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A NEW SPECIES OF *LEUCOSPORA* (SCROPHULARIACEAE)  
FROM THE CHIHUAHUAN DESERT OF MEXICO

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ABSTRACT

A new species, *Leucospora coahuilensis*, is described that is similar to *Schistophragma intermedia* in vegetative and floral characteristics, but has seed characteristics of *Leucospora* showing the value of combining the two genera under the latter genus.

Key words: Scrophulariaceae, *Leucospora*, *Schistophragma*, plant taxonomy.

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INTRODUCTION

Studies in connection with the Chihuahuan Desert Flora have uncovered a second species of *Leucospora* Nutt. (Scrophulariaceae, tribe Grateoleae), that, although appearing similar to *Schistophragma intermedia* (A. Gray) Pennell in many vegetative and floral characteristics, has the technical seed characteristics of the genus *Leucospora*. The new species is known from several collections in central Coahuila, and adjacent Chihuahua, Durango, and Zacatecas, Mexico. Its characters support the submersion of *Schistophragma* Benth. ex Endl. into *Leucospora*.

TAXONOMY

***Leucospora coahuilensis* Henrickson, sp. nov.**

Fig. 1, 2A

Characteribus foliorum et floribus *Schistophragmae intermediae* similis sed seminibus stramineis porcis rectis ut in *Leucospora multifida* (non *brunneolis* porcis spiraliter curvis) differt.

Woody rooted, woody-based, prostrate, widely branched herbs 30 cm in diameter; young stems brownish, moderately pilose with slender stipitate glands (0.05)0.1-0.3(-0.4) mm long. Leaves opposite, 1-2 pinnatifid, obovate in outline, 5-15(-28) mm long, 2-10 mm wide, the basal petiolelike portion 3-8(-12) mm long, entire, the distal portion divided into 3 segments, the lateral divisions oblanceolate in outline, 1.5-5 mm long, entire or mostly coarsely toothed distally, the medial segment more obovoid in outline, 2-6 mm long, 1.5-4 mm wide, 3(-5)-toothed or lobed distally, the main lobes acute, thick; leaf blades sparsely pilose-ciliate with slender gland-tipped hairs 0.05-0.4 mm long. Flowers solitary in axils of leaves throughout the plant (2 per node); pedicels 1-2 mm long, curved, often sigmoidal, brownish, ebracteolate; sepals 5, distinct, brownish, linear-lanceolate, 2.8-3.5 mm long, to 0.4-0.7 mm wide, mostly of similar length, accrescent, sparsely pilose; corollas bilabiate, horizontal in orientation, yellow in the tube and throat with deep-violet lobes, 8-9(-12) mm long, the corolla tubes 4-6(-7) mm long, ampliate distally; lobes 5, the lower lobes separated from upper lobes 2.5-3.5 mm from the tip, the median anterior lobe obovate, 2-3(-5.5) mm long,

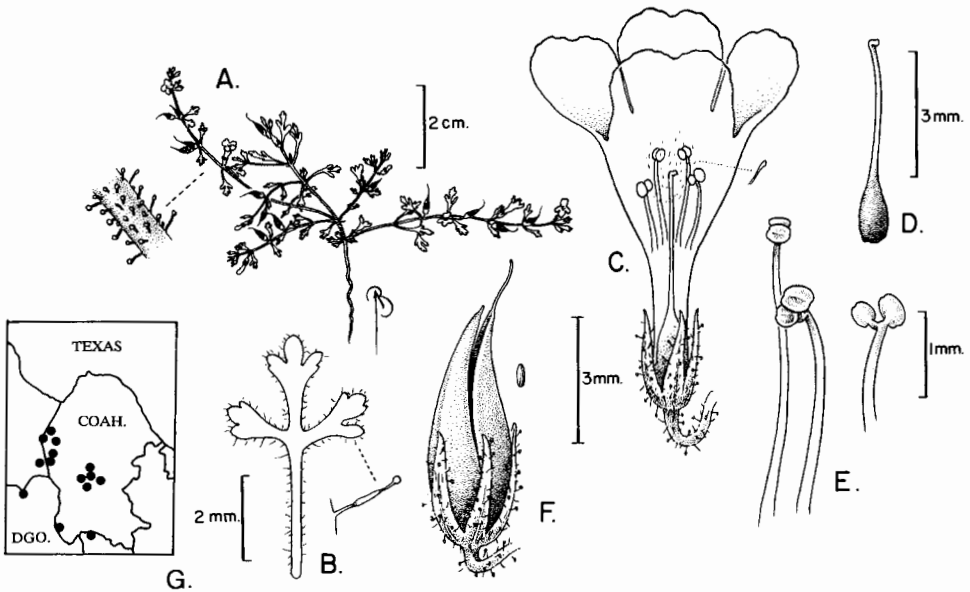


Fig. 1. *Leucospora coahuilensis*. — A. Habit showing small plant; insert shows stem glands. Chiang *et al.* 9631 (LL). — B. Leaf showing lobing; insert shows gland-tipped trichome with alternately collapsed stalk cells. — C. Diagrammatic transparent view of flower showing curved pedicel, calyx, corolla lobes, ovary with hooked style and orientation of anthers. — D. Ovary with hooked style. — E. Stamens: The longer anterior stamens have anthers equally set; the shorter posterior stamens have anther lobes unequally set on expanded connectives and recurved filaments. Another view of the posterior anthers is shown at the right. — F. Typical asymmetrical mature fruit showing calyx and style. Seed shown to right. — G. Map showing distribution of species in Coahuila (Coah.), Durango (Dgo.), Chihuahua, and Zacatecas. Magnifications as indicated. A–F drawn by Bobbi Angell.

2.3–3(–4.5) mm wide, emarginate, the lateral lobes 2.5–3(–5) mm long, rounded distally, the upper (posterior) lobes fused together except for a terminal notch to 0.5 mm deep, 3–4 mm long, 2.7–3.5(–6.5) mm wide, the throat 2-ridged below with claviform hairs 0.2–0.4 mm long on the lower throat; stamens didynamous, borne along the roof at the throat, 2.9–4 mm above the base, the posterior filaments 1.5–1.8 mm long, the anterior filaments 2.3–2.7 mm long, glabrous, white; anthers white, the anther sacs of the anterior stamens equally set, the anther sacs of the posterior stamens unequally set on expanded connectives and distally recurved filaments, in both the anther sacs 0.3–0.4(–0.6) mm long (wet); styles 3–3.5 mm long, persisting on the fruit where 3.7–4.2 mm long; stigmas broadly V-shaped, decurved. Capsules lanceoloid-ovoid, acuminate distally and overall lance-acuminate, 5.5–6.5(–7.2) mm long, 1.8–2.2 mm wide, the 2 locules marked by an exterior groove, brownish, brittle walled, glabrous; fruiting pedicels 2.5–4.5 mm long; fruiting sepals 3–4 mm long, to 0.3–0.7 mm wide at the base; seeds cylindrical but slightly broader distally, light cream-white, 0.6–0.7 mm long, 0.3–0.4 mm wide, with 8 straight ribs, the ribs moderately smooth, not reticulate.

*Type*. — MEXICO. COAHUILA: 4 km by winding road N of Rancho Santa Anita and about 5 km due E of Castellón, gently sloping desert on gravel derived from volcanic rock, matorral deserto inerme, 28°21'N, 103°31'W, 1300 m, 1 Oct 1972, F. Chiang, T. Wendt and M. C. Johnston 9631 (Holotype, LL).

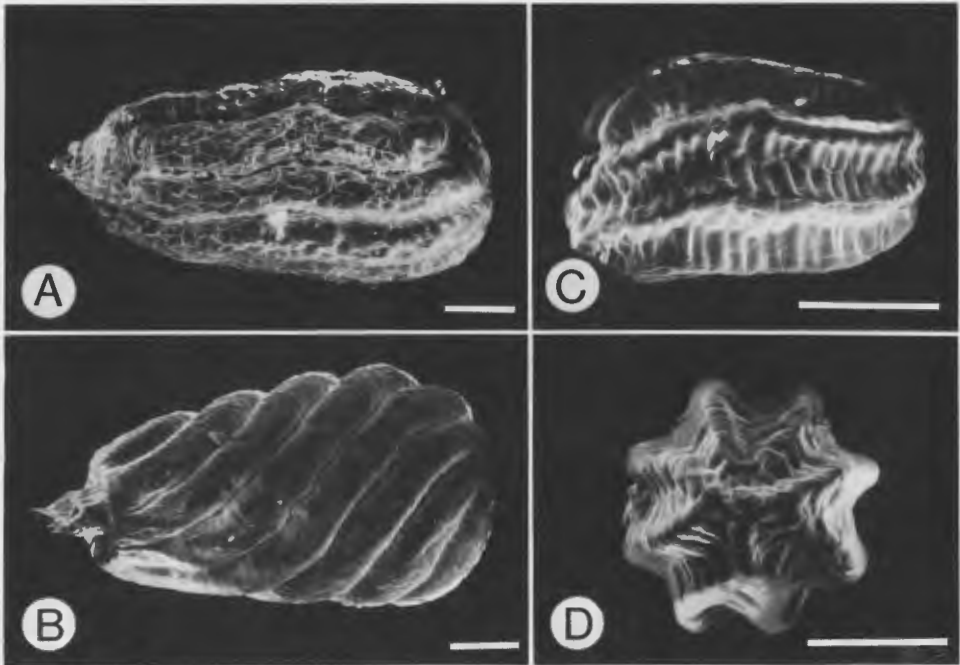


Fig. 2. Scanning electronmicrographs of seeds of *Leucospora* and *Schistophragma*.—A. *Leucospora coahuilensis*. Lateral view of seed showing obovoid shape with eight, more or less straight ridges. Note cell pattern on ridges. *I. M. Johnston & C. H. Muller 827* (LL).—B. *Schistophragma intermedia*. Lateral view of seed showing a similar obovoid shape with eight, distinctly spiralled ridges. Note smooth exterior of ridges. From Sonora, Mexico, *I. L. Wiggins 7470* (TEX).—C–D. *Leucospora multifida*.—C. Lateral view of seed at twice the magnification shown in A and B showing cylindrical shape and straight ridges.—D. Distal view of seed showing arrangement of the eight ribs. From Uvalde Co., Texas, *D. S. Correll & I. M. Johnston 18136* (LL). White bars all equal 100  $\mu$ m.

*Additional specimens.*—MEXICO. CHIHUAHUA: 4 km SSW of Cerro del Gringo in the Sierra del Diablo, 27°09'N, 104°08'W, 1800–2050 m, 30 Aug 1972, *F. Chiang, T. Wendt and M. C. Johnston 9015A* (LL); 90 km N of Cerros Blancos on winding road to Rancho La Gloria, 27°08'N, 104°05'W, 1325 m, *M. C. Johnston et al. 9039A* (LL).—COAHUILA: 4 km N of Rancho Santa Anita, 5 km due E of Castillón, 28°21'N, 103°31'W, 1300 m, 1 Oct 1972, *F. Chiang et al. 9631* (LL); 24.5 km by road NE of Jaco, 28°02'N, 103°44'W, 1150 m, 30 Sep 1972, *F. Chiang et al. 9613* (LL); Mohovano, Jul 1910, *C. A. Purpus 4510* (UC); vicinity of Santa Elena Mines, E foothills of the Sierra de las Cruces, 16 Oct 1942, *R. M. Stewart 2148* (LL); foothills of Sierra Mojada, between Estacion Estanque and Esmeralda, 27°14'N, 103°37'W, 1400 m, 1 Sep 1972, *F. Chiang et al. 9060* (LL); Sierra Planchada, 5 mi NE of Esmeralda, 1 Sep 1940, *I. M. Johnston and C. H. Muller 827* (LL); Sierra de la Madera, 1.1 mi E of Tanque El Toro and 4.1 mi E of Rancho Charretera along road to Cuatro Ciénegas, 27°09'N, 102°21'W, 1090 m, 26 Sep 1976, *T. Wendt et al. 257*; road from Zacatosa SE to Puerto Colorado, ascent from Tanque Colorado to base of Sierra, 31 Aug 1941, *I. M. Johnston 8809* (LL); Sierra de la Fragua, 18 mi S of Cuatro Ciénegas on Hwy 30, 1050 m, 23 May 1975, *D. L. Venable and S. McCormick 796* (LL); 1 km NE of Mina la Reforma, SW side of Sierra de la Purisima, 26°41'N, 101°49'W, 1100 m, 21 Mar 1973, *M. C. Johnston et al. 10319E* (LL); 12.6 km NNE of Las Margaritas, E face of Sierra de las Margaritas, 26°34'N, 102°51'W, 1150–1350 m, 24 Sep 1972, *F. Chiang et al. 9516* (LL); N flank of Sierra de los Alamos, 26°31'N, 102°21'W, 1300 m, 13 Jun 1972, *F. Chiang et al. 7692* (LL); Sierra de Jimulco, 3 km N of Mina San José, 25°06'N, 103°13'W, 1800–3138 m, 27 Sep 1972, *F. Chiang et al. 9534* (LL).—ZACATECAS: 1 km S of San Miguel on road to Cedros, 24°55'N, 102°07'W, 1615 m, 1 Jul 1973, *M. C. Johnston et al. 11540B* (LL); Sierra del Yeso, due W of La Presa de Los Angeles, 25°04'N, 102°07'W, 1400–1500 m, 30 Jun 1973, *M. C. Johnston et al. 11526B* (LL).—

Table 1. All measurements are in mm unless otherwise indicated.

	<i>Schistophragma intermedia</i>	<i>Leucospora coahuilensis</i>	<i>Leucospora multifida</i>
Habit	Erect-ascending	Prostrate	Erect-ascending
Stem hair length	(0.3-)0.5-0.8(-1.2)	0.1-0.3	(0.1-)0.2-0.4
Leaf length	(7.2-)14-25	5.5-15(-28)	(7-)12-22(-28)
Short/long sepal %	55-72(-90)	79-96	90-95
Corolla length	6.4-8	8-12	3.5-4.6
Filament (posterior)	1.5-2	1.5-1.8	0.8-0.9
Filament (anterior)	2.1-2.8	2.3-2.7	1.3-1.6
Fruiting style	(2-)2.6-3.6(-4)	3.7-4.2	0.9-1.2
Flowers per node	(2-)4	2	2
Fruiting pedicel	1.5-2.5	2.2-4.5	(2.6-)4-7
Fruit length	5.8-6.5	5.5-6.5(-7.2)	(3.3-)4-4.5
Fruit shape	Lance-acuminate	Lance-acuminate	Ovate-obtuse
Seed length	0.6-0.7	0.6-0.7	0.33-0.4
Seed width	0.35-0.45	0.3-0.4	0.17-0.23
Seed color	Brownish	Cream-white	Cream-white
Seed ridges	Spiralled	Straight	Straight

DURANGO: 6 km SW of Buen Dia, 26°19'N, 104°33'W, 1450-1600 m, 1 Nov 1972, *F. Chiang et al.* 9994B (LL); S and SE of Estacion Microondas "Sapioris," 20 km NW of Estacion Chocolate, 25°25'N, 103°43'W, 1450-1500 m, 13-14 Aug 1973, *M. C. Johnston et al.* 12223 (LL); Mapimi, Oct 21-23, 1898, *E. Palmer* 548 (US).

Vegetatively and in fruit characteristics the new species is most similar to *Schistophragma intermedia*, but the new species differs conspicuously in its light cream-white seeds that have series of eight more or less straight ridges (Fig. 2A) while *Schistophragma intermedia* has light-brown seeds with eight ridges in a distinct spiralled arrangement (Fig. 2B). In seed color and ridge orientation the new species approaches the monotypic genus *Leucospora* (Fig. 2C-D). *Leucospora multifida* (Michx.) Nutt., however, differs from the new species in having much shorter fruit, longer pedicels, smaller flowers, shorter styles, smaller seeds, etc. Differences between *Schistophragma intermedia*, *Leucospora coahuilensis*, and *L. multifida* are presented in Table 1. In addition to the characters presented there, corollas of *Leucospora coahuilensis* have paired ridges on the lower throat, a feature lacking in the other two species, and many clavate, straight hairs to 0.4-0.5 mm long on the lower throat; such hairs are very scattered on the corolla throats of the other two taxa. Overall the new species has seed characteristics of *Leucospora*, fruit characteristics of *Schistophragma*, mixed with a number of unique characteristics of its own. Both genera are very similar in leaf shape, lobing, vestiture, flower orientation, and structure, and David Keil, who has undertaken a study of the group, had independently concluded that *Schistophragma* (described in 1839) should be merged into *Leucospora* (1834). The intermediate characteristics found in *Leucospora coahuilensis* give further support to his conclusions. Dr. Keil will be transferring the other species of *Schistophragma* into *Leucospora* upon completion of his study of the genera.

*Leucospora coahuilensis* occurs mostly in limestone (rarely igneous rock-derived) slopes, fans in the Chihuahuan Desert from extreme east-central Chihuahua, west, central to southern Coahuila to northeastern Durango and northern Zacatecas over an elevation range of 1100-1500(-1800) m elevation where it occurs

in association with species of *Yucca*, *Dasyilirion*, *Opuntia*, *Agave*, *Fouquieria*, *Hec-  
thia*, *Jatropha*, *Larrea*, *Flourensia*, *Parthenium*, *Gymnosperma*, etc. Flowering  
occurs from April to October. *Schistophragma intermedia*, in contrast, ranges  
from southeastern Arizona and southwestern New Mexico south into Sonora and  
western Chihuahua west of the continental divide. *Leucospora multifida* is more  
widespread and eastern, ranging from southern Ontario, Canada, south to Iowa,  
northern Kansas, northwest Georgia, Alabama, Louisiana, and Texas.

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