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TAXONOMY OF THE *PYRROCOMA SESSILIFLORA* GROUP (ASTERACEAE:ASTEREAE)

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ABSTRACT

Pyrrocoma sessiliflora Greene grows in desert habitats of southern Nevada and southeastern California (mostly Inyo County). *Pyrrocoma microdonta* Greene in the Tecopa area of southern Inyo County is provisionally considered as distinct though similar to *P. sessiliflora*. *Pyrrocoma ciliolata* Greene has diagnostic similarities with *P. sessiliflora* but occurs mostly in Kern County, with close outliers in Los Angeles and Ventura counties. The three taxa are referred to here as the *P. sessiliflora* group — each is illustrated and mapped in detail.

Pyrrocoma sessiliflora Greene and *P. ciliolata* Greene are similar species of desert habitats in southern Nevada and California. *Pyrrocoma sessiliflora* has usually been identified at varietal rank, as *P. racemosa* var. *sessiliflora*. *Pyrrocoma ciliolata* has been essentially incognito, sometimes within the concept of *P. racemosa* var. *paniculata*, but *P. sessiliflora* and *P. ciliolata* are allopatric and distinct in morphology, justifying separate recognition. *Pyrrocoma microdonta* Greene has not been recognized past its original description, instead often considered by collectors among plants of *P. sessiliflora*.

The type of *Pyrrocoma microdonta* is from the Tecopa area of southeastern Inyo County (at the southern extremity of the range of *P. sessiliflora*, Map 1), where other narrow endemics are known (e.g., Fraga 2023), and though its distinction remains ambiguous, its possible existence deserves to be recognized toward further study.

Involucral bracts of the *Pyrrocoma sessiliflora* group are gland-dotted and have an apiculate apex, features that indicate a close relationship with the "eriopoda group" of 7 other species of Utah, Nevada, and California (Nesom 2025b). The *sessiliflora* group is distinct among those other species in a spicate or racemoid inflorescence and phyllaries with a relatively small and abruptly delimited green patch. *Pyrrocoma sessiliflora* is partially sympatric with *P. eriopoda*, *P. ciliolata* with the narrowly endemic *P. isabellae*, but identifications can be made with confidence, except for the problem of *P. microdonta* (comments below).

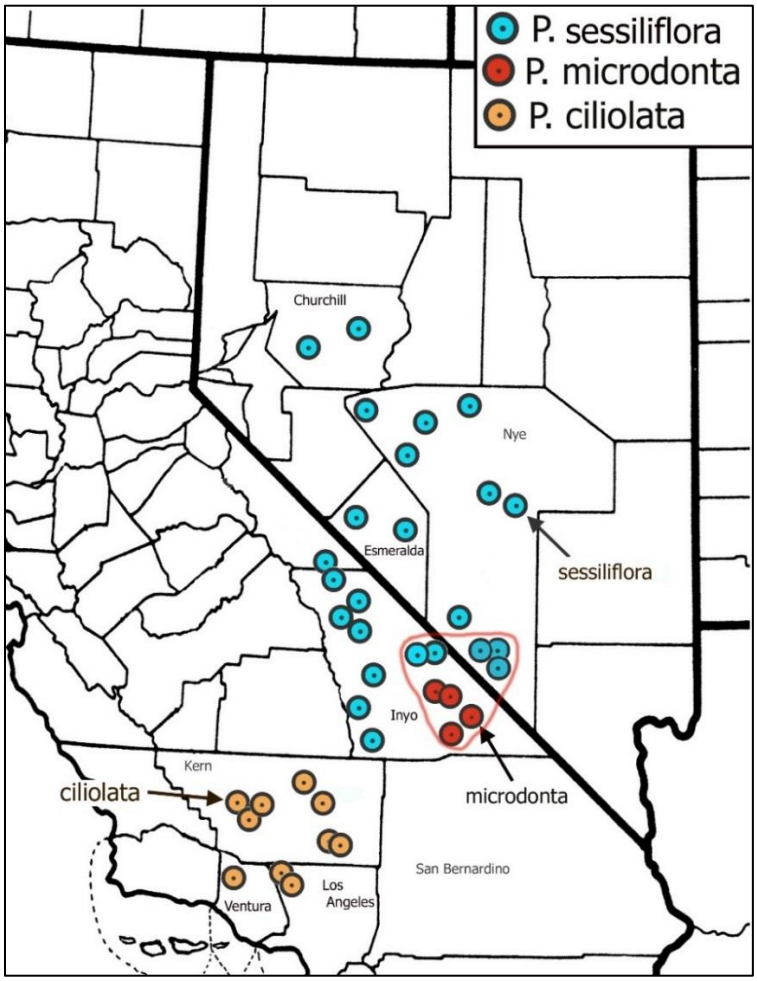
1. PYRROCOMA SESSILIFLORA Greene, Leafl. Bot. Observ. Crit. 2: 11. 1909. *Haplopappus racemosus* subsp. *sessiliflorus* (Greene) Hall, Publ. Carnegie Inst. Wash. 389: 136. 1928. *Haplopappus racemosus* var. *sessiliflorus* (Greene) Welsh, Great Basin Naturalist 43: 294. 1983. *Pyrrocoma racemosa* var. *sessiliflora* (Greene) Mayes ex Brown & Keil, Phytologia. 73: 58. 1992. **TYPE**: **Nevada**. [Nye Co.]: Twin Springs, *C.A. Purpus 6340* (holotype: US; isotypes: DOV, NY, PH).

The collection probably was made along the Amargosa River near Beatty in last week of May 1898, as inferred from published field notes of Purpus, translated by Barbara Ertter (Ertter/Purpus 1898).

Stems 20–65 cm, erect to decumbent-ascending (populational variability?), glabrous, glaucous, eglandular. **Leaves:** basal 5–21 cm, linear-oblanceolate, blades 4–15(–21) mm wide, succulent, margins remotely and obscurely denticulate, sometimes short-ciliate proximally, glabrous, glaucous, eglandular, cauline narrowly lanceolate to narrowly oblanceolate, proximal subclasping-sheathing. **Heads** sessile or nearly so, crowded in glomerate-spiciform arrays, less commonly short-pedunculate (especially on damaged stems). **Involucres** 5–8 mm wide (pressed), subcylindric; phyllaries in 4–5

series of unequal length (strongly graduate), oblong with an abruptly deltate apex, inner 5–7 mm long, green patch in distal 1/3–1/4, imbedded-glandular, apices spreading to recurving, proximal margins (below the green patch) with a white-scarious flange. **Ray florets** (8–)9–13, fertile, corollas 7–10 mm long, 1–1.5 mm wide, coiling. **Disc corollas** 5 mm long. **Achenes** 2 mm long, sericeous-strigose with fine hairs. **Chromosome number**, 2*n* = 12 (*Mayes 78*, *79*, *80*; *Semple 8669*; *Sundberg 1537*). Figures 1-9.

Flowering (May) Jul–Oct. Alkaline flats, saline meadows and marshes, clay meadows, lake edges, pastures, roadside flats; (-50, 400–) 2200-5000 (-5500) ft; Calif., Nev.



Map 1. Distribution of *Pyrrocoma sessiliflora*, *P. microdonta*, and *P. ciliolata*. Localities of type collections are indicated. The identity and geography of *P. microdonta* remain to be securely established (see Map 4).

In northwestern Nye Co, there is a tendency for heads to be clustered distally as a capitate inflorescence. In *Tiehm 9254* (e.g., Fig 5), which comprises at least 10 individuals, this is a consistent feature. Otherwise, a spicate inflorescence is diagnostic of the species — in instances where peduncles have elongated, it seems to be populational variability.

Additional collections. **California**. Inyo Co. (**representative**): N edge of Little Lake, 3140 ft, 11 Aug 1966, *Bacigalupi &.Heckard 9210* (JEPS); Owens Valley, along road to Aqueduct Intake, W of Owens River, 3840 ft, 30 Aug 1969, *DeDecker 2370* (CAS); between Independence and Big Pine, pasture lands, 30 Aug 1926, *Ferris 6609* (CAS, RSA); several km N of Lone Pine (just S of L.A. Aqueduct, on Hwy 395), wet grassy flat beside road, 27 Aug 1986, *Semple 8669*, voucher for chromosome count of n=6 (UC); Owens Valley, 3 mi E of Black Rock Spring, 3800 ft, 8 Aug 1977, *Taylor 6786* (JEPS); Earthquake Memorial, 0.5

mi N of Lone Pine, 3950 ft, moist place on a low sand hill, alkali sink association., 16 Sep 1959, *Twisselmann 5838* (CAS-2, DAV, JEPS); Little Lake (north village limits on the old hwy), 3400 ft, moist alkaline soil, creosote bush association, common, 21 Aug 1964, *Twisselmann 10066* (CAS-2, JEPS, RSA). Mono Co.: Fish Slough ACEC, ca. 7.3 air mi N of Bishop, BLM Spring, near orifice, S of Fish Slough Road 3V01, 37.48056 N, 118.40334 W, edge of *Phragmites-Apocynum* marsh in broad valley, 4166 ft, next to water, scattered with *Juncus balticus*, 17 Oct 2018, *De Groot 10031* (RSA, SD); Fish Slough, 5.9 mi N of Jean Blanc Road (on Fish Slough Road to dirt road heading E), 37.491665 N, 118.38333 W, deep alkali, breeding pond area, 5 meters S of edge of pond, 4180-4400 ft, 22 Oct 1983, *Forbes & Haller FS175* (UC, UCSB).

Inyo Co. (**Death Valley area**, with some plants tending toward *P. microdonta*): Funeral Mts, springs above Natl Park Service Headquarters, 36.500574 N, 116.86645 W, hillside, silty loam, with *Tessaria sericea*, *Distichlis spicata*, *Sporobolus airoides*, basal lvs to 20 cm long, infrequent, 11 Oct 1982, *Annable 98* (UNLV); Grapevine Mountains, NW section of Grapevine Springs, Ubehebe Crater, 37.03644 N, 117.39658 W, hills with many springs, infrequent/scattered along small streamlet/spring, 2606 ft, with *Prosopis glandulosa*, *Arundo donax*, *Vitis girdiana*, *Solidago confinis*, *Anemopsis californica*, *Arida carnosa*, *Pluchea sericea*, *Distichlis spicata*, *Epilobium* sp., *Eleocharis*, *Epipactis gigantea*, *Fimbristylis thermalis*, and *Sisyrinchium funereum*, 12 Oct 2016, *Bell 10191* (RSA); Death Valley, Cow Creek, 24 Oct 1933, Gilman 1001 (RSA); Death Valley, "Cow Creek," [large basal leaves], 6 Sep 1936, *Kerr s.n.* (CAS, SBBG); below Nevares Springs, 36.51205 N, 116.82123 W, moist alkaline seepage on slope, precociously spring-flowering and with elongate lateral branches presmably induced ecologically, 30 Mar 1956, *Sharsmith 6336* (SJSU); Grapevine Mountains, Grapevine Springs, 37.035 N, 117.3875 W, moist, W-facing, alkaline slope at the edges of the west portions of the springs, 2838 ft, with *Baccharis sergiloides*, *Centarium* sp., *Cladium californicum*, *Distichlis spicata*, *Ericameria albida*, *Fimbristylis thermalis*, *Helianthus nuttallii* subsp. *nuttallii*, *Muhlenbergia asperifolia*, *Schoenus nigricans*, *Sisyrinchium funereum*, *Solidago confinis*, and *Sporobolis airoides*, 5 Oct 2003, *York 2843* (CAS).

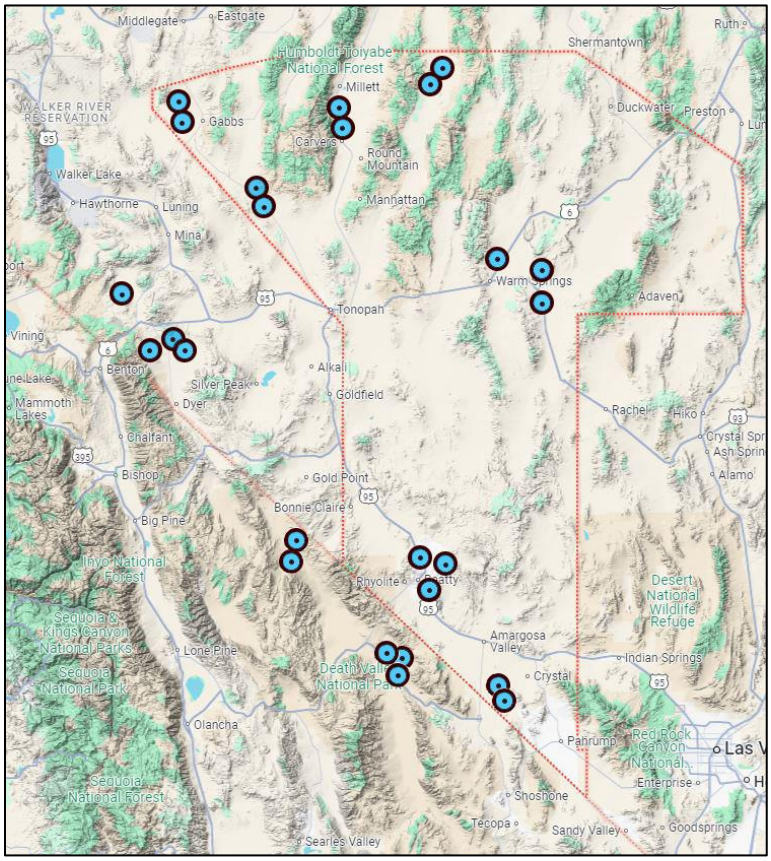
Nevada. Churchill Co.: Salt Wells Basin, Eightmile Flat, 2.3 mi S of Salt Wells (Hwy 50), 3937 ft, 3 Sep 1994, *Holmgren 12170* (BRY, NY); Salt Wells Basin, 2.3 road mi S of Salt Wells, 3980 ft, adjacent to *Phragmites* stand, *Distichlis*, *Nitrophila*, 28 Aug 1981, *Pinzl 4555* (UNLV); W margin of Salt Wells Basin, ca 3.2 km S of Hwy 50 from Salt Wells jct, 39.352 N, 118.579 W, salt marsh, dry in summer, 3900 ft, very dense vegetation relative to surrounding desert, with *Phragmites australis*, *Nitrophila occidentalis*, *Cressa truxillensis*, *Distichlis spicata*, 3 Aug 2004, *Seeds of Success NV030-027* (RENO). Esmeralda Co.: NE branch of Fish Lake Valley, near Gap Spring, 5000 ft, 25 Sep 1938, *Archer 7241* (NY, RENO); Fish Lake Valley, Aug 1969, *Batchelder s.n.* (LSU); Fishlake Valley drainage, 2.1 mi S 75° E of Pinyon Hill summit, marsh of Sand Spring, 37.9182 N, 118.2099 W, 5510 ft, wet slightly brackish sod sloping 5° ENE in marsh, with *Carex*, *Juncus*, *Lotus*, *Rorippa*, *Mimulus*, *Polygonum*, *Artemisia*, *Chrysothamnus*, and *Sarcobatus*, locally frequent, 7 Aug 1984, *Morefield 2487* (ASC, NY, RENO); Gap Springs meadow, N of Fish Lake Valley, 37.98 N, 118 W, 4630 ft, alkaline, damp, 30 Jul 1984, *Pinzl 6316* (UNLV); Silver Peak Range, edge of Fish Lake Salt Marsh, 37.8908 N, 117.9343 W, 4707 ft, transition from clay soils with salt crust to a dusty alkali flat with salt grass, with *Distichlis spicata*, *Cirsium mohavense*, *Juncus balticus*, 2 Sep 2022, *Pipkin 1802* (RENO, RSA); Silver Peak Range, Gap Springs, 37.975 N, 117.9901 W, 4654 ft, S side of the chalky white hill, alongside flowering water, in tall rushes, with *Juncus cooperi*, *Typha domingensis*, *Triglochin maritima*, 16 Sep 2022, *Pipkin 1835* (RENO, RSA); Fish Lake Valley, Gap Springs at the NE end of the valley, 37.9758 N, 118.0259 W, 4640 ft, 11 Sep 1983, *Tiehm 8331* (BRY, CM, COLO, NEB); Montezuma Valley, Alkali Springs, 10 air mi NW of Goldfield, 37.8255 N, 117.3433 W, 5000 ft, 11 Sep 1983, *Tiehm 8340* (BRY, COLO, NEB); Fish Lake Valley, first large group of springs along road coming from Gap Springs, 37.947 N, 118.0076 W, 4720 ft, 9 Jul 1980, *Williams 80-198-7* (NY).

Nye Co. (**representative**): 10 mi due WNW of Warm Springs, 2.7 mi N of Twin Springs Ranch., 38.2206 N, 116.1831 W, 5135 ft, 29 Aug 1980, *Neese 9785* (BRY, NY, RENO); 10 mi N of Cloverdale in Cloverdale Canyon, 38.558° N, 117.546° W, 30 Jul 1945, *Maguire 26020* (NY); Carvers, *Sundberg 1537*, voucher for chromosome count of n=6 (Sundberg 1983) (TEX); Monitor Valley, Dianas Punch Bowl., 39.039 N, 116.670 W, common along the seepage area N of the punch bowl, 6720 ft 8 Aug 1976, *Tiehm 2792* (NY, RENO); Big Smoky Valley, Darrough Hot Springs just E of Hwy 8A, N of Carvers., 38.827 N,

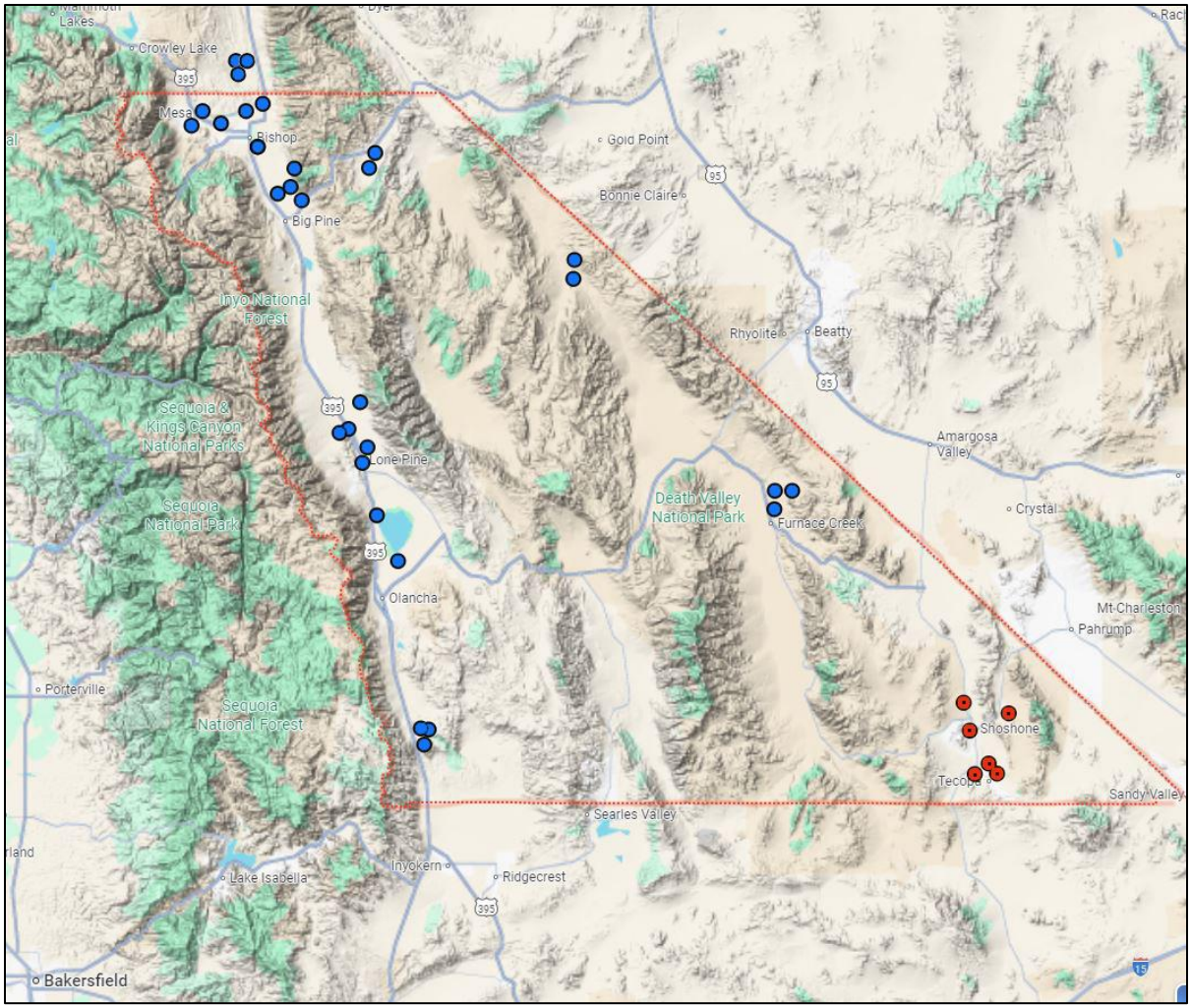
117.190 W, 12 Jul 1984, *Tiehm 8931* (BRY, RENO); Cold Springs area on the E side of Alkali Flat, 4 air mi SW of Mt. Annie, 38.934 N, 118.191 W, 4150 ft, near seepages which were wet early in the year, with *Sarcobatus*. 18 Aug 1984, *Tiehm 9254* (BRY-2, DES, NSMC, NY, OSC, RENO, UT); Black Spring in Ione Wash at end of road from Cedar Summit, W of the Pole Line Road, 38.559 N, 117.660 W, 5550 ft, saline flats just N of the spring, with *Distichlis*, *Ericameria nauseosa oreophila*, plants prostrate from a thick taproot, 9 Aug 2023, *Tiehm 19619* (ASC, RENU, UNLV).

Nye Co. (**around the town of Beatty**, all typical *P. sessiliflora*): Oasis Valley, near N end of Beatty, 3400 ft, common in *Juncus* meadow, 16 Jul 1969, *Beatley 9355* (US); N end of town of Beatty, 36.911234 N, 116.757209 W, 3400 ft. wet, *Distichlis-Juncus* meadow, locally common, 2 Oct 1969, *Beatley 9732* (RENO); Oasis Valley, Hwy 95, N end of Beatty, 36.911946 N, 116.756995 W, *Distichlis* meadow, 3300 ft, common, 9 Sep 1979, *Beatley 11657* (NY, RENO, UNLV); ca. 3.2 mi N of Beatty town limits, W of Hwy 95, 36.9515, 116.7244 W, 3300 ft, 6 Oct 1995, *Niles 4434* (NY, UNLV); Oasis Valley, Fleur de Lis Road, 1.6 road mi N of Hwy 95 [N of Beatty], 37.038588 N, 116.74295 W, *Pinzl 10975* (BRY, NSMC, NY, UNLV, UTC); Beatty, sandy grassy meadow, 3000 ft,19 Aug 1938, *Train 2340* (NSMC, RENO).

Nye Co. (**Ash Meadows area**, with some plants tending toward *P. microdonta*): Nye Co.: N Ash Meadows, Ash Meadows Road, vicinity of 1st ranch ("Collins") ranch S of Devil's Hole, common on uplands, 2300 ft, *Atriplex-Haplopappus*, stems mostly prostrate or ascending, rarely erect, common on uplands and locally in canyons nearby, 8 Oct 1970, *Beatley 11738* (NY, RENO, US); N Ash Meadows, Ash Meadows Road, vicinity of 1st ("Collins") ranch S of Devil's Hole, 36.412707 N, 116.298866 W, 2300 ft, uplands, *Atriplex-Haplopappus acradenius* vegetation, common, 8 Oct 1970, *Beatley 11857* (RENO, US); E Ash Meadows, Ash Meadows Rd, 1-2 mi N of Ranch, locally common on white clay soil, 2200 ft, 1 Sep 1971, *Beatley 13156* (NY, US); Ash Meadows, NW of Ash Meadows Lodge, 36.386506 N 116.306573 W, large alkaline flat W of Ash Meadow Road, 2180 ft, *Haplopappus-Chrysothamnus*, 15 Sep 1968, *Reveal 2112* (BRY, NY, RENO).



Map 2. Distribution of *Pyrrocoma sessiliflora* in Nevada (Churchill Co. not shown) and in the Death Valley region of Inyo Co., California. The Nye County and state boundaries are outlined in red.



Map 3. Distribution of *Pyrrocoma microdonta* and *P. sessiliflora* in Inyo and Mono counties.

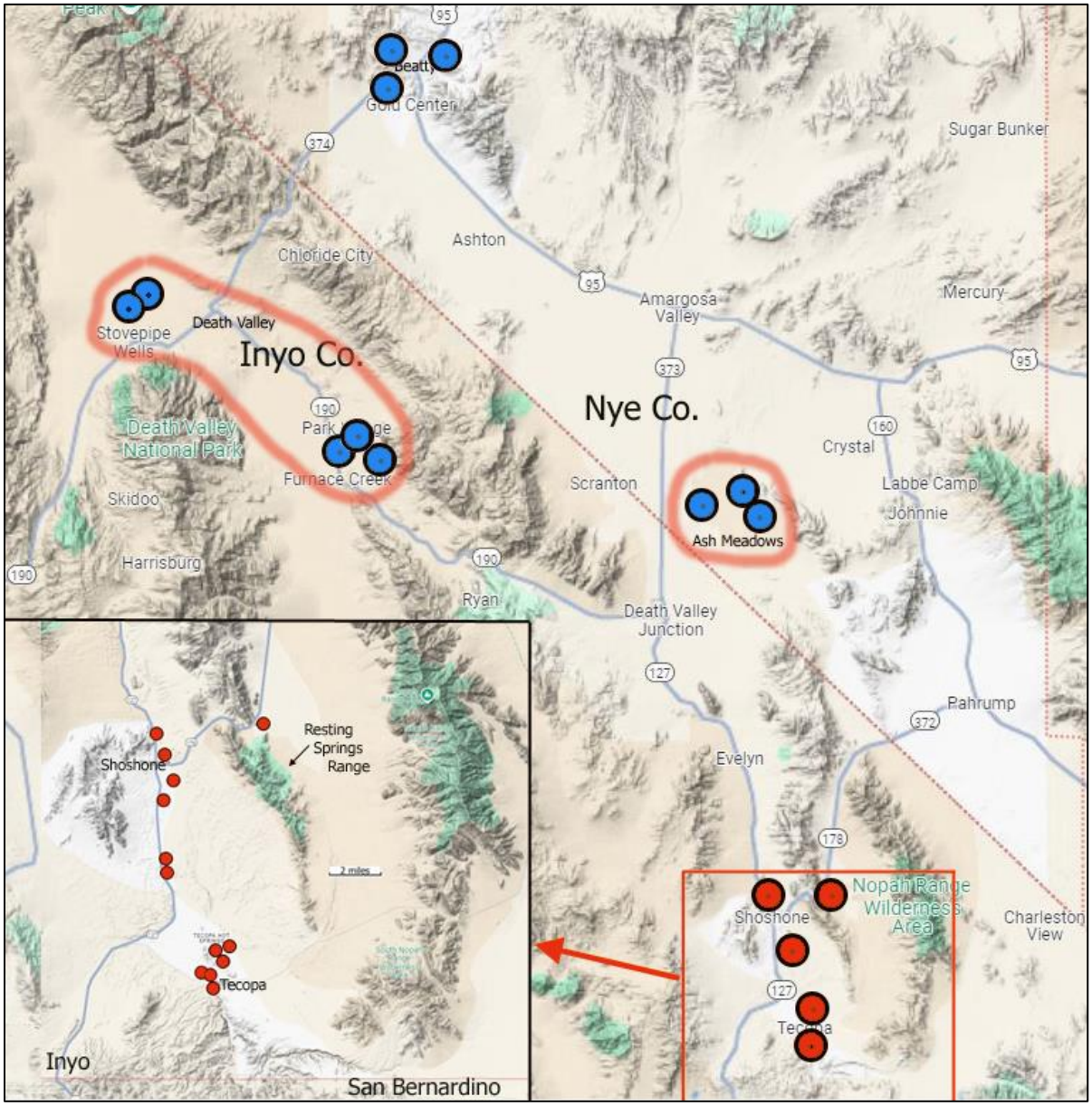
2. PYRROCOMA MICRODONTA Greene, Leafl. Bot. Observ. Crit. 2: 11. 1909. **TYPE**. **California**. Inyo Co.: Resting Springs Valley, 1720 ft, 6 Feb 1891, *F.V. Coville & F. Funston 269* (holotype: US). The towns of Tecopa and Shoshone are in the Resting Springs Valley.

Similar in vegetative and involucral morphology to *Pyrrocoma ciliolata* but generally shorter in stature and with pedunculate heads in a more open inflorescence. These plants might be hypothesized to be populational variants of the more widespread *P. sessiliflora* but the restricted geography suggests they represent a distinct evolutionary entity. In this interpretation, they occur sympatrically with *P. sessiliflora*. Figures 10-20.

Flowering June through October. Alkaline springs, drainages, lake edges, and meadows, salt flats, river bottoms; 1300-1650 feet.

Greene's protologue described the inflorescence of *Pyrrocoma microdonta* as a "strict raceme of 5 or 6 heads," compared to *P. sessiliflora* (which followed immediately on the same page) with stems "subspicately floriferous from below the middle, heads sessile." Hall (1928, p. 139) also emphasized the inflorescence ("peduncles of the racemose inflorescence up to 4 cm long") in placing *P. microdonta* in synonymy of *H. racemosus* subsp. *glomeratus* (vs. subsp. *sessiliflorus*).

Most pyrrocomas from Tecopa are like the type of *Pyrrocoma microdonta*, but the tall, strictly erect stems and subsessile heads of *Wolf 7676* (CAS, Figs. 13, 14) are more like typical *P. sessiliflora*. The *microdonta* expression also occurs around Ash Meadows (e.g., Figs. 15-18) and in the Death Valley region (e.g., Figs. 19-20) — typical *P. sessiliflora* also occurs in both places. The relatively common occurrence of typical *P. microdonta* in the Tepoca area supports formal recognition — lack of commitment here to an unambiguous taxonomy reflects need of critical, perhaps easily obtainable evidence through field study.



Map 4. Distribution of *Pyrrocoma microdonta* (red) and *P. sessiliflora* (blue) in Inyo Co. and closely adjacent Nye Co., Nevada. Plants referable to *P. microdonta* also occur in Ash Meadows (Nye Co.) and the Death Valley area (Inyo Co.), where seemingly intermixed with typical *P. sessiliflora*.

Additional collections. **California**. Inyo Co.: Hwy 127 at jct with Hwy 178, just N of Shoshone, 35.990333 N, 116.273917 W, moist alkali spring area, 1663 ft, local, with *Phragmites australis*, *Baccharis salicina*, *Sporobolus airoides*, *Isocoma acradenia*, *Cirsium mohavense*, 13 Oct 2012, *André 23553*

(GMDRC, RSA); Amargosa River, ca. 5.4 air mi NW of Tecopa and ca. 3.75 air mi S of Shoshone, scattered from hwy to the river in small wet alkali drainages, moist/wet alkali, 1380 ft, with *Sueda*, *Atriplex*, *Oxystylis lutea*, *Pluchea sericea*, *Heliotropium curassavicum*, *Distichlis spicata*, *Juncus cooperi*, fairly common, 8 Sep 2013, *Bell 5833* (CAS, RSA, SD); BLM Amargosa River; just S of Tecopa Hot Springs on alkaline E banks of Grimshaw Lake, 1365 ft, with *Typha*, *Pluchea sericea*, *Heliotropium curassavicum*, *Anemopsis californica*, *Distichlis spicata*, locally common, over 40 individuals, 8 Sep 2013, *Bell 5841* (RSA); Amargosa River, NW of Tecopa, river plain, 1400 ft, alkali scrub, 28 Sep 1979, *DeDecker 4894* (CAS, RSA, UC); along Amargosa River ca. 1.9 air mi SSE of Shoshone, river bottom, 1452 ft, ca. 110 plants, mostly vegetative or budding, with *Distichlis spicata*, *Sporobolus airoides*, *Atriplex lentiformis*, dead and a few live *Prosopis pubescens*, P. *glandulosa*, *Bulboschoenus maritimus*, *Nitrophila occidentalis*, *Juncus cooperi*, 4 Jun 2020, *De Groot 11475* (RSA-2 sheets, SD); Amargosa River Valley, Tecopa, damp seep, 1400 ft, common, with *Distichlis*, Jul 1981, *Emery s.n.* (UCR); BLM near Tecopa, Grimshaw Lake Natural Area. TNC Property, 35.8759 N, 116.2358 W, salt flat, 1420 ft, with *Iva acerosa*, *Nitrophila occidentalis*, *Anemopsis californica*, *Distichlis spicata*, *Cordylanthus tecopensis*, *Phragmities australis*, and *Juncus*, 12 Aug 2012, *Fraga 4074* (RSA); 3 mi W of Shoshone, alkali flat, 1500 ft, 15 Sep 1960, *Howe 2962* (SD); Tecopa Hot Springs, 1296 ft, 23 Aug 1970, *Howe s.n.* (SD); N of Tecopa, alkaline meadow, 1394 ft, 9 Sep 1970, *Howe s.n.* (SD); Shoshone, alkaline wash E of town museum and S to Rte 178, *Tamarix*, *Prosopis*, *Baccharis*, *Tidestromia oblongifolia*, 2 Sep 1989, *Knight 2003a* (UNLV); N of Tecopa, salt flat, 35.854 N, 116.228 W, 1400 ft, 27 Apr 1979 (remnants), *Latting s.n.* (UCR); 1 mi W of Tecopa Hot Springs, 35.8707 N, 116.2505 W, moist alkaline seep, 1400 ft, common, with *Scirpus olneyi* and *Oxytenia*, 9 Oct 1949, *Munz 14354* (CAS, RSA, SD, UC); 3 mi S of Shoshone, valley of Amargosa River, alkaline flats, with *Oxystylis*, forming clumps, no date, *Ripley & Barneby 3991* (CAS); Tecopa, 11 Jul 1965, *Roos s.n.* (DAV, UC); ca. 2 mi N of Tecopa, Tecopa Hot Springs, 35.87278 N, 116.23222 W, 1400 ft, with *Suaeda*, *Atriplex canescens*, *Distichlis spicata*, *Cordylanthus tecopensis*, *Aster intricatus*, *Haplopappus racemosus*, *Oxystylis lutea*, *Tidestromia oblongifolia*, 7 Aug 1950, *Roos s.n.* (UCR); Tecopa, alkali spring, 1400 ft, 3 Sep 1949, *Roos 3567* (RSA); Tecopa Hot Springs, along overflow from the hot springs which run through the county park, 14 Aug 1983, *Sundberg 2073* (TEX); 2.6 mi N of Tecopa, Amargosa Desert Hot Springs, 35.8728 N, 116.232 W, fine alkali silt, [ca. 1350 ft], abundant, mainly *Distichlis*, 10 Oct 1935, *Wolf s.n.* (CAS, RSA, UC); 4 mi S of Shoshone, Amargosa Wash, 35.9185 N, 116.2669 W, fine alkali silt, 1500 ft, 21 Jan[?] 1941, *Wolf 9820* (RSA).

3. PYRROCOMA CILIOLATA Greene, Pittonia 3: 184. 1897. **TYPE**: **California**. Kern Co.: Dry plains at Bakersfield, 4 Oct 1894, *A. Eastwood s.n.* (holotype: CAS; isotype: GH). Greene's epithet alluded to the leaf margins "closely and rigidly ciliolate from base to apex" (protologue).

Stems (20, damaged–)30–70 cm, erect, glabrous, glaucous, eglandular. **Leaves:** basal mostly 2–35 cm long, narrowly oblanceolate, blades 4–6 mm wide, subsucculent, margins minutely and evenly ciliate, glabrous, glaucous, eglandular, cauline linear to linear-lanceolate, closely ascending, at least the proximal subclasping-sheathing. **Heads** sessile to subsessile or short-pedunculate (peduncles mostly 2–15 mm), subspicate to racemoid on internodes 1.5–2.5(–4) cm long. **Involucres** 10–12 mm wide (pressed), cupulate; phyllaries in 4–5 series of unequal length (strongly graduate), oblong with an abruptly deltate apex, inner 5–6 mm long, green patch in distal 1/3–1/4, imbedded-glandular, apices spreading to recurving, proximal margins (below the green patch) with a white-scarious flange. **Ray florets** 16–24, fertile, corollas 6–8 mm long, 1–1.5 mm wide, coiling. **Disc corollas** 4–5.5 mm long. **Achenes** 2–2.5 mm long, sparsely sericeous-strigose with fine hairs. Figures 21-38.

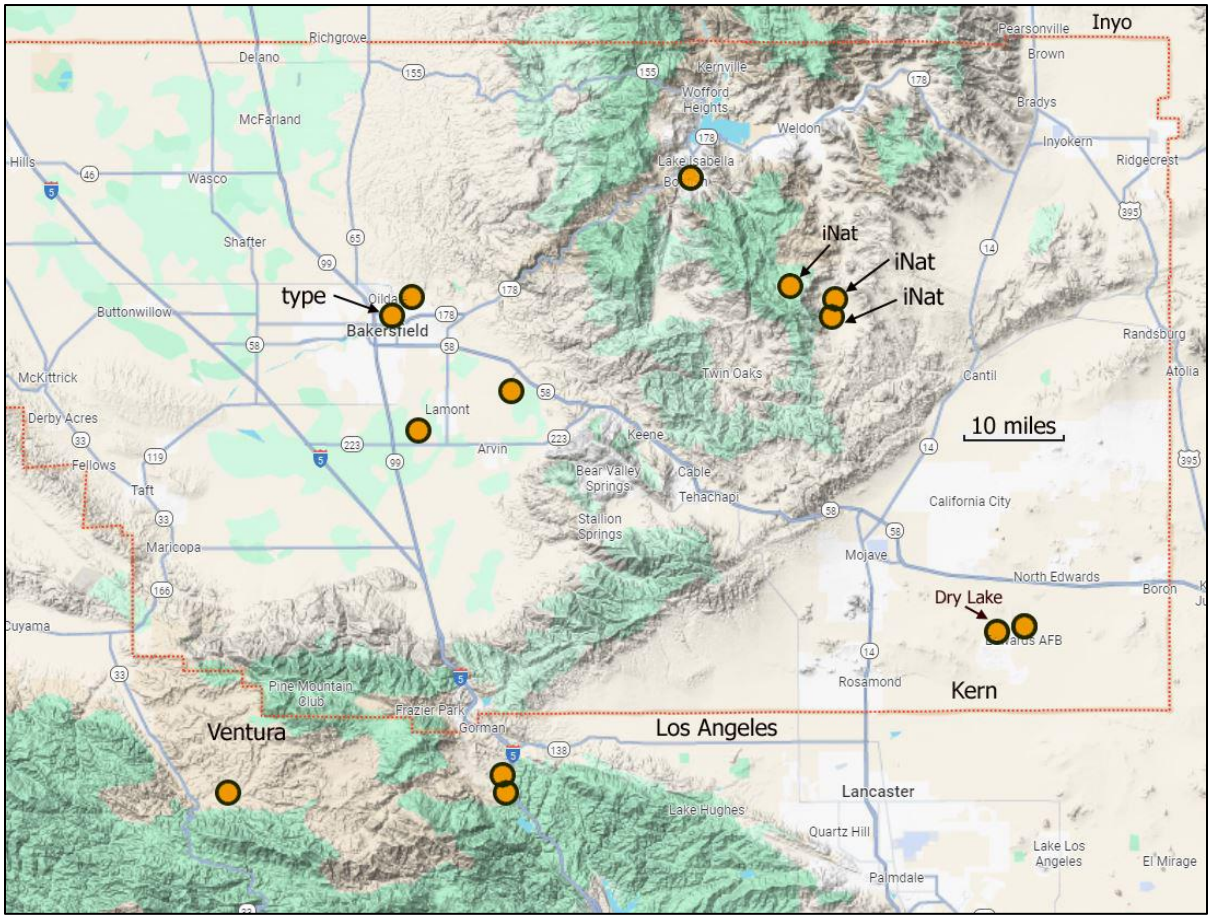
Flowering (May-) July through August (October). Alkaline plains and flats, alkaline seeps and sinks, near springs, moist washes in *Artemisia-Ericameria* meadows; 400-3500 (-6500 in Piute Mts) feet.

Pyrrocoma ciliolata is similar to *P. sessiliflora* in its involucral morphology and phyllaries with imbedded glands but different in the relatively widely separated heads, broader involucres with a greater number of phyllaries, and more ray florets. These plants are similar to those of the *P. racemosa* group (Nesom 2025a), with their elongate spicate-racemoid inflorescence of separated heads and near-

Pacific geography, but the phyllary morphology and glandularity, and perhaps the desert habitat (at the western edge of the Mohave Desert), are evidence of relationship with *P. sessiliflora*. Hall (1928) placed the name in synonymy of *P. racemosa* subsp. *glomerata* rather than allying it with *P. sessiliflora*.

Phyllary glands are evident on some plants (e.g.. Fig. 34) but not on others (e.g., Fig. 35), and John Strother notes that glands are evident on some stems [separate plants?] of *Hall 11781* (UC) but not on others. Such infrapopulational variability might reflect a hybrid origin (*P. racemosa* group x *P. sessiliflora*) but closer observation is needed.

The geography and the very small heads with few rays of the two Davy collections from "Dry Lake" near Rosamond seem out of place for *Pyrrocoma ciliolata* — the specimens are fragmentary and more study is needed.



Map 5. Distribution of *Pyrrocoma ciliolata*. The Kern County boundary is outlined in red. Localities from iNaturalist also are documented by collections (see *Matzke 690, 855, 1704*).

Additional collections. **California**. Kern Co.: Antelope Valley, margin of Dry Lake near Rosamond, [ca. 2300 ft], 9-24 May 1896, *Davy 2251* (UC); margin of Dry Lake [east of Rosamund], in alkali, Oct 1896, *Davy 2942* (UC); 14 mi SE of Bakersfield, alkaline plains, [ca. 600 ft], with *Distichlis*, *Frankenia*, and *Atriplex tularensis* on edge of *Salicornia* belt but not invading, "delights" in alkaline soil of rolling salt grass plains, more abundant 1/2 mi farther E and for 1 mi S, whence some of this material, 15 Oct 1921, *Hall 11781* (CAS-2 sheets, UC); Piute Mts, Lander's Meadow, 35.44499 N, 118.309911 W, drier part of meadow with *Artemisia*, 6248 ft, sandy/loam, with *Artemisia tridentata*, *Ericameria nauseosa*, *Potentilla*, *Muhlenbergia asperifolia*, *Distichlis spicata*, *Acmispon americanus*, *Geranium californicum*, *Achillea millefolium*, 7 Jul 2022, *Matzke 690* (RSA); Piute Mts. Lander's Meadow,

35.447161 N, 118.304686 W, 6242 ft, moist wash in meadow, 18 Aug 2022, *Matzke 855* with Keir Morse (RSA); Piute Mts, Kelso Valley Road, Green Springs, 35.39176 N, 118.22053 W, desert transition area, 6107 ft, alkaline meadow near springs, grazed, 5 Aug 2023, *Matzke 1704* (RSA); Bakersfield, 28 Sep 1910, *McGregor 9* (DS); Isabella alkali flats at Scovern Hot Springs, moist light alkaline soil, 2250 ft, extensive colony, 20 Sep 1962, *Twisselmann 7872* (CAS, TEX); San Joaquin Valley, Weedpatch region, Adobe Road, 0.2 mi N of Bear Mountain Boulevard, alkali sink association, 375 ft, colony of a few plants, not otherwise known from the region, 14 Nov 1962, *Twisselmann 7993* (CAS-2 sheets); Piute Mountains, Landers Meadow [along Piute Mtn Road], 6500 ft, dry soil in a heavily grazed long sunny rabbit brush meadow, Jeffrey pine association, scarce, 16 Sep 1964, *Twisselmann 10202* (CAS-2 sheets). Los Angeles Co.: Ca. 3.9 km NNW of Pyramid Lake, 770 meters NNW of the intersection between Interstate 5 and Smokey Bear Road, immediately S of Orwin Road, 34.7132 N, 118.8006 W, saline seep transitional area between a *Distichlis spicata* and *Elymus triticoides* grassland, and an *Ericamerica nauseosa* shrubland, with *Distichlis spiata*, *Melilotus indicus*, *Ericameria naueosa*, 2886 ft, 2 Oct 2018, *Cain 1887* (OBI); Santa Barbara Forest, Peace Valley, [ca. 34.70193 N, 118.79537 W], meadow, rich black clay, 3500 ft, widely distributed in meadows, 9 Oct 1928, *Hodgson 224* (UCSB). Ventura Co.: Cuyama Valley, Wagy Ranch, 34.694 N, 119.321 W, alkaline soil, moist flat, [ca. 3700 ft], with *Shepherdia*, 28 Jul 1928, *Hoffmann s.n.* (SBBG).

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Figure 1. *Pyrrocoma sessiliflora*. Nye Co., Nevada. *Beatley 11657* (US).

Figure 2. *Pyrrocoma sessiliflora*. Nye Co., Nevada. *Maguire & Holmgren 26020* (US).

Figure 3. *Pyrrocoma sessiliflora*. Esmeralda Co., Nevada. *Morefield 2487* (NY).

Figure 4. *Pyrrocoma sessiliflora*. Nye Co., Nevada. *Tiehm 8931* (BRY).

Figure 5. *Pyrrocoma sessiliflora*. Nye Co., Nevada. *Tiehm 9254* (BRY).

Figure 6. *Pyrrocoma sessiliflora*. Inyo Co., California. *Semple 8669* (UC).

Figure 7. *Pyrrocoma sessiliflora*. Inyo Co., California. *Howell 40266* (CAS).

Figure 8. *Pyrrocoma sessiliflora*. Inyo Co., California. *Gilman 1001* (US).

Figure 9. *Pyrrocoma sessiliflora*. Inyo Co., California. *Kerr s.n.* (CAS).

Figure 10. *Pyrrocoma microdonta*. Inyo Co., California. *Coville & Funston 269* (US). Holotype.

Figure 11. *Pyrrocoma microdonta*. Inyo Co., California. *DeDecker 4894* (CAS).

Figure 12. *Pyrrocoma microdonta*. Inyo Co., California. *Munz 14354* (CAS).

Figure 13. *Pyrrocoma microdonta*. Inyo Co., California. *Wolf 7676* (DS).

Figure 14. *Pyrrocoma microdonta*. Inyo Co., California. *Wolf 7676* (CAS).

Figure 15. *Pyrrocoma* aff. *microdonta*. Nye Co., Nevada. *Beatley 11738* (NY).

Figure 16. *Pyrrocoma* aff. *microdonta*. Nye Co., Nevada. *Beatley 11738* (RENO).

Figure 17. *Pyrrocoma* aff. *microdonta*. Nye Co., Nevada. *Beatley 11857* (RENO).

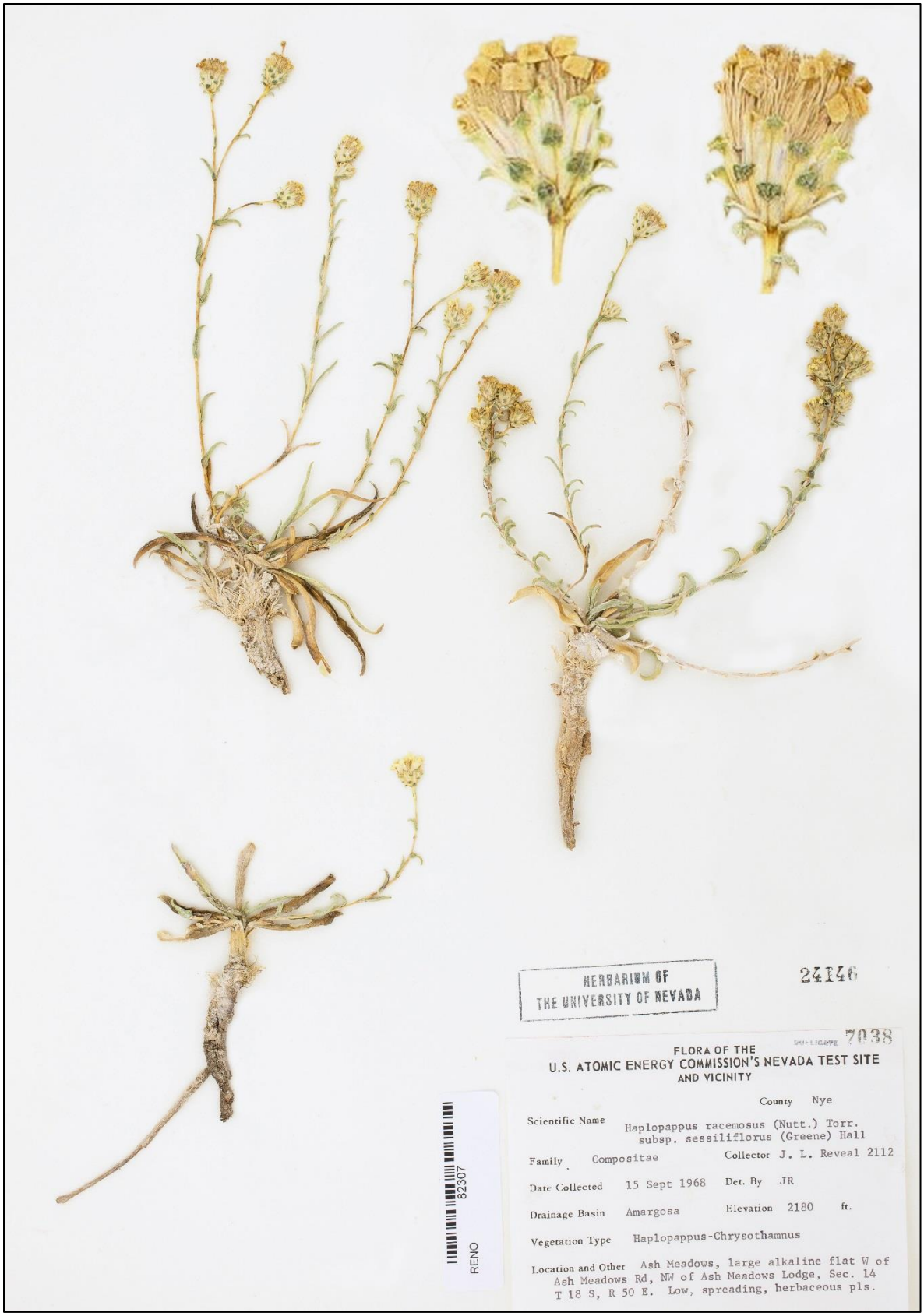

Figure 18. *Pyrrocoma* aff. *microdonta*. Nye Co., Nevada. *Beatley 7038* (RENO).

Figure 19. *Pyrrocoma* aff. *microdonta*. Inyo Co., California. *York 2843* (CAS).

Figure 20. *Pyrrocoma* aff. *microdonta*. Inyo Co., California. *Sharsmith 6336* (SJSU).

Figure 21. *Pyrrocoma ciliolata*. Kern Co., California. *Eastwood s.n.* (CAS).

Figure 22. *Pyrrocoma ciliolata*. Detail from holotype (Fig. 21).

Figure 23. *Pyrrocoma ciliolata*. Kern Co., California. *Hall 11781* (UC).

Figure 24. *Pyrrocoma ciliolata*. Kern Co., California. *McGregor 9* (CAS)

Figure 25. *Pyrrocoma ciliolata*. Kern Co., California. *Hall 11781* (CAS).

Figure 26. *Pyrrocoma ciliolata*. Kern Co., California. *Twisselmann 7872* (CAS).

Figure 27. *Pyrrocoma ciliolata*. Detail from *Twisselmann 7872* (Fig. 26).

Figure 28. *Pyrrocoma ciliolata*. Kern Co., California. *Twisselmann 10202* (CAS).

Figure 29. *Pyrrocoma ciliolata*. Kern Co., California. *Hodgson 224* (UCSB).

Figure 30. *Pyrrocoma ciliolata*. Kern Co., California. iNaturalist photo, Daniel S. Cooper, 7 September 2019, Kelso Valley (west side), Piute Mountains.

Figure 31. *Pyrrocoma ciliolata*. Kern Co., California. iNaturalist photo, Courtney Matzke, 5 August 2023, Kelso Valley (west side), Piute Mountains.

Figure 32. *Pyrrocoma ciliolata*. Kern Co., California. iNaturalist photo, Courtney Matzke, 5 August 2023, Kelso Valley (west side), Piute Mountains.

Figure 33. *Pyrrocoma ciliolata*. Kern Co., California. iNaturalist photo, Keir Morse, 19 August 2022, Landers Meadow, Piute Mountains.

Figure 34. *Pyrrocoma ciliolata*. Kern Co., California. iNaturalist photo, Courtney Matzke, 5 August 2023, Kelso Valley (west side), Piute Mountains.

Figure 35. *Pyrrocoma ciliolata*. Kern Co., California. iNaturalist photo, Keir Morse, 19 August 2022, Landers Meadow, Piute Mountains.

Figure 36. *Pyrrocoma ciliolata*. Kern Co., California. iNaturalist photo, Keir Morse, 19 August 2022, Landers Meadow, Piute Mountains.

Figure 37. *Pyrrocoma ciliolata*. Kern Co., California. iNaturalist photo, Keir Morse, 19 August 2022, Landers Meadow, Piute Mountains.

Figure 38. *Pyrrocoma ciliolata*. Kern Co., California. iNaturalist photo, Keir Morse, 19 August 2022, Landers Meadow, Piute Mountains.