Aphyllon epigalium subsp. notocalifornicum

Element Code: ?
Added to CRPR 1B.3 on 2023-09-20

Rare Plant Status Review: Aphyllon epigalium subsp. notocalifornicum
Proposed Addition to California Rare Plant Rank 1B.3, G4T2 / S2
Adam J. Searcy (CNPS), Aaron E. Sims (CNPS), and Katie Ferguson (CNDDB)
9 August 2023

Changes to the original document are in blue font

This status review is being expedited through an agreement between the California Native Plant Society and the Center for Plant Conservation (CPC), with contributions from the state of California, CPC, and the California Plant Rescue initiative. Aside from being advanced as part of this agreement, the process, content, and information provided herein is not altered, modified, or developed differently in any way or form compared to other status reviews developed by CNPS.

Background and Taxonomy

Aphyllon epigalium Colwell & A. C. Schneid. subsp. notocalifornicum Colwell & A. C. Schneid. is an annual/perennial (winter annual) parasitic herb in the Orobanchaceae known only from the Transverse and Peninsular ranges of southern California (Colwell et al. 2017, Schneider and Colwell 2022). This new taxon is included in the Jepson eFlora (Schneider and Colwell 2022), and while it is not included in The Jepson Manual (Heckard 1993) or the Flora of North America (Collins et al. 2019), the existence of a Galium-parasitizing form is discussed in both treatments under Orobanche fasciculata. A comment received from George Yatskievych on the Forum disputes that this is a winter annual; he believes it to just be an annual plant.

Long treated as one taxon, Aphyllon fasciculatum has since been split into A. fasciculatum, A. franciscanum, and A. epigalium and its two subspecies (Colwell et al. 2017, Schneider and Benton 2021, Schneider and Colwell 2022). Plants now treated as Aphyllon epigalium subsp. notocalifornicum were most recently identified as Aphyllon fasciculatum s.l. exhibiting some characters of (and sometimes identified as) A. purpureum (Colwell et al. 2017, CCH2 2023). Phylogenetic studies of Aphyllon by Schneider et al. (2016) found that plants parasitizing Galium were sister to Aphyllon fasciculatum samples from a wide variety of non-Galium host taxa. Within the A. epigalium clade, disjunct samples from Galium andrewsii host plants in southern California were sister to the remaining samples from a variety of Galium host taxa from further north in the state (Schneider et al. 2016); these two entities were later described as the two A. epigalium subspecies notocalifornicum and epigalium, respectively (Colwell et al. 2017).

Regarding differentiation of Aphyllon epigalium from other Aphyllon taxa, as well as differentiation of the two subspecies of A. epigalium, Colwell et al. (2017) state that “[Aphyllon epigalium is] Distinct from all other species of Aphyllon in parasitizing Galium spp., and from other Western U.S. species of A. sect. Aphyllon, in having a combination of both 2–4 yellow flowers per stem and pedicels longer than the stem (the combined vegetative and inflorescence axis) …. Aphyllon epigalium subsp. notocalifornicum is distinct from A. epigalium subsp. epigalium in its paler, straw-colored flowers, often with a pinkish cast externally, its shorter corolla length of 13-20(-25) mm, its tube more prominently arched, with the corolla mouth presented +/- horizontally, [and] its narrower corolla lobes (length 2X width) that are either erect or weakly recurved at the tips.” The species is named for its host genus, Galium, while the subspecies notocalifornicum is named for its southern California distribution (Colwell et al. 2017).
Ecology
*Aphyllon epigalium* subsp. *notocalifornicum* occurs in the understory of riparian woodland, oak woodland, and coniferous forest (especially stands of *Pseudotsuga macrocarpa*) at elevations ranging from 1200 to 1535 meters (Colwell et al. 2017, CCH2 2023, iNaturalist 2023). The confirmed host plant of all collections cited in Colwell et al. (2017) is *Galium andrewsii*. Two old collections lacked any host information. The apparent host (visible in the photographs but not confirmed by excavation) of a recent iNaturalist (2023) observation identified by Adam Schneider and Keir Morse as *Aphyllon epigalium* subsp. *notocalifornicum* is not *Galium andrewsii* but may be *G. porrigens* (Schneider 2023 pers. comm.). Multiple *Galium* taxa are parasitized by *Aphyllon epigalium* subsp. *epigalium*, and in addition to its main host *G. andrewsii*, *A. e.* subsp. *notocalifornicum* should be looked for on other perennial *Galium* taxa. Associated non-host taxa include *Acer macrophyllum*, *Calocedrus decurrens*, *Ceanothus oliganthus*, *Heteromeles arbutifolia*, *Keckiella breviflora*, *Pseudotsuga macrocarpa*, *Pteridium aquilinum* var. *pubescens*, *Quercus chrysolepis* *Tauschia arguta*, and *Toxicodendron diversilobum* (CCH2 2023). Its flowering period is June, but it may rarely be in flower in early July (Colwell et al. 2017, CCH2 2023, iNaturalist 2023); while Colwell et al. (2017) include May in the flowering time, no May records were found.

Distribution and Abundance
*Aphyllon epigalium* subsp. *notocalifornicum* is known from seven occurrences in the Transverse and Peninsular Ranges of Ventura, San Bernardino, and San Diego counties, California (Colwell et al. 2017, Burgess 2023 pers. comm., CCH2 2023, iNaturalist 2023, Schneider 2023 pers. comm.). The type collection is attributed to Riverside County (Colwell et al. 2017), but the locality is in San Diego County, approximately 2.6 miles south of the Riverside/San Diego County line. Six of the occurrences are on public lands managed by Cleveland NF (3), Los Padres NF (2), or Rancho Cuyamaca State Park (1). One of the Cleveland NF occurrences is in the Agua Tibia Wilderness. The remaining occurrence (*Smith s.n., UC*), from “Mill Creek” in the San Bernardino Mountains, may have been collected on San Bernardino NF lands. Three of the occurrences are recent (observed within the last 20 years) and four are historical. One of the historical occurrences at Fry Creek CG, San Diego County was re-visited in 2016, but the *Aphyllon* was not found (Colwell et al. 2017). Most of the occurrences are from a single collection/observation and population sizes are unknown. Qualitative abundance statements from three sites include “observed in two locations”, “uncommon”, and “very few individuals above ground, but when excavating roots of the host, several more vegetative individuals were found” (CCH2 2023). While additional records are expected within the wider range of its host plant, many of the records of *Aphyllon epigalium* subsp. *notocalifornicum* are from mesic habitat “islands” and the taxon may have abiotic requirements that are not met throughout the entire range of its host (e.g., rainfall, fire history (Colwell et al. 2017). Comment made by Alison Colwell on the Forum: “Since publication of the description of this taxon, Adam Schneider and I have been on the lookout for additional locations in herbaria and have not found any more. It is true that the habitat in which subsp. *notocalifornicum* occurs is inhospitable in the time of year it appears, so new casual observations are not expected. However, the lack of new locations identified by *notocalifornicum*-seekers suggests this taxon has not simply been overlooked and therefore deserves a 1B status.”
Status and Threats
This taxon currently has no conservation status (NatureServe 2023). While there are no known threats to *Aphyllon epigalium* subsp. *notocalifornicum*, it is potentially threatened by frequent or high intensity wildfires (Colwell et al. 2017). Four of the occurrences are within at least one fire perimeter and only one of these occurrences has been confirmed extant since burning. A comment made on the Forum by George Yatskievych points out that another potential threat would be impacts from erosion and other soil movements when it rains following a fire. Also, he points out that it is host imperilment that has the greatest effect on the parasite. Also, a number of reviewers thought that a threat level of 0.2 may be warranted soon, given the recreational and environmental pressures on these locations.

Summary
Based on the available information, CNPS and CNDDB recommend adding *Aphyllon epigalium* subsp. *notocalifornicum* to California Rare Plant Rank 1B.3 of the CNPS Inventory. If knowledge on the distribution, threats, and rarity status of *Aphyllon epigalium* subsp. *notocalifornicum* changes in the future, we will re-evaluate its status at that time.

Recommended Actions
CNPS: Add *Aphyllon epigalium* subsp. *notocalifornicum* to CRPR 1B.3
CNDDB: Add *Aphyllon epigalium* subsp. *notocalifornicum* to G4T2 / S2

Draft CNPS Inventory Record
Southern California galium broomrape
Orobanchaceae
USDA Plants Symbol: None
Synonym(s)/Other Name(s): None
CRPR 1B.3
Counties: San Bernardino, San Diego, Ventura
States: California
Quad name (code): Boucher Hill (3311638), Cuyamaca Peak (3211685), Forest Falls (3411618), Palomar Observatory (3311637), Vail Lake (3311648), White Ledge Peak (3411944)
General Habitat: Riparian forest, cismontane woodland, and lower montane coniferous forest
Microhabitat Details: Most records are from stands of *Pseudotsuga macrocarpa*.
Elevation: 1200-1535 meters
Life form: Annual/perennial parasitic herb
Blooms June (July)
Notes: While Colwell et al. (2017) include May in the flowering time, no May records were found. Colwell et al. (2017) specify that this is an annual herb or winter annual, but Schneider and Colwell (2022, *Jepson eFlora* account) specify that this is an annual or perennial herb.
Threats: Improper burning regime
Taxonomy: Previously identified as either *A. fasciculatum* or (sometimes) *A. purpureum*; differentiated by its growth on *Galium* and the presence of 2-4 yellow flowers per stem with pedicels longer than the stem. Differentiated from *Aphyllon epigalium* subsp. *epigalium* by its paler, straw-colored flowers and shorter corollas with more prominently arched tubes, +/- horizontal mouths, and narrower lobes with erect or weakly recurved tips.

Sent to: SW, A. Colwell, G. Yatskievych, A. Schneider on 9 August 2023
Selected References:
- CNPS Status Review: Proposed addition to CRPR 1B.3, G4T2 / S2 (2023)
- Original Description: Madroño 64(3): 99–107 (2017)

**Literature Cited**


Aphyllon epigalium subsp. notocalifornicum

Element Code: ?
Added to CRPR 1B.3 on 2023-09-20


**Personal Communications**
