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Oreocarya insolita: what was in Vegas is no longer in Vegas

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Abstract: *Oreocarya insolita* is the only plant species endemic to Nevada that is believed to have gone extinct within the last 200 years. It is known from five historical collections made between 1905 and 1940. The collection locality recorded for three specimens is “Las Vegas”, while the other two collections are labeled “Artesian well 4 miles NW of Las Vegas” and “North Las Vegas”. These collections were from the vicinity of Fremont Street in what is now downtown Las Vegas and suitable habitat has long since been destroyed. Searches in downtown Las Vegas have not yielded potential habitat and prospects for the rediscovery of *Oreocarya insolita* are limited to nonexistent.

Keywords: *Cryptantha insolita*, extinct, Las Vegas *Cryptantha*, Nevada endemic.

Resumen: *Oreocarya insolita* es la única especie vegetal endémica de Nevada que se cree que se ha extinguido en los últimos 200 años. Se conoce a partir de cinco recolecciones históricas realizadas entre 1905 y 1940. La localidad de recolección registrada para tres especímenes es “Las Vegas”, mientras que las otras dos recolecciones están etiquetadas como “Pozo artesiano a 4 millas al noroeste de Las Vegas” y “North Las Vegas”. Estas recolecciones procedían de las inmediaciones de Fremont Street, en lo que hoy es el centro de Las Vegas, y el hábitat adecuado hace tiempo que ha sido destruido. Las búsquedas en el centro de Las Vegas no han dado como resultado ningún hábitat potencial y las perspectivas de redescubrir *Oreocarya insolita* son limitadas o inexistentes.

Palabras clave: *Cryptantha insolita*, extinto, Las Vegas *Cryptantha*, Endémico de Nevada.

INTRODUCTION

Natural history

Oreocarya insolita J.F. Macbr. is a small, herbaceous plant in the Boraginaceae, whose habitat has been described as light-colored spring mounds with alkaline soils (R. Barneby pers. comm. 1996). Prior to writing this article, the author was aware of three collections of *Oreocarya insolita*: the type specimen, Las Vegas, 4 May 1905, Goodding 2286 (Holotype RM: Isotypes GH, MINN, MO,

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NY, RENO); another collection from an artesian well 4 miles NW of Las Vegas, May 1939, F.H. Barkley 4096 (GH, MONTU); and a third collection from alkaline clay hills, North Las Vegas, 1 May 1940, Ripley and Barneby 4294 (GH). Herbarium codes follow Index Herbariorum (Thiers 2025). Online herbarium specimen searches were conducted using the Consortium of California Herbaria 2 (CCH2) and the Intermountain Region Herbarium Network websites (CCH2 2025; Intermountain Region Herbarium Network 2025).

In reviewing Payson's work on *Cryptantha* section *Oreocarya*, the author noticed that he cited two more collections: Las Vegas, no date, K. Brandegee s.n. (UC), and Las Vegas, 29 Apr 1905, Jones s.n. (POM) (Payson 1927). Both of these specimens were identified to genus only in CCH2 and were not recovered in a search for *Oreocarya insolita*. The Jones collection is five days before the type collection of *O. insolita* was made. Jones collected across the western United States and northern Mexico. He was one of the preeminent western American botanists of his time and a very skilled field botanist. It is interesting that he collected but did not describe what became known as *Oreocarya insolita*.

The Brandegee collection label is a printed Flora of California label with California crossed off and Nevada written in. It does not contain a date and the location is Las Vegas, Lincoln Co. Las Vegas is now placed in Clark County, which was formed in 1909, primarily from a portion of Lincoln County (UNR Extension 2025). A database search revealed four Brandegee collections from Goodsprings, Nevada, which is in the vicinity of Las Vegas (CCH2 2025). One collection event has no date, two are dated May 1915, and one is dated 1 May 1915. Based on these collection dates, the author believes that *O. insolita* was collected by Brandegee in 1915. The lack of ecological information on the labels and the fact that all collectors are no longer living makes it impossible to fully establish historical ecological rela-

tionships for *O. insolita*. See Figs. 1–4 and Figs. S1–S3 (Supplementary Material) for images of specimens, and Fig. 5 for an illustration of *O. insolita*. Nutlets are shown in Fig. 6 for *O. insolita* (top panel) and *O. virginensis* (M.E. Jones) Payson (bottom panel) (Amsinckiinae Working Group 2025).

Systematics

Oreocarya insolita (Boraginaceae), known as Las Vegas Cryptantha, was described in 1916 by Macbride who was working at Harvard University (Macbride 1916). The species has led a varied life in botanical taxonomy. Nine years after its description, it was recognized in the only published flora covering all of Nevada (Tidestrom 1925). This work has keys, a bibliographic citation, generalized habit, and generalized distribution. However, there are no discussions of relationships, distinctiveness, or ecology of the species. Also in 1925, Johnston published a monograph of *Cryptantha* Lehm. ex G. Don (Johnston 1925), in which he does not treat the taxa of *Oreocarya* Greene and he lists *Oreocarya* as a genus separate from *Cryptantha*.

Two years later Payson transferred *O. insolita* to *Cryptantha*, as *C. insolita* (J.F. Macbr.) Payson, in his monograph of *Cryptantha* section *Oreocarya* (Greene) Payson (Payson 1927). Payson compares *C. insolita* to *C. tumulosa* (Payson) Payson and *C. virginensis*, both of which also occur in the vicinity of Las Vegas.

The next taxonomic treatment for *Oreocarya insolita* was that of Higgins (1971). He wrote a revision of *Cryptantha* subgenus *Oreocarya* (Greene) Higgins. He follows Payson's lead in treating *insolita* as a *Cryptantha*. In his discussion he states: "However, this plant is probably closely related to *C. virginensis*, but differs in the length of the floral bracts, number of cymes, and the shape of the nutlets" (see key below). In a 1979 publication on the Boraginaceae of the southwestern United States, Higgins maintained the submersion of *Oreocarya* into *Cryptantha* (Higgins 1979).



Fig. 1. Isotype of *Oreocarya insolita* in the RENO herbarium, Goodding 2286 (RENO 21903).



Fig. 2. Specimen of *Oreocarya insolita* in the GH herbarium, Ripley and Barneby 4294 (GH 2060834).



Fig. 3. Specimens of *Oreocarya insolita* in the GH herbarium, Barkley 4098 (GH 2060832 and 2060833).



Fig. 4. Specimen of *Oreocarya insolita* in the RSA herbarium, Jones s.n. (RSA 656030).

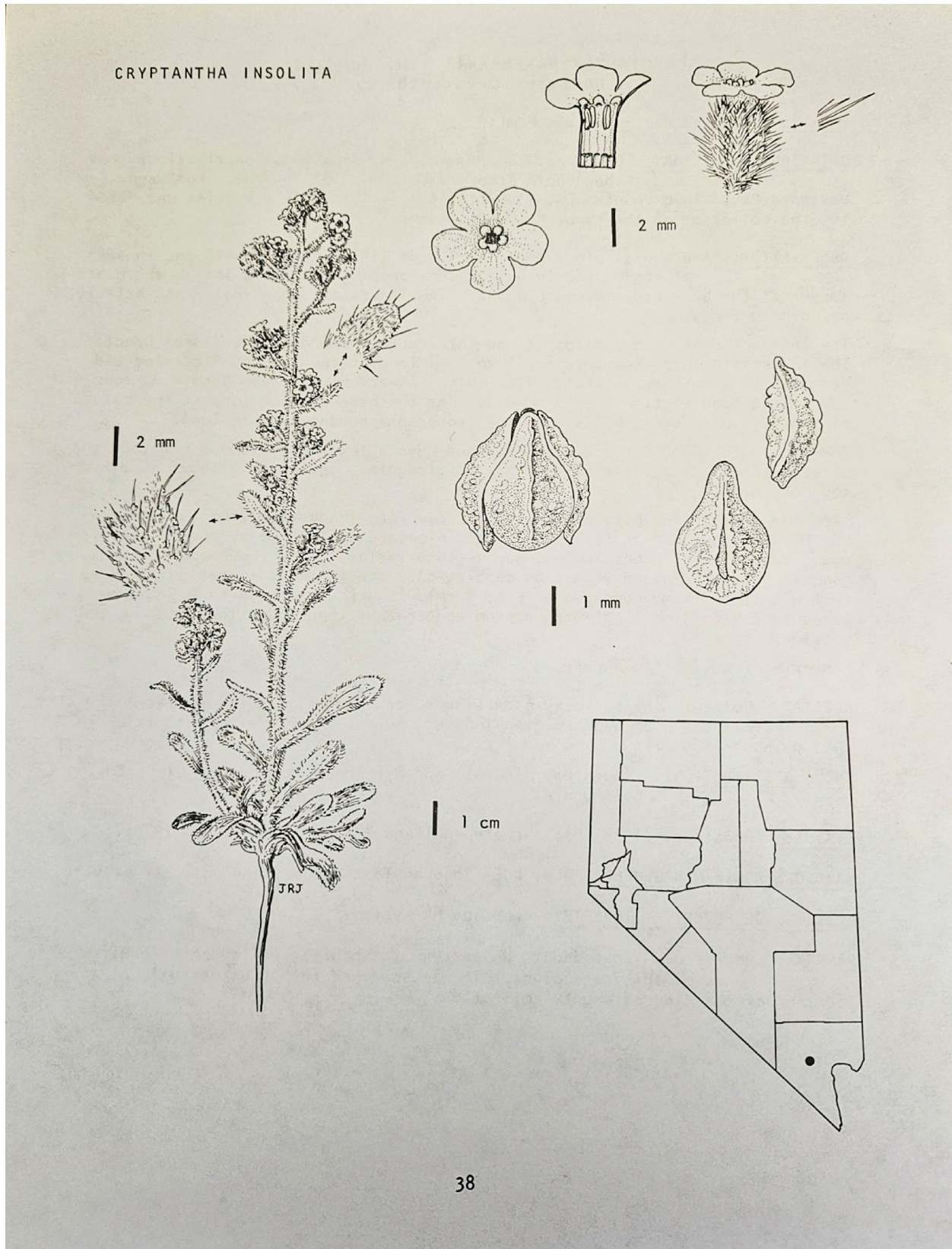


Fig. 5. Illustration of *Oreocarya* (*Cryptantha*) *insolita* from Mozingo and Williams (1980), U.S. Fish and Wildlife Service (public domain).

Relevant portion from the key in Higgins (1971):

49. Surface of the leaves with inconspicuous appressed bristles; inflorescence open, with only a few elongate cymes, 7–14 cm long terminating the stem; endemic to near Las Vegas, Nevada *C. insolita*

49'. Surface of the leaves conspicuously setose-hispid with spreading bristles; inflorescence open, at least at maturity(50)

50. Calyx lobes 7–12 mm long in fruit; nutlets 3–4.5 mm long; prominently carinate on the dorsal side; southwestern Utah to southern California .. *C. virginensis*

50'. Calyx lobes 5–7 mm long in fruit; nutlets 2.5–3 mm long, with only an indistinct central ridge toward the apex; eastern California and western Nevada *C. hoffmannii*

Oreocarya is a genus of over 60 species that occur in both North and South America (Feuillet 2020). It is circumscribed as containing bienni-



Fig. 6, top panel. *Oreocarya insolita* nutlet images; from left to right: dorsal, ventral, and lateral views. Note carinate surface, in dorsal view. H.D. Ripley 4294 with R.C. Barneby, 1 May 1942 (GH 02060834). United States: Nevada, Clark County, North Las Vegas. Elevation: 2000 meters. Habitat: alkaline clay hills. **Bottom panel.** *Oreocarya virginensis* nutlet images; from left to right: dorsal, ventral, and lateral views. Nutlet in dorsal view also appears carinate. L. Ripma 320, 16 May 2012 (SDSU 20011). United States: Arizona, Mohave County, Beaver Dam Mountains. Elevation: 1677 meters. Habitat: Pinyon-Juniper woodland. Used with permission from the *Amsinckiinae* Working Group (2025).

als, or more usually, perennials with persistent basal rosettes of leaves, and having generally larger flowers than *Cryptantha* (Hasenstab-Lehman and Simpson 2012). Recent molecular studies have also supported the separation of *Oreocarya* from *Cryptantha* (Simpson et al. 2017) as seen in recent floras of Oregon (Feuillet 2020) and California (Simpson et al. 2022).

Geography

Because our knowledge of the ecology and distribution of *O. insolita* is limited, early historical reports from the area are relevant, and the following account of Las Vegas is based on publicly available resources (City of Las Vegas 2025; History Facts 2025; Wikipedia 2025).

Prior to the arrival of Europeans, the primary indigenous inhabitants in the valley where the city of Las Vegas is now were the Southern Paiute (Nuwu), whose descendants include the present-day Las Vegas Paiute Tribe (Fowler and Garey-Sage 2000). The first recorded reference to Las Vegas is from Spanish merchant Antonio Armijo's trading party that in 1829 was heading to Los Angeles. A member of the party, Rafael Rivera, named the area Las Vegas, Spanish for "the meadows." Las Vegas became a welcome rest stop on the Old Spanish Trail from New Mexico to Los Angeles. Water and grazing resources were most welcome to the bedraggled travelers through this inhospitable desert land. A later trail diverged and went to Salt Lake City.

On May 3rd, 1844, the explorer John Charles Frémont arrived at Las Vegas. His narrative is enlightening: "After a day's journey of 15 miles in a northeasterly direction we encamped in the midst of another very large basin, at a camping ground called las Vegas [...] Two narrow streams of clear water, four or five feet deep, gush suddenly with a quick current, from two singularly large springs; these, and other waters of the basin, pass out in a gap to the eastward. The taste of the water is good, but rather too warm to be agreeable; the temperature being 71° in the one, and 73° in the other. They,

however, afforded a delightful bathing place." (Frémont 1845).

In 1855, Mormon missionaries from Utah built a fort in Las Vegas. The hardships proved too much, and they returned to Utah in 1857. Remnants of the fort are preserved in the Old Las Vegas Mormon Fort State Historic Park located at 500 E. Washington Ave.

The San Pedro, Los Angeles, and Salt Lake Railroad was completed in 1905, with Las Vegas being a stop in the middle of the route. The railroad depot was built where the Plaza Hotel and Casino is now located, at 1 N. Main St. In May of 1905, 110 acres of land was auctioned to form downtown Las Vegas. The land was bounded by Stewart St. on the north, Garces St. on the south, Main St. on the west, and 5th St. or Las Vegas Blvd., on the east. The auction date of May 15th, 1905, became the official date of the founding of the town of Las Vegas. It was incorporated in 1911.

The locations of the Old Mormon Fort, the old Railroad Depot, and the 110 acres in the 1905 auction are all close together in downtown Las Vegas, in and around Fremont St. When Ripley and Barneby visited Las Vegas in 1940 they stayed in the Sal Sagev Hotel, an anagram of Las Vegas (R. Barneby pers. comm. 1996). Barneby said that behind the hotel were springs with moist mineral deposits and that *Oreocarya insolita* was on these deposits. The Sal Sagev Hotel is now the Golden Gate Hotel and Casino and is located at 1 Fremont St. (Fig. 7).

STATUS

Evidence

Oreocarya insolita has not been assessed for the International Union for Conservation of Nature Red List of Threatened Species (IUCN 2025). It is included on the Nevada list of fully protected species of native flora (NAC 527.010, added 14 February 1979) and on the Bureau of Land Management Nevada Special Status Species List (U.S. Bureau of Land Management 2023).

It is also ranked as SH (possibly extirpated in the state) by the Nevada Division of Natural Heritage and GH (possibly extinct globally) by

NatureServe (2025). At the 2024 Nevada Rare Plant Workshop, the Nevada Native Plant Society (NNPS) updated the NNPS status to PE



Fig. 7. Geographical context: Las Vegas, Nevada (top left); three locations discussed in the main text (top right); closer views of three focal sites (bottom panels). The three locations are as follows: (A) Old Las Vegas Mormon Fort State Historical Park, (B) Plaza Hotel and Casino, historic site of San Pedro, Los Angeles, and Salt Lake Railroad depot; (C) Golden Gate Hotel and Casino, historic site of Sal Sagev Hotel. This map includes data from: Vexcel Imaging US, Inc. Imagery from the dates: 11/9/2022–3/5/2024. Imagery © 2025 Google, Maxar Technologies; figure assembled by M. Forister.

(possibly extirpated). This follows discussions during the 2007, 2010, 2011, 2012, 2014, 2016, 2018, 2019, 2023, and 2024 workshops in which no positive observations for the species had been confirmed.

Mozingo and Williams compiled a list of threatened and endangered plants of Nevada (Mozingo and Williams 1980). They treat *insolita* as a *Cryptantha* and recommend that it should be considered possibly extinct and that the search for it should continue whenever possible. A different approach is taken by Cronquist in Intermountain Flora (Cronquist 1984). Here, he keeps *insolita* in *Cryptantha* but lists it as a synonym of *C. virginensis* and does not discuss this submersion.

Hasenstab-Lehman and Simpson (2012) published a work on subtribe *Cryptanthinae* Brand (Boraginaceae). Within it they separate *Oreocarya* from *Cryptantha*. They also separate *Eremocarya* Greene, *Greeneocharis* Gürke and Harms, and *Johnstonella* Brand. This splitting of genera was corroborated by Simpson et al (2017). This approach will be followed in the forthcoming volume 15 of Flora of North America, and in that work *O. insolita* will be recognized as a distinct species (M. Simpson pers. comm. 2025). In a recent checklist of Nevada vascular plants, Tiehm and Nachlinger (2025) recognize *O. insolita*, noting that it was last collected in 1940, and is likely extinct because of the urbanization of Las Vegas.

Oreocarya insolita was listed as possibly extinct in four Federal Registers (1976, 1980, 1983, 1985). Higgins (1979) was the first to comment on the demise of *O. insolita* (as *Cryptantha*). He states: “A rare endemic that may no longer exist because of the urbanization of the area of Las Vegas. The two known collections were labeled Las Vegas, so may have occurred in what is now the city or could possibly exist in outlying regions near the town.”

Mozingo and Williams (1980) also comment on the possibility of *O. insolita* (as *Cryptantha*) being extinct. They state: “The last known collection of *Cryptantha insolita* was in 1942 [actually 1940], the type is the only other known

collection. This taxon has been searched for recently without success. Although it is the recommendation of Mozingo and Williams that this taxon should be considered to be possibly extinct, the search for it should be continued whenever possible.” Tiehm and Nachlinger (2025) have the following comment: “It could well be considered Nevada’s only known historically extinct plant.” Humphreys et al. (2019) included it in their global plant extinction analysis and Knapp et al. (2021) included it in an analysis of extinct plants of the continental United States and Canada.

It is unlikely that ex situ material ever existed. Indeed, a Botanic Gardens Conservation International plant search of >1.5 million living collections records representing >360,000 taxa from >1,100 institutions for the taxon and its synonym yielded 0 results (Botanic Gardens Conservation International 2025).

Search effort

The author has not personally searched for *O. insolita* in the field but has inferred sites from known location information (discussed above) and has examined land use change at these sites using aerial imagery in Google Earth (Fig. 7). The area around Fremont St. is now completely developed (locations B and C in Fig. 7). There are no visible springs, moist mineral deposits, alkaline clay hills, or even vacant lots. According to Las Vegas botanists Wes Niles, Pat Leary, and the current curator of the UNLV herbarium, Marcus Hooker, the only plausible remaining location is the Springs Preserve located near Meadows Lane and S. Valley View Blvd. (M. Hooker pers. comm. 2025). This is about 2.5 miles west of 1 Fremont St. Wes told the author that he had conducted several thorough field investigations of the area and had not found *O. insolita*.

It is the opinion of this author that the possibility of *O. insolita* still occurring in the greater Las Vegas area is, at best, wishful thinking, and the species should be listed as extinct where appropriate.

Data accessibility

Discussion of locations and dates of collection for the focal species were based on publicly available records and personal conversations with experts.

Ethical standards and competing interests

This work was based on inspection of available records and specimens, and conversations with curators. No permits or institutional approvals were required, and the author declares no competing interests.

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Supplementary material

Supplementary material associated with this article is available online and includes additional images of *O. insolita* (Figs. S1–S3).

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