

TAXONOMIC STATUS OF *ERYTHRANTHE MINOR* (PHRYMACEAE)

GUY L. NESOM

Research Associate

Academy of Natural Sciences of Drexel University

Philadelphia, Pennsylvania 19103

guynesom@sbcglobal.net

ABSTRACT

Most plants in Colorado previously identified as *Erythranthe guttata*, *E. tilingii*, and *E. minor* apparently represent a single entity, here identified within *E. guttata* sensu stricto as the “minor morph,” characterized especially by densely hirtellous, eglandular vestiture. *Erythranthe guttata* with glandular vestiture is known from Moffat County and in several north-central counties. The minor morph occurs northward into Albany and Carbon cos., Wyoming, southward into northern New Mexico, and slightly westward into Utah. It appears to be relatively sharply delimited in morphology from glandular *E. guttata* to the south and southwest, but plants closely similar to the minor morph extend northwestward to the Pacific coast and make its recognition as a species distinct from *E. guttata* problematic.

In earlier treatments (Nesom 2012; Nesom & Fraga 2019), *Erythranthe minor* (A. Nels.) Nesom has been recognized as a species perhaps closely related to *E. tilingii* (Regel) Nesom but distinct in morphology and nearly endemic to Colorado. After opportunities to examine a larger number of collections, evidence suggests that it is better identified as part of the widespread and variable *E. guttata*.

In the protologue of *Mimulus minor*, Nelson (1904) contrasted it with *M. guttatus*, pointing out the smaller corollas in the new species. Pennell (1951) treated *Mimulus minor* as a distinct species occurring from Oregon and Idaho south to Utah and New Mexico — he also emphasized the short corollas and noted that the pedicels produced only eglandular hairs. In 2012 I saw similarity in the Colorado plants to *Erythranthe tilingii* in their relatively high elevation habitat (subalpine to alpine, 8000–12,100 feet, rarely down to 7000 feet) and their filiform, prolifically produced rhizomes that often arise from lower cauline nodes, identifying them as *Erythranthe minor* and contrasting them with *E. tilingii* by their shorter corolla tube-throats (9–11 mm vs 15–25 mm) only slightly exerted beyond the calyx margin (but apparently herkogamous and allogamous) as well as their distinctive geographic range.

The Colorado plants are distinctive and consistent in vestiture and corolla morphology, but similar morphology appears sporadically elsewhere in the range of more typical *Erythranthe guttata* and a formal distinction is problematic to maintain. Almost all Colorado plants previously identified as *E. guttata*, *E. tilingii*, and *E. minor* are characterized by short corolla tubes (Figs. 1, 2, 3) and densely and minutely hirtellous, eglandular stems, peduncles, and pedicels (Fig. 4) — the range of this “minor morph” extends southward into northern New Mexico, slightly westward into Utah, and northward into Albany and Carbon cos., Wyoming (Fig. 5). To the south and southwest, there appears to be a discontinuity between the minor morph and more typical *E. guttata* with longer corolla tubes and vestiture with gland-tipped hairs, but beyond southern Wyoming these morphological features appear sporadically northwestward and with intergradation to the Pacific coast (northern Oregon, Washington, British Columbia).

In southern Oregon, California, and into Nevada and northwestern Arizona, vestiture of *Erythranthe guttata* is consistently villous-glandular, usually without eglandular hairs. Elsewhere in its geographic range (except for the Colorado segment), vestiture characteristically is a mix — hirsute-hirtellous and villous-glandular — with both eglandular and glandular hairs.



Figure 1. *Erythranthe guttata* in Colorado, the “minor morph.” The minor morph usually produces a few distal flowers but variants can produce a raceme like that often seen in broadly distributed *E. guttata*.



Figure 2. *Erythranthe guttata* in Colorado, the “minor morph.” Left: Groundhog Meadow Trail, Rio Grande Co.. Right: Wildcat Trail, Montezuma Co. Photos by Al Schneider, used by permission.



Figure 3. *Erythranthe guttata* in Colorado, along Wildcat Canyon Stream, Montezuma Co. Photo by Al Schneider, used by permission.

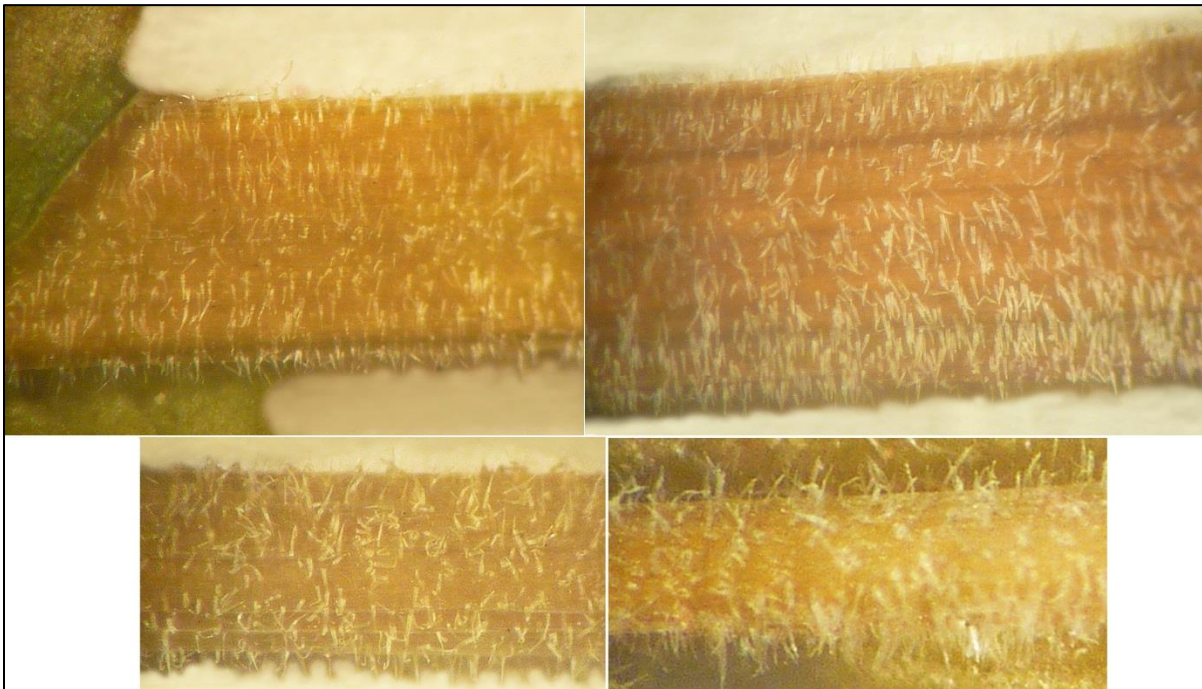


Figure 4. *Erythranthe guttata* (the "minor morph") in Colorado. Characteristic upper cauline vestiture.

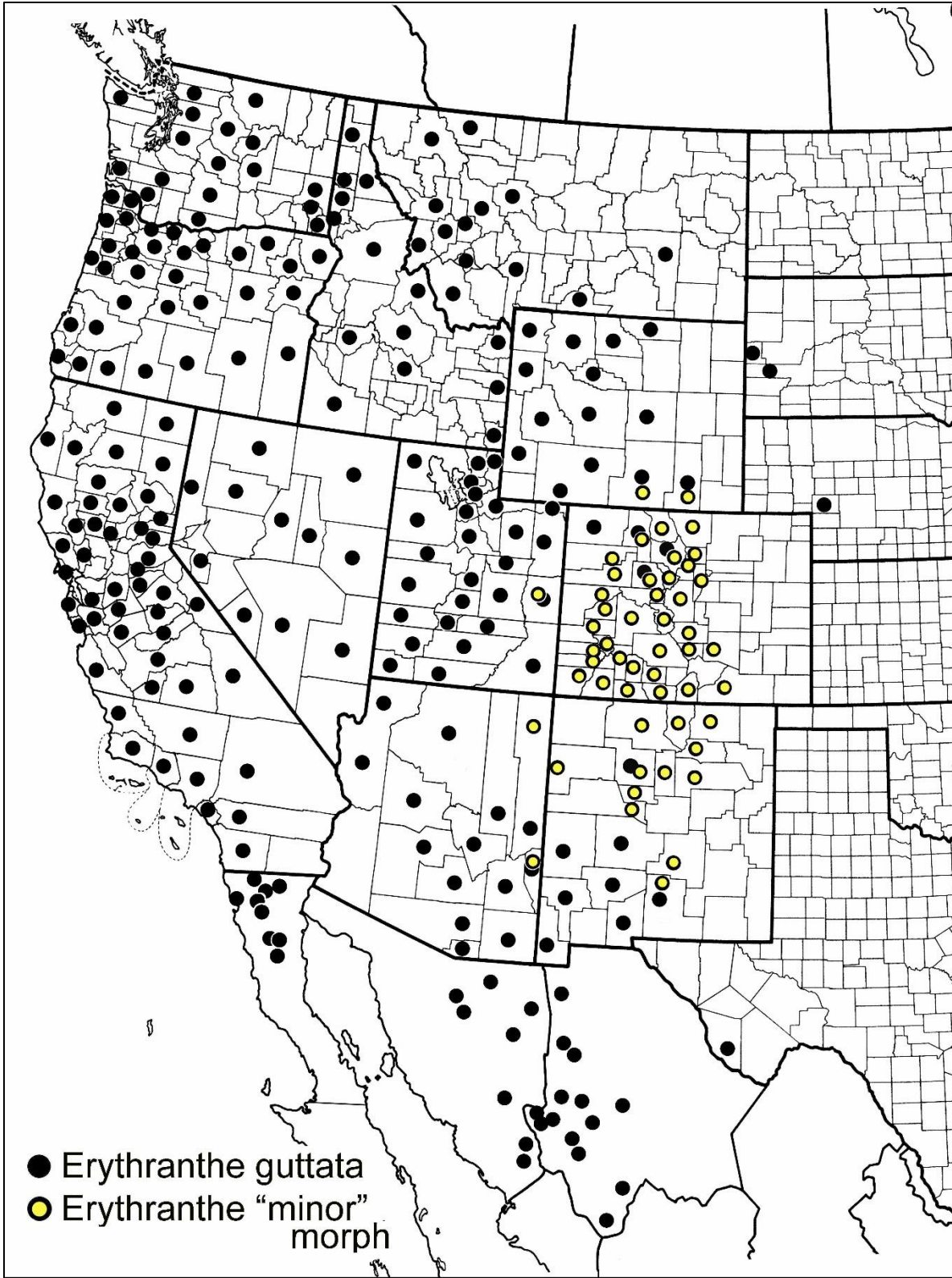


Figure 5. Distribution of *Erythranthe guttata*, including the minor morph, in the USA and Mexico. It is characterized mainly by the densely hirtellous, eglandular vestiture of at least the peduncles and pedicels. Plants similar to the minor morph continue sporadically across Wyoming to northern Oregon, Washington, and southern British Columbia. The discontinuity appears to be more sharply defined southwestward.

As noted earlier (Nesom 2012), the distribution of tetraploid chromosome counts for *Erythranthe guttata* (Fig. 6) seems to be largely congruent with the distribution of the minor morph. If the morph proves to be consistently tetraploid, it may be reproductively isolated from diploid *E. guttata*. More data are needed to delineate in detail the geographic boundary between diploids and tetraploids, and collections from Arizona and southeastern Utah should be reexamined for vestiture type.

In the earlier concepts of *Erythranthe minor* (Nesom 2012; Nesom & Fraga 2019) the vestiture was described as “densely minutely hirtellous and eglandular or with a mixture of hirtellous and gland-tipped hairs.” As indicated by Figure 5, however, within the range of the minor morph, glandular plants are uncommon.

Documentation of sympatry of the "minor morph" and glandular-stemmed plants of *Erythranthe guttata* in Arizona, Colorado, and New Mexico.

ARIZONA.

Greenlee Co.: Hannagan Meadow area, 8900-9300 ft, 21 Jun 1962, *Schmidt 170* (ARIZ)— the minor morph. Other collections examined from Greenlee Co. are *E. guttata* with minutely glandular stems.

COLORADO.

Eagle Co.: Gore Range, ca. 12.5 mi SE of Vail, just N of Vail Pass, *Holt 2310* (RM)—vestiture small plants with solitary heads and vestiture greatly reduced, minutely hirtellous; Sawatch Range, ca. 6 air mi S of Minturn, Notch Mtn Creek, Holy Cross Wilderness, *Kirkpatrick 4181* (RM)—pedicels and calyces glandular; Sawatch Range, ca. 15 air mi S of Dowds Junction, along Missouri Creek, *Kirkpatrick 4514* (RM)—similar to *Holt 2310*. The following from Eagle Co. are typical minor morph: Sawatch Range, ca. 6 air mi S of Vail, *Holt 1713* (RM); Gore Range, ca. 5 air mi E of Vail, *Holt 3130* (RM); Gore Range, ca. 5 mi ENE of Vail, *Holt 3040* (RM); Gore Range, ca. 8 air mi E of State Bridge, *Kirkpatrick 2656* (RM).

Grand Co.: Arapaho Natl Forest, Byers Peak Wilderness, Lake Evelyn Trail, ca. 9.5 air mi WSW of Fraser, *Foley 4251* (RM)—vestiture greatly reduced, pedicels and calyx barely hirtellous, stems glabrous; Arapaho Natl Forest, Vasquez Mtns, ca. 2 air mi ESE of Byers Peak and ca. 8 air mi SW of Fraser, *Foley 7621* (RM)—distal stems, pedicels, and calyces stipitate-glandular and sparsely hirtellous. Other collections examined from Grand Co. are the "minor morph."

Routt Co.: W slope of Park Range, Rte 40, along cold brook, *Pennell & Schaeffer 22369* (PH)—nearly glabrous, with a few glands. Other collections from Routt Co. are the "minor morph."

NEW MEXICO.

Sandoval Co.: Jemez Mtns, Seven Springs Fish Hatchery, riparian on river, *Reif 441* (RM)—stems and calyx sparsely villous-glandular. Other collections examined from Sandoval Co. are the "minor morph."

Nomenclatural summaries

The two names below are typified by plants of the "minor morph."

Mimulus minor A. Nels., Proc. Biol. Soc. Wash. 17: 178. 1904. *Mimulus langsdorffii* var. *minor* (A. Nels.) Cockerell in Daniel, Fl. Boulder, Colorado, 213. 1911. *Erythranthe minor* (A. Nels.) Nesom, Phytoneuron 2012-40: 44. 2012. **TYPE: USA. Colorado.** [Boulder Co.:] Arapahoe Pass (near Boulder), timberline, 1904, *D.M. Andrews 8* (holotype: RM!).

Mimulus puberulus Greene ex Rydb., Fl. Colorado, 311. 1906 [Greene, Leaf. Bot. Observ. Crit. 2: 4. 1909]. *Mimulus guttatus* var. *puberulus* (Greene ex Rydb.) A.L. Grant, Ann. Missouri Bot. Gard. 11: 170. 1924. **LECTOTYPE** (Nesom 2012): **USA. Colorado.** [Archuleta Co.:] Pagosa Springs, 27 Jul 1899, *C.F. Baker 587* (ND-Greene 046404!; isolectotypes: F image, MO!, ND-Greene!, NY image, POM!, RM!, UC!, US image).

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- Nesom, G.L. 2012. Taxonomy of *Erythranthe* sect. *Simiola* (Phrymaceae) in the USA and Mexico. *Phytoneuron* 2012-40: 1–123.
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