Nesom, G.L. 2020. *Erythranthe howaldiae* (sect. *Simiolus*; Phrymaceae), a new species from Mono Co., California.
Phytoneuron 2020-1: 1–7. Published 20 January 2020. ISSN 2153 733X

ERYTHRANTHE HOWALDIAE (SECT. *SIMIOLUS*; PHRYMACEAE), A NEW SPECIES FROM MONO CO., CALIFORNIA

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ABSTRACT

Erythranthe howaldiae Nesom, **sp. nov.**, is described from the Sierra Nevada of Mono Co., California, where it grows on a seepy, granite slope, known only from the type collection. It is at least superficially most similar to *E. percaulis* and *E. nudata*, both of which are serpentine endemics from northern California localities, but its closest evolutionary relationship may be with other species.

Collections and study by Ann Howald of the plants of Mono County, California, have brought to light a previously undescribed species of *Erythranthe* sect. *Simiolus*. The species is known only from the type locality, slightly east of Sonora Pass.

The observations here are similar to those of the collector, who recognized the close similarity of the Mono County plants to *Erythranthe percaulis* Nesom, which is endemic to serpentine habitats in the North Fork Feather River Canyon (Serpentine Canyon) of Plumas County, about 150 miles north of the Mono County locality (Schoenig 2016).

ERYTHRANTHE HOWALDIAE Nesom, **sp. nov.** **TYPE**: **California**. Mono Co.: Sierra Nevada east slope, Sonora Pass Road (Hwy 108), ca. 1.5 mi E of Sardine Meadow, N side of road, 38° 18' 34.2" N, 119° 34' 59.7" W, NAD 83, Pickel Meadow 7.5' Q. (T5N, R22E, S5), among mosses on gradual, S-facing, seepy granite slope, 8164 ft, uncommon annual herb, with high diversity of herbaceous plants, 24 Jul 2019, *A. Howald 5078* (holotype: CAS; isotype: PH).

Similar to *Erythranthe percaulis* in its annual duration, small and sessile cauline leaves, strictly ascending pedicels, and relatively small corollas but different in its geography and ecology, smaller stature, minutely hirsutulous leaves (adaxially) with slightly dilated, perfoliate bases, shorter fruiting pedicels, and larger corollas.

Annual herbs from shallow fibrous roots. **Stems** 1–4 from basal or near-basal nodes, erect to ascending from the base, 4–12 cm tall, glabrous or minutely stipitate-glandular at the nodes, terete, internodes 1.5–2.5 cm. **Leaves** basal and cauline, adaxial surfaces minutely hirsutulous with stiffly erect, sharp-pointed hairs, glabrous abaxially, basal and lowermost cauline petiolate, petioles 4–10 mm, blades ovate, 6–10 mm, margins shallowly serrate, more distal cauline abruptly becoming sessile, even-sized or becoming slightly smaller, oblong- to elliptic-ovate, entire, (mid to distal) mostly 4–6 mm long, base slightly dilated and perfoliate base. **Fruiting pedicels** 9–20 mm long, ascending. **Calyces** 5-lobed, in fruit cylindric to cylindric-obconic, 5–7 mm long, with sharply raised and purplish ridges and often sparsely purple-mottled near the ridges, lobes with acute to acute-acuminate apices, upper lobe slightly longer, the lower closing upward at maturity. **Flowers** in 3–6 pairs, from lowermost to uppermost nodes. **Corollas** yellow with a red spot in the center of the lower lip, palate ridges hairy, tube-throat narrowly cylindric-funnelform, 7–8 mm, exserted 3–4 mm beyond calyx margin, limb bilabiate, 3–5 mm in width (pressed). **Anthers** glabrous, included. **Styles** glabrous; stigma above the level of the anthers (apparently herkogamous). **Capsules** short-stipitate, included (capsule apex reaching calyx lobe sinuses).

Figure 1. *Erythranthe howaldiae*, from the holotype collection.

Figure 2. *Erythranthe howaldiae*, selected plants from the array in Figure 1.

Figure 3. *Erythranthe howaldiae*, flower details from plants of holotype collection.

Figure 4. *Erythranthe howaldiae*, leaf details from plants of holotype collection.

Figure 5. *Erythranthe howaldiae*, details from plants of isotype collection. Bottom left shows vestiture of adaxial leaf surface.

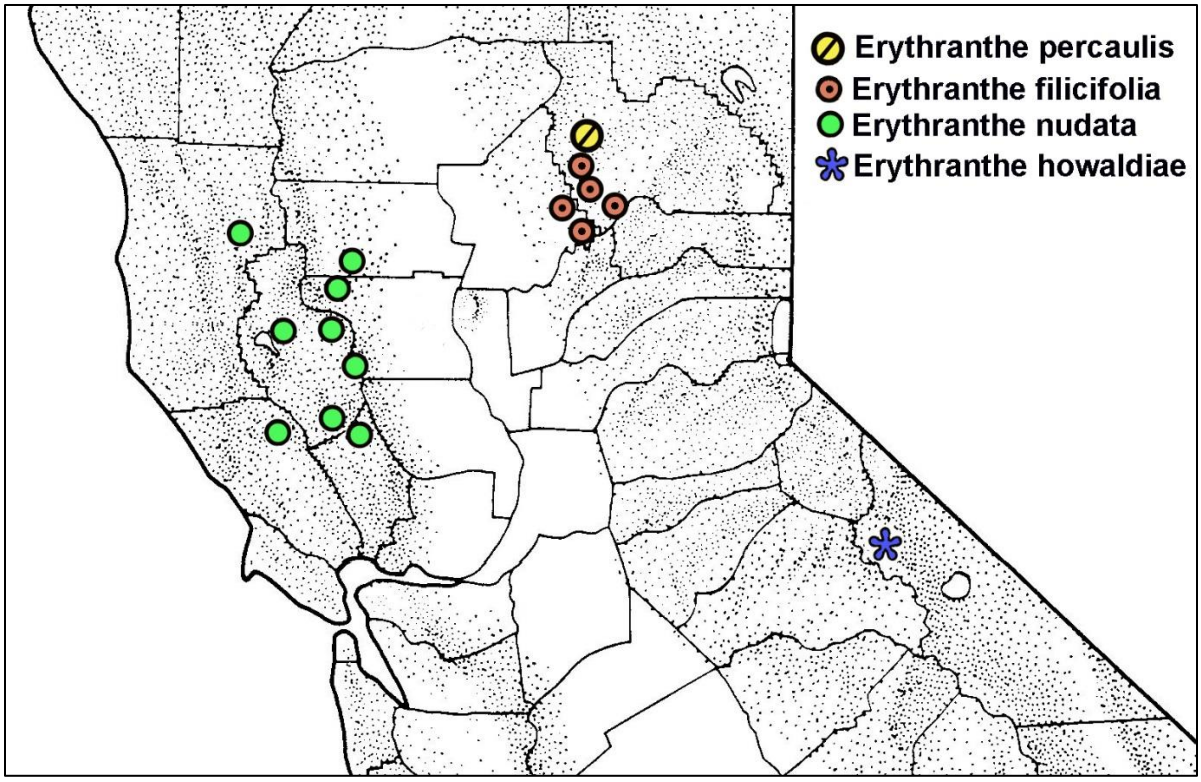

Figure 5. Distribution of *Erythranthe howaldiae* and putative close relatives. See Keever et al. (2016) for details on the distribution of *E. filicifolia*.

Figure 6. Locality of *Erythranthe howaldiae* type collection — south-facing, seepy granite slope on north side of Hwy 108 in Mono County. Leavitt Creek is along the south side of the road. Google Earth photo.

The species is named for its collector, Ann Howald, who has been studying the Mono County flora since 1975 and working toward an annotated checklist. She has an MA in Botany from UC-Santa Barbara and has been a consulting botanist focusing on rare plant surveys and conservation issues. She's now retired and an active volunteer for the California Native Plant Society, living in Mono County in the summer and teaching about its plants and habitats.

Erythranthe howaldiae is closely similar in aspect to *E. percaulis* and *E. nudata* (Curran ex Greene) Nesom, especially to the former. As in *E. percaulis*, the distinctly exserted style and stigma and the herkogamous arrangement of stigma and anthers indicate that flowers of *E. howaldiae* are chasmogamous and allogamous. The morphological differences, however, are consistent and the taxa are separated in geography (Fig. 5) and ecology (Fig. 6).

1. Cauline leaf blades 5–15(–30) mm; plants glabrous or stems, leaves, and fruiting calyces minutely stipitate-glandular, hairs 0.05–0.1 mm, at least just above nodes; fruiting calyces 6–13 mm long; corolla limb expanded 8–12 mm in width; serpentine substrate ..... **Erythranthe nudata**
1. Cauline leaf blades 4–10 mm; plants glabrous; fruiting calyces 4–7 mm long; corolla limb expanded 3–5 mm in width; serpentine or granite substrate.

2. Stems 7–30 cm tall, internodes 2–5 cm; leaves glabrous on both surfaces; corolla tube-throat 4–6 mm long, exserted 2–3 mm beyond the calyx, throat floor and lower lip with red markings; fruiting pedicels 15–35 mm long; serpentine substrate ..... **Erythranthe percaulis**
2. Stems 4–12 cm tall, internodes 1.5–2.5 cm; leaves minutely hirsutulous adaxially; corolla tube-throat 7–8 mm long, exserted 3–4 mm beyond the calyx, lower lip with a single red spot; fruiting pedicels 9–20 mm long; granite substrate ..... **Erythranthe howaldiae**

The similarities also suggests that *Erythranthe howaldiae* is part of the evolutionary clade hypothesized to include *E. percaulis*, *E. nudata*, and *E. filicifolia* (Sexton et al.) Nesom (e.g., Nesom 2013a, 2013b, 2019), perhaps as a derivative of *E. percaulis* (or of *E. nudata*), with a loss of fidelity to serpentine substrate. On the other hand, the hirsutulous leaf surfaces and unusual leaf bases of *E. howaldiae* suggest that its evolutionary affinity may be closer to the group of annual species comprising *E. microphylla*, *E. nasuta*, *E. laciniata*, *E. marmorata*, and *E. pardalis* (Nesom 2019), the latter three more similar in geography to *E. howaldiae*.

ACKNOWLEDGEMENTS

Many thanks to Emily Magnaghi (Dept. of Botany, CAS) for the photo of plants of the type collection (Figure 1).

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