

**Added to California Rare Plant Rank 2.1 on August 21, 2012****Rare Plant Status Review: *Plagiobothrys verrucosus*****Proposed New Add to Rank 2.1, G4? / S1**

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Changes made to the original document appear in blue text.

**Background**

*Plagiobothrys verrucosus* is an annual herb in the Boraginaceae family that is known in California only from the Mt. Hamilton Range of Santa Clara County, but also occurs disjunctly in southern South America (Chile and Argentina). It is included in *The Jepson Manual, Second Edition* (TJM 2; available online at [http://ucjeps.berkeley.edu/cgi-bin/get\\_IJM.pl?tid=91915](http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=91915)). In *The Jepson Manual* (TJM, 1993) these plants were treated as *P. myosotoides* (CNPS Rank 4.3), a taxon that is no longer considered to occur in California and is currently under status review. The *Flora of North America* treatment for Boraginaceae is not yet available. ~~*Eretichum*~~ *Eritrichium* *verrucosum* was first described by Philippi (1858) and was later treated as *P. verrucosus* by Johnston (1927). These names, however, were only applied to plants from South America. Johnston (1939) treated the specimen from Santa Clara County, C.W. ~~and H.K. Sharsmith 1893~~, as *P. myosotoides* (Consortium of California Herbaria, CCH, 2012). Later floras followed suit, recognizing the plants from Santa Clara County, as well as plants from Fresno and Tulare counties, as *P. myosotoides* (e.g., Munz and Keck 1959, Sharsmith 1982, TJM 1993). Today, the Fresno and Tulare county plants are assigned to *P. torreyi* var. *perplexans* (R. Kelley pers. comm. 2011), which is also currently under status review. The California specimen from Santa Clara County was assigned to *P. verrucosus* by R. Kelley in 2007 (CCH 2012). This assignment was based on N. Horn's (2000) doctoral dissertation, in which she analyzed the morphology of both dried and garden-grown plants. She was able to distinguish *P. verrucosus* from *P. myosotoides* by its larger ovate-lanceolate leaves (up to 2.5 cm x 4 mm) and larger nutlets (up to 1.8 x 1.5 mm). *Plagiobothrys myosotoides* has shorter linear leaves (up to 2 cm x 3 mm) and smaller nutlets (up to 1.4 x 1.1 mm). Horn (2000) treated these taxa at the subspecific level (*P. myosotoides* ssp. *myosotoides* and ssp. *verrucosus*), but because these names were never validly published, they are maintained at the specific level (TJM 2). Photographs of the nutlets from Horn's dissertation were important in assigning the Santa Clara County specimen to *P. verrucosus* (R. Kelley pers. comm. 2011). *Plagiobothrys verrucosus* blooms in California from April to May.

In California, *Plagiobothrys verrucosus* is only known to occur in the understory of chaparral. It has been found in [relatively bare areas](#) on loose shale (CCH 2012, [D. Gowen pers. comm. 2012](#)), and grows between 610 and 760 meters in elevation.

There are [approximately](#) ~~only three observations~~ [known occurrences](#) of *P. verrucosus* in California, ~~representing two nearby occurrences~~. The most recent record of this plant's occurrence in California was an observation by [D. Gowen](#) ~~J. Greenhouse~~ at Arnold

Ranch in May 2009 ~~1995~~ (California ~~2012~~ D. Mayall pers. comm. 2012). Although the occurrence of *P. verrucosus* is near Highway 130 there does not appear to be any threats at the location. The ranch is likely still family owned and the use of agriculture is minimal; however, the existence of some 15 ranked taxa on the ranch make it a place of prime concern for rare plant conservation, and members of the Santa Clara Valley Chapter of CNPS did a survey of the ranch in 2010 (D. Mayall pers. comm. 2012). ~~Details on the current management of Arnold Ranch are unknown, but in 1995 it was still a working ranch (J. Greenhouse pers. comm. 2012).~~ The other **second** occurrence is a nearby collection from 1935 on the ridge between Isabel Valley and Arroyo Bayo (Sharsmith 1893). ~~The two occurrences are possibly within about a mile of each other, and could actually represent a single occurrence.~~ A third occurrence is known from near the summit of Del Puerto Road in the Mt. Boardman USGS 7.5' quadrangle. This record is a 1963 collection of *P. uncinatus* by Breedlove that was annotated to *P. myosotoides* by R. Kelley in August 2006. It is included as CNDDDB occurrence #8 for *P. uncinatus* and the CNDDDB record should be transferred to *P. verrucosus* (D. Gowen pers. comm. 2011 and 2012).

*Streptanthus callistus* has been observed with *P. verrucosus* and is present at the Thomas Addition of Henry Coe State Park, which is only about 5 miles due south of the Arroyo Bayo occurrence of *P. verrucosus*. David Gowen (pers. comm. 2012) surveyed the Thomas Addition area a few years ago for *P. verrucosus* with no success, but future surveys should ensue as it may occur there.

Outside of California's Mt. Hamilton Range, *P. verrucosus* occurs only in Chile and Argentina. Horn (2000) used 16 separate collections from southern South America for her taxonomic work, which shows that it is considerably more common in southern South America than it is in California.

Given the unique disjunct distribution of *P. verrucosus*, a discussion of the origin of the California occurrences is warranted. Johnston (1939) noted that the Mt. Hamilton Range had not received much attention botanically until shortly before his 1939 publication, suggesting that the *P. verrucosus* from the Mt. Hamilton Range was unlikely to be a recent introduction from Chile. *Plagiobothrys verrucosus* is not unique in the Boraginaceae family in having a disjunct distribution between California and South America; many other taxa in the family have a similar distribution, and in other cases there are close relatives found on each continent (Johnston 1939). Most instances of a trans-tropical distribution between North and South America likely arose from long-distance dispersal by migrating birds in the past several hundred thousand years (Raven 1972).

Threats to *P. verrucosus* are currently unknown, but given that this plant is known from one historical, and one recent occurrence on private land, it should be considered of serious conservation concern. Based on the available information, CNPS and CNDDDB recommend that *Plagiobothrys verrucosus* be added to California Rare Plant Rank 2.1.

### Recommended Actions

CNPS: Add to CNPS 2.1

CNDDDB: Add to CNDDDB G4? / S1

Please review the draft CNPS Inventory record below, respond Yes or No on the proposal to add this species to the Inventory and CNDDDB, and provide any edits/comments. If responding No, please provide supporting information.

### Draft CNPS Inventory Record

*Plagiobothrys verrucosus* (Phil.) I.M. Johnst.

warty popcorn-flower

Boraginaceae

Rank 2.1

Santa Clara, [Stanislaus](#)

South America

Eylar Mtn. (426A) 3712145, Isabel Valley (426D) 3712135, [Mt. Boardman \(425B\) 3712144](#)

Chaparral / shale; elevation 610 – 760 meters.

Annual herb. Blooms April to May.

Known in CA only from the Mt. Hamilton Range. Previously identified as *P. myosotoides*, which does not occur in CA. See *Linnaea: Ein Journal für die Botanik in ihrem ganzen Umfange* 29:17-18 (1858) for original description, and *Contributions from the Gray Herbarium of Harvard University* 78:79 (1927) for revised nomenclature.