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A SHORT FLORA OF SHORT CANYON, KERN COUNTY, CALIFORNIA

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ABSTRACT: Short Canyon lies at the eastern end of the southern Sierra Nevada within the Bureau of Land Management's Owens Peak Wilderness Area in Kern County, California. The canyon has an unusual floristic composition, and is botanically diverse, comprising elements of the southern Sierra Nevada, Great Basin, and Mojave Desert. Elevation ranges from 2400 ft at the canyon mouth to 5700 ft at the head of the canyon. There are 56 families, 182 genera, and 324 species currently documented within Short Canyon. Approximately 500 vascular plant collections were made within the study area. The primary objectives of this study were to catalogue, voucher, and create an annotated checklist of Short Canyon's vascular flora.

KEYWORDS: California, eastern Sierra Nevada, flora, floristics, Great Basin, Mojave Desert, rare plants, Short Canyon, southern Sierra Nevada

DEDICATION: I would like to dedicate this manuscript to the memory of Mary Ann Henry (May 26, 1918–August 11, 2006). Mary Ann was a self taught botanist and environmental advocate whose efforts led to the designation of Short Canyon as an Area of Critical Environmental Concern. She recognized the uniqueness of the region's flora, spending over 10 years cataloging the plants of Short Canyon before writing the first checklist (available at the Maturago Museum in Ridgecrest). Her list has been indispensable to wildflower enthusiasts who frequent the canyon. I heard so much about Mary Ann during the course of my study, and finally had the good fortune to meet her at the Maturago Museum wildflower show in April of 2006. I am grateful to Mary Ann for her work in conserving California's desert flora and for her efforts in protecting a special place like Short Canyon.

INTRODUCTION

Short Canyon is a popular destination for wildflower enthusiasts, and is located within the 74,640 acres of the Owens Peak Wilderness area, where the Mojave Desert meets the southern Sierra Nevada in Kern County, California (Fig. 1). Not just another clever name, Short Canyon literally is a short canyon covering approximately 1,200 acres and 4.5 miles from the US Highway 395 to the head of the canyon. However, in this relatively small area there is enormous botanical diversity influenced by the geography and topography of the area (Fraga 2005; Fraga 2006). The floristic elements of the Sierra Nevada, Mojave Desert and Great Basin all influence this region of southern California and provide Short Canyon with an interesting plant composition. Habitats in the canyon range from Creosote Bush Scrub at the canyon mouth



Fig. 1. A map of Short Canyon and its location in California.

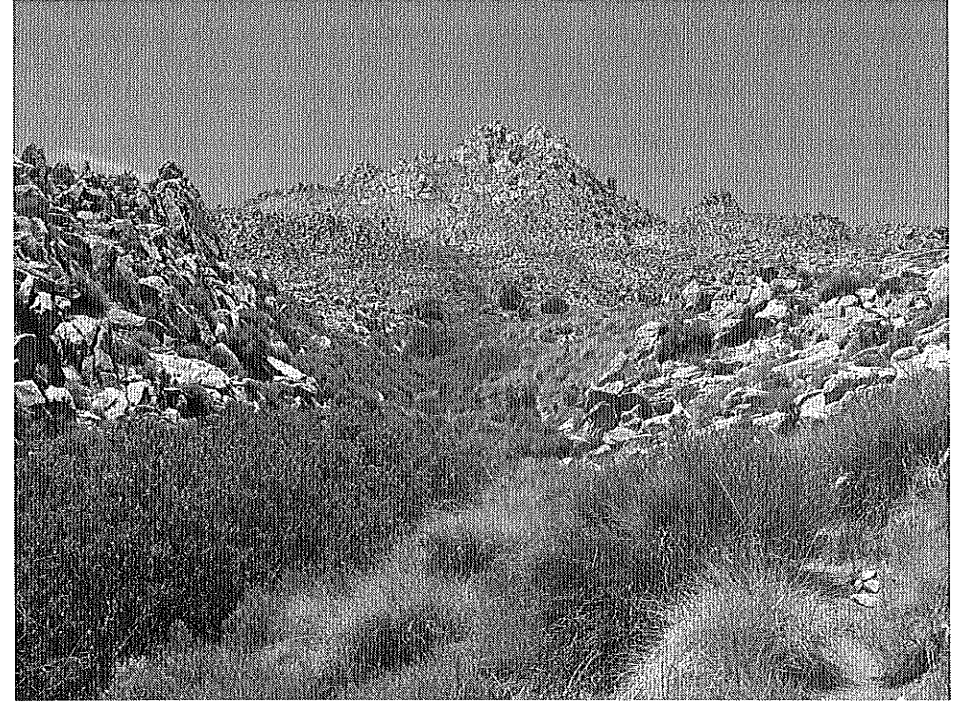


Fig. 2. Riparian area and adjacent slopes in Short Canyon.

Many local botanists are familiar with this small desert canyon in the northwestern Mojave Desert, as it is widely recognized for its spring wildflower displays. Mary Ann Henry compiled the first checklist of Short Canyon based on several years of field work she conducted from 1970-1983 (Henry 2003). Largely thanks to Mary Ann Henry's botanical work, Short Canyon was designated as an Area of Critical Environmental Concern to preserve the vegetation and diverse flora of the canyon (BLM 1996). Her checklist provides the baseline for this study.

METHODS

This project was initiated in 2002 as a senior project while I was a student at California Polytechnic University at Pomona. This small project is a component of a much larger project

(Fig. 2) to the presence of Foothill and Pinyon Pines and at the upper reaches of the canyon. There are also several springs throughout Short Canyon providing many mesic microsites.

that constituted the larger part of my masters thesis; The Vascular Flora of the Owens Peak Eastern Watershed, southern Sierra Nevada California (Fraga 2005; Fraga 2006). Most collections were made from March to September, however collections were made in all months of the year from 2002-2005. An effort was made to collect at all possible locations, from all major physiographic features, geologic and edaphic substrates, and plant communities. All specimens were verified and annotated. Vouchers were deposited at RSA with duplicates to be sent to CAS/DS, UC/JEPS, UCR, and elsewhere. Searches of herbaria at CAS/DS, RSA-POM, and UC/JEPS were conducted in order to include historical collections as a part of the study.

Notes were taken at each collection site indicating the locality, latitude and longitude (via global positioning system receiver), elevation, substrate, aspect, habitat, associated species, and plant attributes (flower color, life form, etc.). The information was entered into the RSA-POM database from which labels were generated. Plant determinations were made using several references, including *The Jepson Desert Manual* (Baldwin et al. 2002), *The Jepson Manual: Higher Plants of California* (Hickman 1993), *A Flora of Southern California* (Munz 1974), *A Flora of Kern County, California* (Twisselmann 1967), and the RSA-POM herbarium. All nomenclature conforms to Hickman (1993) with the exception of new treatments for Cactaceae (Flora of North America, 2003), Polemoniaceae (Porter and Johnson 2000), Madiinae (Baldwin 1999), and *Ambrosia* (Strother et al. 2003). Classification of families follow the Flora of North America [FNA] (2005).

RESULTS AND DISCUSSION

This study documents 324 vascular plant taxa (including species, subspecies, varieties, and hybrids) as occurring in the study area. These include 56 families and 182 genera (sensu FNA 2005; Hickman 1993). Asteraceae is by far the largest family, accounting for 17.3% of the total flora. Important collections from Short Canyon include *Deinandra mohavensis* and *Quercus palmeri*, both collected by A. C. Sanders, S. Boyd, and V. Soza (1998). The discoveries of *D. mohavensis*, and *Q. palmeri* are significant range extensions and also new records for Kern county. Other Kern county records that have been documented since the publication of *A Flora of Kern County, California* (Twisselmann 1967) include: *Antirrhinum kingii*, *Brickellia watsonii*, *Dudleya saxosa* subsp. *aloides*, *Eriogonum ampullaceum*, *Fraxinus velutina*, *Leptochloa filiformis*, *Mentzelia obscura*, *Oenothera californica* subsp. *californica*, *Phacelia lemmonii*, *Scirpus nevadensis*, and *Solidago confinis*.

Non-native taxa account for 4% of the total flora and occur primarily near disturbed areas, and along roadsides. Several species were documented adjacent to Brady's Gas Station at the mouth of the canyon. The area has a relatively intact native flora compared with the State of California in which 17.4% of the total flora is non-native (Hickman 1993). *Encelia farinosa*, while native to California, is not native to this portion of the Mojave Desert. Plants have been planted near the roadside at the intersection of California State Route 14 and US Highway 395. Seedlings of *E. farinosa* were collected adjacent to California State Route 14; neither mature plants nor evidence of hybridization (between *E. farinosa* and the native *E. actoni*) were observed over the course of this study.

ANNOTATED CATALOG OF THE VASCULAR FLORA

The following is a list of all vascular plant taxa documented from Short Canyon. This catalog is a result of field work and search of herbaria conducted as of October 2005. Specimens that are cited can be found at RSA-POM unless designated *CAS*, *DS*, *JEPS*, or *UC*. Common, locally common, occasional, uncommon, and rare are used as an indication of the distribution of taxa across the study area. Non-native taxa are denoted by an asterisk (*); sensitive taxa are denoted by a dagger (†); those taxa which have been vouchered within the Owens Peak Eastern Watershed (Fraga 2006) but not in Short Canyon are denoted by a double dagger (‡). An appendix listing taxa that have not been vouchered on Mary Ann Henry's checklist follows the main list.

FERNS AND FERN ALLIES

Equisetaceae

Equisetum laevigatum A. Braun Perennial herb. Uncommon along sandy banks near streams. 1000-1200 m (3400-3800 ft) *Fraga & Fraga 105*.

Azollaceae

Azolla filiculoides Lam. Aquatic annual. Uncommon in standing water in stream channels. 1000-1200 m. (3400-3800 ft) *Fraga & Brock 1136*.

Pteridaceae

Cheilanthes covillei Maxon Perennial herb. Common from rock crevices and between large boulders. 1100-1500 m (3500-5500 ft) *Fraga & Denlow 182*.

Pellaea mucronata (D. C. Eaton) D. C. Eaton var. *californica* (Lemmon) Munz & I. M. Johnston Perennial herb. Uncommon from rock crevices and between large boulders. 1000-1200 m (3400-3800 ft) *Fraga, Anderson & Stonzenburg 1032*.

Pentagramma triangularis (Kaulf.) Yatsk., Windam & Woolenw. subsp. *triangularis* Perennial herb. Uncommon from rock crevices and between large boulders. 700-1200 m (2400-3800 ft) *Fraga & Anderson 1004*.

CONIFERAE

Cupressaceae

Juniperus californica Carrière Large shrub. Uncommon on desert and mountain slopes. 1200-1500 m (4000-5000 ft) *Fraga & Fraga 101*.

Ephedraceae

Ephedra nevadensis S. Watson Small shrub. Occasional on gravelly desert slopes. 800-1500 m (2600-5000 ft) *Fraga, Boyd, Denslow & Gross 357*.

Ephedra viridis Coville Small shrub. Common on gravelly desert slopes, and rocky mountain slopes. 1200-1500 m (3800-5000 ft) *Fraga Boyd, Denslow & Gross 361*.

Pinaceae

Pinus monophylla Torr. & Frém. Tree. Occasional at the head of the canyon. 1200-1740 m (3800-5700 ft) *Fraga & Maurice 244*.

Pinus sabiniana Douglas Tree. Occasional on upper reaches of canyon. 1000-1740 m (3400-5700 ft) *Fraga & Fraga 130*.

ANGIOSPERMAE - DICOTYLEDONES

Apiaceae

Berula erecta (Huds.) Coville Perennial herb. Occasional in riparian area. 1000-1200 m (3300-3900 ft) *Fraga & Tessel 151*.

Lomatium mohavense (J. M. Coult. & Rose) J. M. Coult. & Rose Geophyte. Common on alluvial slopes and bajada. 850-1500 m (2800-5000 ft) *Fraga, Boyd, Denslow & Gross 327*.

Tauschia parishii (J. M. Coult. & Rose) J. F. Macbr. Geophyte. Occasional on alluvial slopes. 1200-1500 m (3900-5000 ft) *Fraga Boyd, Denslow & Gross 360*.

Apocynaceae

Asclepias fascicularis Decne. Perennial herb. Occasional near banks of riparian area. 1000-1200 m (3400-4000 ft) *Fraga & Tessel 140*.

Asteraceae

Acamptopappus sphaerocephalus (A. Gray) A. Gray Small shrub. Occasional on bajada and on alluvial slopes in open desert scrub. 800-1100 m (2600-3500 ft) *Fraga & Denslow 472*.

Ambrosia acanthicarpa Hook. Annual. Occasional on roadways and disturbed sites. 800-1000 m (2600-3400 ft) *Fraga & De Groot 999*.

Ambrosia dumosa (A. Gray) Payne Small shrub. Common on desert slopes and bajadas. 800-1200 m (2600-3800 ft) *Fraga & Fraga 88*.

Ambrosia salsola (Torr. & A. Gray) Strother & B.G. Baldwin var. *salsola* Small shrub. Common on desert slopes and canyon floor. 850-1500 m (2800-5000 ft) *Fraga & Maurice 219*.

Anisocoma acaulis Torr. & A. Gray Annual. Common on desert slopes and bajada. 1000-1500 m (3300-5000 ft) *Fraga & Fraga 523*.

Artemisia dracunculus L. Suffruticose perennial. Occasional along banks above riparian area. 980-1200 m (3200-4000 ft) *Fraga, Boyd, Denslow & Gross 371*.

Artemisia ludoviciana Nutt. subsp. *ludoviciana* Perennial herb. Common along banks above riparian area. 1000-1500 m (3200-5000 ft) *Fraga, De Groot & Hobbs 991*.

Artemisia tridentata Nutt. subsp. *tridentata* Small shrub. Common on north slopes and at the head of the canyon. 1000-1500 m (3400-5000 ft) *Fraga & Brock 1344*.

Baccharis salicifolius (Ruiz & Pav.) Pers. Large shrub. Occasional in riparian areas. 1000-1400 m (3300-4500 ft) *Fraga & Maurice 169*.

Baccharis sergiloides A. Gray Small shrub. Common on banks above stream channels and desert slopes. 1000-1200 m (3300-4000 ft) *Fraga & Fraga 112*.

Brickellia desertorum Cov. Small shrub. Occasional from in between large granite boulders and desert slopes. 900-1400 m (3000-4500 ft) *Fraga, De Groot & Hobbs*.

Brickellia watsonii Robinson Small shrub. Occasional in between large granite boulders and desert slopes. 900-1400 m (3000-4500 ft) *Fraga, De Groot & Hobbs 996*.

Chaenactis fremontii A. Gray Annual. Occasional in sandy bajadas and desert slopes. 800-1100 m (2600-3500 ft) *Fraga & Fraga 1110*.

Chaenactis stevioides Hook. & Arn. Annual. Uncommon in sandy bajadas and desert slopes. 900-1400 m (3000-4500 ft) *Fraga, Boyd, Denslow & Gross 323*.

Chaenactis xantiana A. Gray Annual. Common in sandy bajadas, desert and exposed mountain slopes. 800-1740 m (2600-5500 ft) *Fraga & Fraga 193*.

Chrysothamnus nauseosus (Pall.) Britton subsp. *consimilis* (Greene) H. M. Hall & Clem. Small shrub. Common on desert slopes and the canyon floor. 1100-1500 m (3500-5000 ft) *Fraga, Boyd, Denslow & Gross 353*.

Chrysothamnus nauseosus (Pall.) Britton subsp. *hololeucus* (A. Gray) H. M. Hall & Clem. Small shrub. Common on sandy bajadas. 800-1000 m (2600-3400 ft) *Fraga & Brock 1347*.

Chrysothamnus nauseosus (Pall.) Britton subsp. *mohavensis* (Greene) H. M. Hall & Clem. Small shrub. Common on desert slopes of canyons. 1200-1220 m (3500-4000 ft) *Fraga & De Groot 998*.

- Chrysothamnus teretifolius* (Durand & Hilg.) H. M. Hall Small shrub. Occasional on desert slopes. 900-1200 m (3000-4000 ft) *Fraga, De Groot & Hobbs 985.*
- Cirsium occidentale* (Nutt.) Jeps. var. *venustum* (Greene) Jeps. Biennial herb. Occasional on desert slopes. 900-1500 m (3000-5000 ft) *Fraga & Fraga 120.*
- Coreopsis bigelovii* (A. Gray) H. M. Hall Annual. Common on alluvial slopes and sandy bajadas. 900-1500 m (3000-5000 ft) *Fraga & Denslow 494.*
- †*Deinandra mohavensis* (D. D. Keck) B. G. Baldwin Annual. Occasional from springs and seeps. 1150-1200 m (3800-4000 ft) *Fraga, Buck, McAllister, Morgan & Virgen 954.*
- Encelia actoni* (Elmer) D. D. Keck Small shrub. Common on desert slopes and sandy bajadas. 900-1500 m (3000-5000 ft) *Fraga & Denslow 518.*
- **Encelia farinosa* Torr. & A. Gray Small shrub. Rare; from along SR 14 between the Indian Wells Steakhouse and Brewery and Brady's Gas Station. Only seedlings collected, the source population is located along the hwy. Plants not seen naturalizing further into the study area. 800 m (2600 ft) *Fraga, Bigelow & Denslow 1017.*
- Ericameria cooperi* (A. Gray) H. M. Hall subsp. *cooperi* Small shrub. Common on desert slopes. 850-1200 m (2800-4000 ft) *Fraga & Denslow 483.*
- Ericameria cuneata* (A. Gray) McClatchie Small shrub. Locally common from underneath boulders and in granite outcrops. 1000-1500 m (3300-5000 ft) *Fraga & De Groot 995.*
- Ericameria linearifolia* (DC.) Urbatsch & Wussow Small shrub. Common on sandy canyon floors, desert slopes, and rocky mountain slopes. 1000-1500 m (3500-5000 ft) *Fraga & Fraga 90.*
- Erigeron foliosus* Nutt. var. *foliosus* Perennial herb. Occasional on slopes at upper reaches of canyon. 1200-1500 m (3800-5000 ft) *Fraga & Soza 893.*
- Eriophyllum ambiguum* (A. Gray) A. Gray var. *palaecum* (Brandege) Ferris Annual. Common on desert slope, exposed ridgelines and canyon floors. 900-1500 m (3000-5000 ft) *Fraga, Griffith & Walker 571.*
- Eriophyllum confertiflorum* (DC.) A. Gray var. *confertiflorum* Suffruticose perennial. Common from granite rock outcrops and desert slopes. 900-1500 m (3000-5000 ft) *Fraga & Fraga 63.*
- Eriophyllum pringlei* A. Gray Annual. Common on alluvial slopes and sandy canyon bottom. 900-1500 m (3000-5000 ft) *Fraga & Denslow 528.*
- Eriophyllum wallacei* (A. Gray) A. Gray Annual. Common on alluvial slopes and sandy canyon bottom. 900-1500 m (3000-5000 ft) *Fraga & Fraga 57.*
- Filago depressa* A. Gray Annual. Uncommon on sandy canyon bottom. 800-1200 m (2600-4000 ft) *Fraga & Denslow 452.*
- ‡*Gnaphalium canescens* DC. Suffruticose perennial. Occasional in moist drainages. 1710 m (5600 ft) *Fraga, Anderson, Gross & Kempton 1644.*
- **Gnaphalium luteo-album* L. Annual. Occasional on moist banks above stream channels. 1000-1400 m (3400-4600 ft) *Fraga & Tessel 152.*
- Gutierrezia microcephala* (DC.) A. Gray Suffruticose perennial. Common on sandy canyon floor and desert slopes. 900-1300 m (3000-4200 ft) *Fraga & Brock 1322.*
- Lasthenia californica* DC. ex Lindl. Annual. Occasional on sandy bajadas and desert slopes. 850-1000 m (2800-3300 ft) *Fraga & Denslow 458.*

- Layia glandulosa* (Hook.) Hook. & Arn. Annual. Locally abundant on open desert slopes and canyon floor. 1100-1500 m (3500-5000 ft) *Fraga & Griffith 1087.*
- Lepidospartum squamatum* (A. Gray) A. Gray Small shrub. Occasional on sandy bajadas and dry washes. 800-1100 m (2600-3600 ft) *Fraga & Brock 1325.*
- Lessingia filaginifolia* (Hook. & Arn.) M.A. Lane var. *filaginifolia* Suffruticose perennial. Occasional on canyon slopes. 975-1500 m (3200-5000 ft) *Fraga & De Groot & Hobbs 992.*
- Malacothrix glabrata* (D. C. Eaton) A. Gray Annual. Common on bajadas, generally growing underneath shrubs. 800-1500 m (2600-5000 ft) *Fraga & Fraga 194.*
- Monoptilon bellidifforme* A. Gray Annual. Uncommon; in a dry alluvial wash with fine sandy soil. 1000 m (3400 ft) *Fraga & Denslow 527.*
- Nicolletia occidentalis* A. Gray Perennial herb. Common on canyons floor in sandy soil and sand dunes. 800-1100 m (2600-3600 ft) *Twisselmann 4540 CAS.*
- Rafinesquia neomexicana* A. Gray Annual. Occasional from underneath shrubs serving as nurse plants in bajadas, and desert slopes. 800-900 m (2600-3000 ft) *Fraga & Denslow 463.*
- Senecio flaccidus* Less. var. *monoensis* (Greene) B. L. Turner & T. M. Barkley Small shrub. Occasional from desert slopes and near dry stream channels. 1100-1400 m (3500-4600 ft) *Fraga, Buck, McAllister, Morgan & Virgen 957.*
- Solidago californica* Nutt. Perennial herb. Locally abundant along moist stream channels. 1100-1220 m (3500-4000 ft) *Fraga, Buck, McAllister, Morgan & Virgen 949.*
- Solidago confinis* A. Gray Perennial herb. Locally abundant on moist banks of stream channels. 1100-1220 m (3500-4000 ft) *Fraga, Buck, McAllister, Morgan & Virgen 958.*
- **Sonchus oleraceus* L. Annual. Rare in canyon drainages. 1100-1500 m (3600-5000 ft) *Fraga & Tessel 833.*
- ‡*Stephanomeria exigua* Nutt. subsp. *coronaria* (Greene) Gottlieb Annual. Occasional on desert slopes. 1220-1500 m (4000-5000 ft) *Fraga & Soza 891.*
- Stephanomeria pauciflora* (Nutt.) A. Nelson Suffruticose perennial. Common on desert slopes. 800-1500 m (2600-5000 ft) *Fraga & De Groot 988.*
- **Taraxacum officinale* Weber ex G. H. Wiggers Perennial herb. Rare; on wet soil from seeps and springs. 1200 m (3900 ft) *Fraga & Griffith 1083.*
- Tetradymia axillaris* A. Nelson var. *longispina* (M. E. Jones) Strother Small shrub. Occasional on canyons floor and desert slopes. 1100-1300 m (3600-4400 ft) *Fraga, Griffith & Walker 568.*
- Tetradymia stenolepis* E. Greene Small shrub. Occasional on canyons floor and desert slopes. 1100-1500 m (3600-5000 ft) *Fraga, Boyd, Denslow & Gross 383.*
- Uropappus lindleyi* Nutt. Annual. Occasional on bajadas, generally growing underneath shrubs. 900-1500 m (3000-5000 ft) *Fraga, Boyd, Denslow & Gross 338.*
- ‡*Xanthium strumarium* L. Annual. Rare; in riparian areas. 1100 m (3600 ft) *Fraga & Brock 1339.*

Xylorhiza tortifolia (Torr. & A. Gray) Greene var. *tortifolia* Suffruticose perennial. Occasional on canyon bajadas and exposed ridgetops. 800-1500 m (2600-5000 ft) *Fraga* & *Fraga* 1100.

Boraginaceae

- Amsinckia tessellata* A. Gray var. *tessellata*. Annual. Common on bajadas and desert slopes. 800-1500 m (2600-5000 ft) *Fraga*, *Boyd*, *Denslow* & *Gross* 278.
- Cryptantha barbiger* (A. Gray) Greene Annual. Occasional in bajadas and desert slopes. 800-1500 m (2600-5000 ft) *Fraga* & *Fraga* 187.
- Cryptantha circumscissa* (Hook. & Arn.) I. M. Johnst. Annual. Common in sandy openings of bajadas. 800-1500 m (2600-5000 ft) *Fraga*, *Boyd*, *Denslow* & *Gross* 348.
- Cryptantha decipiens* (M. E. Jones) A. Heller Annual. Occasional in open sandy areas. 800-1000 m (2600-3300 ft) *Fraga* & *Fraga* 109.
- Cryptantha intermedia* (A. Gray) Greene Annual. Occasional in open sandy areas. 1100-1220 m (3500-4000 ft) *Fraga* & *Maurice* 231.
- Cryptantha micrantha* (Torr.) I. M. Johnst. Annual. Occasional in sandy open places. 800-1200 m (2600-4000 ft) *Fraga*, *Boyd*, *Denslow* & *Gross* 347.
- ‡*Cryptantha mohavensis* (Greene) Greene Annual. Common in open habitats on desert slopes and exposed ridgetops. 1100-1900 m (3500-6200 ft) *Fraga* & *Soza* 759.
- Cryptantha nevadensis* A. Nelson & Kennedy Annual. Common in sandy open places. 800-1220 m (2600-4000 ft) *Fraga* & *Denslow* 475.
- Cryptantha pterocarya* (Torr.) Greene var. *pterocarya* Annual. Common in open habitats on desert slopes, canyon floor and exposed ridgetops. 800-1500 m (2600-5000 ft) *Fraga* & *Denslow* 496.
- ‡*Cryptantha utahensis* (A. Gray) E. Greene Annual. Rare; on canyon slopes. 1220 m (4000 ft) *Fraga*, *De Groot* & *Porter* 605.
- Heliotropium curassavicum* L. subsp. *oculatum* (A. Heller) Thorne Perennial herb. Occasional, from disturbed sites, and open sandy places. 800-1500 m (2600-5000 ft) *Fraga* *Buck*, *McAllister*, *Morgan* & *Virgen* 959.
- Pectocarya penicillata* (Hook. & Arn.) A. DC. Annual. Occasional from sandy open places. 800-1500 m (2600-5000 ft) *Fraga*, *Boyd*, *Denslow* & *Gross* 328.
- ‡*Pectocarya recurvata* I. M. Johnst. Annual. Uncommon from sandy open places. 800-1500 m (2600-5000 ft) *Fraga*, *Gross* & *Navid-Ara* 1079.
- Pectocarya setosa* A. Gray Annual. Occasional from sandy open places. 800-1220 m (2600-4000 ft) *Fraga*, *Boyd*, *Denslow* & *Gross* 309.
- Plagiobothrys arizonicus* (A. Gray) Greene ex A. Gray Annual. Common in open sandy habitats. 800-1500 m (2600-5000 ft) *Fraga* & *Denslow* 456.
- Tiquilia nuttallii* (Hook.) A. T. Richardson Annual. Uncommon on bajadas and desert slopes. 900-1200 m (2800-4000 ft) *Kefee* 13740.

Brassicaceae

- Arabis inyoensis* Rollins Perennial herb. Occasional from granite outcrops. 1160-1370 m (3800-4500 ft) *Fraga* & *Brock* 1517.
- Arabis pulchra* M. E. Jones var. *pulchra* Perennial herb. Common in the shade of pinyons, canyon floor, and exposed ridges. 1200-1370 m (3800-4500 ft) *Fraga* & *Maurice* 237.
- Athyasus pusillus* (Hook.) Greene Annual. Uncommon on wet seeps and moist sandy hummocks. 1200-1370 m (3800-4500 ft) *Fraga*, *Boyd*, *Denslow* & *Gross* 321.
- Caulanthus cooperi* (S. Watson) Payson Annual. Common from bajadas and desert slopes. 800-1220 m (2600-4000 ft) *Fraga* & *Fraga* 196.
- Descurainia pinnata* (Walter) Britton subsp. *glabra* (Wootton & Standl.) Detling Annual. Occasional on desert slopes. 850-1370 m (2800-4500 ft) *Fraga* & *Fraga* 196.
- Dithyrea californica* Harvey Annual. Occasional on slopes with fine sandy soil and dunes. 850-900 m (2800-3000 ft) *Fraga* & *Fraga* 210.
- Draba cuneifolia* Torr. & A. Gray Annual. Rare on moist sandy banks near springs. 1100-1200 m (3500-3800 ft) *Fraga*, *Boyd*, *Denslow* & *Gross* 344.
- Guillenia lasiophylla* (Hook. & Arn.) E. Greene Annual. Occasional in canyon bajadas and desert slopes. 900-1220 m (2800-4000 ft) *Fraga* & *Denslow* 521.
- Hutchinsia procumbens* (L.) Desv. Annual. Locally common on moist sandy hummocks. 1200-1300 m (3800-4200 ft) *Fraga* & *Fraga* 1085.
- Lepidium fremontii* S. Watson var. *fremontii* Small shrub. Occasional on desert slopes and bajadas. 850-1370 m (2800-4500 ft) *Fraga* & *Maurice* 226.
- Lepidium lasiocarpum* Torr. & A. Gray Annual. Occasional on sandy bajadas and desert slopes. 800-1220 m (2600-4000 ft) *Fraga* & *Boyd* 414.
- Rorippa nasturtium-aquaticum* (L.) Schinz & Thell. Perennial herb. Locally abundant in stream channels with running water. 1300-1100 m (3500-4200 ft) *Fraga* & *Fraga* 104.
- Thysanocarpus curvipes* Hook. Annual. Occasional on sandy slopes and canyon floor. 1200-1500 m (3800-5000 ft) *Fraga* & *Maurice* 229.
- Thysanocarpus laciniatus* Nutt. ex Torr. & A. Gray Annual. Occasional on sandy slopes and canyon floor. 1100-1400 m (3600-4500 ft) *Fraga*, *Boyd*, *Denslow* & *Gross* 299.
- Tropidocarpum gracile* Hook. Annual. Occasional on desert slopes and canyon floor. 850-1500 m (2800-5000 ft) *Fraga* & *Maurice* 227.

Cactaceae

- Cylindropuntia echinocarpa* (Engelm. & Bigel.) F. M. Knuth Succulent shrub. Common on sandy bajadas and desert slopes. 800-1220 m (2600-4000 ft) *Fraga* & *Tessel* 136.
- Opuntia basilaris* Engelm. & J. Bigel. Succulent shrub. Common on sandy bajadas, and desert slopes. 800-1370 m (2600-4500 ft) *Fraga* & *Denslow* 511.

Campanulaceae

Nemacladus sigmoideus G. T. Robbins Annual. Uncommon in alluvial wash and sand dunes. 900-1000 m (2800-3400 ft) *Fraga et al. (field trip attendees) 1099.*

Capparaceae

Isomeris arborea Nutt. Small shrub. Common on desert slopes and bajadas. 800-1280 m (2600-4200 ft) *Fraga & Denslow 507.*

Caryophyllaceae

‡*Arenaria macradenia* S. Watson var. *arcuifolia* Maguire Suffruticose perennial. Occasional on shaded and rocky talus slopes. 1220-1370 m (4000-4500 ft) *Fraga, Honer & Soza 749.*

Minuartia douglasii (Torr. & A. Gray) Mattf. Annual. Uncommon on north canyon slopes. 1220 m (4000 ft) *Fraga, Soza, Honer 738.*

Minuartia pusilla (S. Watson) Mattf. Annual. Locally common in moist fed by springs on coarse sand. 1100 m (3600 ft) *Fraga & Brock 1517.*

Silene verecunda S. Wats. subsp. *platyota* (S. Wats.) C. L. Hitchc. & Maguire Perennial herb. Occasional on desert slopes. 1220-1370 m (4000-4500 ft) *Fraga & Anderson 1265.*

Chenopodiaceae

Atriplex canescens (Pursh) Nutt. Small shrub. Common on desert slopes. 1010-1220 m (3300-4000 ft) *Fraga & Brock 1326.*

Atriplex polycarpa (Torr.) S. Watson Small shrub. Occasional on desert slopes. 800-1220 m (2600-4000 ft) *Fraga, Boyd, Denslow & Gross 363.*

Chenopodium californicum (S. Watson) S. Watson Perennial herb. Rare, in moist shaded areas. 1200 m (3900 ft) *Fraga, Griffith & Walker 573.*

Grayia spinosa (Hook.) Moq. Small shrub. Occasional on canyon bajadas and rocky desert slopes. Common on the exposed ridgeline of Backus Peak. 850-1500 m (2800-5000 ft) *Fraga & Denslow 464.*

Krascheninnikovia lanata (Pursh) Gludenstaedt Small shrub. Occasional on desert slopes. 910-1220 m (3000-4000 ft) *Fraga & Denslow 498.*

Convolvulaceae

Calystegia longipes (S. Watson) Brummitt Perennial herb. Occasional on desert slopes and sandy canyon floor. 1100-1220 m (3600-4000 ft) *Fraga & Fraga 1108.*

Crassulaceae

Crassula connata (Ruiz & Pav.) A. Berger Annual. Uncommon on moist sandy hummocks. 1100-1300 m (3500-4100 ft) *Fraga & Maurice 236.*

Dudleya saxosa (M. E. Jones) Britton & Rose subsp. *aloides* (Rose) Moran Succulent perennial herb. Occasional from near crevices of large granite boulders and desert slopes. 1100-1500 m (3500-5000 ft) *Fraga, Griffith & Walker 565.*

Cuscutaceae

Cuscuta californica Hook. & Arn. var. *californica* Parasitic annual. Common on desert slopes, most commonly growing on *Baccharis sergiloides* and *Eriogonum fasciculatum*. 1200-1370 m (3800-4500 ft) *Fraga, Buck, McAllister, Morgan & Virgin 952.*

Cuscuta subinclusa Durand & Hilg. Parasitic annual. Uncommon; from large granite boulders on *Artemisia ludoviciana*. 1200 m (3800 ft) *Fraga & Anderson 1003.*

Euphorbiaceae

Chamaesyce albomarginata (Torr. & A. Gray) Small Perennial herb. Occasional in open or disturbed places. 800-1370 m (2600-4500 ft) *Fraga, Gross & Navid-Ara 1057.*

†*Chamaesyce vallis-mortae* Millsp. Perennial herb. Locally common from sandy open places. 800-1500 m (2600-5000 ft) *Fraga & Brock 1321.*

Fabaceae

Astragalus didymocarpus Hook. & Arn. var. *didymocarpus* Annual. Occasional, growing on moist sand from seeps. 1100-1200 m (3500-3800 ft) *Fraga, Griffith & Walker 560.*

‡*Astragalus layneae* E. Greene Perennial herb. Rare; from desert bajadas. 800-1000 m (2600-3300 ft) *Rose s.n. 3 Apr 1967 67011.*

Astragalus lentiginosus Hook. var. *variabilis* Barneby Perennial herb. Occasional, on desert slopes, and bajadas. 900-1066 m (3000-3500 ft) *Fraga & Denslow 428.*

Astragalus pachypus Greene var. *pachypus* Suffruticose perennial. Uncommon from the desert slopes. 850-1200 m (2800-4000 ft) *Berry 269 UCR.*

Lotus argophyllus (A. Gray) Greene var. *argophyllus* Perennial herb. Uncommon from crevices and in between granite boulders. 1100-1520 m (3600-5000 ft) *Fraga & Tessel 145.*

Lotus humistratus Greene Annual. Occasional from sandy bajadas and desert slopes. 800-1220 m (2600-4000 ft) *Fraga & Boyd 428.*

Lotus oblongifolius (Benth.) Greene var. *oblongifolius* Perennial herb. Locally common from moist stream channels. 1100-1220 m (3500-4000 ft) *Fraga & Tessel 145.*

- ‡*Lotus procumbens* (Greene) Greene var. *procumbens* Perennial herb. Occasional in shade of pinyon woodland and on open slopes. 1830-2200 m (6000-5000 ft) *Fraga & Anderson 1273*.
- Lotus purshianus* Clem. & E. G. Clem. Perennial herb. Occasional from banks above stream channels. 1100-1220 m (3500-4000 ft) *Fraga & Fraga 1105*.
- Lotus strigosus* (Nutt.) Greene Annual. Common from sandy canyons, and dry slopes. 800-1370 m (2600-4500 ft) *Fraga & Denslow 509*.
- Lupinus bicolor* Lindl. Annual. Occasional from bajadas and desert slopes. 915-1370 m (3000-4500 ft) *Fraga & Maurice 225*.
- Lupinus concinnus* J. G. Agardh Annual. Common on bajadas, sand dunes and desert slopes. 915-1370 m (3000-4500 ft) *Fraga, Boyd, Denslow & Gross 320*.
- Lupinus excubitus* M. E. Jones var. *excubitus* Suffruticose perennial. Common on desert canyon slopes and rocky mountain slopes. 1100-1370 m (3600-4500 ft) *Fraga & Fraga 541*.
- Psoralea arborescens* (A. Gray) Barneby var. *minutiflora* Parish (Barneby) Small shrub. Occasional on bajadas and desert slopes. 800-1100 m (2600-3600 ft) *Fraga & Denslow 517*.
- Trifolium microcephalum* Pursh Annual. Rare; on moist bank above stream edge. 1100 m (3600 ft) *Fraga & Fraga 1104*.
- Trifolium willdenovii* Spreng. Annual. Uncommon from moist areas on banks above stream, or vernal wet from nearby springs. 1100 m (3600 ft) *Fraga, Griffith & Walker 559*.
- Trifolium wormskjoldii* Lehm. Perennial herb. Rare; from near vernal moist depression fed by spring. 1200 m (3800 ft) *Fraga & Anderson 1102*.

Fagaceae

- Quercus chrysolepis* Lieb. Tree or large shrub. Common on north slopes of canyons and rocky mountain slopes. 1100-1524 m (3500-5000 ft) *Fraga & Anderson 1007*.
- Quercus palmeri* Engelm. Large shrub. Uncommon; growing above streams and vernal moist places. 1000-1200 m (3400-3800 ft) *Sanders & Boyd 22350*.
- Quercus wislizenii* A. DC. Tree. Occasional on north slopes of canyons and on rocky mountain slopes. 1000-1500 m (3400-5000 ft) *Fraga & Maurice 242*.

Gentianaceae

- Centaurium exaltatum* (Griseb.) Piper Annual. Rare; near moist places associated with springs. 1100 m (3600 ft) *Fraga & Fraga 132*.
- Centaurium venustum* (A. Gray) B. L. Rob. Annual. Rare; near moist places associated with springs. 1200 m (4000 ft) *Luthey s.n. 14 Sep 1978 CAS*.

Geraniaceae

- **Erodium cicutarium* (L.) L'her. Annual. Common especially on bajadas, desert slopes, and disturbed roadsides. 800-1500 m (2600-5000 ft) *Fraga & Fraga 117*.

Hydrophyllaceae

- Emmenanthe penduliflora* Benth. var. *penduliflora* Annual. Occasional on desert slopes. 980-1500 m (3200-5000 ft) *Fraga, Griffith & Walker 561*.
- Eucryphia chrysanthemifolia* (Benth.) Greene var. *bipinnatifida* (Torr.) Constance Annual. Occasional on desert slopes from underneath shrubs and granite rock crevices. 980-1400 m (3200-4500 ft) *Fraga, Boyd, Denslow & Gross 287*.
- Nama demissum* A. Gray var. *demissum* Annual. Occasional on bajadas and desert slopes. 800-1500 m (2600-5000 ft) *Fraga & Denslow 477*.
- Nemophila menziesii* Hook. & Arn. var. *integrifolia* Parish Annual. Occasional on desert slopes and bajadas. Usually growing from underneath shrubs. 800-1500 m (2600-5000 ft) *Fraga & Maurice 253*.
- ‡*Phacelia austromontana* J. T. Howell Annual. Occasional from talus slopes on Owens Peak. 2100-2600 m (7000-8400 ft) *Fraga & Griffith 811*.
- Phacelia bicolor* S. Watson var. *bicolor* Annual. Occasional on bajadas and desert slopes. 800-1220 m (2600-4000 ft) *Kirby 1279 CAS*.
- Phacelia cicutaria* Greene var. *hispida* (A. Gray) J. T. Howell Annual. Uncommon on desert slopes and from between rock crevices or in between shrubs. 1200-1500 m (3800-5000 ft) *Fraga, Griffith & Walker 563*.
- Phacelia curvipes* S. Wats. Annual. Uncommon in openings on desert slopes. 1066 m (3500 ft) *Fraga & Maurice 243*.
- Phacelia distans* Benth. Annual. Common on bajadas and desert slopes. 800-1500 m (2600-5000 ft) *Fraga, Boyd, Denslow & Gross 326*.
- Phacelia fremontii* Torr. Annual. Occasional on bajadas and desert slopes. 800-1500 m (2600-5000 ft) *Fraga & Maurice 223*.
- Phacelia lemmonii* A. Gray Annual. Locally common on vernal moist areas on banks above stream, moisture often associated with springs. 1200 m (3800 ft) *Fraga, Boyd, Denslow & Gross 343*.
- †*Phacelia nashiana* Jeps. Annual. Occasional on sandy slopes and exposed ridelines. 915-1500 m (3000-5000 ft) *Fraga & Fraga 529*.
- Phacelia ramosissima* Douglas ex Lehm. var. *ramosissima* Perennial herb. Uncommon growing from rock crevices or between shrubs. 1000-1500 m (3400-5000 ft) *Fraga Tessel 149*.
- Pholistoma membranaceum* (Benth.) Constance Annual. Occasional from underneath shrubs on desert slopes. 8000-1500 m (2600-5000 ft) *Fraga & Fraga 199*.
- Tricardia watsonii* S. Watson Perennial herb. Uncommon on sandy desert slopes. 800-1220 m (2600-4000 ft) *Fraga, Boyd, Denlow & Gross 292*.

Lamiaceae

- Monardella odoratissima* Benth. subsp. *pallida* Epling Perennial herb. Occasional on shaded slopes in upper reaches of canyon. 1220-1500 m (4000-5000 ft) *Fraga & De Groot 925*.
- Salazaria mexicana* Torr. Small shrub. Common on bajadas and desert slopes. 1100-1500 m (3600-5000 ft) *Fraga & Fraga 91*.
- Salvia columbariae* Benth. Annual. Common on canyon floors and desert slopes. 800-1500 m (2600-5000 ft) *Fraga & Fraga 212*.
- Salvia dorrii* (Kellogg) Abrams var. *pilosa* (A. Gray) Strachan & Reveal Small shrub. Occasional on desert slopes and sandy canyon floor. 1200-1400 m (3800-4500 ft) *Fraga, Boyd, Denslow & Gross 369*.

Lennoaceae

- ‡*Pholisma arenarium* Hook. Parasitic perennial herb. Rare in open places in sandy soil and along road cuts. 1100-1400 m (3500-4500 ft) *Fraga & DeGroot 841*.

Loasaceae

- Mentzelia affinis* Greene Annual. Occasional in bajadas and desert slopes. 800-1500 m (2600-5000 ft) *Fraga & Denslow 478*.
- Mentzelia albicaulis* Hook. Annual. Common on bajadas and desert slopes. 800-1500 m (2600-5000 ft) *Fraga & Fraga 554*.
- Mentzelia obscura* H. J. Thompson & Joyce Roberts Annual. Occasional on bajadas and desert slopes. 800-1220 m (2600-4000 ft) *Fraga & Boyd 429*.
- Mentzelia veatchiana* Kellogg Annual. Occasional on bajadas and desert slopes. 8000-1220 m (2600-4000 ft) *Fraga, Boyd, Denslow & Gross 288*.
- Petalonyx thurberi* A. Gray subsp. *thurberi* Small shrub. Occasional in bajadas and sandy slopes. 8000-1100 m (2600-3500 ft) *Fraga & De Groot 846*.

Lythraceae

- Lythrum californicum* Torr. & A. Gray Perennial herb. Uncommon on banks above stream channels in moist soil. 1000-1200 m (3300-3800 ft) *Fraga & Tessel 146*.

Malvaceae

- Eremalche exilis* (A. Gray) E. Greene Annual. Rare; in fine sandy soil on the canyon bajadas. 915 m (3000 ft) *Fraga & Denslow 490*.
- Sphaeralcea ambigua* A. Gray var. *ambigua* Suffruticose perennial. Common on bajadas and desert slopes. 1200-1500 m (3600-5000 ft) *Fraga, Boyd, Denslow & Gross 374*.

Nyctaginaceae

- Abronia pogonantha* Heimerl Annual. Locally common on sand dunes and sandy slopes. 800-975 m (2800-3200 ft) *Fraga & Denslow 495*.
- Abronia villosa* S. Wats. var. *villosa* Annual. Locally common on sand dunes and sandy slopes. 900-975 m (2800-3200 ft) *Fraga & Denslow 503*.
- Mirabilis bigelovii* A. Gray var. *retrorsa* (A. A. Heller) Munz Perennial herb. Occasional from sandy canyon floor and desert slopes. 900-1500 m (2800-5000 ft) *Fraga, DeGroot & Porter 582*.
- Mirabilis californica* A. Gray Suffruticose perennial. Occasional from sandy canyon floor and desert slopes. 1100-1500 m (3500-5000 ft) *Fraga, Honer & Soza 734*.

Oleaceae

- ‡*Fraxinus velutina* Torr. Tree. Occasional in stream channels. 1100-1500 m (3600-5000 ft) *Fraga & Fraga 1102*.

Onagraceae

- Camissonia boothii* (Douglas) P. H. Raven subsp. *desertorum* (Munz) Raven Annual. Rare; from canyon bajadas. 800 m (2600 ft) *Luthy 323 CAS*.
- Camissonia campestris* (Greene) P. H. Raven subsp. *campestris* Annual. Common on bajadas and desert slopes. 800-1220 m (2600-4000 ft) *Fraga & Denslow 454*.
- Camissonia claviformis* (Torr. & Frém.) P. H. Raven subsp. *claviformis* Annual. Common on desert slopes and bajadas. 800-1500 m (2600-5000 ft) *Fraga & Fraga 211*.
- Camissonia kernensis* (Munz) P. H. Raven subsp. *gilmanii* (Munz) P. H. Raven Annual. Occasional on desert slopes and bajadas. 800-1500 m (2600-5000 ft) *Fraga & Fraga 184*.
- †*Camissonia kernensis* (Munz) P. H. Raven subsp. *kernensis* Annual. Occasional on desert slopes and bajadas. 850-1500 m (2800-5000 ft) *Fraga & Fraga 301*.
- Camissonia pallida* (Abrams) P. H. Raven subsp. *pallida* Annual. Common on bajadas and desert slopes. 800-1400 m (2600-4500 ft) *Fraga & Fraga 538*.
- Camissonia palmeri* (S. Watson) P. H. Raven Annual. Common on bajadas and desert slopes. 800-1220 m (2600-4000 ft) *Fraga & Denslow 469*.
- Clarkia xantiana* A. Gray subsp. *xantiana* Annual. Occasional from north facing slopes with coarse granitic soil. 1200-1500 m (3800-5000 ft) *Fraga & McGlaughlin 1175*.
- Epilobium canum* (Greene) P. H. Raven subsp. *canum* Suffruticose perennial. Occasional from desert slope, and near edges of stream channels. 1000-1220 m (3400-4000 ft) *Fraga, De Groot & Hobbs 993*.
- Epilobium canum* (Greene) P. H. Raven subsp. *latifolium* (Hook.) P. H. Raven Suffruticose perennial. Occasional from desert slopes. 1000-1500 m (3400-5000 ft) *Fraga, Buck, McAllister, Morgan & Virgen 951*.

Epilobium ciliatum Raf. subsp. *ciliatum* Perennial herb. Locally common in stream channels. 1100-1300 m (3500-4200 ft) *Fraga & Tessel 150*.

Oenothera californica S. Watson subsp. *californica* Perennial herb. Common on sand dunes and on sandy desert slopes. 915-1220 m (3000-4000 ft) *Fraga & Denslow 500*.

Orobanchaceae

Castilleja angustifolia (Nutt.) G. Don Parasitic perennial herb. Common on desert slopes. 915-1500 m (3000-5000 ft) *Fraga, Boyd, Denslow & Gross 279*.

†*Castilleja applegatei* Fern. subsp. *martinii* (Abrams) T. I. Chuang & Heckard Parasitic perennial herb. Occasional on mountain slopes. 1950-2100 m (6400-7000 ft) *Fraga & Anderson 1117*.

Castilleja linariifolia Benth. Parasitic perennial herb. Uncommon on desert slopes, near riparian areas. 1100-1200 m (3500-3800 ft) *Fraga & Tessel 142*.

‡*Orobanche fasciculata* Nutt. Parasitic perennial herb. Uncommon on desert and mountain slopes. 1220-2100 m (4000-7000 ft) *Fraga & Mills 1246*.

Papaveraceae

†*Canbya candida* C. Parry Annual. Uncommon on north slopes of course granite soils, in open habitats. 1200-1600 m (3800-5200 ft) *Fraga, Honer & Soza 721*.

Eschscholzia californica Cham. Perennial herb. Common on desert slopes. 915-1700 m (3000-5500 ft) *Fraga & Maurice 221*.

Eschscholzia glyptosperma E. Greene Annual. Occasional on desert slopes. 900-1300 m (2800-4000 ft) *Fraga & Fraga 213*.

Eschscholzia minutiflora S. Watson subsp. *covillei* (Greene) C. Clark Annual. Common on desert slopes and bajadas. 900-1500 m (2800-5000 ft) *Fraga & Denslow 516*.

Platystemon californicus Benth. Annual. Common on desert slopes and canyon floor. 1200-1500 m (3800-5000 ft) *Fraga, Boyd, Denslow & Gross 282*.

Polemoniaceae

Aliciella lottiae (A. Day) J. M. Porter Annual. Occasional on bajadas and desert slopes. 800-1200 m (2600-4000 ft) *Twisselman 7163 CAS*.

Aliciella sp. nov. Annual. Occasional on bajadas and desert slopes. 800-1100 m (2600-3500 ft) *Fraga & Denslow 526*.

Eriastrum densifolium (Benth.) H. Mason subsp. *elongatum* (Benth.) H. Mason Suffruticose perennial. Rare; from one historical collection in Short Canyon. *Vollmer s.n. 1 Jul 1953 DS*.

Eriastrum densifolium (Benth.) H. Mason subsp. *mohavense* (Craig) H. Mason Suffruticose perennial. Occasional on bajadas and desert slopes. 1200-1500 m (3800-5000 ft) *Fraga & Tessel 155*.

Eriastrum eremicum (Jeps.) H. Mason Annual. Occasional in open habitats, on desert slopes. 9000-1500 m (2800-5000 ft) *Twisselman 4541 CAS*.

Eriastrum pluriflorum (A. A. Heller) H. Mason Annual. Occasional in open habitats, especially along roadsides. 800-1220 m (2600-4000 ft) *Fraga & Soza 697*.

Gilia aliquanta A. D. Grant & V. E. Grant subsp. *aliquanta* Annual. Occasional on canyon slopes and bajadas. 850-1400 m (2800-4500 ft) *Fraga & Maurice 234*.

Gilia brecciarum M. E. Jones subsp. *neglecta* A. D. Grant & V. E. Grant Annual. Common on canyon floor and desert slopes. 850-1500 m (2800-5000 ft) *Fraga & Maurice 254*.

Gilia cana (M. E. Jones) A. A. Heller subsp. *speciosa* (Jeps.) A. D. Grant & V. E. Grant Annual. Occasional on desert slopes. 915-1500 m (3000-5000 ft) *Fraga, Gross & Navid-Ara 1082*.

Gilia leptantha Parish subsp. *purpusii* (Milliken) A. D. Grant & V. E. Grant Annual. Occasional on upper desert slopes. 1500-1500 m (5000-5000 ft) *Fraga & Mills 1249*.

Gilia malior A. G. Day & V. E. Grant Annual. Occasional on desert slopes and bajadas. 915-1220 m (3000-4000 ft) *Fraga, Gross & Navid-Ara 1056*.

Gilia ochroleuca M. E. Jones subsp. *ochroleuca* Annual. Common on desert slopes and bajadas. 800-1500 m (2600-5000 ft) *Fraga & Denslow 465*.

Gilia sinuata Benth. Annual. Common on desert slopes and bajadas. 800-1500 m (2600-5000 ft) *Fraga & Denslow 522*.

Linanthus aureus (Nutt.) Greene Annual. Occasional on desert slopes and bajadas. 800-1500 m (2600-5000 ft) *Fraga & Fraga 537*.

‡*Linanthus bigelovii* (A. Gray) Greene Annual. Occasional on desert slopes and bajadas. 800-1500 m (2600-5000 ft) *Fraga & Boyd 418*.

Linanthus dichotomus Benth. Annual. Common on desert slopes and bajadas. 800-1500 m (2600-5000 ft) *Fraga, Boyd, Denslow & Gross 307*.

Linanthus parryae (A. Gray) Greene Annual. Common on desert slopes and bajadas. 800-1220 m (2600-4000 ft) *Fraga & Denslow 471*.

Loeseliastrum matthewsii (A. Gray) Timbrook Annual. Common on desert slopes and bajadas. 850-1220 m (2800-4000 ft) *Fraga, Griffith & Walker 570*.

‡*Phlox gracilis* (Hook.) Greene Annual. Occasional on canyon floor and desert slopes. 1500-1500 m (4800-5000 ft) *Fraga, Anderson & Stolzenburg 1053*.

Polygonaceae

Centrostegia thurberi A. Gray ex Benth. in DC. Annual. Occasional on desert slopes and canyon floor. 915-1500 m (3000-5000 ft) *Fraga & Denslow 489*.

Chorizanthe brevicornu Torr. var. *brevicornu* Annual. Occasional on bajadas and canyon slopes. 800-1220 m (2600-4000 ft) *Fraga & Denslow 457*.

Chorizanthe watsonii Torr. & A. Gray Annual. Uncommon on bajadas and canyon slopes. 800-1500 m (2600-5000 ft) *Fraga & Denslow 459*.

Eriogonum ampullaceum J. T. Howell Annual. Uncommon on desert slopes. 915-1500 m (3000-5000 ft) *Fraga & Brock 1327*.

- Eriogonum baileyi* S. Watson Annual. Occasional on mountain slopes and bajadas. 915-1500 m (3000-5000 ft) *Fraga, De Groot & Hobbs 990*.
- Eriogonum brachyanthum* Coville Annual. Occasional on fine sandy soil of canyons in open habitats. 900-1400 m (2800-4500 ft) *Fraga, De Groot & Hobbs 1000*.
- Eriogonum deflexum* Torr. var. *baratum* (Elmer) Reveal Annual. Common on exposed mountain slopes, often growing along trails. 915-1500 m (3000-5000 ft) *Fraga & De Groot 940*.
- Eriogonum fasciculatum* Benth. var. *polifolium* (Benth. in A. DC.) Torr. & A. Gray Small shrub. Common on canyon floor, and slopes. 915-1500 m (3000-5000 ft) *Fraga & Fraga 119*.
- Eriogonum gracillimum* S. Watson Annual. Occasional on fine sandy soil on canyon slopes bajadas. 800-1220 m (2600-4000 ft) *Fraga & Denslow 488*.
- Eriogonum heermannii* Durand & Hilg. var. *heermannii* Small shrub. Occasional on desert slopes. 1000-1400 m (3300-4500 ft) *Fraga, Boyd, Denslow & Gross 379*.
- Eriogonum inflatum* Torr. & Frém. Perennial herb. Common on desert slopes and bajadas. 915-1500 m (3000-5000 ft) *Fraga & Fraga 102*.
- Eriogonum maculatum* A. A. Heller Annual. Occasional in open habitats on fine granite sand. 915-1500 m (3000-5000 ft) *Fraga, De Groot & Porter 629*.
- ‡*Eriogonum nidularium* Cov. Annual. Occasional in open habitats on fine granite sand. 915-1400 m (3000-4500 ft) *Fraga & McGlaughlin 1151*.
- Eriogonum nudum* Douglas ex Benth. var. *westonii* (S. Stokes) J. T. Howell Perennial herb. Common on desert slopes. 1000-1500 m (3500-5000 ft) *Fraga, Honer & Soza 731*.
- Eriogonum plumatella* Durand & Hilg. Small shrub. Occasional on bajadas and desert slopes. 915-1220 m (3000-4000 ft) *Fraga & Fraga 540*.
- Eriogonum pusillum* Torr. & A. Gray Annual. Common on fine sandy soil in open habitats. 915-1500 m (3000-5000 ft) *Fraga & Denslow 505*.
- Eriogonum reniforme* Torr. & Frém. Annual. Rare on canyon bajadas and desert slopes. 8000-1000 m (2600-3300 ft) *Luthey 324 CAS*.
- ‡*Eriogonum roseum* Durand & Hilg. Annual. Occasional on mountain slopes. 1600-1500 m (5500-5000 ft) *Fraga & De Groot 920*.
- ‡*Eriogonum saxatile* S. Watson Perennial herb. Occasional on rock outcroppings on mountain slopes. 1220-1500 m (4000-5000 ft) *Fraga & McGlaughlin 1161*.
- Eriogonum trichopes* Torr. Annual. Uncommon on bajadas and desert slopes. 915-1524 m (3000-5000 ft) *Fraga & Denslow 520*.
- Eriogonum wrightii* Benth. var. *subscaposum* S. Watson Small shrub. Common on open pinyon woodland and sagebrush scrub on mountain slopes. 1100-1500 m (3600-5000 ft) *Fraga & Brock 1343*.
- ‡*Pterostegia drymarioides* Fisch. & C.A. May Annual. Uncommon in shaded areas in moist crevices. 1100-1500 m (3600-5000 ft) *Kempton, De Groot & Fraga 251*.

Portulacaceae

- Calandrinia ciliata* (Ruiz & Pav.) DC. Annual. Uncommon on canyon floor and shaded north slopes. 1400-1500 m (4500-5000 ft) *Fraga & Maurice 252*.
- Calyptidium monandrum* Nutt. in Torr. & A. Gray Annual. Occasional on desert slopes and bajadas. 915-1500 m (3000-5000 ft) *Fraga & Denslow 491*.
- Claytonia parviflora* Douglas ex Hook. subsp. *parviflora* Annual. Occasional from north slopes in moist areas under rock crevices. 915-1500 m (3000-5000 ft) *Fraga Boyd, Denslow & Gross 322*.
- Claytonia parviflora* Douglas ex Hook. subsp. *viridis* (Davidson) John M. Miller & Chambers Annual. Uncommon from north slopes in moist areas under rock crevices. 915-1220 m (3000-4000 ft) *Fraga, Boyd, Denslow & Gross 333*.
- ‡*Claytonia perfoliata* D. Donn ex Willd. subsp. *perfoliata* Annual. Occasional from north slopes in moist areas under rock crevices. 1220-1500 m (4000-5000 ft) *Fraga & Griffith 1142*.

Ranunculaceae

- Delphinium hansenii* (E. Greene) E. Greene subsp. *kernense* (Davidson) Ewan Geophyte. Uncommon in shade of mixed coniferous forest on steep mountain slopes. 2200-2400 m (7000-7800 ft) *Fraga & Griffith 1226*.
- Delphinium parishii* A. Gray subsp. *parishii* Geophyte. Common in canyons and desert slopes. 915-1500 m (3000-5000 ft) *Fraga & Denslow 504*.

Rhamnaceae

- ‡*Ceanothus greggii* A. Gray var. *vestitus* (Greene) McMinn Large shrub. Occasional in open pinyon woodland in the upper reaches of canyons and mountain slopes. 1000-1500 m (3400-5000 ft) *Fraga & Mills 1244*.
- Rhamnus tomentella* Benth. subsp. *cuspidata* (Greene) J. O. Sawyer Large shrub. Occasional at the upper reaches of canyons. 1220-1500 m (4000-5000 ft) *Fraga & Maurice 174*.

Rosaceae

- Cercocarpus ledifolius* Nutt. var. *ledifolius* Large shrub. Occasional on open mountain slopes. 1500-1740 m (5000-5700 ft) *Fraga & Anderson 1005*.
- Coleogyne ramosissima* Torr. Small shrub. Common on desert slopes. 1100-1400 m (3500-5000 ft) *Fraga, Boyd, Denslow & Gross 331*.
- Prunus andersonii* A. Gray Large shrub. Occasional on desert slopes and in the shade of pinyon woodland. 1100-1500 m (3500-5000 ft) *Fraga, Griffith & Walker 572*.

Purshia tridentata (Pursh) DC. var. *glandulosa* (Curran) M. E. Jones Large shrub. Occasional at the upper reaches of canyons and on mountain slopes in pinyon-oak woodland. 1200-1740 m (3800-5700 ft) *Fraga & DeGroot 929*.

Rubiaceae

‡*Galium hallii* Munz & I. M. Johnst. Small shrub. Occasional on mountain slopes in pinyon-oak woodland and mixed coniferous forest. 1700-2300 m (5600-7500 ft) *Fraga & Anderson 1261*.

Galium matthewsii A. Gray Perennial herb. Occasional on desert slopes. 915-1500 m (3000-5000 ft) *Fraga & Fraga 1106*.

Salicaceae

‡*Populus fremontii* S. Watson subsp. *fremontii* Tree. Occasional in riparian areas. 915-1500 m (3000-5000 ft) *Fraga & Mills 1210*.

Salix lasiolepis Benth. Large shrub. Common in riparian scrub. 980-1500 m (3200-5000 ft) *Fraga & Mills 1204*.

Saururaceae

Anemopsis californica (Nutt.) Hook. & Arn. Perennial herb. Uncommon on moist banks above riparian area. 1000-1220 m (3300-4000 ft) *Fraga & Fraga 121*.

Scrophulariaceae

Antirrhinum kingii S. Watson Annual. Uncommon from desert slopes and near the base of large granitic outcrop. 915-1220 m (3000-4000 ft) *O'Brien & Thibault s.n. 18 Apr 2003*.

‡*Collinsia callosa* Parish Annual. Occasional on desert and mountain slopes or exposed ridgelines. 1500 m (5000 ft) *Fraga, De Groot & Porter 655*.

‡*Keckiella breviflora* (Lindl.) Straw var. *breviflora* Small shrub. Occasional on open mountain slopes and upper reaches of canyons. 1220-5000 m (4000-5000 ft) *Fraga, Honer & Soza 747*.

Mimulus androsaceus Greene Annual. Uncommon on gravelly flats that obtain moisture from springs. 1160-1220 m (3800-4000 ft) *Fraga, Boyd, Denslow & Gross 339*.

Mimulus aurantiacus Curtis var. *pubescens* (Torr.) D. M. Thompson Small shrub. Common, growing from crevices in large granite boulders. 975-1500 m (3200-5000 ft) *Fraga & Fraga 110*.

Mimulus cardinalis Benth. Perennial herb. Uncommon in riparian areas. 975-1220 m (3200-4000 ft) *Fraga & Maurice 162*.

‡*Mimulus floribundus* Douglas ex Lindl. Annual. Uncommon in moist drainages. 1710 m (5600 ft) *Fraga, Anderson, Gross & Kempton 1637*.

Mimulus fremontii (Benth.) A. Gray Annual. Uncommon on bajadas and open mountain slopes. 915-1500 m (3000-5000 ft) *Fraga & Denslow 484*.

Mimulus guttatus DC. Annual or perennial herb. Occasional in moist soil of riparian areas. 1100-1500 m (3500-5000 ft) *Fraga & Tessel 147*.

‡*Mimulus pilosus* (Benth.) S. Watson Annual. Locally common in moist drainages. 1710 m (5600 ft) *Fraga, Anderson, Gross & Kempton 1636*

‡*Penstemon incertus* Brandegee Small shrub. Occasional on desert slopes and canyon floor. 1000-1500 m (3400-5000 ft) *Fraga 1202*.

Solanaceae

‡*Datura wrightii* Regel Perennial herb. Uncommon in disturbed areas, especially roadside. 800-1220 m (2600-4000 ft) *Fraga & Maurice 157*.

Lycium andersonii A. Gray Small shrub. Common on desert slopes and canyon floor. 850-1220 m (2800-4000 ft) *Fraga & Denslow 473*

Lycium cooperi A. Gray Small shrub. Occasional on desert slopes and canyon floor. 1100-1500 m (3600-5000 ft) *Fraga & Fraga 1109*

‡*Nicotiana attenuata* Torr. Annual. Uncommon on desert slopes and canyon floor. 1400-1500 m (4500-5000 ft) *Fraga & DeGroot 636*.

Urticaceae

Urtica dioica L. subsp. *holosericea* (Nutt.) Thorne Perennial herb. Uncommon at the edge of riparian areas. 1100-1220 m (3500-4000 ft) *Fraga, Buck, McAllister, Morgan & Virgen 955*.

Verbenaceae

Verbena lasiostachys Link subsp. *lasiostachys* Perennial herb. Rare; from one historical collection in Short Canyon. *Henry s.n. 4 Jul 1991*.

Viscaceae

Arceuthobium occidentale Engelm. Parasitic perennial herb. Occasional at the upper reaches of canyons commonly growing on *Pinus sabiniana*. 1000-1700 m (3400-5500 ft) *Fraga, Honer & Soza 702*.

Phoradendron villosum (Nutt. in Torr. & A. Gray) Nutt. Parasitic perennial herb. Occasional on *Quercus chrysolepis* at the upper reaches of canyons. 1220-1500 m (4000-5000 ft) *Fraga & Boyd 388*.

Vitaceae

Vitis girdiana Munson Liana. Common, in riparian areas commonly growing on other shrubs. 1100-1500 m (3500-5000 ft) *Fraga & Fraga 106*

Zygophyllaceae

Larrea tridentata (Sessé & Moc. ex DC.) Coville Large shrub. Common on bajadas in sandy soil. 800-1200 m (2600-3800 ft) *Fraga & Denslow 480*.
 **Tribulus terrestris* L. Annual. Locally common along disturbed roadsides near highways. 792 m (2600 ft) *Fraga, Brock, Fisher & Oberlin 1659*.

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Agavaceae

Nolina parryi S. Wats. Succulent shrub. Occasional on desert slopes and upper reaches of the canyon. 1100-1500 m (3600-5000 ft) *Fraga & Fraga 103*.
Yucca brevifolia Engelm. Tree. Common on canyon floor, northern desert slopes and upper reaches of the canyon. 1100-1500 m (3500-5000 ft) *Fraga, DeGroot & Porter 619*.

Cyperaceae

Carex alma L. H. Bailey Perennial herb. Uncommon in riparian areas, more commonly at the upper reaches of the canyon. 975-1500 m (3200-5000 ft) *Fraga & Gross 970*.
 ‡*Eleocharis parishii* Britton Perennial herb. Occasional on moist edges of riparian areas. 1100-1500 m (3600-5000 ft) *Fraga & Soza 788*.

Juncaceae

Juncus balticus Willd. Perennial herb. Occasional on edges of riparian areas, often on banks above stream channels. 1100-1500 m (3500-5000 ft) *Fraga & Tessel 123*.
Juncus rugulosus Engelm. Perennial herb. Uncommon on edges of riparian areas, in moist soil. 1100-1500 m (3500-5000 ft) *Fraga & Tessel 143*.
Juncus xiphioides E. Meyer Perennial herb. Occasional in moist soil of riparian areas. 1100-1400 m (3500-4500 ft) *Fraga & Tessel 144*.

Lemnaceae

Lemna gibba L. Aquatic annual. Uncommon in standing water of stream channels. 1100-1400 m (3500-4500 ft) *Fraga & Anderson 1024*.

Liliaceae

‡*Allium fimbriatum* S. Watson var. *mohavense* Jeps. Geophyte. From bajadas on sandy soil documented near SR 14. 800 m (2600 ft) *McNeal 3048*.
Allium lacunosum S. Watson var. *davisiae* (M. E. Jones) McNeal & Ownbey Geophyte. Occasional on floor of canyons in gravelly soil. 1100-1220 m (3600-4000 ft) *Fraga, Griffith & Walker 562*.
Dichelostemma capitatum (Benth.) Keator var. *pauciflorum* (Torr.) Keator Geophyte. Occasional on mountain and desert slopes and canyon floor. 1200-1500 m (3800-5000 ft) *Fraga & Fraga 197*.
 †*Muilla coronata* E. Greene Geophyte. Uncommon on sandy bajadas and sandy desert slopes. 800-1220 m (2600-4000 ft) *Fraga & Boyd 415*.

Poaceae

Achnatherum hymenoides (Roem. & J. A. Schultes) Barkworth Perennial herb. Common on sandy bajadas, and occasional on exposed ridges and the upper reaches of canyons. 850-1500 m (2800-5000 ft) *Fraga & Denslow 497*.
Achnatherum speciosum (Trin. & Rupr.) M. E. Barkworth Perennial herb. Common on canyon floor, and desert slopes. 1100-1500 m (3500-5000 ft) *Fraga & Fraga 542*.
 **Bromus diandrus* Roth Annual. Occasional in disturbed moist sites, often adjacent to roads. 800-1400 m (2600-4500 ft) *Fraga & Soza 787*.
 **Bromus rubens* L. Annual. Common on desert slopes and canyon floor. 800-1500 m (2600-5000 ft) *Fraga & Fraga 113*.
 **Bromus tectorum* L. Annual. Common on canyon floor, desert slopes. Most abundant in open habitats on slopes. 1100-1500 m (3600-5000 ft) *Fraga & Maurice 217*.
Bromus trinitii Desv. Annual. Uncommon on desert slopes, often growing from between rock crevices. 1100-1400 m (3500-4500 ft) *Fraga, Griffith & Walker 564*.
Distichlis spicata (L.) Greene Perennial herb. Occasional on alkaline flats near stream channels. 1100-1500 m (3500-5000 ft) *Fraga & Fraga 124*.
Elymus elymoides (Raf.) Swezey subsp. *californicus* (J. G. Smith) Barkworth Perennial herb. Common throughout the study area in open habitats on desert and mountain slopes. 918-1500 m (3000-5000 ft) *Fraga & Fraga 58*.
 *‡*Hordeum murinum* L. subsp. *glaucum* (Steud.) Tzvelev Annual. Uncommon, near stream channels with moist soil. 1220-1400 m (4000-4500 ft) *Fraga & Mills 1213*.
Leptochloa filiformis (Lam.) Beauv. Perennial herb. Rare; from one collection in a cement crack at Brady's Gas Station. 792 m (2600 ft) *Fraga, Brock, Fisher & Oberlin 1659*.
Melica imperfecta Trin. Perennial herb. Occasional on mountain and desert slopes, often in shaded areas. 1100-5000 m (3500-5000 ft) *Fraga & Griffith 1114*.
Muhlenbergia asperifolia (Nees & Meyen) Parodi Perennial herb. Occasional on alkaline flats near stream channels. 1100-1220 m (3500-4000 ft) *Fraga & Tessel 153*.

- Muhlenbergia rigens* (Benth.) Hitchc. Perennial herb. Common on edges of stream channels and moist areas fed by springs. 1000-1400 m (3200-4500 ft) *Fraga & Maurice 163*.
- Phragmites australis* (Cav.) Steud. Perennial herb. Uncommon, near the stream edge. 1100-1200 m (3500-3800 ft) *Fraga, Buck, McAllister, Morgan & Virgen 950*.
- Poa secunda* J. Presl subsp. *secunda* Perennial herb. Common throughout the site, on desert slopes and bajadas. 1100-1500 m (3500-5000 ft) *Fraga & Denslow 177*.
- **Polygonum monspeliensis* (L.) Desf. Annual. Common, in moist soil of riparian areas. 975-10660 m (3200-3500 ft) *Fraga & Denslow 177*.
- *†*Schismus arabicus* Nees Annual. Uncommon on bajadas and desert slopes in sandy areas. 850-1220 m (2800-4000 ft) *Fraga & Fraga 114*.
- **Schismus barbatus* (L.) Thell. Annual. Common on desert slopes and bajadas, most abundant in Creosote Bush Scrub. 800-1220 m (2600-4200 ft) *Fraga & Fraga 205*.
- Sporobolus flexuosus* (Vasey) Rydb. Perennial herb. Uncommon on desert slopes and sandy flats above stream channels. 1100-1160 m (3500-3800 ft) *Fraga & Maurice 167*.
- Vulpia microstachys* (Nutt.) Munro in Benth var. *microstachys*. Annual. Uncommon in open habitats on desert slopes and canyon floor. 915-1520 m (3000-5000 ft) *Fraga, Gross & Navid-Ara 1069*.
- Vulpia microstachys* (Nutt.) Munro in Benth. var. *pauciflora* (Beal) Lonard & Gould Annual. Uncommon, from desert slopes. 1190 m (3900 ft) *Fraga, Boyd, Denslow & Gross 285b*.
- Vulpia octoflora* (Walter) Rydb. Annual. Occasional in open habitats on canyon floor, desert slopes and bajadas. 915-1380 m (3000-4500 ft) *Fraga, Anderson & Stolzenburg 1025*.

Typhaceae

- Typha domingensis* Pers. Perennial herb. Uncommon, near stream channels and spring fed areas. 1100-1220 m (3500-4000 ft) *Fraga & Brock 1342*.

APPENDIX – UNVOUCHERED TAXA

Those taxa which are believed to be misidentified are marked by an equal sign (=) with the appropriate identification following.

Apocynaceae

- Amsonia tomentosa* Torr. & Frém. Perennial herb.
Apocynum cannabinum L. Perennial herb

Asteraceae

- Aster lanceolatus* Willd. ssp. *hesperius* (A. Gray) Semple & J. Chmielewski Perennial herb.
Chrysothamnus paniculatus (A. Gray) H. M. Hall Small shrub
Cirsium occidentale (Nutt.) Jeps. var. *californicum* (A. Gray) D. J. Keil & C. Turner
 Biennial herb = *Cirsium occidentale* var. *venustum*
Deinandra kelloggii. Greene Annual = *Deinandra mohavensis*
Euthamia occidentalis Nutt. Perennial herb
 **Gnaphalium palustre* Nutt. Annual
Solidago spectabilis (D. Eaton) A. Gray Perennial herb = *Solidago confinis*
Stylocline micropoides A. Gray Annual

Boraginaceae

- Cryptantha oxygona* (A. Gray) Greene Annual

Brassicaceae

- Lepidium flavum* Torr. var. *flavum* Annual

Campanulaceae

- Nemacladus gracilis* Eastw. Annual = *Nemacladus sigmoideus*
Nemacladus interior (Munz) G. Robb. Annual
Nemacladus secundiflorus G. Robb. Annual

Caryophyllaceae

- Arenaria macradenia* S. Watson var. *ferrisiae* Maguire Tufted perennial = *Arenaria macradenia* S. Watson var. *arcuifolia*
 **Spergula arvensis* L. ssp. *arvensis* Annual

Crassulaceae

Dudleya calcicola Bartel & Shevock Succulent perennial herb = *Dudleya saxosa* subsp. *alioides*

Euphorbiaceae

Chamaesyce micromeria (Engelm.) Wooton & Standley Annual
Chamaesyce polycarpa (Benth.) Millsp. Perennial herb

Fabaceae

Trifolium gracilentum Torr. & A. Gray Annual

Hydrophyllaceae

Phacelia novemmillensis Munz Annual = *Phacelia curvipes* or *Phacelia humilis* Torr. ex Gray var. *dudleyi* J.T. Howell

Molluginaceae

**Mollugo verticillata* L. Annual

Nyctaginaceae

Mirabilis bigelovii A. Gray var. *bigelovii* Perennial herb = *Mirabilis bigelovii* var. *retrorsa*

Plantaginaceae

**Plantago major* L. Perennial herb

Polemoniaceae

Gilia latiflora (A. Gray) A. Gray ssp. *davyi* (Milliken) A. D. Grant & V. E. Grant Annual
Gilia tricolor Benth. Annual

Polygonaceae

Eriogonum nudum Douglas ex Benth. var. *pubiflorum* Benth. Perennial herb = *Eriogonum nudum*. var. *westonii*
Oxytheca perfoliata Torr. & A. Gray Annual

Ranunculaceae

Ranunculus cymbalaria Pursh ssp. *saximontanus* (Fernald) Thorne Perennial
Thalictrum indet. Perennial herb

Rubiaceae

Galium munzii Hilend & J. Howell Perennial herb = *Galium mathewsii*
Galium stellatum Kellogg var. *eremicum* Hilend & J. Howell Small shrub

Salicaceae

Salix exigua Nutt. Large shrub
Salix lucida Muhlenb. ssp. *lasiandra* (Benth.) E. Murray Tree = *Salix laevigata*

Scrophulariaceae

Mimulus palmeri A. Gray Annual
Mimulus rubellus A. Gray Annual

Solanaceae

Solanum americanum Mill. Annual or perennial herb
Solanum sarrachoides Sendtner ex Martius Annual

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**Avena fatua* L. Annual
Bromus arizonicus (Shear) Stebbins Annual
 **Vulpia myuros* (L.) C. C. Gmel. var. *hirsuta* (Hackel) Asch. & Graebn. Annual = *Vulpia microstachys* (Nutt.) Munro in Benth. var. *pauciflora*

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NOTEWORTHY COLLECTIONS

Lichens and Lichenicolous Fungi

LICHENOCHORA VERRUCICOLA (Wedd.) Nik. Hoffm. & Hafellner.

1st collection. Santa Barbara County: Los Padres National Forest, Figueroa Mountain, Davy Brown Trailhead on Road 7N07. USGS 7.5' Figueroa Mountain Quadrangle. 34° 43' 47"N, 119° 58' 14"W; elevation ~1292 m. *Quercus douglasii* and *Pinus coulteri*-dominated woodland. On *Aspicilia* species. Shirley Tucker # 35933 (SBBG), Det. by K. Knudsen.

2nd collection. San Diego County: Anza Borrego State Park, Pena Spring. USGS 7.5' Tub Canyon Quadrangle. 33° 13' 29"N, 116° 27' 41"W; elevation 1035 m. Scattered chaparral. On *Aspicilia* species. Knudsen # 3682 (UCR, hb. Etayo) Det. by Javier Etayo.

3rd collection. San Diego County: Palomar Mountain State Park, Palomar Mountain, below Nat Harrison Grade, Adams Trail. USGS 7.5' Boucher Peak Quadrangle. 33° 20' 41"N, 116° 55' 14"W; elev. 1,475 m. On *Aspicilia* species. Knudsen # 2934.2 & Mary Knudsen (UCR) Det. By K. Knudsen.

Previous knowledge. Lichenicolous fungi have long relations with host species and may be useful as ecological indicators when their taxonomy and ecology is better understood. They generally occur in habitats that have been undisturbed for long periods. *Lichenochora verrucicola* is a lichenicolous fungus restricted to species of the crustose genus *Aspicilia*. It is known only in North America from South Dakota and a single site in northern Arizona (J. Hafellner & P. Navarro-Rosinès. 2004. "Lichenochora" In Nash *et al.*, Lichen Flora of the Greater Sonoran Region, Vol. 2, p. 756-759). It has also been collected in France and Spain.

Significance. In California *L. verrucicola* occurs on an *Aspicilia* species that appears to be the undescribed taxon which Bjorn Owe-Larsson will describe as *Aspicilia cuprea* (Owe-Larsson, *pers comm.*) *L. verrucicola* forms dark galls and seems to have a pathogenic effect on its host. The *Aspicilia* when heavily infested produces a reddish powder that looks like iron ore dust and sometimes stains the areoles of the host. It is probably not rare in California but under-collected. Though the large spores of *L. verrucicola* are described as colorless, an outer perispore is often present which is a light brownish hue.

RINODINA ZWACKHIANA (Kremp.) Korb. San Bernardino County: San Bernardino Mountains, north side of Sugarlump. USGS 7.5' Moonridge Quadrangle. 34° 12' 37"N, 116° 51' 11"W; elevation 8499 m. Dolomite outcrops among *Abies concolor*. Underneath a dolomite ledge growing among small stalactites. Knudsen #1607 & Chris L. Wagner (UCR, hb. Lendemmer). Det. by J.W. Sheard.