

THREE NEW SPECIES OF CARLOWRIGHTIA (ACANTHACEAE) FROM THE CHIHUAHUAN DESERT REGION

JAMES HENRICKSON

Department of Biology, California State University,
Los Angeles 90032

THOMAS F. DANIEL

Department of Botany, University of Michigan, Ann Arbor 48109

ABSTRACT

Carlowrightia texana, *C. mexicana*, and *C. lesueurii* are described, illustrated, and mapped. The new species are distinguished from *C. torreyana*, *C. arizonica*, and *C. mexicana* respectively.

Carlowrightia is a genus of relatively small-flowered subshrubs and suffrutescent, perennial herbs comprising about 20 species occurring from the southwestern United States to northern Costa Rica. Members of the genus have entire, linear to ovate, sessile to petiolate, opposite leaves and vestiture is uniseriate, mostly multicellular, ranging from puberulent, velutinous, hispidulous, or recurved-strigulose to stipitate-glandular on vegetative portions. Flowers are borne in axillary clusters, or more commonly in spicate to paniculate thyrses, and are subtended by leaves or reduced bracts and paired bractlets. They have 5-parted calyces, 4-parted corollas, and 2 stamens. Stamens arise from the corolla tube and have nearly parallel, equal-sized anther thecae, though these are often subequally inserted on the filaments. Corollas are usually pubescent where exposed in bud and range from nearly regular when vertical to strongly zygomorphic when horizontally oriented at anthesis. The lower corolla lobe is usually somewhat keeled and contains the anthers and style in bud. The upper spatulate, banner-like petal is actually a paired structure. It is often marked with a distinctively colored eye or radiating nerves above the point of reflexion. Lateral petal lobes are elliptical to obliquely ovate and at anthesis may be ascending, spreading, or strongly reflexed, but in bud lie inside the basal keel-like lobe and surround and enclose the upper banner-like lobe. In certain features, flowers of most species resemble papilionaceous flowers of legumes, in which the lower keel-like lobe contains the anthers and style at anthesis. However, in *Carlowrightia*, it is the upper banner-like petal, not the keel, that is the paired structure. Flowers of several species in the Chihuahuan Desert open in the morning and fall by midday. Some of these are capable of self-pollination while the anthers and style are enclosed within the keel.

Fruits of *Carlowrightia* are explosively dehiscent capsules with flattened stipes, compressed-ovoid, acuminate heads usually containing four disk-like, ovoid, smooth, muricate to tuberculate seeds; these are

rounded or somewhat acute at the tip and obliquely notched at the base. Seeds may be uniform in structure (homomorphic) or heteromorphic, differing in surface markings and the development of marginal, often retrorsely barbed teeth. They rest upon subulate, up-curved retinacula that project the seeds outward as the capsule dehisces.

The genus appears to attain its greatest diversity in the desert regions of northern Mexico, where at least 13 species occur. Because previous knowledge of *Carlowrightia* has been restricted to descriptions of new taxa and regional floristic surveys, the limits and relationships of many species are poorly understood. During the senior author's preparation of a treatment of Acanthaceae for the Chihuahuan Desert Flora and in the course of the junior author's monograph of *Carlowrightia* certain distinctive novelties became apparent in the genus and are presented below.

There are two species of *Carlowrightia* common in Texas and northern Mexico that have been treated within *C. torreyana* Wasshausen. Both are low-growing perennials with broadly ovate leaves at the base and often narrowly ovate leaves above. They differ, however, in stem pubescence, position and coloration of flowers, and development of seed margins. The two species are occasionally sympatric, but remain distinguishable.

In true *C. torreyana*, based on *Schaueria parvifolia* Torrey, stem pubescence consists of both short and long, slender, erect trichomes 0.1–1 (–1.7) mm long (Fig. 4c). Flowers are usually produced on slender, terminal, stipitate-glandular spikes (Fig. 1f) and are subtended by slender, subulate bractlets. Corollas are white, except for a papillate, yellow eye surrounded by a maroon ring on the upper reflexed petal lobe, and margins of seeds are usually crenulate to denticulate, the short teeth having recurved barbs (Fig. 1h, j, k).

The new species differs from *C. torreyana* in that stem pubescence consists of stout, tapering, decurved trichomes mostly 0.1–0.5 (–1) mm long (Fig. 4a). Flowers are usually borne from the bases to the tips of the stems, with each cluster subtended by ovate, petiolate leaves (sometimes reduced to bracts above), and the inner bractlets are petiolate and narrowly ovate to lanceolate (Fig. 1a, d) rather than subulate. Corollas of this species are white with maroon nerves on each petal lobe, and the seeds have entire margins (Fig. 1b, c, e).

***Carlowrightia texana* Henrickson & Daniel, sp. nov.**

Differt a *C. torreyana* Wasshausen caules strigosis pilis decurvis crassiusculis apicem versus angustatis, floribus axillaribus bracteolis foliosis oblongis lanceolatisve petiolatis, lobis corollae albis venis marroninis, seminibus marginibus integris.

TYPE: Texas, Val Verde Co.: In loose rock along route No. 163, 6



FIG. 1. *Carlowrightia texana* Henrickson & Daniel and *C. torreyana* Wasshausen. a-e: *C. texana*. a. Habit (Warnock 6036, LL). b. Flower, showing oblong-ovate, petiolate bracts and bractlets (Warnock 10491, LL). c. Upper "banner-like" corolla lobe showing venation (Baird s.n., TEX). d. Open capsule showing large petiolate bracts, smaller bractlets, subulate calyx lobes, and 4 seeds situated on retinacula (Correll & Johnston 25636, LL). e. Seed, face view (Correll & Johnston, 25636, LL). f-k: *C. torreyana*. f. Habit (Correll & Johnston 18225, LL). g. Flower, top view showing position of lateral corolla lobes (from photograph of Daniel 97, MICH). h. Upper "banner-like" corolla lobe showing venation and position of papillate yellow eye (Correll & Wasshausen 27753, LL). i. Open capsule showing narrow bracts, bractlets, and calyx (Warnock 21183, TEX). j. Seed, face view, showing muricate pattern (Warnock 11714, TEX). k. Retrorsely-barbed denticulate seed margin (Warnock 11714, TEX).

mi N of Juno; flowers white, 19 June 1957, D. S. Correll & I. M. Johnston 18254. Holotype: LL; Isotypes: GH, NY, SMU.

Suffrutescent perennials (0.5-) 1-3 dm high from a much-branched twiggy base; stems often decumbent, erect-ascending above, scabrous

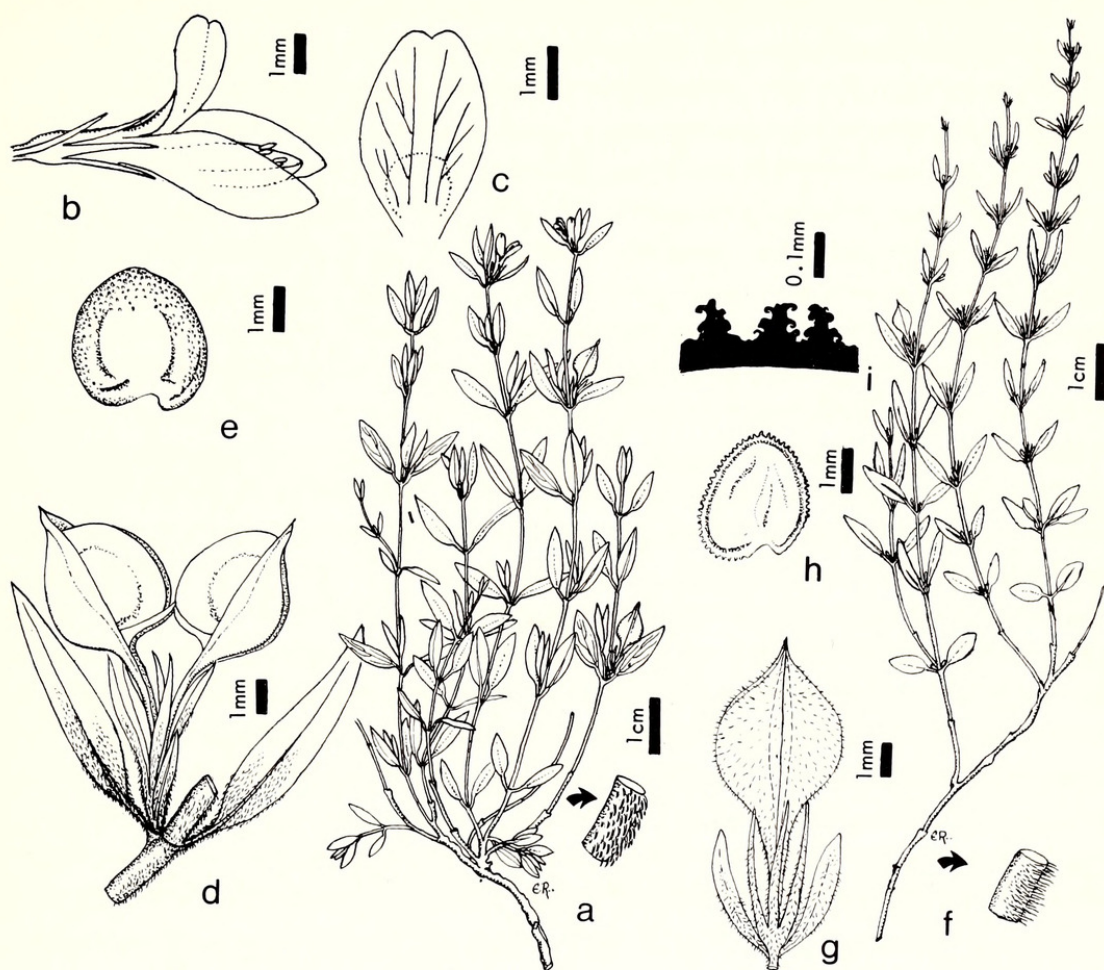


FIG. 2. *Carlowrightia mexicana* Henrickson & Daniel and *C. lesueurii* Henrickson & Daniel. a-e: *C. mexicana*. a. Habit (Henrickson & Lee 16013, TEX). b. Flower, lateral view (lateral corolla lobes are more reflexed at anthesis than shown) (Wendt & Riskind 1698, LL). c. Upper "banner-like" corolla lobe showing venation and location of papillate yellow eye (Henrickson & Lee 16013, TEX). d. Capsule showing large leafy bracts, smaller bractlets and calyx (I. M. Johnston 8508, GH). e. Seed, face view, note entire margin (I. M. Johnston 8508, GH). f-i: *C. lesueurii*. f. Habit. g. Mature puberulent-hispidulous capsule with bractlets, calyx. h. Seed, face view, showing denticulate margin. i. Retrorsely-barbed denticulate seed margin. (All LeSueur 864, TEX).

with rather coarse, strigulose, decurved, tapering trichomes 0.1–0.5 (–1) mm long. Leaves with petioles (1–) 3–7 (–20) mm long; blades broadly ovate to orbicular when larger, more oblong-ovate when reduced (2.5–) 6–16 (–42) mm long, (1.5–) 3–11 (–33) mm wide, acute to obtuse at apex, cuneate to rounded-truncate at base, entire, strigulose throughout as stems but trichomes often shorter. Flowers 1–3 in axils of (basal-) middle-upper leaves in compressed thyrses; peduncles 0–3 mm long; bracts and bractlets leafy in texture and vestiture, mostly oblong to oblong-obovate or lanceolate, (2–) 3–12 mm long, (0.7–) 1–3.5 mm wide, with petioles 1–5 mm long, occasionally stems forming elongate, eglandular, terminal, spike-like inflorescences with reduced leaves-bracts; calyx 3–5 mm long, strigulose as leaves, borne on pedicels to 1 mm long, lobes lanceolate to subulate, 2.5–4 mm long,

tube 0.5–0.8 mm long; corollas zygomorphic, 6–7 mm long, white, with maroon nerves on lobes, upper lobe spathulate, reflexed, retuse, lower lobe keeled, lateral lobes oblong-obovate, 3.5–5 mm long, 2–2.8 mm wide, tube 1.5–3 mm long, 1 mm in diameter; anthers 0.5–0.9 mm long, filaments 3–4 mm long; styles 3–4.5 mm long. Capsules 7.5–11 mm long, glabrous, tan, stipes 2–3.5 mm long, heads compressed ovoid, 5.5–7.5 mm long; mature seeds black, 4.2–6 mm long, ovate, thin, smooth to muricate on sides, entire (Figs. 1a–e; 4a–b).

Rocky slopes, often disturbed areas, southern Texas across the Edwards Plateau to trans-Pecos Texas and southeastern New Mexico, Chihuahua, Coahuila, Nuevo Leon, and San Luis Potosi (Fig. 3). Flowers April–November.

While most specimens are rather uniform in leaf size, certain specimens representing extremes in variation are worthy of note. Very reduced plants, which often do not exceed 5–9 cm in height, have flowers from the base to the tip of the plant, and all leaves are reduced and bract-like, measuring 2.5–4.5 mm in length, and 1.5–2.5 mm in width. Stem pubescence, however, is recurved, bractlets tend to be petiolate and leafy in texture, and seed margins are entire. These appear to be exposed drought forms. Examples include: Texas: Kleberg Co.; Santa Gertrudis Division of King Ranch, 6 Aug 1953, *M. C. Johnston* 53266.1 (TEX 3). Val Verde Co.: San Felipe Springs, 9 Jun 1963, *V. L. Cory* 18921 (GH 3). Mexico: Coahuila: Saltillo, May 1898, *E. Palmer* 179 (GH, US). At the other extreme, specimens may have very large, often more membranous leaf-blades to 21–42 mm long and 14–33 mm wide and more slender, sometimes straight pubescence, but otherwise they exhibit all the distinctive characters of the new species. These appear to represent shade forms. Examples include: Texas: Webb Co.: Laredo, 13 Apr 1963, *F. Mosqueda* 25 (SMU, TEX). Duval Co.: San Diego, 1888, *M. B. Croft* 210 (NY). Kinney Co.: Stream along hwy. 2.3 mi S of jct. of 277 and Hwy. 693, 4 Jun 1977, *T. F. Daniel* 127 (MICH).

Representative Specimens: Texas: Pecos Co.: Limestone flats along US route 290, near jct. with road to Iraan, 24 mi NW of Sheffield, 7 May 1947, *R. McVaugh* 8204 (F, GH, MICH, SMU, US). Webb Co.: Roadside on Hwy. 83, 13 mi NW of Webb, 16 Jul 1957, *D. S. Correll & I. M. Johnston* 18108 (LL, MO, SMU). New Mexico: Eddy Co.: Carlsbad, 10 Jun 1959, *B. E. McKechnie* 15 (MO). Mexico: Chihuahua: Mesas near Chihuahua, 4 Sep 1886, *C. G. Pringle* 1101 (PH, UC, MO, NY). Coahuila: Roadside on Hwy. 57, 27 mi S of Monclova, 12 May 1977, *T. F. Daniel* 100 (MICH). Nuevo Leon: 1 mi NE of Vallecillo on Laredo–Monterrey hwy., 10 Nov 1959, *J. Graham & M. C. Johnston* 4596 (MICH, US). San Luis Potosi: Desert hill between Matehuala and Doctor Arroyo, 5.9 mi E of Hwy. 57, 16 Sep 1978, *T. F. Daniel* 873 (MICH).

In contrast to the above, *Carlowrightia torreyana* must be redefined

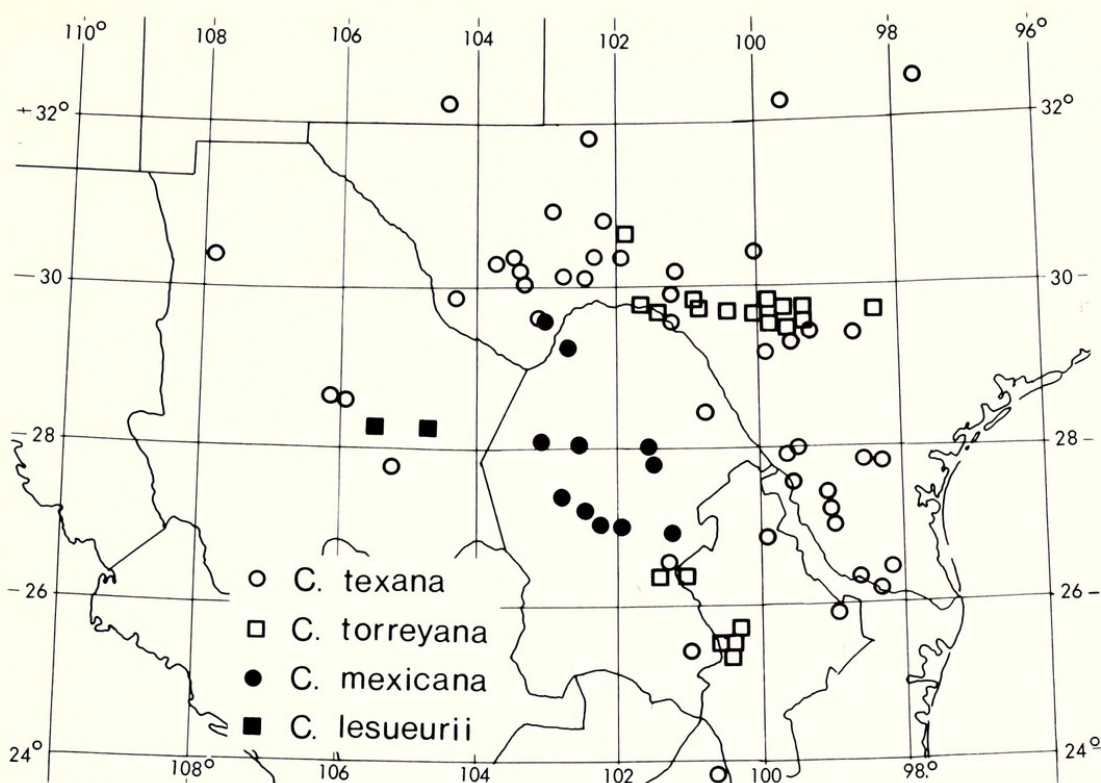


FIG. 3. Distribution of *Carlowrightia texana* Henrickson & Daniel, *C. torreyana* Wasshausen, *C. mexicana* Henrickson & Daniel, and *C. lesueurii* Henrickson & Daniel.

as follows: suffrutescent perennials 1–5 dm high; stems straggling-decumbent to ascending, strongly pubescent-villous with slender, straight to crooked trichomes (0.2–) 0.5–1 (–1.7) mm long, often with an understory of erect to decurved trichomes 0.1–0.2 mm long. Leaves with petioles 2–12 mm long; blades broadly ovate to orbicular-reniform, (6–) 10–20 (–40) mm long; (4–7) 7–13 (–27) mm wide, acute to obtuse at apex, broadly cuneate to rounded-truncate or oblique at base, pubescent throughout with slender tapering trichomes 0.2–0.6 mm long. Flowers usually 1–3 at nodes of terminal, elongate, erect to arcuate or zigzagged spikes 5–13 cm long, rachis internodes 5–25 mm long with slender glandular tipped trichomes 0.1–0.2 (–0.4) mm long and an understory of nonglandular trichomes; bracts subulate to ovate, 1–3 mm long, 0.5–1.3 mm wide, bractlets subulate, 1.2–3 mm long, 0.3–0.7 mm wide (occasionally flowers borne in axils of upper leaves but these subtended by subulate bractlets). Flowers and capsules otherwise as in *Carlowrightia texana*, but corollas 7–9 mm long, white with a papillate yellow eye surrounded by a maroon ring with radiating maroon markings on the upper reflexed petal lobe, and seed margins crenulate to denticulate with minutely barbed teeth (Figs. 1f–k; 4c–e).

Igneous-rock and limestone slopes, ledges, and plains in Texas from the Edwards Plateau to the South Texas Plains, to S Coahuila, W Nuevo Leon (Fig. 3). Flowers May–September and sporadically during other months.

Representative Specimens: Texas: Val Verde Co.: Along hwy. near mouth of Pecos River, 26 Sep 1953, *B. H. Warnock 11714* (LL, SMU). Real Co.: 2–3 mi NE of Camp Wood, 22 Jun 1963, *D. S. Correll & D. C. Wasshausen 28003* (MO, NCU, SMU, UC, US). Bandera Co.: N of Vanderpool, along Sabinal River, 23 Jun 1963, *D. S. Correll & D. C. Wasshausen 28035* (LL, NCU, SMU, US). Mexico: Coahuila: Rocky limestone valley, 23 mi SW of Monterrey, 1 Dec 1945, *B. H. Warnock & F. A. Barkley 14884m* (TEX, F, UC, US). Nuevo Leon: Mountains near Monterrey, Diente Canyon, Jul 1933, *C. H. & M. T. Muller 118* (F).

Specimens previously recognized as *Carlowrightia arizonica* Gray represent a heterogeneous group of plants. The group is taxonomically difficult, as plants are often heavily grazed and morphologically variable. During this study it was possible to distinguish a distinct new species from this complex.

***Carlowrightia mexicana* Henrickson & Daniel, sp. nov.**

Differt a *C. arizonica* Gray corollis coloribus caryophyllaceis purpureisve lavandulisve (non albis) 5–8 (non 12–17) mm longis, foliis caulis saepe amplioribus pluribus bene distributis (non tantum infra flores limitatis), seminibus marginibus integris (non denticulatis).

TYPE: Mexico: Coahuila: ca. 30 (air) mi WNW of Cuatro Cienegas in the limestone Cañon Los Pozos, about 3–4 mi W of Rancho Cerro de la Madera along trail to Cañon Desiderio (near 27°08'N, 102°28'W), flowers blue, 1400 m, 2 May 1977, *James Henrickson & Esther Lee 16013*. Holotype: TEX; Isotypes: to be distributed.

Erect to spreading-globose, twiggy, suffrutescent perennials 1–3.5 dm high; stems ascending, moderately branched, closely strigulose with stiff, mostly decurved, tapering trichomes to 0.1 (–0.2) mm long. Leaves subsessile or with petioles 1–3 (–6) mm long, blades elliptical-lanceolate to elliptical-ovate, more ovate below; more linear-oblan-ceolate above, (4–) 8–17 (–29) mm long, 1–6 (–8) mm wide, ascending, acute to acuminate at apex, narrowly cuneate at base, firm, entire, sparsely to moderately short strigulose with decurved trichomes to 0.1 (0.2) mm long throughout, or only along margins and midrib beneath. Flowers axillary, 1 (2) at upper nodes, subtended by reduced, erect, linear, leaf-like bracts 2–10 mm long, 0.5–2 mm wide, bractlets subulate, 1–2 mm long, 0.2–0.4 mm wide, upper branches terminating in leafy or bracted, straight to zigzagged spikes 2–5 cm long, rachis internodes 5–15 mm long; calyx 3–5 mm long, sessile or with pedicels 0.5 mm long, lobes subulate, 2–3.5 mm long, tube 1–1.5 mm long; corollas zygomorphic, 6.5–8 mm long, pinkish to lavender-blue with yellow on base of upper spatulate, reflexed lobe, lower lobe keeled, lateral lobes elliptical 3.5–6 mm long, 1.5–2 mm wide, spreading at

anthesis, tube 2–2.5 mm long, 1.5 mm in diameter, whitish; anthers 0.5–0.8 mm long, filaments 3–4 mm long; styles 4–5.5 mm long. Capsules 9–12 mm long, glabrous, tan, stipes 3–5.5 mm long, heads compressed-ovoid, 5.5–7 mm long; mature seeds black, 3.5–4.5 mm long, ovate, thin, concavo-convex, somewhat muricate on faces, margins entire (Fig. 2a–e).

Rocky flats and slopes, especially in consolidated arroyo gravel; trans-Pecos Texas (Brewster Co.) to mountains of central Coahuila (Fig. 3). Flowers April–October.

In his original description of the genus *Carlowrightia*, Gray (1878) described both *C. linearifolia* and *C. arizonica* as having rose to purple corollas. Later published descriptions indicate *C. arizonica* has cream or white corollas (Standley, 1926) with lavender or purple markings (Kearney and Peebles, 1960; Shreve and Wiggins, 1964). In contrast Wasshausen in Lundell (1966, see also Correll and Johnston, 1970) indicates the corollas of *C. arizonica* may be either white or purple. The label on Gray's type specimen of *C. arizonica* (Palmer s. n. 1867, GH) states "corolla yellow and deep purple." Field studies have shown that *C. arizonica* has long (12–17 mm), white corollas with a yellow eye bordered by purplish radiating lines on the upper banner-like lobe and a twiggy habit usually with a few reduced leaves subtending the flowers. Palmer's type specimen of *C. arizonica* has similar small leaves and corollas 12 mm in length, indicating that it probably had a white-flowered corolla with yellow and deep purple markings. The purple-flowered plant that has been included within *C. arizonica* represents the newly described species *C. mexicana*, which is easily separated from *C. arizonica* by its shorter, purple to blue-lavender corollas 6–8 mm long, more leafy growth habitat, and entire seed margins.

Representative Specimens: Texas: Brewster Co.: 17 mi E of Marathon, Hwy. 90, 31 Oct 1966, *D. S. Correll* 34082 (LL, GH, US). Mexico: Coahuila: Sierra de la Madera, vicinity of "La Cueva" in Corte Blanco fork of Charretera Canyon, 11–15 Sep 1941, *I. M. Johnston & C. H. Muller* 637 (LL, GH). Cañon de Cuervo Chico about 16 km N of Cuesta Zozaya, 27 Aug 1941, *I. M. Johnston* 8508 (LL, GH 2). Cañon de San Enrique, E side Sierra de la Encantada, 5 km W of Rancho Buena Vista, 4 Sep 1941, *R. M. Stewart* 1385 (GH). Sierra de Santa Rosa, S of Muzquiz, 27 Jul 1938, *E. G. Marsh* 1551 (GH). Intersection of Huerfanita-Jardin Rd. N of Rancho Piedra Azul and NE of Rancho El Jardin, 27 Jul 1973, *M. C. Johnston et al.* 11763c (LL). Sierra de la Gloria, Cañon del Chilpitin, ca. 5 mi up (E) from mouth of cyn, near El Chilpitin, 7 Sep 1976, *T. Wendt & D. Riskind* 1698m (LL). El Berrendo, near Muzquiz, 13–16 Jul 1939, *S. White* 1867 (MICH).

A third new species shows affinities with *C. mexicana*.

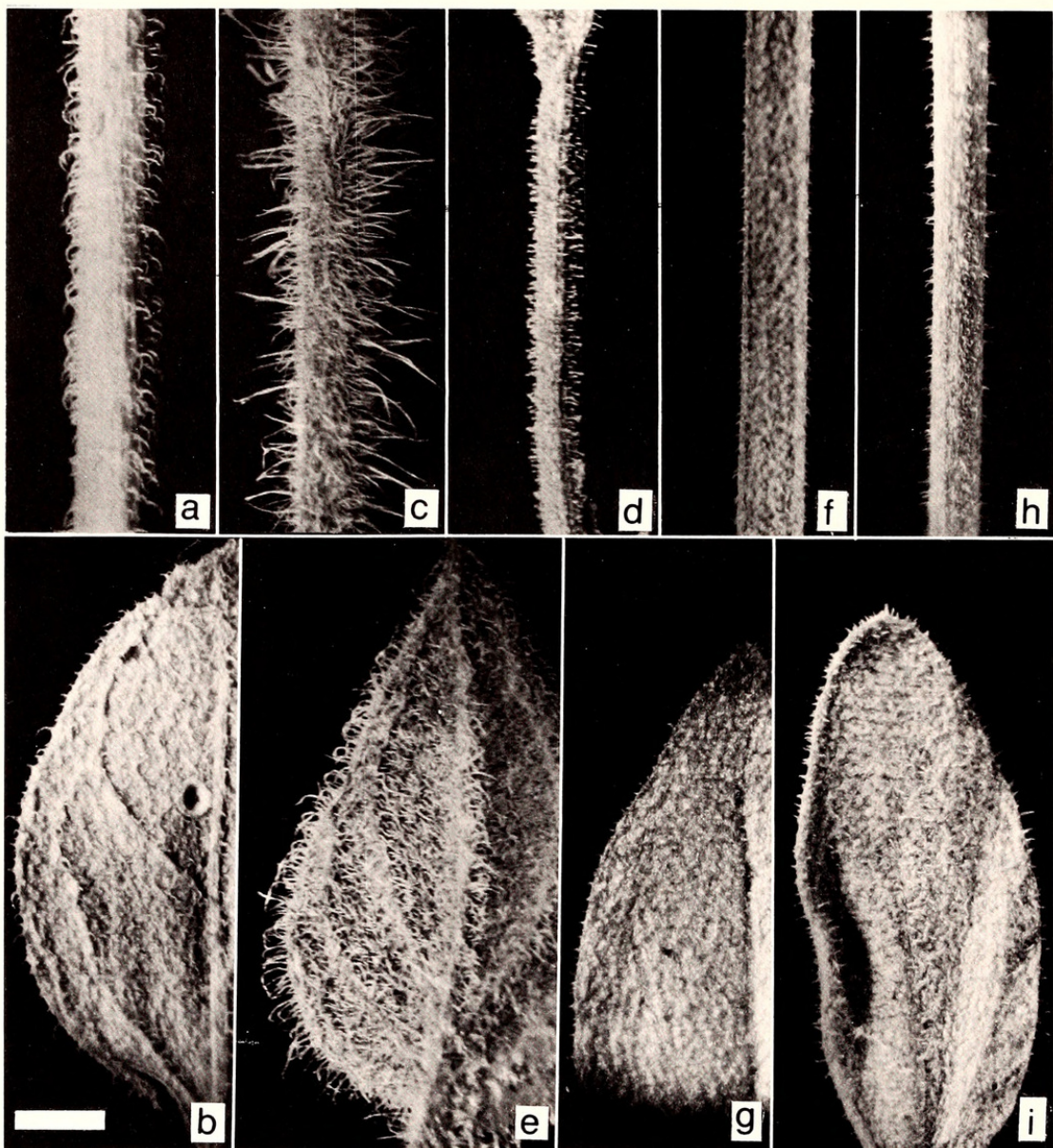


FIG. 4. Photographs of stem, inflorescence, and leaf material of *Carlowrightias*. a–b: *C. texana* Henrickson & Daniel. a. Stem showing decurved, tapering, white trichomes. b. Leaf, lower surface showing recurved trichomes (both *Correll 18254*, Type, LL). c–e: *C. torreyana* Wasshausen. c. Stem, showing long, straight, tapering, white trichomes. d. Inflorescence showing conspicuous gland-tipped trichomes. e. Leaf, lower surface showing long trichomes (all *Correll & Johnston 19399*, LL). f–g: *C. mexicana* Henrickson & Daniel. f. Stem with short descending trichomes. g. Leaf, upper surface showing straight trichomes (both *Henrickson & Lee 16013*, TEX). h–i: *C. lesueurii* Henrickson & Daniel. h. Stem showing small erect trichomes. i. Leaf, upper surface showing short straight trichomes (both *LeSueur 864*, TEX). White bar in b. is 1 mm long.

***Carlowrightia lesueurii* Henrickson & Daniel, sp. nov.**

Differt a *C. mexicana* Henrickson & Daniel caulibus pilis rectis (non retrorsis), bracteolis 3.5–6 (non 1–2) mm longis, corollis 8–9 (non 5–8) mm longis, capsulis 8–8.5 (non 9–12) mm longis pubescentibus (non glabris), seminibus marginibus denticulatis (non integris).

TYPE: Mexico: Chihuahua: Meoqui, 6 Aug 1936, *Harde LeSueur* 864. Holotype: UC; Isotypes: ARIZ, UC, CAS, F, GH, MO (2), SMU (2), TEX.

Erect to spreading, suffrutescent perennials 0.5–2 dm high from a stout or tortuous, twiggy, spreading, corky base, stems closely striate, uniformly puberulent with slender, straight or slightly decurved moderately dense trichomes 0.1–0.4 mm long. Leaves with petioles 0.5–2 mm long; blades elliptical to oblong-lanceolate, oblanceolate, more obovate below, more linear-lanceolate and bract-like above, 4.2–13 mm long, 0.5–4.5 mm wide, acute to obtuse-rounded at apex, cuneate at base, entire, puberulent as stems, midnerves raised below. Flowers axillary, 1–4 at middle and upper nodes, sessile or on distinct peduncles 0.5–3 mm long, paired bractlets subulate to oblong-lanceolate, 3–7 mm long, 0.3–0.5 mm wide, puberulent as leaves; calyx 2.5–3 mm long, lobes 1.5–2.5 mm long, subulate, puberulent, tube 0.5–1 mm long; corollas 8–9 mm long, color unknown, zygomorphic, lobes narrowly obovate, 5–6 mm long, 2 mm wide, tube 2.5–3 mm long, 1 mm in diameter; anthers 0.9–1.1 mm long, filaments 3.5–4 mm long; styles 6–6.5 mm long. Capsules 8–8.5 mm long, puberulent-strigulose with trichomes 0.1–0.2 mm long, tan, stipes 2.3–3 mm long, heads compressed-ovoid, 5.5 mm long; mature seeds black, 3.5–4 mm long, faces smooth to somewhat muricate, margins with retrorsely barbed teeth 0.1–0.2 mm long.

Although known from only two collections, this is a very distinctive species of *Carlowrightia* that can be distinguished from other species by the combination of its puberulent capsules, narrow leaves, and denticulate seed margins. It appears to be most similar to *C. mexicana*, from which it can be distinguished by the longer bractlets, corollas, and anthers; and by the shorter calyx and capsules, as well as the pubescent capsules and denticulate seed margins.

Representative Specimen: Mexico: Chihuahua: Los Organos Mts., (near 26°42'N, 103°02'W), 8 Sep 1937, *Harde LeSueur* 1254, (F, TEX).

ACKNOWLEDGMENTS

We thank M. C. Johnston for Latin diagnoses and the curators of the following herbaria for loans of specimens: ARIZ, F, GH, LL, MICH, MO, NCU, NY, PH, SMU, TEX, UC, US. Illustrations were drawn by Frances Runyon.

LITERATURE CITED

- CORRELL, D. S. and M. C. JOHNSTON. 1970. Manual of the Vascular Plants of Texas. Texas Research Foundation, Renner.
- GRAY, A. 1878. Contributions to the botany of North America. Proc. Amer. Acad. Arts & Sci. 13:361–374.
- KEARNEY, T. and R. PEEBLES. 1960. Arizona Flora, 2nd ed. Univ. Calif. Press, Berkeley.
- LUNDELL, C. L. 1966. Flora of Texas. Vol. 1. Texas Research Foundation, Renner.

- SHREVE, F. and I. L. WIGGINS. 1964. Vegetation and Flora of the Sonoran Desert. Stanford Univ. Press, Stanford, Calif.
- STANDLEY, P. C. 1926. *Carlowrightia*. In *Contr. U. S. Natl. Herb.* 23:1339-1342.

(Accepted 20 Dec 1978.)

NOTES AND NEWS

INTERNATIONAL REGISTER OF SPECIALISTS AND CURRENT RESEARCH IN PLANT SYSTEMATICS

The Hunt Institute for Botanical Documentation has received a grant from the U. S. National Science Foundation to produce an international register accounting for both specialists and individual research projects in systematic botany. The *Register*, to be produced in both computerized and published forms, will revive and incorporate the now dormant "Index of Current Research" previously sponsored by the American Society of Plant Taxonomists and "Register of Specialists" produced by the International Association for Plant Taxonomy. This new *Register* project is being undertaken with the endorsements and assistance of both those organizations. Financial assistance has also been received from the U. S. National Park Service, through the New York Botanical Garden.

Questionnaires and accompanying instructions (trilingual: English, French, German) will be distributed within the systematic botanical community starting in November 1978. Major means of distribution will include enclosure in individual copies of *Taxon* (first 1979 mailing) and *Systematic Botany*, and by mailing modest supplies to selected botanical institutions and academies of science. These forms have been designed to permit easy photoduplication, which is strongly encouraged. Anyone working in systematic botany (including its history, bibliography, art, and applications to structural, ecological and evolutionary botany) is urged to fill out and return a questionnaire by 31 August 1979. Those not receiving questionnaires directly should obtain them (or photocopies) from a convenient botanical institution or can request them by writing to: Hunt Institute, Attention Register, Carnegie-Mellon University, Pittsburgh, PA 15213 USA. Such direct requests should be made only if the materials are unavailable through the other channels.

The first printed edition of the *Register* will be published in spring 1980. Thereafter, with adequate continuing assistance from the botanical community and its sponsors, the Institute plans to maintain the *Register* as an active computerized data base and to produce succeeding printed editions triennially. A copy of the published *Register* will be sent without charge to each questionnaire respondent as well as to relevant institutions and governmental agencies. Reasonable special query service will be available to the public at no or minimal cost upon application to the Institute. This may involve special permutations of the data, or simply requests for up-to-date information on a given topic during the periods between successive published editions.

The utility of the *Register* to both the botanical community and the general public will depend in large measure upon its comprehensiveness. To maximize coverage, the Institute is requesting the cooperation and active assistance of botanists and their institutions on a worldwide basis.



Henrickson, James and Daniel, Thomas Franklin. 1979. "THREE NEW SPECIES OF CARLOWRIGHTIA (ACANTHACEAE) FROM THE CHIHUAHUAN DESERT REGION." *Madroño; a West American journal of botany* 26, 26–36.

View This Item Online: <https://www.biodiversitylibrary.org/item/185361>

Permalink: <https://www.biodiversitylibrary.org/partpdf/170776>

Holding Institution

Smithsonian Libraries and Archives

Sponsored by

Biodiversity Heritage Library

Copyright & Reuse

Copyright Status: In Copyright. Digitized with the permission of the rights holder

Rights Holder: California Botanical Society

License: <http://creativecommons.org/licenses/by-nc/3.0/>

Rights: <https://www.biodiversitylibrary.org/permissions/>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.