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Barry A. Prigge

*University of California, Los Angeles*

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NEW SPECIES OF MENTZELIA (LOASACEAE) FROM GRAND COUNTY, UTAH

Barry A. Prigge

ABSTRACT. — A new species, Mentzelia (Section Bartonia) shultziorum, of the Loasaceae (Mentzelioideae) is described. A close relationship with M. multicaulis (Osterh.) Darl. and M. argillosa Darl. is suggested based on the morphology of the flowers, leaves, and seeds.

Recent field work in Grand County of southeastern Utah has turned up two populations of an undescribed species of Mentzelia (sect. Bartonia). This section of Mentzelia demonstrates considerable morphological diversity and adaptability and has radiated into many of the diverse and often isolated habitats resulting from the wide range of substrate, elevation, and precipitation of the Colorado Plateau Province of eastern Utah, western Colorado, northern Arizona, and western New Mexico. Many species of this section occur on unusual substrates that are commonly unsuitable for most species because of textural properties or high concentrations of evaporites or minerals. Mentzelia is apparently able to exploit these habitats by escaping intense competition from species that occur on more suitable substrates. Edaphic factors and isolation are very important in their speciation and probably account for the many edaphically restricted, and often locally endemic populations of Mentzelia in the Colorado Plateau Province. It is from such a small, isolated, unusual substrate that this new species was discovered.

Within Mentzelia species recognition is based on subtle and technically difficult characters, and in the section Bartonia speciation has created many permutations of the available character states. This has resulted in many taxonomic headaches that standard collecting and herbarium techniques have generally been ineffective in solving. Scanning electron microscopy has greatly facilitated the delimitation of taxa by revealing the microstructure of the seed coat (Hill 1976), thus providing two new characters and several character states (radial walls straight or wavy and number and shape of papillae on tangential walls) that help elucidate the taxonomic problems. It is on the basis of micromorphological characteristics of the seed and the standard macroanatomical characteristics that we recognize this new species.

Mentzelia shultziorum Prigge, sp. nov.

Fig. 1

Mentzelia multicaulis (Osterh.) Darl. affinis, sed ab eo alis seminum 0.20–0.35 mm latis, foliis caulinis ovatis vel obovatis, dentibus non profundis, diversum.

Rounded, much branched, herbaceous perennial 20–30 cm tall; branches generally arching upward; pubescent with glochidiate and pointed hairs. Cauline leaves obovate, ovate or elliptic in outline, 10–30 (33) mm long, 4–20 mm wide, shallowly toothed at margin with 3–4 teeth on each side, cuneate or broadly attenuate at base, rounded obtuse or acute at apex, densely pubescent on both surfaces with both glochidiate and pointed hairs, some of which have pustulate bases. Bracts linear, lanceolate or oblanceolate; 3.5–11.5 mm long, 1.2–2 mm wide; entire or with 1 or 2 short teeth along margin. Flowers with pedicels to 2.5 mm long; calyx lobes 5, 5.4–8.5 mm long, deltoid, acuminate, 2.2–3.0 mm wide at base, calyx tube 1–1.5 mm long; petals 5, yellow, 9.2–15.5 mm long, 2.7–5.2 mm wide, acute at apex, clawed, glabrous; the next whorl within the petals of 5 petaloid stamens, broadly obovate to oblanceolate, 6.5–9.0 mm long, 1.1–3.8 mm wide, with functional anthers; stamens numerous; grading from 9 mm long for the outermost

1Department of Biology, University of California, Los Angeles, California 90024.
Fig. 1. *Mentzelia shultziorum* flowering branch: a. Fruit. b. Flower.
whorl to 3.8 mm long for the innermost whorl; filaments narrow except sometimes for about 3 in the outermost whorl which are up to 1.5 mm wide; anthers 0.7–1.0 mm long; pistil 1, style 1, 7–9 mm long. Capsules broadly urceolate, 4.0–5.5 (6.0) mm long and topped by a persistent calyx, 4.2–5.0 (5.2) mm diam. Seeds lenticular, dark brown or black, 2.3–2.8
mm long, 1.4–3.1 mm wide, with a narrow wing 0.2–0.35 mm wide, often ridged on one or both faces, seed coat cells with straight radial walls and with 2–5 papillae on tangential walls. Flowers from July to Sept.

**Type:**—Utah. Grand Co.: 7.3 mi S of intersection of Hwy 128 and Onion Creek Rd in Fisher Valley, 11 air mi NE of Moab; Elev 5,200 ft, T24S, R24E, Sec 19, Shultz & Shultz 2070. Holotype: UTC. Isotypes: RSA.

**Specimens examined:**—Utah. Grand Co.: above Onion Creek, 5,200 ft., 7.1 mi E of State Hwy 128 on Fisher Ranch Rd (38°42’ N; 109°15’ W), Prigge, Shultz, & Shultz 6644,
(LA); Onion Creek drainage of Fisher Valley (11 air mi NE of Moab) 7.3 mi ESE of Hwy 128: Sec 22, T24S, R24E, 38° 42' N, 109° 15' W, elev 5,200 ft, Shultz, Shultz, & Prigge 9030 (UTC, LA); 9 mi NE of Moab, NW above pass between Castle Valley and Porcupine Canyon, T25S, R23E, Sec 6 NW 1/4, 4,600 ft, Franklin 2201 (BRY).

The specific epithet is in honor of John and Leila Shultz, students of the botany of the Great Basin and Colorado Plateau, who found this new population of Mentzelia.

Mentzelia shultziorum is known from only two localities in Grand Co., Utah (Fig. 2). At the first locality it occurs near an old uranium and vanadium mine site on gray clay substrates of the Moss Back Member of the Chinle shale, which outcrops locally. It is restricted to steep, sparsely vegetated south-facing exposures on these substrates where alluvial and colluvial erosion rates are high. Associated species are: Oryzopsis hymenoides, Fallugia paradoxa, Atriplex canescens, and Chrysothamnus nauseosus. At the second locality it is on dark red clay of the Moenkopi Formation(?) with Atriplex, Eriogonum, and Ephedra.

Mentzelia shultziorum possesses no characteristics that are not found in other species of Mentzelia (Sect. Bartonia) in Utah. However, the combination of characteristics is unique, and its relationships within the section Bartonia are not entirely clear. Seed shape, which is lenticular with a narrow wing 0.2–0.35 mm wide (Fig. 4), is similar to that of M. pumila; the seed coat cells, which have straight radial walls and 2–5 papillae on tangential walls (Fig. 4), are like those of M. pumila (Nutt.) T. & G. as well as M. multicaulis (Osterh.) Darl. and M. argillosa Darl.; the floral parts, which are of 5 obovate, glabrous petals and 5 obovate, petaloid stamens (Fig. 3), are like those of M. multicaulis and M. argillosa (to a lesser extent); and the leaves, which are obovate to ovate and shallowly toothed, are similar to M. marginata (Osterh.) Thompson & Prigge or M. pterosperma Eastw. Based on floral (petal shape, vestiture, and size; petaloid stamens presence/absence), seed (size, winged, seed coat cell radial walls straight or wavy and tangential walls papillae), and cauline leaf (shape and size) characteristics, Mentzelia shultziorum is phenetically close to M. multicaulis and M. argillosa (perhaps closer to the latter) and is probably closely related to these two species. Chromosome counts and hybridization studies will have to be done to confirm its relationship to these two species.

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