La Crosse and expert on *Aphyllon*. Email correspondence about distribution of *A. ludoviciana* and identification of *Dean Taylor 16178*. Personal communication 12 January 2023.