

SYNOPSIS OF THE SPECIES OF *OMPHALODES* (BORAGINACEAE) NATIVE TO THE NEW WORLD

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ABSTRACT

A key and summary of typification are provided for the six Mexican species of *Omphalodes*, including the new species *O. richardsonii* Nesom from the Gómez Farías region of Tamaulipas, México. All are from México and are the only taxa of *Omphalodes* native to North America. The locality of the new species reinforces the observation that northeastern México is a secondary center of diversity for this primarily Eurasian genus.

Six Mexican species of *Omphalodes* Miller are recognized. All are primarily narrow endemics from Coahuila, Nuevo León, and Tamaulipas in northeastern México, although *O. cardiophylla* A. Gray is disjunct in southern Puebla from its main range to the north. *Omphalodes aliena* A. Gray has the widest distribution and is the only species that crosses the México-United States border into south-central Texas. Apart from the native Mexican species and the two North American introductions noted below, the remainder of the genus comprises about 20–30 species, primarily from temperate Asia and the Mediterranean region. Ingram (1960) provided a key and comments for five Eurasian species in American cultivation as well as notes on the correct citation of authority for the genus.

In their checklist of plants of the United States, Canada, and Greenland, Kartesz and Kartesz (1980) listed *Omphalodes aliena*, *O. linifolia* (L.) Moench, and *O. verna* Moench; the records for the latter two species are from Ontario and Quebec, Canada, respectively (J. Kartesz, pers. comm.). As noted by Johnston (1924), *Omphalodes linifolia* also has been collected in Oregon ("Salem, on street parking, 26 Jul 1919, Nelson 2749", GH!, annotated "First occurrence"). It is distinguished by the following characteristics: annual, taprooted, erect, 5–40 cm tall, flowers in terminal, ebracteate racemes, leaves narrowly oblanceolate and mostly basal, without a distinct petiole, and nutlets with incurved, crenate or dentate wings. It is a species native to southwestern Europe (Tutin et al., 1972) and apparently was a non-reproducing waif in Oregon, because it has never been reported in floristic manuals from the Pacific Northwest.

The Mexican species of *Omphalodes* can be identified using the following key:

1. Stems at least partially erect, solitary, from a slender or thick, woody taproot; flowers in terminal racemes, ebracteate. (2)
 2. Plants perennial; stems stiffly erect, 3–6 dm tall; leaves elliptic to elliptic-oblongate with an acute to short-acuminate base 1. *O. erecta*
 2. Plants annual or short-lived perennial, from very slender taproots; stems weakly erect to decumbent; leaves broadly ovate to deltate with a distinctly cordate base 2. *O. aliena*
1. Stem procumbent to decumbent, forming colonies or mats from slender rhizomes; flowers at least mostly axillary, scattered along stems. (3)
 3. Stem vestiture of even-length hairs, with at least some hairs widely spreading near the stem tips, densely spreading or spreading-deflexed below; leaves densely strigose on both surfaces with erect hairs; nutlets glabrous 6. *O. mexicana*
 3. Stem vestiture absent or of short, appressed hairs near the stem tips with the hairs appressed or longer, vary sparse, and spreading below; leaves sparsely to moderately strigose, hairs appressed at least on lower surface; nutlets sparsely hairy to glabrous. (4)
 4. Stem vestiture appressed from top to bottom; nutlets glabrous, the wing strongly incurved, entire 5. *O. chiangii*
 4. Stem vestiture completely absent or long, sparse, and spreading on lower part of stems; nutlets hairy, the wing erect or slightly incurved, prominently toothed. (5)
 5. Stems sparsely hairy; hairs on upper leaf surfaces with expanded, multicellular, pustulate bases; calyx lobes 3–5 mm long in fruit; teeth of nutlet wing with sharp, straight, antrorse serrations along the sides and apex 3. *O. cardiophylla*
 5. Stems glabrous; hairs on upper leaf surfaces with simple, unexpanded bases; calyx lobes 2–2.2 mm long in fruit; teeth of nutlet wing with 2–3 minute, recurved hooks (uncinate trichomes) at the apex, otherwise entire 4. *O. richardsonii*

1. *OMPHALODES ERECTA* I. M. Johnston, J. Arnold Arbor. 16:204. 1935.
TYPE: MÉXICO, NUEVO LEÓN, Alamar to Taray, ca 15 mi SW of Galeana, C. H. and M. T. Mueller 992 (HOLOTYPE: GH!; ISOTYPE: TEX!).

Distribution: Central Nuevo León to west-central Tamaulipas; in oak woods or nearby fields, ca 2000 m; Jun-Aug.

2. *OMPHALODES ALIENA* A. Gray in Hemsley, Biol. Centr. Amer. Bot. 2:377. 1882. TYPE: MÉXICO, NUEVO LEÓN, Monterrey, E. Palmer 893 (HOLOTYPE K; ISOTYPE: GH!).

Distribution: Southern Texas (Brewster, Presidio, Terrell, and Val Verde cos.) to Nuevo León and central Coahuila; rocky limestone soil, hillsides, bluffs, or ledges, occasionally sandy riversides, mostly in areas of matorral, less commonly with oaks, 500–1200 m; Feb–Apr (–May).

In the original description, Gray commented “We think there can be no doubt that the nucules of this species are dimorphic, the wing in a few of the lower ones being thickened, hispid, and turned back, and in the rest

thin, glabrous, and flat." After examining many more collections than Gray had at his disposal, I can affirm that significant variation exists in the teeth of the nutlets, but variation between the extreme forms (Fig. 2a, b and c) appears to be continuous rather than dimorphic. There is a tendency, on long inflorescences, for thin and glabrous teeth to be on the upper fruits but it is much more common to find only the thickened and hispid teeth on a single plant.

In an envelope on the type of sheet of *O. aliena* is a letter from Asa Gray to Sereno Watson, written from Kew in July, 1881, in response to a short manuscript by Watson (also in the envelope) describing Palmer's collections 893 and 894 as two species of a new genus, "Leptocarya." Having duplicates before him at Kew, Gray's reply was "My Dear Watson, Withhold your genus *Leptocarya*" ... and Gray could "confidently say, refer these species to *Omphalodes*." "I'm running over Palmer's Mex.-Tex. plants here to help the Kew herbarium. I am putting names to some new things in order to stop off—as well as to help—Hemsley."

3. *Omphalodes cardiophylla* A. Gray in Hemsley, Biol. Centr. Amer. Bot. 2:377. 1882. TYPE: MÉXICO, COAHUILA, mountains near Saltillo, *E. Palmer* 894 (HOLOTYPE: K; ISOTYPE: GH!).

Omphalodes acuminata B. L. Rob., Proc. Amer. Acad. Arts 26:170. 1891. TYPE: MÉXICO, NUEVO LEÓN, in the Sierra Madre near Monterrey, *C.G. Pringle* 2220 (HOLOTYPE: GH!).

Distribution: Coahuila to Nueva León and west-central Tamaulipas, with a disjunct population system in southern Puebla; rocky soil, rock slides or ledges in oak or pine-oak woods, ca 800 – 2500 m; Feb – Aug.

Robinson distinguished *Omphalodes acuminata* from *O. cardiophylla* by its longer stems, longer leaves more attenuate at the apex, greater number of nutlet teeth, and 2 – 4 (vs. only one) nutlets maturing per flower. Johnston (1924) later contrasted the two in leaf width and texture and in corolla size. I find, however, that the variation in these features is continuous within what appears to be a single species. Further, there is no consistent pattern to the abortion of nutlets. In fact, in all species all four nutlets normally mature.

4. *OMPHALODES richardsonii* Nesom, sp. nov.

A *O. cardiophylla* A. Gray in Hemsley simile sed caulibus glabris, lobis calycis brevioribus, dentibus nucula ad apicem 2 – 3 unciis differt.

Herbaceous perennials. Stems procumbent or trailing, seldom branched, glabrous, to at least 85 cm long, to 3 mm thick near the base. Leaves alternate, blade deltate- to lanceolate- to hastate-cordate, often

auriculate, 6–50 mm wide, 18–55 mm long, sparsely to densely strigose beneath, sparsely strigose above with hairs 0.3–1 mm long, apex acuminate, petioles 4–50 mm long, moderately strigose. Flowers solitary, axillary, each subtended by a leaf, sometimes also with 1–5 ebracteate flowers at the branch tips; pedicels 5–11 mm long in flower, 16–20 mm long in fruit, glabrous or very sparsely strigose; calyces divided 5/6 to the base, the lobes 5, broadly lanceolate, prominently short-strigose, 2–2.2 mm long in flower and fruit; corollas rotate, blue with yellow throats, the tubes 2 mm long, the limbs ca 6 mm wide; style and stamens included. Nutlets (mericarps) depressed-pyramidal, (1–3–) 4 maturing or persisting, 2–2.5 mm broad, sparsely but prominently strigose, wings thin, erect, with 30–45 entire teeth that terminate in 2–3 recurved hooks (Fig. 1).

Known only from the region of Rancho del Cielo near Gómez Farías, Sierra de Guatemala, Tamaulipas, at ca 2100–3800 ft in elevation.

TYPE: MÉXICO, TAMAULIPAS, Mpio. Gómez Farías, area of Rancho del Cielo, ca 3.5 km NW of Gómez Farías, Aguacates grade, 29 Mar 1969, *A. Richardson 1148* (HOLOTYPE: TEX).

Additional collections examined: MÉXICO. TAMAULIPAS. Mpio. Gómez Farías, area of Rancho del Cielo, ca 4–6.5 km NW of Gómez Farías: between shrine and Aguacates grade, 27 Dec 1968, *Richardson 1092* (TEX); road near ranch, 28 Dec 1968, *Richardson 1114* (TEX); Casa Piedras, ca 1.6 km NNW of San José, 30 May 1969, *Richardson 1279* (TEX); NW of Gómez Farías, E-facing slope midway to summit, 17 Mar 1987, *Woodruff 160* with M.C. Johnston et al. (MEXU, TEX); NW of Gómez Farías, E-most ridge of Sierra de Guatemala, 18 Mar 1987, *Woodruff 171* with M.C. Johnston et al. (GH, MEXU, TEX, US).

The new species is named for Dr. Alfred Richardson of the Department of Biology at Texas Southmost College, Brownsville, who made four of the six known collections of the taxon. He collected about 1400 numbers of vascular plants from the foot trails of the Rancho del Cielo area in 1968 and 1969 as an undergraduate at the University of Texas at Austin. His collections (all at TEX-LL) still provide the most complete view of the flora of that region.

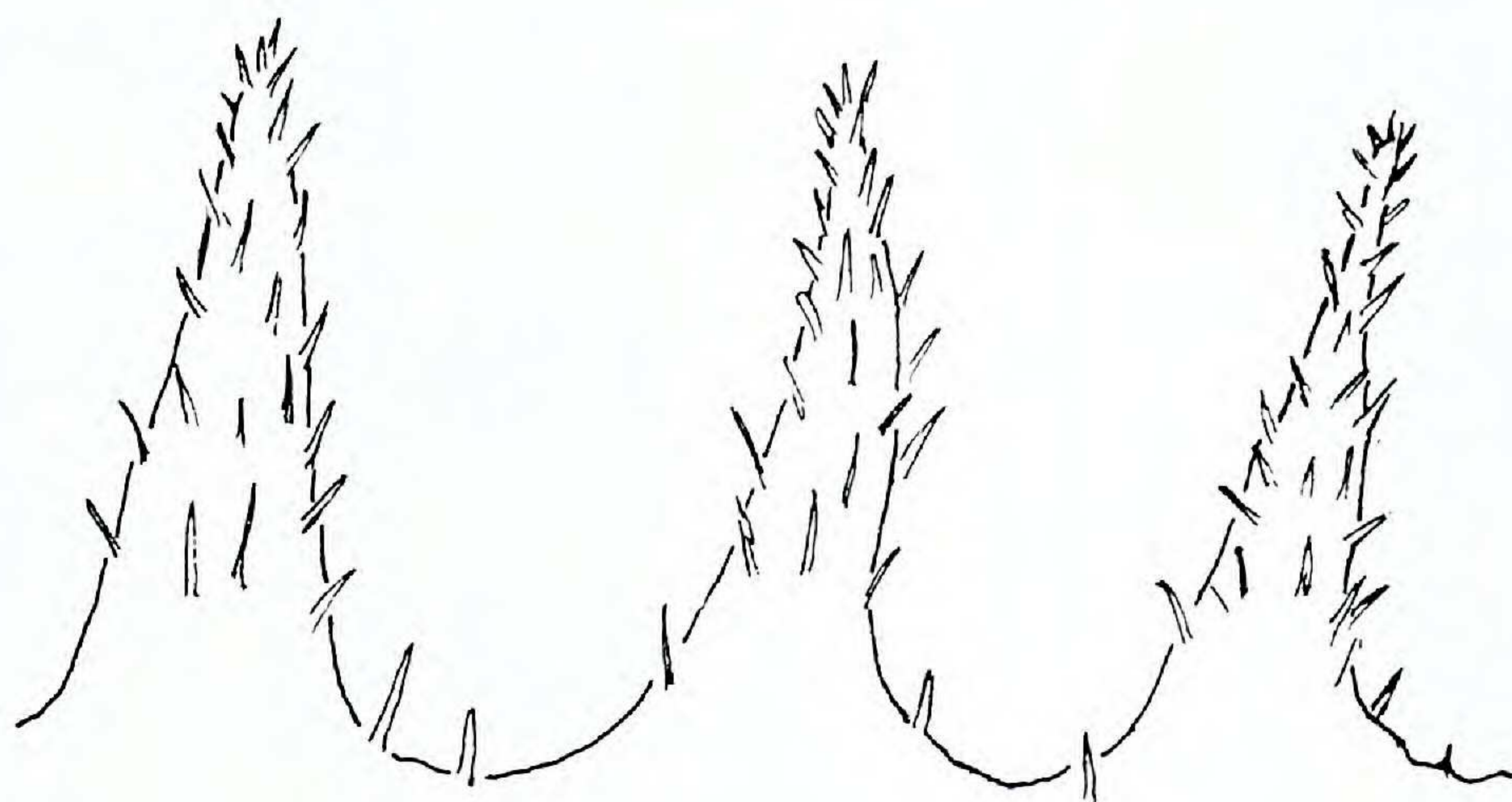
Omphalodes richardsonii is most similar to *O. cardiophylla*. In addition to the differences noted in the key above, the new species produces a short, terminal raceme of 1–5 ebracteate flowers as well as its primary complement of axillary ones. *Omphalodes cardiophylla*, *O. chiangii* Higgins, and *O. mexicana* S. Wats. also are characterized by the production of axillary flowers, but none appears to form the terminal, ebracteate ones.

FIG. 1. Nutlet teeth of *Omphalodes richardsonii*.

FIG. 2. Nutlet teeth of *Omphalodes aliena*, extremes in form: 2a, 2b and 2c.

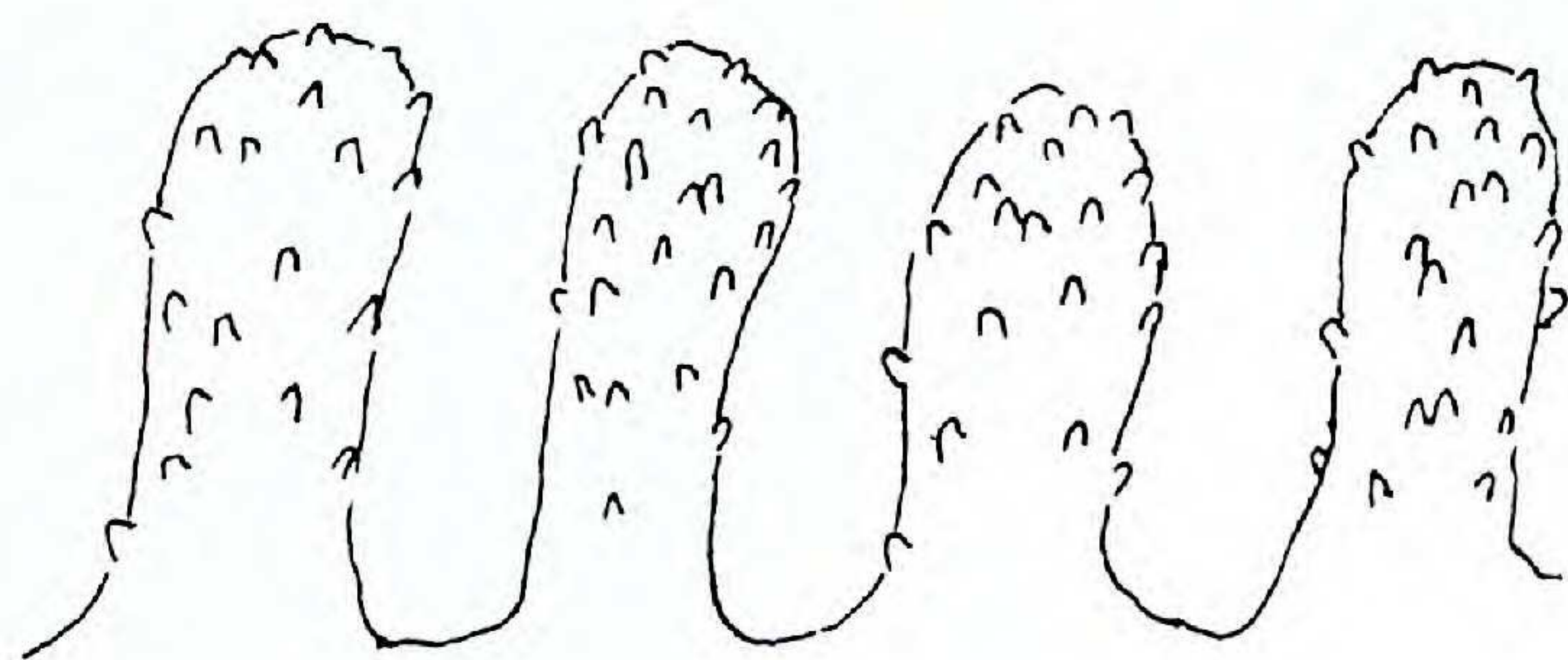


1



0.6 mm

2a



2b



2c

5. *OMPHALODES CHIANGII* Higgins, *Phytologia* 33:412 – 413. 1976.
 TYPE: MÉXICO, COAHUILA, Cañon de Centinela, Sierra del Jardín, M.C. *Johnston et al.* 11975B (HOLOTYPE: LL!; ISOTYPE: WTS).

Distribution: Known only from the type collection in north central Coahuila; sandy-gravelly soil with oak, pine, and douglas fir, 1600 – 2225 m; Jun – Aug.

6. *OMPHALODES MEXICANA* S. Watson, *Proc. Amer. Acad. Arts* 25:158. 1890. TYPE: MÉXICO, NUEVO LEÓN, Sierra Madre near Monterrey, C.G. *Pringle* 1878 (HOLOTYPE: GH!).

Distribution: Central Nuevo León; rocks or boulders in areas of oak woods, ca 1400 m; May – Jun.

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