

**PYRROCOMA (ASTERACEAE: ASTEREAE) FROM OREGON  
COLLECTED BY NUTTALL IN 1834**

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**ABSTRACT**

Thomas Nuttall made the type collections of *Pyrrocoma arguta*, *P. glomerata*, and *P. paniculata* in northeastern Oregon — the first two are recognized as species, while *P. paniculata* is a synonym of *P. arguta*, as is *P. duriuscula* Greene. Nuttall's type collection of *P. racemosa* was made in northwestern Oregon — it is accepted at specific rank. Lectotypes are designated for *Homopappus argutus* and *Homopappus glomeratus*. Because collections of *P. arguta* often have been identified as *P. liatriformis* or *P. scaberula*, their taxonomy also is reviewed here. Each of the species is mapped and illustrated.

Thomas Nuttall was part of the overland expedition led by Nathaniel Wyeth in 1834 that began in Independence, Missouri, crossed Wyoming and Idaho, and traveled through northern Oregon to reach the mouth of the Columbia River. In July, from where the expedition left the Snake River in Baker Co., Oregon, it traveled northwest and reached the Grande Ronde Valley (Nuttall's "Grande Ronde") in Union County on 31 July, presumably traveling between the present-day towns of Union and La Grande. From there it left northwest following the "Walla Walla Trail" and reaching the Columbia River and then Fort Walla Walla (Washington) on 2-3 August. Nuttall's label data were minimal but indicate that the type collections of *Homopappus argutus*, *Homopappus glomeratus*, and *Homopappus paniculatus* probably were made in Union County (Townsend 1839; Pennell 1936; Wyeth 1984).

From northeastern Oregon, as the expedition continued westward along the Columbia River, Nuttall with Wyeth and ornithologist John Townsend made a side trip on 29-30 August southward along the Willamette River, going as far as Willamette Falls (Clackamas County) — the collection of *Homopappus racemosus* was made on that trip.

These four species of *Homopappus* were described in the same paper (Nuttall 1840) — two from Union County are regarded here as accepted species, *Pyrrocoma arguta* and *Pyrrocoma glomerata*, as detailed below. *Pyrrocoma glomerata* apparently is rare, while *P. arguta* has a wider and more continuous distribution. *Pyrrocoma racemosa* (Nutt.) Torr. & Gray also is an accepted species (Nesom 2025) and also is rare.

**1. PYRROCOMA GLOMERATA** (Nutt.) Torr. & Gray, Fl. N. Amer. 2: 244. 1842. *Homopappus glomeratus* Nutt., Trans. Amer. Philos. Soc. ser. 2, 7: 331. 1840. *Haplopappus racemosus* var. *glomerellus* A. Gray, Syn. Fl. N. Amer. 1, pt. 2: 127. 1884. *Haplopappus racemosus* subsp. *glomeratus* (Nutt.) Hall, Publ. Carnegie Inst. Wash. 389: 132. 1928. *Haplopappus racemosus* var. *glomeratus* (Nutt.) Peck, Man. Pl. Oregon 712. 1941. **LECTOTYPE** (designated here): **Oregon**: "Plains of the Columbia" [**BM** and **GH** labels], late July-early September 1834, *T. Nuttall s.n.* (BM 1025339; isoelectotypes: GH 9248, GH 9251, NY 178916, PH). The BM and GH sheets have Nuttall's original label with an asterisk. **Protologue**: "With the above [*Homopappus paniculatus*], to which it is closely allied."

As noted by Hall (1928, p. 137), Gray apparently regarded var. *glomerellus* as based on *Homopappus glomeratus*, giving it a different rank. Gray's **protologue** for var. *glomerellus*: "Heads

narrower and smaller, disposed to be fascicled in twos or threes in the axils of small upper leaves, or at summit of stem or short peduncles: involucre often turbinate: akenes glabrate or sometimes glabrous: herbage somewhat more disposed to be balsamic-viscid. — *Homopappus glomeratus*, *paniculatus*, & *argutus*, Nutt. l.c. 331. *Pyrrocoma glomerata*, *paniculata*, & *arguta* (the latter a stouter and more leafy state), Torr. & Gray, l.c. *Aplopappus paniculatus* Gray, Bot. Calif. i. 311. — Plains of the Columbia, E. Oregon, Nuttall, Nevius, Cusick, &c. N.W. Nevada, Anderson, Lemmon."

*Pyrrocoma paniculata* (Nutt.) Torr. & Gray, Fl. N. Amer. 2: 244. 1842. *Homopappus paniculatus* Nutt., Trans. Amer. Philos. Soc., ser. 2, 7: 331. 1840. *Pyrrocoma racemosa* var. *paniculata* (Nutt.) Kartesz & Gandhi, Phytologia 71: 610. 1991. *Haplopappus racemosus* var. *paniculatus* (Nutt.) Cronq., Intermount. Fl. 5: 210. 1994. **TYPE: Oregon.** Union Co.: "Grand Ronde prairie" [BM 1025337 label], ca. 31 Jul 1834, T. Nuttall s.n. (holotype: BM). **Protologue:** "Plains of the Oregon [Columbia R.], not far from Walla-Walla, particularly the prairie called the Grand Ronde. About a foot high, growing in considerable quantities in wet places."

**Stems** ascending-erect to erect, 25–40 cm, glabrous, eglandular but often viscid distally. **Leaves:** basal lanceolate to oblanceolate, 12–25 cm long, blades ca. 15–30 cm wide, attenuate to a petiole 1/3 the leaf length, without persistent fibrous bases, faces glabrous, eglandular or gland-dotted, sometimes with raised venation, margins entire or minutely and sparsely serrulate, eciliate, cauline oblong to oblanceolate or lanceolate, sessile or often subclasping, margins entire, apically acute, the distal often viscid. **Heads** few to numerous, sessile and solitary or glomerate in a spike, separated on internodes 1–4.5 cm long or sometimes only at the stem apex, each head or glomerule immediate subtending by an elongate leaf-like bract. **Involucres** 8–11 mm wide (pressed). **Phyllaries** oblong with a deltate-rounded-apiculate apex, glabrous, in 3–4 series of unequal length, the inner 6–9 mm, margins entire, apical green patch ca. 1/4 the length, viscid with imbedded glands, white-indurate proximally. **Ray florets** (6–)8–14, sterile, corollas 8–10 mm long, 1 mm wide, coiling. **Disc corollas** 5–5.5 mm long. **Achenes** 3 mm long, glabrous. Figures 7-12.

Since Nuttall's type collections, *Pyrrocoma glomerata* apparently has been seen in Washington only in the vicinity of La Grande, and it is probable that Nuttall also found the plants in that area as the Wyeth Expedition traveled toward the Columbia River. The type of *Homopappus paniculatus* also is from the Grand Ronde prairie. The species has a disjunct occurrence in western Idaho.

*Pyrrocoma glomerata* is recognized by its glandular-viscid but otherwise glabrous vestiture, spicate inflorescence of bracteate-glomerate heads, small, subglobose heads with few, strongly graduate phyllaries with a deltate, glandular-viscid green tip, sterile ray florets, and glabrous achenes. The type of *P. glomerata* has phyllaries with a rounded apex like the recent collections from near La Grande, while the type of *P. paniculata* has phyllaries with a deltate-rounded-apiculate apex. Otherwise, their similarity is that of conspecific plants. The Idaho plants are about 75 miles distant from those in Washington, but their morphological identity is clear (Figs. 13-16).

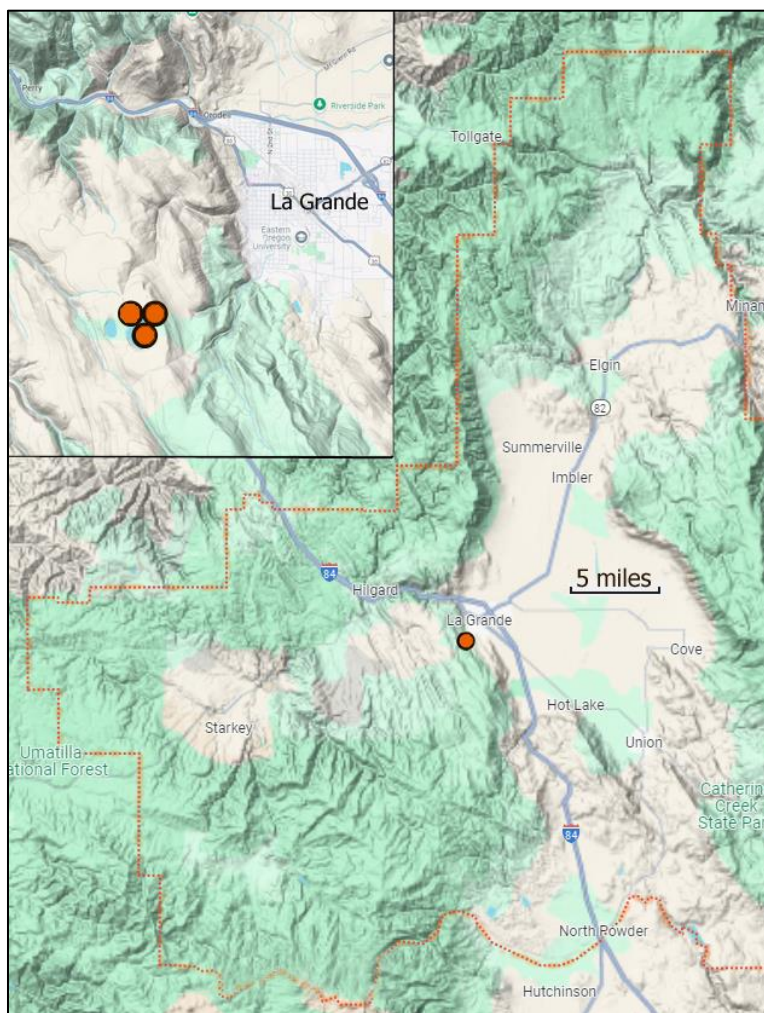
Similarities in morphology and geography of *Pyrrocoma glomerata* and *P. arguta* suggest that they are sister species. Both have viscid vestiture from imbedded glands, lack of fibrous remnants of basal leaf petioles, a mostly spicate inflorescence, small and few-flowered heads, sterile ray florets, and glabrous achenes. Where they are sympatric (Union Co. Washington), the following couplet outlines their distinction.

1. Leaves entire, bracts eciliate; phyllaries in 3–4 series strongly unequal in length, inner 6–9 mm long, green portion 1/4 the phyllary length ..... ***Pyrrocoma glomerata***
1. Leaves serrate, bracts ciliate; phyllaries in 2–3(–4) series of subequal length, inner 9–12 mm long, green portion 1/2–2/3 the phyllary length ..... ***Pyrrocoma arguta***

Hall (1928) used *Haplopappus racemosus* subsp. *glomeratus* to include Nuttall's *Homopappus paniculatus* and *Homopappus argutus* as well as taxa from California and Nevada. Mayes (1976)

subsequently placed all three of Nuttall's northeast Oregon species as synonyms of *P. racemosa*. var. *virgata* (the type from Mono Co., California).

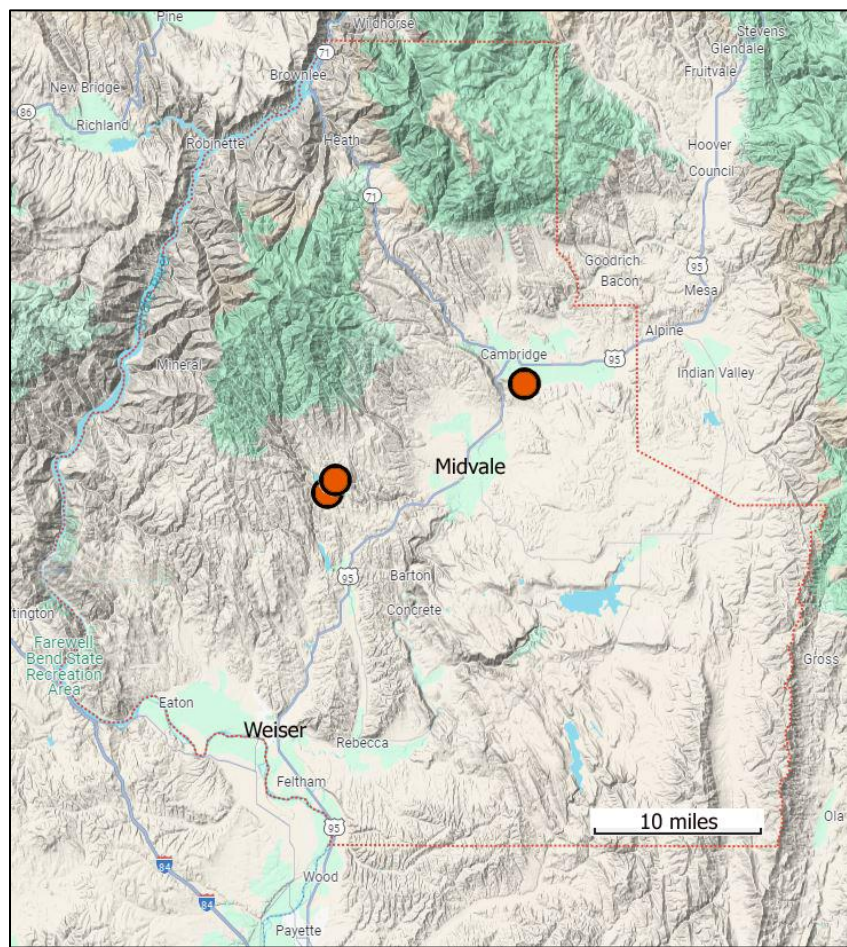
**Additional collections. Idaho. Washington Co.:** 30 mi NE of Weiser, W sides of hills along Weiser River, 23 Aug 1941, *Christ* 12904 (ID); 15 mi N of Weiser, Hixon Sharptail Grouse Preserve, 1/4 mile E of Fairchild Reservoir, 4 mi N of Mann Creek Reservoir, open shrub-steppe with a few scattered conifer trees, W-facing slope, in a slight swale in deeper soils, blooming just after *Haplopappus radiatus* growing nearby, 3800 ft, 17 Aug 2005, *Tuason* 457 (ID); 15 mi N of Weiser, Hixon Sharptail Grouse Preserve, 1/4 mile E of Fairchild Reservoir, 4 mi N of Mann Creek Reservoir, 44.464355° N, 116.90393° W, open shrub-steppe with a few scattered conifer trees, middle and lower 1/3's of E-facing slope, in deeper soils and swales in patches often with *Haplopappus radiatus* but slightly more mesic habitat than *H. radiatus*, 3850 ft, 26 Aug 2005, *Tuason* 479 (CIC, ID-2 sheets). **Oregon. Union Co.:** Near the headwaters of Mill Creek on Glass Hill Natural Area, prairie plants in an open dry ponderosa pine stand, 4300 ft, with *Festuca idahoensis*, *Koeleria macrantha*, *Symphoricarpos albus*, *Potentilla gracilis*, *Symphyotrichum* sp., *Geranium viscosissimum*, 10 Oct 2023, *Geer* 1515 (WTU); N edge of La Grande, Morgan Lake, large open dry to moist meadow with many rock outcroppings, 7 Jul 1974, *C. Maser* 7-1 (OSC); La Grande, Morgan Lake, dry meadow, 7 Jul 1974, *R&C Maser* RM366 (PSM). [**Union Co.**]: Oregon River, 1873, *R.D. Nevius* s.n. (GH, right side of sheet with isotype of *Homopappus glomeratus* GH8251; Nevius was in La Grande in 1873, fide Roth 2022).



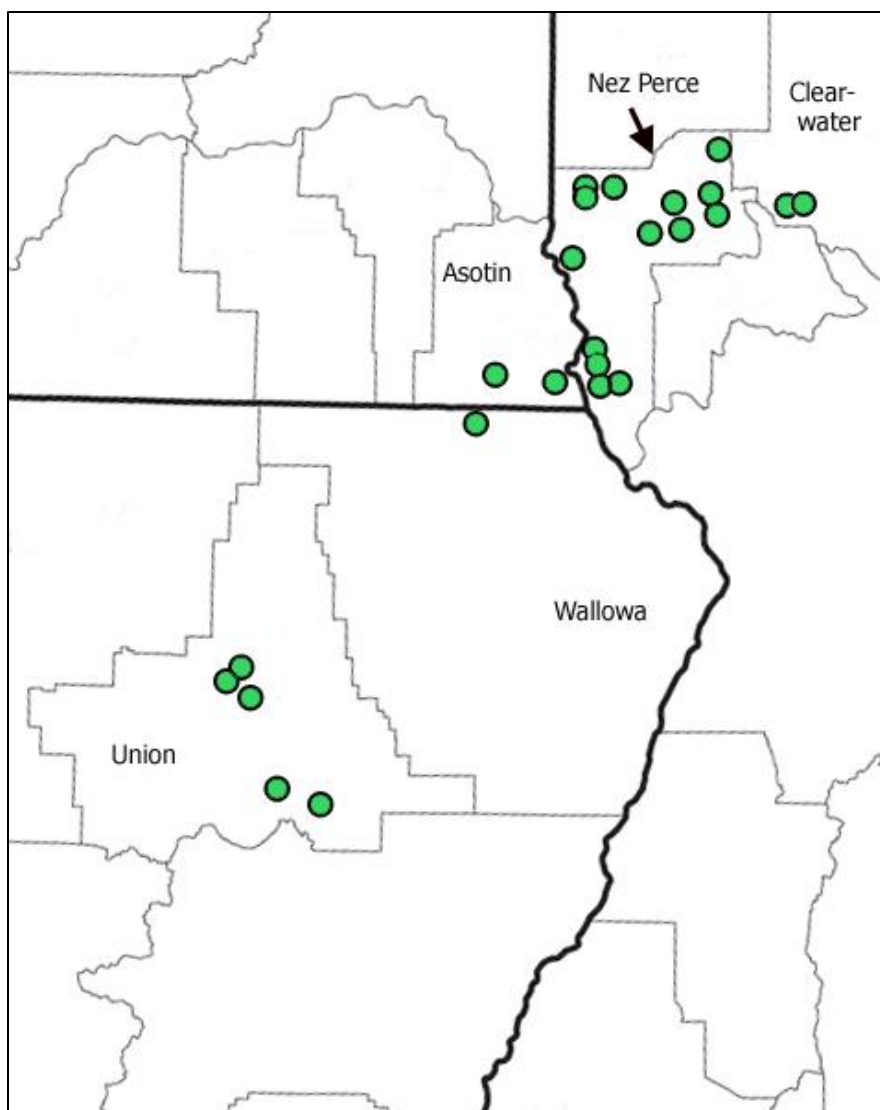
Map 1. Distribution of *Pyrrocoma glomerata* in Washington. The Union County boundary is outlined in red. Inset shows known localities from recent collections — in the vicinity of Morgan Lake, southwest of La Grande. The locality of Nuttall's type collection is not known but presumed to be in the same vicinity.



Map 2. Distribution of *Pyrrocoma glomerata* — Union Co. Oregon, and Washington Co. Idaho.



Map 3. Distribution of *Pyrrocoma glomerata* in Idaho. The Washington County boundary is outlined in red.



Map 4. Distribution of *Pyrrocoma arguta*.

**2. PYRROCOMA ARGUTA** (Nutt.) Torr. & Gray, Fl. N. Amer. 2: 244. 1842. *Homopappus argutus* Nutt., Trans. Amer. Philos. Soc. ser. 2, 7: 331. 1840. **LECTOTYPE** (designated here): **Oregon**. "Plains of the Columbia" [BM label], 1834, *T. Nuttall s.n.* (BM 102340; probable isotype: NY "Ex Herbario Musei Britannici"). **Protologue**: "With the above [*Homopappus paniculatus* and *Homopappus glomeratus*] and on the plains of the Oregon [Columbia]." The BM label has Nuttall's original label, the name with his asterisk.

Two other sheets have Nuttall's original label, identified as '*Homopappus argutus*' with his asterisk, but the locality is different — they may represent a different collection. "Plains of the Columbia above the lower Falls" [BM and GH labels], 1834, *T. Nuttall s.n.* (GH 9247, BM 102534 and GH 9252-a BM fragment). The label for GH 9252 is completely in Gray's hand, as '*paniculatus*.'

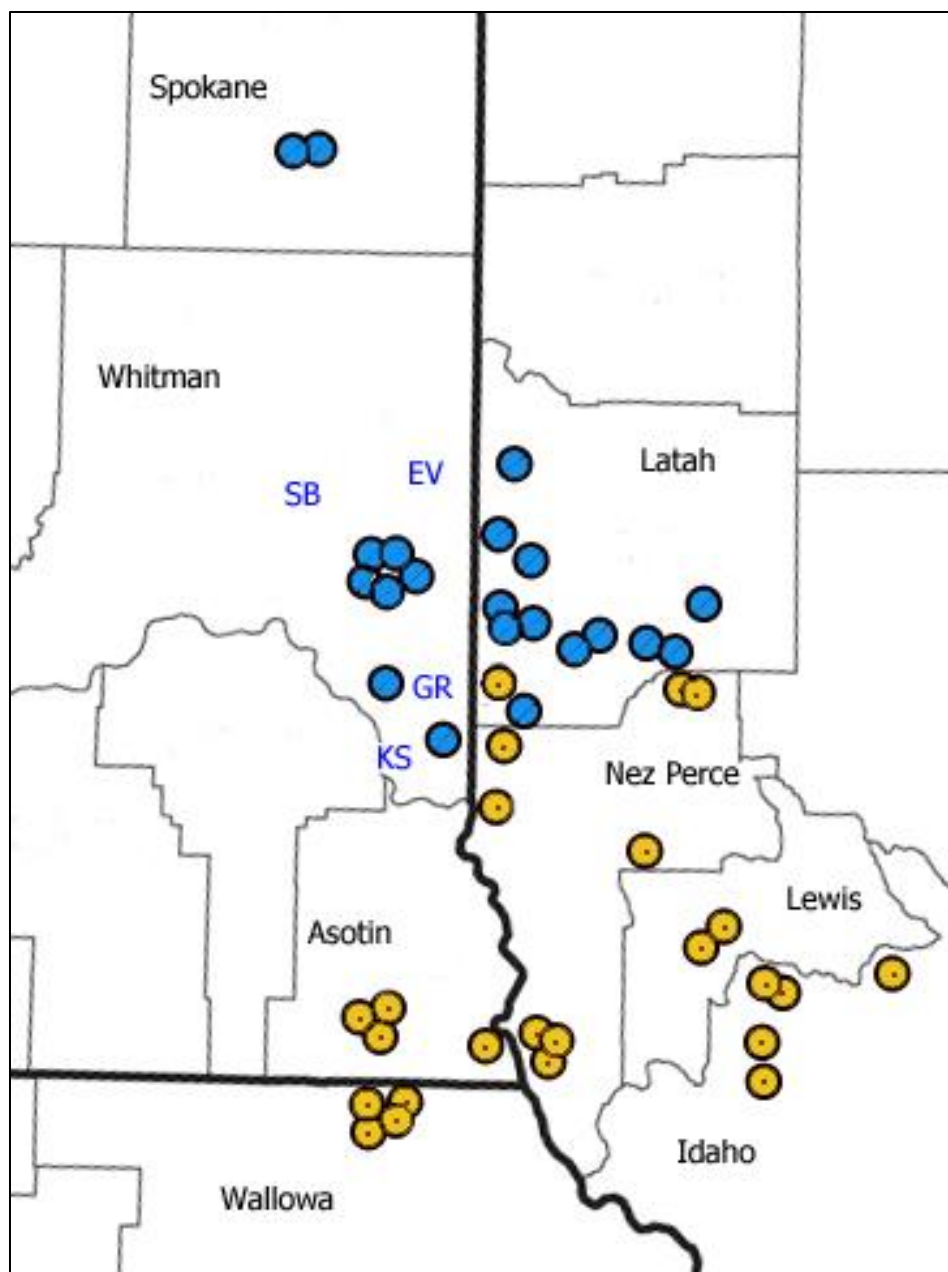
*Pyrrocoma duriuscula* Greene, Leaflet Bot. Observ. Crit. 2: 16. 1909. *Haplopappus racemosus* subsp. *duriusculus* (Greene) Hall, Publ. Carnegie Inst. Wash. 389: 129. 1928. **TYPE**: **Oregon**. [Union Co.]: "Eastern Oregon," stony ground, 3500 ft, Aug 1897, *W.C. Cusick 1755* (holotype: US; isotypes: BRU, E, MO, NDG).

**Stems** erect to ascending-erect, 20–50 cm, viscid. **Leaves:** basal lanceolate to oblanceolate, 14–20 cm long, attenuate to a petiole 1/4–1/2 the leaf length, without persistent fibrous bases, margins shallowly serrate, cauline often subclasping distally, blades 10–20 cm wide, abaxial venation often raised, faces with imbedded glands, margins shallowly serrate to entire. **Heads** spicate, ca. 15–50, solitary or in glomerules separated on internodes 2–5 cm long or sometimes clustered distally, sometimes subracemose on peduncles 1–4 cm long, each head or glomerule immediately subtended by a leaf-like bract. **Involucre**s 8–10 mm wide (pressed). **Phyllaries** oblong with an acute-acuminate to triangular apex, often spreading to recurving at maturity, in 2–3(–4) series of subequal length, inner 9–12 mm, margins entire, sometimes with a very narrow scarious flange, green portion of outer 1/2–2/3 the length, viscid with imbedded glands, otherwise glabrous. **Ray florets** 10–15, sterile, corollas 9–10 mm long, 1–1.5 mm wide, coiling. **Disc corollas** 5–6 mm long. **Achenes** 2.5–3 mm long, glabrous. **Chromosome number** not reported. Figures 1–6.

*Pyrrcoma arguta* is known from Union and Wallowa counties, Oregon, and southern Asotin Co., Washington. It occurs throughout Nez Perce Co., Idaho, touching into adjacent Clearwater County. The species has not been previously recognized in floristic treatments — recent collections mostly have been identified either as *P. liatriformis* or *P. racemosa* var. *paniculata*.

**Additional collections.** **Idaho.** Clearwater Co.: Ridge between Orofino Creek and Clearwater River, 46.4612° N, 116.2141° W, on ridge, open ponderosa pine-grass community, tire track in primitive road, 2500 ft, 5 Aug 1995, *Gray 795* (ID); SE of Orofino, ridge between the Clearwater River and Orofino Creek, bunchgrass grassland with scattered *Pinus ponderosa* and *Pseudotsuga menziesii*, 2380 ft, 16 Aug 2004, *Gray 4876* (MO). Nez Perce Co.: Mouth of Hells Canyon on Craig Mtn, 46.1° N, 116.9° W, grassland of *Calamagrostis rubescens*, *Festuca idahoensis*, and under *Pinus/Pseudotsuga* forest, basaltic substrates, May 2003, *Björk 7687* (NY); near Culdesac, midway on Winchester Grade, grassy slopes, 30 Jul 1940, *Christ 11646* (IDS, NY); E of Snake River 0.75 mi, 0.5 mi S of Billy Creek, Limekiln Rapids, 46° 6.688' N, 116° 56.015' W, open bunchgrass, 2060 ft, 23 Jul 2003, *Gray 4287* (ID); Snake River Canyon, Craig Mountain, hillside S of Middle Creek, bunchgrass steppe, ca. 2660 ft, 1 Jul 2004, *Gray 4624* (WS); Snake River Canyon, Craig Mountain, hillside S of Middle Creek, 46.05394° N, 116.90906° W, bunchgrass steppe, ca. 2780 ft, 1 Jul 2004, *Gray 4634* (NY); Snake River Canyon, Craig Mountain, E of Corral Creek on hillside S of Redemsky Creek, 46.028867° N, 116.880167° W, bunchgrass meadow steppe, 2700 ft, dominant *Geum triflorum*, 2 Jul 2004, *Gray 4636* (WS); Snake River Canyon, Craig Mountain, E of Corral Creek hillside S of Redemsky Creek, 46.02886° N, 116.88017° W, bunchgrass meadow steppe, 2700 ft, dominant *Geum triflorum*, 2 Jul 2004, *Gray 4638* (NY); Snake River Canyon, Craig Mountain, S of Middle Creek, E of the Snake River, 46.0482° N, 116.9096° W, northwest bunchgrass grassland, ca. 2560 ft, 22 Jul 2004, *Gray 4667* (WS); Snake River Canyon, Craig Mountain, Ft. Smons Ridge, E of the headwaters of Madden Creek, 46.1937° N, 116.8459° W, bunchgrass steppe, scattered *Pseudotsuga menziesii* on E flank of ridge, ca. 4430 ft, 28 Jul 2004, *Gray 4675* (WS); Snake River Canyon, Craig Mountain, Ft. Simons Ridge, E of the headwaters of Madden Creek, 46.19372° N, 116.84625° W, bunchgrass steppe, 4430 ft, scattered *Pseudotsuga menziesii* on E flank of ridge, 28 Jul 2004, *Gray 4676* (NY, OSC); Craig Mountain, Ft. Simons Ridge, E of the headwaters of Madden Creek, 46° 11.624' N, 116° 50.775' W, bunchgrass steppe, scattered *Pseudotsuga menziesii* on E flank of ridge, 4430 ft, 28 Jul 2004, *Gray 4678* (ID); Craig Mountain, Ft. Simons Ridge, E of the headwaters of Madden Creek, 46° 11.624' N, 116° 50.775' W, bunchgrass steppe, scattered *Pseudotsuga menziesii* on E flank of ridge, 4330 ft, 28 Jul 2004, *Gray 4680* (CIC); Snake River Canyon, ridge S of Billy Creek, N of Camp Creek, 46° 6.359' N, 116° 54.912' W, bunchgrass grasslands, 2850 ft, many flower heads with the weevil *Anthonomus squamosus*, 29 Jul 2004, *Gray 4684* (ID); Snake River Canyon, ridge S of Billy Creek, N of Camp Creek, 46° 6.359' N, 116° 54.912' W, bunchgrass grasslands, 2850 ft, many flower heads with the weevil *Anthonomus squamosus*, 29 Jul 2004, *Gray 4685* (CIC); Snake River Canyon, ridge S of Billy Creek, N of Camp Creek, 46.10597° N, 116.91519° W, bunchgrass grassland, ca. 2850 ft, many heads with the weevil *Anthonomus squamosus*, 29 Jul 2004, *Gray 4690* (NY); Snake River Canyon, ridge S of Billy Creek, N of Camp Creek, 46.105983° N, 116.9152° W, bunchgrass grasslands, 2850 ft, many flower heads with the weevil *Anthonomus squamosus*, 29 Jul 2004, *Gray 4691* (WS); Snake River Canyon, ridge S of Billy Creek, N of Camp Creek, bunchgrass grassland, ca. 2850 ft, flower heads with the

weevil *Anthonomus squamosus*, 29 Jul 2004, *Gray 4692* (MO, *Gray 4696* (MO)); Snake River Canyon, ridge S of Billy Creek, N of Camp Creek, 46.10972 N, 116.92864 W, bunchgrass grassland, ca. 2490 ft, many heads with the weevil *Anthonomus squamosus*, 29 Jul 2004, *Gray 4695* (NY); Snake River Canyon, ridge S of Billy Creek, N of Camp Creek, 46.1097 N, 116.9286 W, bunchgrass grasslands, ca. 2490 ft, many flower heads with the weevil *Anthonomus squamosus*, 29 Jul 2004, *Gray 4697* (OSC, WS); Snake River Canyon, ridge E of Madden Creek, 46° 9.811' N, 116° 52.816' W, bunchgrass grasslands, 2760 ft, 30 Jul 2004, *Gray 4706* (ID); ca. 1.5 mi SW of Genesee, E of Hwy 95, 46.531317 N, 116.946433 W, remnant Palouse Prairie grassland, 2700 ft, 3 Aug 2004, *Gray 4728* (OSC, WS); ca. 1.5 mi SW of Genesee, E of Hwy 95, remnant Palouse Prairie grassland, 2690 ft, 3 Aug 2004, *Gray 4729* (MO); Snake River Canyon, near saddle on ridge above Cave Gulch and Big Cougar Creek, 45.989283 N, 116.859833 W, bunchgrass grasslands, 3360 ft, 17 Aug 2004, *Gray 4885* (WS); Snake River Canyon, N of Billy Creek, ca. 2.5 mi E of the Snake River, 46.12339 N, 116.89394 W, near ridge on edge of *Pseudotsuga menziesii* stand, bunchgrass meadow steppe, 3800 ft, 18 Aug 2004, *Gray 4905* (NY, OSU) and *Gray 4906* (CIC); Snake River Canyon, N of Billy Creek, ca. 2.5 mi E of the Snake River, near ridge, edge of *Pseudotsuga menziesii* stand, bunchgrass meadow steppe, 3800 ft, 18 Aug 2004, *Gray 4911* (MO); Snake River Canyon, north of Billy Creek, ca. 2.5 mi E of the Snake River, 46.1234 N, 116.8939 W, bunchgrass meadow steppe, near ridge on edge of *Pseudotsuga menziesii* stand, 3800 ft, 18 Aug 2004, *Gray 4912* (WS); near top of Gifford-Lenore Grade, ca 0.5 mi SSE of summit, 46.46401° N, 116.55528° W, weedy roadbank surrounded by cultivated fields and road, 2855 ft, 4 Oct 2004, *Gray 5001* (ID); Angel Ridge Road, ca 1.75-2.0 mi S of Angel Ridge Cemetery, E of road, 46.44459° N, 116.46685° W, grassy opening in *Pinus ponderosa* forest, 3030 ft. 11 Oct 2004, *Gray 5002* (ID); Craig Mountain WMA, Craig Mountain Ridge, ca. 1/4 mi E of Madden Creek, 46° 11.054' N, 116° 52.038' W, bunchgrasses, 3110 ft, 50-60 plants in a 20x20 ft area, 11 Jul 2004, *Hill 338* (ID); ca. 7-8 air mi SE of Genesee, on upper breaks of Howard Gulch and ca. 1 mi S of Nez Perce/Latah Co. line, private property, 46.5338° N, 116.7769° W, very small patch of remnant Palouse Prairie (ungrazed) on uphill side of road overlooking gulch and surrounded by *Crataegus douglasii* community, 2600 ft, ca. 25 plants scattered, 24 Aug 1990, *Lorain 2131* (ID); SE of Genesee, alongside Gray Eagle/190 Road near deadend (private ranch), individual tribal allotment #1, 46.529682° N, 116.78362° W, remnant palouse prairie habitat, 2500 ft, 23 Jul 2013, *McClarin 13-0025* (NEZ) and *13-0026* (NEZ); Bedrock Creek Mitigation Unit, 46.567776° N, 116.51207° W, 2400-2600 ft, 3 subpopulations with estimated 300 plants, 16 Oct 2018, *McClarin 18-0001* (NEZ); Craig Mountain, upper portions of Gold Hill, 46.084366° N, 116.93006° W, broad ridgeline and upper slope positions, 3300 ft, locally common, 15 Jul 1993, *Mancuso 1036* (ID). **Oregon. Union Co.:** No specific locality, stony ground, 3000-4000 ft, Aug 1882, *Cusick 530* (OSC, US-2 sheets); Hog Valley, 3 mi S of Union, wet stony hills, 13 Sep 1914, *Cusick 3855* (OSC, WS); Gangloff City Park on the W edge of La Grande, between the upper and lower asphalt paths, with *Pseudoregnia spicata*, *Festuca idahoensis*, *Lomatium leptocarpum*, *Pinus ponderosa*, 28 Aug 2022, *Geer 1509* (OSC, WTU); La Grande, dry hillside, 30 Jul 1910, *Peck 2695* (OSC); 2 mi E of Telocaset, dry woods, 9 Aug 1915, *Peck 3544* (OSC). **Wallowa Co.:** Precious Lands WMA, Buford Ranch, open canyon grassland habitat E of house, 45.995873° N, 117.25931° W, 3500 ft, 22 Jun 2013, *McClarin 13-0014* (NEZ). **Washington. Asotin Co.:** Lime Hill-Rogersburg, Merid 033, T7N R47E, Sec 19, 2400 ft, bluebunch wheatgrass- sandberg bluegrass association, 28 Jul 2004, *Button V-824* (VALE 904; *Button V-824-BLMV* is *P. scaberula*); Blue Mountains, NW corner of Fields Spring State Park, slopes NW of Rattlesnake Creek and Hwy 129, 3.5 mi N of Grande Ronde River, 6.2 mi N of Oregon state line, 46.08648 N, 117.18675 W, ecotone of *Pinus ponderosa*/ *Pseudotsuga menziesii*/ *Symphoricarpos albus* forest and Palouse grassland of *Pseudoroegneria spicata* and *Poa secunda* on E-dipping upper slope, 3900 ft, 10 Sep 2020, *Fertig 34851* (WS).



Map 5. Distribution of *Pyrrocoma liatrifomis* (blue) and *P. scaberula* (gold). EV, GR, KS, and SB are abbreviations for geographic localities cited by Smith et al. (2010), see text. The Latah Co. record for *P. scaberula* (Gray 4733) should be reexamined, as the habit is more characteristic of *P. liatrifomis*.

**3. PYRROCOMA LIATRIFORMIS** Greene, Leaf. Bot. Observ. Crit. 2: 17. 1909. *Haplopappus integrifolius* subsp. *liatrifomis* (Greene) Hall, Publ. Carnegie Inst. Wash. 389: 111 1928. *Haplopappus liatrifomis* (Greene) H. St. John, Fl. Southeast. Washington, 455. 1937. *Haplopappus racemosus* subsp. *liatrifomis* (Greene) Keck, Aliso 4: 103. 1958. **TYPE: Washington.** Whitman Co.: Pullman, 29 Aug 1903, C.V. Piper s.n. (holotype: US; isotypes: GH-2 sheets, MICH, MO, RM, UC, WS).

*Pyrrocoma suksdorfii* Greene, Leaf. Bot. Observ. Crit. 2: 18. 1909. **TYPE: Washington.** Spokane Co.: On prairies, 18 Jul 1889, W.N. Suksdorf 923 (holotype: US; isotypes: CAS, F, MO, PH, UC, WTU).

**Stems** erect to ascending-erect, 25–70 cm, sparsely cobwebby-pubescent, eglandular. **Leaves:** basal lanceolate to oblanceolate, 8–30 cm long, attenuate to a petiolar region, blades 10–30 mm wide, without persistent fibrous bases or fibers few, margins entire, ciliate, cauline lanceolate, 3–12 cm long, sessile (not clasping), glabrous or sparsely tomentose near the base at the petiole and midrib, eglandular. **Heads** 1 or usually (2–)3–14 in spiciform to open, racemiform arrays, peduncles 1–3 cm long. **Involucres** mostly 14–18 mm wide. **Phyllaries** triangular to oblong, with a triangular-lanceolate apex, in 4–5 subequal to unequal series, inner 10–14 mm, margins entire, sometimes with a narrow, white-scarious rim, ciliate-fringed with crinkly white hairs, faces sparsely villous, eglandular (rarely glandular), apices acute. **Ray florets** 15–25, sterile, corollas 10–14 mm long, 1–1.5 mm wide, coiling. **Disc corollas** 6–8 mm long. **Achenes** 3.5–4.5 mm long, sericeous-strigose; pappus bristles flattened and slightly dilated apically. **Chromosome number**,  $2n = 36$  (Anderson et al. 1974 – *Anderson 3508* from Whitman Co.; Mayes 1976 – *Mayes 163* and *164* from Latah Co., *165* and *166* from Whitman Co.).

**Additional collections. Idaho. Latah Co.:** Near Moscow on the Pullman road, 19 Jul 1939, *Baker 1485* (ID-2 sheets); 4 mi SE of Moscow, E slope of Tomer's Butte, 46.71° N, 116.92° W, wooded draw, 21 Jul 1956, *Baker 14513* (ID, NY); 5 mi NE of Moscow, along road to Moscow Mountain, 19 Jul 1950, *Chichester 444* (ID); 6 mi S of Troy, grassland at head of canyons leading to Potlatch River. 14 Aug 1937, *Christ 6887* (NY); Genesee, virgin fescue-wheatgrass prairie, 9 Jul 1937, *Daubenmire 37547* (WS-2 sheets, WTU); 2.5 mi S of Viola, open pine woods, gravelly soil, 27 Jun 1936, *Dillon 675* (WS); S of Moscow, S end of Paradise Ridge, Palouse Prairie grassland, 3555–3580 ft, 11 Aug 2004, *Gray 4735* (ID), *4736* (WS); *4737* (WS), *4738* (NY, WS), *4739* (CIC), *4740* (ID); N of Moscow, W of State Hwy 95, ca 1.5 mi E of border with Washington, 46° 48.075' N, 117° 0.5862' W, Palouse Prairie grasslands, 3010 ft, 15 Oct 2004, *Gray 5003* (ID); Texas Ridge Road, head of a small drainage into the Potlatch River on E side of Texas Ridge, 46° 39.239' N, 116° 34.319' W, small grassland remnant with few ponderosa pine trees on W side of road, 2605 ft, 40–50 plants, 8 Jul 2004, *Hill 335* (ID); Cedar Creek Road ca 0.5 mi from where the road leaves the Potlatch River going SE uphill along Cedar Creek, 46° 38.999' N, 116° 32.555' W, 1950 ft, 8 Jul 2004, *Hill 336* (ID); 1 mi S of Cornwall (5–6 mi E of Moscow) off Cays Road, mid and lower slopes of 1st butte S of Middle Potlatch Creek, private land, 46.69402° N, 116.86451° W, open slope of remnant Palouse Prairie in *Balsamorhiza sagittata*/*Festuca idahoensis* community with few scattered *Pinus ponderosa*, 2800–3000 ft, Aug 22, 1990, *Lorain 2126* (ID, OSC); 1 mi S of Joel (ca. 5 mi E of Moscow) on lower slopes of large off E side of small gravel road, 46.6933° N, 116.8812° W, open slope of remnant Palouse Prairie in *Festuca idahoensis*/*Balsamorhiza sagittata* community with few scattered *Pinus ponderosa*, 2800–3000 ft, 22 Aug 1990, *Lorain 2127* (ID); ca. 2–3 mi SE of Moscow, W midslopes of Tomer's Butte, Don Oleson property, 46.7078° N, 116.9229° W, open slope of remnant Palouse Prairie in a *Festuca idahoensis*/*Rosa* spp. and *Agropyron spicatum*/*Balsamorhiza sagittata* community with scattered *Pinus ponderosa*, 3200 ft, 23 Aug 1990, *Lorain 2129* (ID-2 sheets); ca. 2 air mi SE of Moscow, far S end of Paradise Ridge, private property, 46.6643° N, 116.9854° W, open slopes of remnant Palouse Prairie in a *Festuca idahoensis*/*Rosa* spp.-*Symphoricarpos albus* community, 24 Aug 1990, *Lorain 2130* (ID); 5.2 mi N of Kendrick along Hwy 99 at crest of lower end of American Ridge, between mile posts 5 and 6 (ca 0.2 mi N of MP 5), 46.6643° N, 116.7144° W, open W slopes in hwy roadcut, in *Pinus ponderosa*/*Symphoricarpos albus*-*Agropyron spicatum* community, 2600 ft, 27 Aug 1990, *Lorain 2138* (ID); ca 5.5 air mi ENE of Kendrick, between 1–2 mi SE up Cedar Creek Gulch from Potlatch River, 46.6498° W, 116.5476° W, open, dry slopes above road in *Pinus ponderosa*/*Symphoricarpos albus*-*Agropyron spicatum* community, 1950 ft, 27 Aug 1990, *Lorain 2139* (ID); ca 3.5 air mi NE of Kendrick, S end of Texas Ridge on upper crests overlooking small tributary gulch to Potlatch River, ca 4 mi N of Potlatch River along small gravel road up Pine Creek to Texas Ridge, 46.6498° N, 116.5685° W, open, small (< 1 acre) patch of remnant Palouse Prairie in *Pinus ponderosa*/*Rosa* spp./*Agropyron spicatum* community, 2600 ft, 27 Aug 1990, *Lorain 2142* (ID); 3 mi SSE of Farmington, Wash. or ca. 1.3 mi S of Palmer Butte at base of unnamed ridge S of Skyline Drive, 47.0405° N, 117.011° W, open, 5-acre patch of remnant Palouse Prairie 200 ft E off road in *Pinus ponderosa*/*Festuca idahoensis*/*Symphoricarpos albus* community with a few scattered ponderosa pine trees, 3050 ft, 30 Aug 1990, *Lorain 2143* (ID); ca 3 mi SE of Moscow, Tomer Butte, ca 0.3 mi SW of Butte summit, 46.7078° N, 116.9229° W, *Pinus ponderosa*-grassland interface along ridgeline, 3350 ft, 14 Aug 2004, *Mancuso 2636* (ID); ca 3 mi SE

of Moscow, Tomer Butte, ca 0.5 mi SW of Butte summit, 46.7078° N, 116.9229° W, *Festuca idahoensis-Rosa* spp. community, 2950 ft, 14 Aug 2004, Mancuso 2637 (ID); summit of Tomer's Butte, Aug 1916, Thomas s.n. (ID). **Washington. Spokane Co.:** Spangle, 3 Jul 1884, Suksdorf 11237 (337) (WS); prairie SW of Spangle, 24 Jul 1916, Suksdorf 8913 (WS, WTU-2 sheets). **Whitman Co.:** 4 mi S of Uniontown, along hwy, dry soil, 2 Aug 1937, Dillon 908 (MO, WS, WTU); Pullman, Conservation Park, lower trail, Military Hill, 46.738 N, 117.187 W, along trail in *Elymus spicatus-Poa bulbosa-Aegilops cylindrica* grassland on W-facing slope at edge of Crataegus grove, 2400 ft, 6 Jul 2023, Fertig 35794 (WS); Kramer Palouse Preserve (Washington State Univ.), S of jct of Wawawai Road and Rimrock Road, ca 4 air mi WNW of Colton, 46.583 N, 117.212 W, weedy ridgetop of Palouse grassland, 2850 ft, locally common but scattered, 5 Aug 2023, Fertig 35846 (WS); ca. 2 mi W of Johnson, along Union Flat, rocky slope, 25 Aug 1950, Gaines 530 (NY, US, WS); Pullman, College Farm, Botany Dept. Prairie Strip, open areas on the ridge top and along upper parts of the slope, 6 Jul 1947, Lingenfelter 444 (WS); 3 mi NE of Pullman on Kitzmiller Road, 46.761976° N, 117.13481° W, remnant of Palouse Prairie in Frontier Cemetery, abundant, 1 Sep 1979, Mitchell 81172 (ID); Whelan, 1/8 mi E of Whelan Drive, old cemetery, 46.783936° N, 117.11168° W, *Festuca idahoensis-Symphoricarpos albus*, 2540 ft, 3 Jun 1980, Morse 37 (ID); Pullman, College Farm, Botany Dept. Prairie Strip [campus prairie by WSU golf course], 14 Aug 1952, Ownbey s.n. (WS); Pullman, dry hillside pastures, 8 Sep 1915, Pickett 347 (WS, WTU); Pullman, dry hillsides, 12 Aug 1893, Piper 1572 (WS, WTU-3 sheets); Pullman, 13 Aug 1893, Piper s.n. (MO, WCW); WSU Botany Prairie Strip, just NE of Pullman beyond nuclear reactor, mostly in *Crataegus/ Symphoricarpos* habitat, but a few plants in *Festuca/ Symphoricarpos* habitat, 12 Aug 1982, Schuller s.n. (WS).

**4. PYRROCOMA SCABERULA** Greene, Leaf. Bot. Observ. 2: 19. 1909. *Haplopappus integrifolius* subsp. *scaberula* (Greene) Hall, Publ. Carnegie Inst. Wash. 389: 111. 1928. **TYPE:** Idaho. Nez Perce Co.: About Forest, 3500 ft, 29 Jul 1896, A.A. Heller 3469 (holotype: US; isotypes: MO, NY, UC). All of Heller's 1896 collections from Nez Perce County give the locality as "ABOUT FOREST" — currently, the village of Forest is located at 46° 09' 03" N, 116° 39' 47" W, "at the junction of Forest Road and Soldiers Meadow/Morrowtown Road, where the map point is placed here.

**Stems** erect, 30–70 cm, finely hirtellous, eglandular. **Leaves:** basal lanceolate to oblanceolate, 14–22 cm long, attenuate to a petiole 1/3 the leaf length, without persistent fibrous bases or fibers few, venation finely reticulate, raised abaxially, pubescent along abaxial midvein, margins entire, cauline narrowly oblanceolate to lanceolate, 8–25 mm wide, distal often subclasping. **Heads** (1, as in the type) or 2–3 at the stem apex or sessile and 2–6 and spicate, less commonly subracemose on peduncles 1–2 cm long, usually without a conspicuous, closely subtending bract. **Involucres** 12–15 mm wide, without immediately subtending bracts. **Phyllaries** oblong with a triangular-lanceolate apex, in 4-5 series subequal in length, inner 12–15 mm long, outermost bract-like and longer than involucre, green portion on distal 1/2–2/3, gland-dotted and resinous-viscid, otherwise glabrous, margins eciliate sometimes with a narrow, white-scarious rim. **Ray florets** 14–25, sterile, corollas 15–18 mm long, 1–1.5 mm wide. **Disc corollas** 9–10 mm long. **Achenes** 3.5–4.5 mm long, sericeous-strigose; pappus bristles not flattened or dilated apically. **Chromosome number**, not reported.

Where *Pyrrocoma scaberula* is sympatric with *P. arguta*, the following contrasts distinguish them.

1. Leaves entire, eglandular; heads 1 or 2–6 in a spike, without an immediately subtending bract; involucres 12–15 mm wide, phyllaries in 3–4 series, inner 12–15 mm long, ray corollas 15–18 mm long; disc corollas 9–10 mm long; achenes sericeous-strigose ..... **Pyrrocoma scaberula**
1. Leaves serrate, with imbedded glands; heads 15–50 in a spike, heads or glomerules with a prominent, immediately subtending bract; involucres 8–10 mm wide, phyllaries in 2–3(–4) series, inner 9–12 mm long; ray corollas 9–10 mm long; disc corollas 5–6 mm long; achenes glabrous ..... **Pyrrocoma arguta**

**Additional collections. Idaho. Idaho Co.:** Ca. 1.5 mi due N of Big Butte and 1 mi W of Thorn Springs Creek on N end of Grangeville Prairie, head of small drainage into Lawyers Canyon, 46.1711°N, 116.1307° W, Palouse Prairie remnant surrounded by cultivated fields, 3175 ft, two patches on N half of remnant, 13 Sep 1990, *Lorain 2148* (ID); 2 mi E of Ferdinand on Meadow Creek Road, 46.142296° N, 116.34308° W, prairie habitat S of roadway, 5 Jul 2016, *McClarin 16-0010* (NEZ); ca 1.5 mi S of Ferdinand, Ferdinand Butte, 46.134355° N, 116.36682° W, with *Festuca idahoensis*, *Koeleria cristata*, *Spiraea betulifolia*, *Iris missouriensis*, *Lupinus* sp., 4500 ft, uncommon, 29 Aug 2005, *Mancuso 2843* (ID); Salmon River Canyon, 0.3 mi W of Salmon River, ca 5 mi downriver from mouth of Rice Creek, ca 7 mi SW of Cottonwood, 45.95383 N, 116.44197 W, 1800 ft, 27 Jul 2005, *Mancuso 2798* (ID). **Latah Co.:** S of Moscow, S end of Paradise Ridge, Palouse Prairie grassland, 46° 40.27' N, 116° 58.749' W, 11 Aug 2004, *Gray 4733* (MO). **Lewis Co.:** Craigmont, rocky hillside, 21 Jul 1932, *Christ 1737* (ID-2 sheets, NY); Big Canyon Creek, T33N R2W S1 NE1/4 of NW1/4 [46.23511 N, 116.51929 W, location is actually on Coldspring Creek not Big Canyon Creek, fide Idaho National Heritage Program], on small slope area of native vegetation, 20 Aug 1979, *Heidel 79396* (ID); 2 mi W of Craigmont, 22 Aug 1979, *Heidel s.n.* (WTU). **Nez Perce Co.:** Snake River Canyon, Craig Mountain, ca. 2/3 air mi S of Middle Creek, 1 2/3 air mi E of the Snake River, 46° 2.925' N, 116° 54.32' W, northwest bunchgrass grassland, 2840 ft, ca. 500 plants in the area, 17 Sep 1999, *Gray 1559* (ID); ca. 1.5 mi SW of Genesee, E of Hwy 95, 46° 31.879' N, 116° 56.786' W, remnant Palouse Prairie grassland, 2700 ft, 3 Aug 2004, *Gray 4727* (ID); Snake River Canyon, near saddle on ridge above Cave Gulch and Big Cougar Creek, 45.989283° N, 116.85983° W, bunchgrass grasslands, 3360 ft, 17 Aug 2004, *Gray 4885* (WS); Snake River Canyon, near saddle on ridge between Cave Gulch and Big Cougar Creek, 45° 59.357' N, 116° 51.59' W, bunchgrass grasslands, 3360 ft, 17 Aug 2004, *Gray 4886* (ID); Craig Mountains, Wapshilla Ridge, 45° 58.101' N, 116° 48.54' W, bunchgrass steppe, 4790 ft, 17 Aug 2004, *Gray 4895* (CIC); between Snake and Salmon rivers, Craig Mountain, Wapshilla Ridge, 45.96836 N, 116.809 W, bunchgrass steppe, 4790 ft, 17 Aug 2004, *Gray 4900* (NY); between Snake and Salmon Rivers, Craig Mountain, Wapshilla Ridge, 45.9684 N, 116.809 W, bunchgrass steppe, 4790 ft, 17 Aug 2004, *Gray 4903* (OSC, WS); Culdesac-Reubens Road, ca 4 mi E of Culdesac, 46.36544° N, 116.58173° W, open *Pinus ponderosa* forest interspersed with bunchgrass meadow and shrub patches, 3580 ft, 1 Oct 2004, *Gray 4997* (ID); Tschantz Road ca 0.25 mi S of Cameron-Southwick Road (Co. Rd P1), ca 30 ft E of Tschantz Rd, 46° 35.84' N, 116° 31.094' W, with cultivated raspberries, *Poa pratensis*, *Cirsium arvense*, *Rosa* sp., *Symphoricarpos albus*, 2755 ft, 8 Jul 2004, *Hill 337* (ID); 2.3 mi E of Cameron, ca. 3 mi W of Southwick, on County Rd P1 just before MilePost 6, 46.5918° N, 116.5268° W, small, open Palouse Prairie remnant on N side of road with scattered *Pinus ponderosa* within a *Pinus ponderosa*/*Symphoricarpos albus*-*Festuca idahoensis* community, 2650 ft, single plant in SW corner of remnant near small ditch, 27 Aug 1990, *Lorain 2135* (ID-2 sheets, SRP). **Oregon. Wallowa Co.:** Joseph Canyon - Coulson Acquisition, Merid 033 T50N R440E Sec 25, open ponderosa pine forest edge, 4440 ft, 20 Jul 2004, *Button V-822* (BLMVL); Colson property off Hwy 3, canyon grassland with ponderosa pine, 4440 ft, 17 Aug 2011, *Ferriell RDF 2011-002* (BLMVL); Precious Lands WMA, Paradise Point, 75' E of ridgetop bench on downslope overlooking Joseph Creek Canyon, 45.943962° W, 117.18912° N, dry open native bunchgrass community (pristine *Pseudoregneria spicata* / *Festuca idahoensis* habitat), 4200 ft, 11 Aug 2009, *McClarin 09-0018* (NEZ); Precious Lands WMA, Buford Ranch, ridgetop bench overlooking Grande Ronde River Canyon, 45.996395° N, 117.26505° W, dry open native bunchgrass community, 3720 ft, 11 Aug 2009, *McClarin 09-0019* (NEZ); Precious Lands WMA, Buford Ranch, ridgetop bench overlooking Grande Ronde River Canyon, 45.996995° N, 117.26274° W, dry open native bunchgrass community, 3720 ft, 11 Aug 2009, *McClarin 09-0020* (NEZ); Precious Lands WMA, Buford Ranch, ridgetop bench overlooking Grande Ronde River canyon, 45.996995 N, 117.262741 W, dry, open bunchgrass community, 3720 ft, 11 Aug 2009, *McClarin 09-0021* (NEZ); Precious Lands WMA, Paradise Point, 75' E of ridgetop bench on downslope overlooking Joseph Creek Canyon, 45.943962° N, 117.18912° W, dry open native bunchgrass community (pristine *Pseudoregneria spicata* / *Festuca idahoensis* habitat), 4200 ft, 11 Aug 2009, *McClarin 09-0022* (NEZ). **Washington. Asotin Co.:** Lime Hill-Rogersburg, Merid 033, T007N R047E, Sec 19, 2400 ft, bluebunch wheatgrass- sandberg bluegrass association, 28 Jul 2004, *Button V-824* (BLMV 5651; *Button V-824-VALE 904* is *P. arguta*); Fields Spring State Park, E slope of Puffer Butte, E of main park road, near park boundary, 1 mi SE of Hwy 129, 46.06979° N, 117.16713° W, N-facing slope below summit at ecotone *Pseudoregneria spicata*-*Festuca idahoensis* grassland and open *Pinus ponderosa* forest, 3900 ft, 3 10 Sep

2020, *Fertig 34845* (WS); ca 6.5 air mi W of Anatone, SE flank of Little Butte, NW of Coombs Canyon, ca 2 air mi NNW of Anatone Butte, 46.13917° N, 117.26539° W, E-facing slope below *Pinus ponderosa* forest in grassland-forest ecotone, 4400 ft, 80% of *Pyrrocoma scaberula* plants vegetative, in scattered patches on rocky slopes, rocky clay openings, or edge of forest, absent in center of meadow with high grass cover and abundant *Ventenata dubia*, also absent from forest, 11 Sep 2020, *Fertig 34865* (WS); SE slope of Little Butte, open meadow, 46.14293° N, 117.27349° W, ca. 200 flowering individuals, 1 Aug 2018, *Kinsell 18-002* (WTU).

### Previous studies

Two previous studies have investigated the distinction between *Pyrrocoma liatriformis* and *P. scaberula* — Björk & Darrach (2009) and Smith et al. (2010). The ultimate results of the Björk & Darrach study (as mapped, their Figure 2) correspond with those here. Mayes (1976) did not cite specimens but he also mapped the distribution of *P. liatriformis* in the same way.

The two species are distinct in morphology and geography, *Pyrrocoma liatriformis* occurring on Palouse grasslands, *P. scaberula* on canyon/Camas Prairie grassland. Both species have been recently recognized (e.g., Hitchcock & Cronquist 2018; Chambers 2020). Björk & Darrach noted that "two Palouse populations have the non-tomentose and strongly glandular condition of *P. scaberula*," perhaps suggesting introgression, but these two (KS and GR) are within the geographic range of *P. liatriformis* (Map 3, here) and not in contact with *P. scaberula*.

The two cladograms in Smith et al. (Fig. 2, neighbor-joining, from AFLP allele frequency data; Fig. 3, neighbor-joining, from AFLP band presence/absence) also show a separation of the two species. Subgroups exist within *Pyrrocoma liatriformis*, one of them comprising most of the Latah County populations. Data of Smith et al. also suggest that population EV might be influenced by recent hybridization, but it is far-removed from proximity with *P. scaberula*.

Björk & Darrach studied plants from 31 populations in the field and "from large populations, voucher specimens (one fertile stem each) were gathered for every sampled plant. ... Photos will be archived in both digital and printed format at the Stillinger Herbarium ... , where voucher specimens will be deposited as well." They did not cite vouchers, which apparently are the same as for the study of Smith et al., and the existence of vouchers is not evident.

Smith et al. noted that a total of 32 populations of *Pyrrocoma liatriformis* and *P. scaberula* (as identified by morphology) were studied via molecular analyses, their samples "the same populations and individuals sampled for morphological data by Björk & Darrach (2009)." They cited the populations only by a locality phrase, noting that "all vouchers ... are deposited in Herbarium ID" and thanking Karen Gray and Tyson Kemper for collecting leaf material, but vouchers are not among databased collections. Many collections of Oregon *Pyrrocoma* (including *P. arguta*, *P. liatriformis*, and *P. scaberula*) were made by Christine Lorain in 1990 and Karen Gray and associates in 2004 in connection with a study of Palouse Goldenweed (Gray et al. 2005) — these are deposited in the ID herbarium and elsewhere and some of the Latah County localities cited by Smith et al. align with those collections. Map 3 (here) includes a few range-expanding map points in Whitman County based on geography cited by Smith et al.

### LITERATURE CITED

- Björk, C.R. and M. Darrach. 2009. An investigation of morphological evidence supports the resurrection of *Pyrrocoma scaberula* (Asteraceae: Astereae). *J. Bot. Res. Inst. Texas* 3: 231–238.
- Chambers, K. 2020. *Pyrrocoma*. Goldenweed. Pp. 329–332, in *Flora Of Oregon*, Vol. 2: Dicots A-F. BRIT Press, Bot. Res. Inst. of Texas, Fort Worth.

- Gray, K., J. Hill, and M. Mancuso. 2005. Updated Palouse Goldenweed (*Pyrrocoma liatriformis*) occurrence on BLM land, Craig Mountain, Idaho. Idaho Conservation Data Center, Idaho Dept. of Fish & Game, Boise. <<https://idahodocs.contentdm.oclc.org/digital/collection/p16293coll7/id/109035>>
- Hitchcock, C.L. and A. Cronquist (D.E. Giblin, B.S. Legler, P.F. Zika, and R.G. Olmstead — eds.). Flora of the Pacific Northwest. An Illustrated Manual. Second Edition. Univ. of Washington Press, Seattle.
- Nesom, G.L. 2025. Taxonomy of the *Pyrrocoma racemosa* group (Asteraceae: Astereae). *Phyto-neuron* 2025-05: 1–60.
- Nuttall T. 1840. Descriptions of new species and genera of plants in the natural Order of the Compositae, collected in a tour across the continent to the Pacific, a residence in Oregon, and a visit to the Sandwich Islands and Upper California, during the years 1834 and 1835. *Trans. Amer. Philos. Soc.*, ser. 2, 7: 283–453.
- Pennell, F.W. 1936. Travels and scientific collections of Thomas Nuttall. *Bartonia* 18: 1–51.
- Roth, L. 2022. Reuben Nevius (1827-1913). *Oregon Encyclopedia*. <[https://www.oregonencyclopedia.org/articles/nevius\\_reuben\\_1827\\_1913\\_/](https://www.oregonencyclopedia.org/articles/nevius_reuben_1827_1913_/)>
- Smith, J.F., D.N. Perkins, C.J. Björk, and G. Glenne. 2010. Species boundaries in *Pyrrocoma liatriformis* and *Pyrrocoma scaberula* (Asteraceae) based on AFLP data. *Madroño* 57: 95–105
- Townsend, J.K. 1839. Narrative of a Journey Across the Rocky Mountains to the Columbia River ... With a Scientific Appendix. Henry Perkins, Philadelphia.
- Wyeth, N.J. [D. Johnson, ed.]. 1984. The Journals Of Captain Nathaniel J Wyeth's Expeditions To The Oregon Country 1831-1836. Ye Galleon Press, Fairfield, Washington.



Figure 1. *Pyrocoma arguta*. Holotype, Nuttall s.n. (BM 1025340).



Figure 2. *Pyrrocoma arguta*. Detail from holotype, Nuttall s.n. (BM 1025340).



Figure 3. *Pyrrocoma arguta*. Detail from holotype, Nuttall s.n. (BM 1025340).



Figure 4. *Pyrrocoma duriuscula*. Holotype, Cusick 1755 (US).



Figure 5. *Pyrrocoma duriuscula*. Detail from isotype, *Cusick 1755* (E).



Figure 6. *Pyrocoma duriuscula*. Isotype, Cusick 1755 (BRU).



Figure 7. *Pyrocoma glomerata*. Holotype, Nuttall s.n. (BM 1025339).



Figure 8. *Pyrrocoma glomerata*. Details from holotype, Nuttall s.n. (BM 1025339). yes



Figure 9. *Pyrocoma glomerata*. Details from Nuttall *s.n.* — left (GH 9248), right (NY 178916).

Figure 10. *Pyrrocoma glomerata*. Isotype (left side), Nuttall s.n. (GH).



Figure 11. *Pyrrocoma glomerata*. Details of *Homopappus paniculatus*. Isotype, Nuttall s.n. (GH).



Figure 12. *Pyrrocoma glomerata*. Detail from holotype of *Homopappus paniculatus*, Nuttall s.n. (BM 1025337).



Figure 13. *Pyrrocoma glomerata*. Washington Co., Idaho, Tuason 457 (ID).



Figure 14. *Pyrocoma glomerata*. Washington Co., Idaho, Tuason 479 (ID).



Figure 15. *Pyrrocoma glomerata*. Washington Co., Idaho, Tuason 479 (CIC).



Figure 16. *Pyrrocoma glomerata*. Washington Co., Idaho, Christ 12904 (ID).