

## NEW PHANEROGAMS FROM MEXICO, IV\*

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**Atriplex Stewartii**, sp. nov.

Frutex dioicus 2.5–5 dm. altus pallidus saepe erectus et globosus; caulibus numerosis ascenderet ramosis; foliis numerosis alternis oblongis vel late lanceolatis, majoribus 2–2.5 cm. longis 5–8 mm. latis infra medium vel rariter supra medium latioribus, basi cuneatis subsessilibus, margine integris vel sinuato-dentatis; floribus femineis in axillis foliorum minorum superiorum glomeratis; bracteis fructiferis corpus seminiferum quadrialatum rostro conspicuo terminali donatum formantibus; corpore (alis 1–4 mm. latis exclusis) subsessili 3–6 mm. longo 1.5–2.5 mm. crasso infra medium crassiore; rostro conspicuo 2–5 (–7) mm. longo lobos subaequilongos ligulatos vel cuneatos basim versus 1–1.5 (–2) mm. latos bifido supra alas corporis conspicue projecto; corpore alato a latere viso transverse elliptico vel suborbiculato usque ad ob-reniforme 5–10 mm. lato, basi saepe rotundato, apice rotundo vel truncato vel breviter lateque angulato-lobato, margine integro vel undulato rariter dentato-lobato; seminibus eas *A. acanthocarpae* simulantibus; floribus masculis spicas elongatas moniliformes formantibus numerosis; staminibus 5.

COAHUILA (Llano de Guaje): margin of playa at base of Lomas del Aparejo, abundant, erect globose bush 10–16 in. tall, August 28, 1940, *Johnston & Muller 777* (TYPE, Gray Herb.); margin of playa near Tanque La India, erect usually globose bush up to 18 in. tall, 1940, *Johnston & Muller 781* (G); margin of playa near Tanque La India, growing among low bushes and supported by them, stems 3 ft. long, 1940, *Johnston & Muller 785* (G).

This plant was observed only about the margin of the playa in the Llano de Guaje, about 100 km. northeast of Sierra Mojada. It grew with *A. obovata*, but was much more common than that species. The only other *Atriplex* observed in the region was *A. canescens*, which grew in the desert-scrub back from the dry-lake. The soil about the playa was only moderately saline. No species of *Suaeda*, for example, was found in the region.

The species is probably most closely related to *A. acanthocarpa* from which it is quickly distinguished by its fruit. The fruiting bracts bear

\*New Phanerogams from Mexico, III. See Jour. Arnold Arb. 21: 253–265 (1940).

4 well developed longitudinal wings, in the manner of *A. canescens*, rather than being covered with irregularly arranged numerous coarse flattened appendages. The fruiting bracts most suggest those of *A. linearis* and some forms of *A. canescens*, but differ in their very long slender conspicuous rostrum and in the lack of a stipe. The species commonly had a low bushy habit very similar to that of *A. obovata*, but some plants (represented by no. 785) had the sprawling habit of *A. acanthocarpa*. The leaves varied in form; some had leaves similar to those of *A. obovata* (no. 781), but most of the plants had sinuately toothed leaves suggestive of *A. acanthocarpa*. Of all the many plants examined only those in one colony had the bract with lobed wings. This is represented by no. 785. Some of the fruits of this collection have the wings well developed and subentire while others have some of the wings broken down into a row of flattened appendages. In habit of growth, foliage and fruit, therefore, this collection gives the clearest indication of the relationship of *A. Stewartii* and *A. acanthocarpa*.

I am naming this species in honor of my good friend Mr. Robert Stewart of Santa Elena Mines, who accompanied me when it was collected. Without Mr. Stewart's help, Mr. Muller and I could not have visited the great Llano de Guaje. In fact, he was responsible for much of the success of our collecting trip in Coahuila this past summer. Not content with contributing indirectly to the study of the Coahuilan flora, Mr. Stewart has now started to botanize. His name is very fittingly associated with this interesting Coahuilan plant.

***Atriplex reptans*, sp. nov.**

Planta dioica perennis rhizomatosa depressa prostrata pallida foliosisima; rhizomatibus valde elongatis ad 3–4 mm. crassis; ramis foliatis abundantibus, raro elongatis saepe congestis 2–5 cm. longis dense ascender ramosis; foliis oppositis crassulis ovato-oblongis vel elliptico-oblongis 2.5–4.5 mm. longis 1.5–2 mm. latis medium versus vel infra medium latioribus saepe quam internodiis subduplo longioribus basi connatis apice obtusiusculis; floribus masculis in axillis foliorum superiorum glomeratis; glomerulis 3–5-floris inconspicuis, lobis perianthii 4 triangulari-ovatis, filamentis ad 1.4 mm. longis compressis, antheris rosaceis; floribus femineis saepe solitariis in axillis foliorum superiorum gestis; bracteis fructiferis minutis inconspicuis 2.5–3 mm. longis infra medium et ultra connatis; partibus connatis 1.2–1.4 mm. latis (medium versus latioribus) 0.7–0.8 mm. crassis, faciebus alte convexis nullo modo appendiculatis vel rugosis, basi rotundis sessilibus; partibus liberis bractee crassis stricte ascendentibus ovato-triangularibus, apice obtu-



siusculis, margine integris vel basim versus crasse unidentatis; seminibus brunneis crasse biconvexis radícula lateraliter erecta apice circa 4/5 altitudinis seminis attingente cotyledonem nullo modo superantibus; stylo fere ad basim bilobato.

COAHUILA: local on flats at the base of a gypseous ridge a mile or so east of Laguna de Jaco, September 9, 1940, *Johnston & Muller 1081*, pistillate (TYPE, Gray Herb.), *Johnston & Muller 1080*, staminate (G).

This remarkable *Atriplex* was discovered while travelling from San Vicente southwesterly to Jaco. It was seen only on the flats at the eastern base of the gypseous ridges to the east of Lake Jaco. These flats are probably flooded after each rain. The *Atriplex* is the dominant and most common and conspicuous plant upon them. It forms irregular mats frequently a meter or more broad. I suspect that the plant is gypsophilous. It is evidently related to *A. Watsoni* Nels. (*A. decumbens* Wats.) of the coast of California and Baja California. It agrees with that western plant in having opposite leaves and similar fruiting bracts. It differs conspicuously from this relative in having the staminate flowers in inconspicuous axillary glomerules rather than in conspicuous terminal moniliform spikes.

***Fendlera rigida*, sp. nov.**

Frutex rigidus erectus 5–18 dm. altus supra intricate ramosus; caulibus saepe numerosis cortice nigrescente obtectis basim versus ad 1 cm. crassis, supra dense breviter ramulosis, ramulis subdivaricatis brunneis non raro subspinescentibus, internodiis ad 14 mm. longis; foliis saepe congestis, non raro subfasciculatis; lamina crassa lineari 10–15 mm. longa 1.2–2.5 mm. lata, apice rotundata vel obtusa, basi in petiolum 1–2 mm. longum 0.3–0.5 mm. crassum tomentulosum abrupte contracta, supra convexa vel medium versus supra costam obscure impressa basim versus villosula, alibi pilis pallidis rigidis 0.2–0.3 mm. longis adpressis sparsis ornata; marginibus folii valde revolutis costam latam planam subattingentibus et canaliculos duos angustos fundo pilis minutis abundantissimis barbellatis ornatos formantibus; floribus parvis apice ramulorum 1–3; pedicellis 2–4 mm. longis canescenti-puberulentibus; calyce canescente puberulente, lobis triangularibus ad 3 mm. longis acutis (maturitate ad 5 mm. longis saepe ascendentibus et media capsulam superantibus), tubo calycis ad 5 mm. diametro ad 2 mm. profundo; petalis albis extus medium versus sparse pilosis, lamina ovato-triangulari 4–5 mm. lata et 4.5–5.5 mm. longa apice acutiuscula margine saepe erosa, basi in unguem 3.5 mm. longum 1–1.5 mm. latum abruptissime contracta; staminibus sepalos superantibus, filamentis (i.e. a basi antheris usque ad basim



staminum) ca. 3.5 mm. longis, anthera (appendiculo apicale 0.6 mm. longo inclusa) 1.8 mm. longa quam lobis filamenti ca. 3 mm. longis breviori; stylo piloso ca. 3.6 mm. longo, ovario glabro; capsula late ovoidea (stylis persistentibus exceptis) ad 5 mm. longa.

COAHUILA: common on the coarse volcanic tuff near the mouth of the canyon at San Antonio de los Alamos, September 2-3, 1940, *Johnston & Muller 912* (TYPE, Gray Herb.).

A well marked species most closely related to *F. linearis* of the Sierra Madre near Monterey. It is a stiffer, more densely branched bush with shorter, more hairy leaves, broader sepals, and much shorter, stouter capsules. It was seen only in the Sierra San Antonio, in the vicinity of San Antonio de los Alamos, where it was confined to coarse volcanic tuff. It grew high on the canyon wall and on sunny flats, particularly favoring seams in the beds of tufa. In habit it formed a stiff upright bush with the short, stiff numerous branchlets intricately entangled above.

**Genistidium**, gen. nov. Leguminosarum.

Calyx campanulatus, lobis elongatis tubo longioribus, duobus superioribus alte connatis. Petala longe unguiculata, vexillo suborbiculato dorso infra apicem secus lineam medialem pilos minutos gerente alibi glabro, alis lunato-oblongis glabris late evidententerque auriculatis, petalis carinae obtuse lunatis evidententer lateque auriculatis margine tertia parte exteriori laminarum connatis. Stamen vexillare omnino liber basim versus puberulentum, stamina cetera in vaginam (margine basim versus puberulentam) connata. Antherae homomorphae. Ovarium subsessile 4-6-ovulatum. Stylus inflexus subteres subcorneus subulatus supra medium ubique barbatus apice stigmatibus capitato minuto terminali donatus. Legumen lineare compressum rectum bivalvatum uniloculare, valvis coriaceis, suturis crassiusculis. Semina suborbiculata compressa estrophiolata. — Frutex erectus parvus ramosissimus rigidus strigosus. Folia trifoliolata, foliolis integerrimis elongatis firmis enervatis exstipellatis. Stipulae rigidusculae subulatae minutae. Flores flavi in axillis foliorum superiorum saepe unifoliolatorum solitarii vel raro geminati.

**Genistidium dumosum**, sp. nov.

Planta fruticosa 2.5-5 dm. alta rigida globosa dense intricateque ramosa; ramis erectis numerosis abundanter ascendenter ramosis basim versus 2-3 mm. crassis inconspicue sed distincte 8-15-costatis, juventate pallidis dense strigosis deinde glabrescentibus et viridibus; foliis alternis abundantibus trifoliolatis dense strigosis, petiolis 1-4 mm. longis; foliolis oblanceolatis 5-18 mm. longis firmis medio-costatis sed enervatis apice



acutis, duobus lateralibus subsessilibus, foliolo mediali breviter petiolulato et majori; stipulis subulatis 1–1.5 mm. longis subpersistentibus; inflorescentia racemiformi dissitiflora bracteata; floribus in parte superiore ramulorum gestis ex axillis foliorum (saepe unifoliolatorum quam floribus saepe longiorum) orientibus, 5–25 mm. distantibus unoquoque breviter et inconspicue pedunculato; pedunculo ad 1 mm. longo summum ad apicem florem solitarium et bracteas duas subulatas 1.5–2 mm. longas strictas gerente; calyce basi plus minusve obliquo in pedicellum 2–3 mm. longum abrupte transmutato, tubo 2.5–3 mm. longo sparse strigoso, lobis duobus inferioribus fere ad apicem connatis cuneatis ad 3 mm. longis, lobis lateralibus et supremo subulatis 3 mm. longis; alis flavis, ungue curvato 4 mm. longo ad 0.8 mm. lato, lamina 6 mm. longa medium versus 2.5 mm. lata carinam 1–2 mm. superante; carina alba, unguibus 3.8 mm. longis, laminis 4.5 mm. longis et 2.8 mm. latis; vexillo flavo medium versus viridi-maculato, lamina ca. 8 mm. lata, ungue ca. 3 mm. longo; staminibus 5–6 mm. longis; ovario secus marginem superiorem strigoso; legumine (submature) strigoso recto 2–2.5 cm. longo ca. 4 mm. lato.

COAHUILA: frequent along the summit of the cliffs of volcanic tuff at San Antonio de los Alamos, September 2–3, 1940, *Johnston & Muller 944* (TYPE, Gray Herb.).

This small bush, though in gross habit much suggesting the *Papilionatae-Genisteae* of the Old World, is, doubtless, a member of the *Galegeae* and, particularly, of the *Galegeae-Craccanae* as defined by Rydberg, *Am. Jour. Bot.* **10**: 488 (1923) and *No. Am. Fl.* **24**: 156 (1923). It appears to have its closest relations in *Tephrosia* and *Peteria*, from which it differs in its dense bushy habit of growth, coarsely auriculate petals, trifoliolate leaves and bearded subulate (rather than flattened) style. From *Tephrosia*, in particular, it further differs in its veinless leaflets and completely free vexillar stamen. From *Peteria*, in particular, it further differs in the absence of spinescent stipules, and in the less well developed inflorescence, and better developed calyx-lobes.

The plant was seen only about the summit of the high cliffs of coarse volcanic tuff which dominate San Antonio de los Alamos. At this locality it was observed at several stations and was always scattered on level areas just back of the summit of the tuff-cliffs in arid exposed situations.

***Nama Stewartii*, sp. nov.**

Herba succulenta foliosa erecta 1–2 dm. alta viscida e radice 2–4 mm. crassa palari annua oriens glandulifera (glandulis minutis stipitatis); caulibus solitariis vel pluribus saepe e basi sursum ramos elongatos



stricte ascendentes proferentibus hispidulis et glanduliferis; foliis succulentis alternis oblanceolatis apice angulatis obtusiusculis, supra medium latoribus deinde basim versus gradatim attenuatis, margine saepe revolutis, supra hispidulis subtus pilis sparsis obsitis vel subglabris; cymis numerosis apicem versus ramulorum gestis folia suffulciantia haud vel vix superantibus; pedicellis 1–4 (saepe ad 2) mm. longis; calyce sub anthesi 5–6 mm. longis, deinde 1–2 mm. longioribus, lobis erectis ciliolatis spathulato-linearibus apice ca. 0.5 mm. latis, fructiferis quam capsula subduplo longioribus; corolla infundibuliformi-campanulata 7–9 mm. longa rosacea, lobis 2.5–3 mm. latis rotundis; staminibus inaequalibus fere ad vel paullo supra medium cum corolla coalatis, parte libera 2–3.5 mm. longa subcompressa, parte adnata 2.5–3 mm. longa praesertim supra medium anguste alata; stylis distinctis hispidulis; capsula 3–4 mm. longa glandulifera compressa ovoideo-ellipsoidea; seminibus ca. 50 brunnea angulate subglobosis ca. 0.4 mm. longis minute alveolatis.

COAHUILA: Picachos Colorados, slope at west end of cliffs, 1940, *Johnston & Muller* 139 (G); between Carrizo and Carricito on gypseous ridge, 1940, *Johnston & Muller* 159 (G); Castillon, confined to gypsum flats, 1940, *Johnston & Muller* 1271 (G); foothills of Sierra de las Cruces west of Santa Elena Mines, confined to gypsum-flats, 1940, *Johnston & Muller* 228 (G); Sierra de las Cruces, gypsum flats and cliffs at south base of Picacho de San Jose, August 29, 1940, *Johnston & Muller* 814 (TYPE, Gray Herb.)

This species is probably most closely related to *N. Havardii* of the Big Bend area in southern Brewster County, Texas, but is a lower, less robust, more branched and more juicy plant which is more glandular and has a much scantier indument. The herbarium specimens are green, rather than gray. The fresh plants are dense with numerous stems and thick fleshy leaves. They are light green and somewhat slimy. The corolla-lobes are an intense pink or rose color on the inner face and much paler on the outer surface. The corolla is smaller (7–9 rather than 9–12 mm.) than in *N. Havardii*, and the filaments are adnate only to about their middle, rather than distinctly above their middle as in *N. Havardii*. The species is gypsophilous and was found only on gypseous soils or on pure gypsum. In the eastern foothills of the Sierra de las Cruces, about Santa Elena Mines, it was present on nearly all the scattered exposures of gypsum, even on small isolated exposures of only a few square meters in extent.

It is a pleasure to associate the name of Mr. Robert M. Stewart with this interesting gypsophile. Mr. Stewart, drawing on his knowledge of the geological structure of the region, accompanied and guided me to



various exposures of gypsum in the area about Santa Elena Mines. It is appropriate that this, the most characteristic gypsophile of the Sierra de las Cruces, be associated with his name.

**Petrogenia**, gen. nov. Convolvacearum.

Flores solitarii parvi in axillis foliorum superiorum brevissime pedicellati nullo modo aggregati pentameri. Sepala 5 inaequalia imbricata calycem et corollam superantia, bracteolis parvis. Corolla minima campanulata flava, lobis brevibus induplicatis sub anthesi ascendentibus. Stamina glabra, filamentis linearibus, antheris fundum sinuum lorum corollae vix superantibus. Ovarium perfecte biloculare 4-ovulatum. Stylus fere ad basim bifidus, stigmatibus duobus capitatis. Capsula globosa bilocularis saepe 4-seminata 2-4-valva membranacea apicem versus villosa. Semina glabra. — Herba prostrata fruticulosa sericea pilis dibrachiatis adpressis abundanter strigoso-vestita. Folia parva numerosa.

**Petrogenia repens**, sp. nov.

Planta perennis sericea; caulibus prostratis rigidulis laxè ramosis e radice palari profundo erumpentibus non rariter in nodis radículas gerentibus foliosis elongatis 1-5 dm. longis saepe ca. 1 mm. crassis, internodiis saepe 5-10 mm. longis; foliis numerosis alternis, lamina firma elliptica vel lanceo-elliptica 3-9 mm. lata 7-14 mm. longa concolore apice acuta vel rotunda basi in petiolum 1-2 mm. longum gradatim vel abrupte contracta; floribus in axillis solitariis, pedicellis 0.5-0.8 mm. longis; lobis calycis inaequalibus; lobis exterioribus ad anthesim 3.5-4 mm. longis ovato-lanceolatis infra medium 1.5 mm. latis apice acutis, fructiferis ca. 6 mm. longis et 3 mm. latis ovatis acuminatis; lobis interioribus 2.5-3 mm. longis lanceolatis acuminatis basim versus ad 1 mm. latis, maturitate ad 5 mm. longis 1 mm. latis lanceolatis; bracteolis 2-2.5 mm. longis ca. 0.5 mm. latis, maturitate ad 3 mm. longis inconspicuis lobis calycis conspicue brevioribus; corolla viridi-lutea inconspicua quam calyce brevior 3-3.5 mm. longa, a basi ca. 1 mm. diametro sursum ad limbum 4 mm. diametro valde sed gradatim ampliata; lobis corollae 5 ascendentibus 1-1.2 mm. longis et latis apice late obtuso-rotundis extus infra medium sparse villosis alibi glabris, sinibus apertis angulatis; staminibus 5 ad 1 mm. supra basim corollae affixis, filamentis glabris linearibus 1 mm. longis basim sinuum corollae attingentibus, antheris in ambitu subcircularibus ca. 0.4 mm. diametro basim sinuum corollae vix superantibus; ovario 4-ovulato sub anthesi ca. 1 mm. longo subcylindræo infra medium glabro apice stylos duos imam ad basim connatos ca. 1.9 mm. longos filiformes gerente; capsula bilocu-



lari (utroque loculo saepe biseminato) globosa ad 3.5 mm. diametro membranacea supra medium sparse villosa quam calyce brevior et ab eo laxè velata; seminibus saepe 4 glaberrimis ca. 2 mm. longis dorso convexis ventre angulatis.

COAHUILA: foothills of Sierra Hechiceros, 9 mi. south of El Tule, about rocks on gravelly ridge of rhyolite, 1940, *Johnston & Muller* 1374 (G); Sierra de la Cruces near Santa Elena, limestone ledges, 1940, *Johnston & Muller* 211 (G); Lomas del Aparejo, eastern margin of Llano de Guaje, limestone ledges, 1940, *Johnston & Muller* 776 (G); south end of Sierra del Pino, limestone ledges, 1940, *Johnston & Muller* 731 (TYPE, Gray Herb.); Sierra Planchada, 6 mi. northeast of Esmeralda, limestone ledges, 1940, *Johnston & Muller* 835 (G); Sierra Almagre, limestone ledges, 1940, *Johnston & Muller* 1162 (G); hillside 8 mi. west of Saltillo, about limestone rocks, 1938, *Johnston* 7661 (G). CHIHUAHUA: Sierra San Carlos, road to mine, base of limestone cliffs, 1940, *Johnston & Muller* 53 (G); Santa Eulalia Mts., limestone ledges, 1885, *Pringle* 591 (G). SAN LUIS POTOSI: Minas de San Rafael, 1910, *Purpus* 4915 (G).

This interesting little plant evidently belongs to the *Convolvulaceae-Dicranostyleae* as defined by Hallier, Bot. Jahrb. 16: 569 (1893). The material collected by Pringle and Purpus has been determined as *Cressa*, but that is obviously incorrect, since the plant has a 4-seeded globose capsule, inconspicuous greenish campanulate corollas, a calyx of unequal lobes which invests both flowers and fruit, and stamens which are only barely exerted from the corolla. Finally, it is a rock-loving xerophyte, rather than, as in *Cressa*, an inhabitant of moist saline soils. By Hallier's key, p. 563, *Petrogenia* traces out either to the African genus *Seddera*, which differs in its small calyx, toothed filaments and very different style, or to the rather heteromorphic genus, *Bonamia*. Our present Mexican plant, however, differs from *Bonamia* in its small inconspicuous yellow corollas, the calyx which over-tops both corolla and fruit, the nearly exerted stamens, and its very different habit. I do not think that *Petrogenia* is closely related to *Bonamia*.

In western Coahuila *Petrogenia* is widely distributed and can be expected on almost any sunny hillside with ledges or cliffs of limestone. Its wiry creeping stems and silvery leaves commonly fill crevices on limestone ledges or form carpets about large rocks on slopes below limestone cliffs. Only at one locality, near the south base of the Sierra Hechiceros, have I seen this plant growing away from limestone rocks. At this locality it grew about large rocks on a sunny ridge formed of decomposed rhyolite. It seems probable that the igneous rock at this



locality was unusually basic since several other species, otherwise known only from limestones, grew with the *Petrogenia* there.

***Salviastrum canescens* (Gray), comb. nov.**

*Salvia texana* var. *canescens* Gray, Proc. Am. Acad. 8: 368 (1872).

*Salviastrum texanum* var. *canescens* (Gray) Cory, Rhodora 38: 407 (1936).

Corolla pink, marked with two elongate yellow spots at the base of the lower lip, subtubular, 2 cm. long, villous-hispidulous outside, glabrous inside except for a few scattered hairs above the base; limb very oblique; tube 1.7–2 mm. thick at base, gradually expanding and becoming ca. 3.2 mm. thick at summit; lower (and most protruding) lip of corolla 5 mm. broad, 3.5 mm. long, broadly notched, abruptly narrowed at base into a claw 1.5 mm. broad and ca. 0.6 mm. long; lateral lobes rounded, 1.5–2 mm. long; upper lip about 1.5 mm. long, notched; stamens attached 15 mm. above base of corolla, rudimentary pair of stamens about 0.5 mm. long; fertile filaments compressed 1.5 mm. long, 0.25 mm. wide; larger anther-sac ca. 1.2 mm. long borne on a thick curved connective ca. 0.5 mm. long; smaller anther-sac about 0.9 mm. long, subsessile; style 15 mm. long, not exerted; stylar lobes 3–3.5 mm. long, flattened, lanceolate 0.5 mm. wide.

COAHUILA: dry chalky soil in a small open exposed arroyo near the high eastern ridge, Sierra del Pino northeast of Noria, 1940, *Johnston & Muller 646* (G).

The above cited collection agrees very closely with the original material of Gray's *Salvia texana* var. *canescens*. This variety has remained known only from fruiting plants collected near the Pecos River, Texas, by Charles Wright in 1849. A description of the corolla, from the new collection, is supplied above. This reveals that the variety, *canescens*, is not at all closely related to *S. texanum*. It is a plant with tubular corollas and evidently has its closest relations with *S. dolichanthum* Cory, from which it differs in its much smaller flowers, more slender fruticulose habit and different inflorescence. The flowers of *S. canescens* are lateral, being borne along the lower part of leafy shoots. The leaves surpass the subtended flowers. In *S. dolichanthum* the flowers are borne in a terminal inflorescence composed of numerous whorls of flowers and short bracts. The persisting stems of *S. canescens* are fruticulose and apparently represent several years growth. Those of *S. dolichanthum* are annual growth springing from a strong perennial root. The plant was seen only twice in Coahuila, once near the crest of the high eastern ridge of the Sierra del Pino and again at the mouth of the canyon at



the southern end of the same range. At both localities it grew in patches of chalky calcareous soil on dry sunny slopes. At both stations it was locally common.

***Leucophyllum pruinsum*, sp. nov.**

Frutex 10–25 dm. altus, partibus junioribus griseis pruinosis molliter tomentosis pilis ad 0.5 mm. longis ramos graciles elongatos ca. 0.2 mm. longos superimpositos gerentibus; partibus vetustioribus plantae aliquantum glabrescentibus griseoribus; ramulis elongatis saepe 1–2 dm. longis ascendentibus; foliis alternis saepe 4–10 mm. distantibus, lamina ovata vel late elliptica vel suborbiculari costata sed enervata 8–16 mm. longa 5–12 mm. lata, apice rotundata vel obtusa, basi in petiolum 2–4 mm. longum saepe abrupte contracta, subtus saepe plus minusve pallidiore; calyce in alabastro candido (lobis late lanceolatis erectis) ad anthesi ca. 4 mm. longo 2–3 mm. longe pedicellato; corolla purpurea 9–14 mm. longa extus sparse glandulifera eam *L. ambigu* persimulante.

SAN LUIS POTOSI: rocky hillside 11 miles south of Matehuala, pale bush 12–24 dm. tall with purple flowers, 1938, *Johnston* 7569 (TYPE, Gray Herb.). NUEVO LEON: arid limestone slopes east of Soledad, 5500 ft., 1940, *Shreve & Tinkham* 9695 (G); low shrub, loma near Doctor Arroyo, 6200 ft., 1940, *Shreve & Tinkham* 9682a (G).

This plant of southern Nuevo Leon and adjacent San Luis Potosi is a relative of *L. ambigu*, of Hidalgo, from which it differs conspicuously in its indument. Typical *L. ambigu* has a dense felt-like indument and is usually tawny. In *L. pruinsum* the herbage is covered with much less abundant coarser grayish or white trichomes and is loosely tomentose. The plant has a frosted appearance. Though related to *L. ambigu*, the plant may be separated at a glance from its more southern relative.

***Leucophyllum griseum*, sp. nov.**

Frutex 8–18 dm. altus rigide ascender ramosus, partibus juvenilibus pilos compositos minutos abundantissimos griseos gerentibus evidenter griseo-vestitis, maturis paullo glabrescentibus; ramulis 5–15 cm. longis numerosis ascendentibus, internodiis saepe 1–10 mm. longis; foliis alternis oblanceolatis vel rariter subobovatis 5–15 mm. longis saepe 2–5 (rariter ad 7) mm. latis costatis sed enervatis, apice rotundis vel obtusis, basi in petiolum 1–2 mm. longum gradatim contractis; calyce ad anthesim ca. 3 mm. longis basi in pedicellum saepe gracilem 1–2 mm. longum contractis, lobis lanceolatis ascendentibus; corolla purpurea 10–18 mm. longa, limbo 9–15 mm. diametro extus glabrato vel piliferis, lobis ovatis ascendentibus in facie interiore saepe piliferis.



COAHUILA: crest of an isolated hill one mile north of San Rafael (31 mi. south of Castillon), two plants, 9 dm. tall, 1940, *Johnston & Muller* 198 (G); mouth of Cañon de Tinaja Blanca, Sierra de las Cruces, 1940, *Johnston & Muller* 256 (G); foothills of the Sierra Planchada, 6 mi. north of Esmeralda, shrub 6–9 dm. tall, 1940, *Johnston & Muller* 341 (TYPE, Gray Herb.); Parras, 1880, *Palmer* 969 (G); Sierra de Parras, 1910, *Purpus* 4639 (G); Sierra de Parras, 5500–6000 ft., 1940, *Shreve & Tinkham* 9856 (G); rocky base of hills 3 mi. north of Peña Pass, bush 9–18 dm. tall, 1938, *Johnston* 7721 (G). ZACATECAS: 21 miles south of Concepcion del Oro, 6–15 dm. tall, 1938, *Johnston* 7353 (G); Cedros, *Lloyd* 106 (G) and ? 58 (G).

This species is related to *L. minus* of western Texas, northern Chihuahua and extreme northwestern Coahuila, and probably includes most of the Mexican material which has been identified as that species. In floral structures, size and shape of leaves, and habit of growth, the plants are very similar. The two species differ, however, in the nature of their induments. In *L. minus* the indument is very dense and close and almost suggests a coating of aluminum paint. The very numerous small white trichomes are flat and stellate. The primary axis of the trichomes is extremely shortened and its tip appears as a small dot or knob at the center of the radially arranged arms. In *L. griseum* the indument is much less dense and more loose and at best appears as a dull thin grayish felt. The small grayish trichomes have a short but distinctly elongate axis along which the more or less unequal arms are borne at different heights. The tip of the axis projects well beyond the upper arms. The trichome is, hence, clearly three dimensional, rather than flat as in *L. minus*. During the past summer I visited the southern parts of the range of *L. minus* and the northern parts of the range of *L. griseum*. I found absolutely no evidence that these species intergraded. The species are readily distinguished in the field and herbarium.

***Leucophyllum candidum*, sp. nov.**

Frutex globosus saepe 3–6 (rariter ad 12) dm. altus ramosissimus, ramulis saepe 5–15 cm. longis, internodiis saepe minus quam 1 cm. longis, partibus junioribus indumentum candidum densum tomentosum gerentibus; pilis abundantissimis elongatis verticellos plures superimpositos ramulorum longiusculorum gerentibus; foliis oppositis vel suboppositis numerosis concoloribus medio-costatis sed enervatis, lamina 6–10 (rariter ad 16) mm. longa 4–8 mm. lata late obovata vel raro oblanceo-obovata apice obtuse angulata basi in petiolum 1–3 mm. longum saepe abrupte contracta; calyce 3–4 mm. longo lobis 1–1.5 mm. latis acutis cum pilis elongatis ramosis abundantibus crasse vestitis; corolla



purpurea 12–17 mm. longa intus sparse pilifera, limbo 10–13 mm. diametro, lobis 4–5 mm. longis suborbiculatis tubo basi imo 2.5 mm. crasso; filamentis ca. 4 et 4.5 mm. longis sparse piliferis; ovario subglabro vel tomentoso; stylo glabro vel sparse pilifero.

COAHUILA: El Berrendo near Muzquiz, 4000 ft. alt., fl. purple, 1939, *White 1799* (G); limestone ledges near mouth of southern canyon, Sierra del Pino, pallid bush 1–2 ft. tall, not common, 1940, *Johnston & Muller 730* (G); crest of cliffs of volcanic tuff near San Antonio de los Alamos, frequent, globose bush 1–1.5 ft. tall, 1940, *Johnston & Muller 936* (G); between Carrizo and Carricito, on small ridge, local, bush 3–4 ft. tall, 1940, *Johnston & Muller 160* (TYPE, Gray Herb.); small isolated hill one mile north of San Rafael (31 mi. south of Castillon) abundant pallid shrub 1–2 ft. tall, 1940, *Johnston & Muller 199* (G).

This plant of northern Coahuila is closely related to *L. zygothallum* of the dry valleys of southern Nuevo Leon. These two geographically well separated species differ in the size and form of the complex trichomes covering the herbage and accordingly in the nature and appearance of the indument. The trichomes of the northern *L. candidum* are relatively coarse, those on the leaves being about 0.2 mm. in diameter and those on the calyx being about 0.2 mm. long. The trichomes of *L. zygothallum* are, at most, a quarter that size and are less rigid in texture. Even under 40–50 magnification the indument on the leaves of *L. zygothallum* appears to be very dense and thin. The indument is so dense and thin that the older leaves, to the naked eye, appear to have a smooth grayish cuticle or a waxed surface rather than a coating of very abundant fine stellate trichomes. The thicker, whiter, felty indument of *L. candidum* is much less smooth and the coarser trichomes make it appear somewhat pulverulent or pruinose. The very much greater coarseness of the trichomes in *L. candidum* make its calyx-lobes and pedicels appear to be very coarse and thick.

The plant is a very attractive one and is probably widely distributed in the foothills of northern Coahuila. In addition to the stations where I collected it, I noted it in the foothills of the Sierra de las Cruces near Santa Elena Mines, at the base of the Sierra Almagre, and in the northern foothills of the Sierra Planchada north of Esmeralda. It was usually frequent locally and commonly growing with either *L. laevigatum* or *L. griseum*. Even when not in flower the plant is conspicuous for no other shrub in the region has an indument so white.

### **Haploesthes robusta**, sp. nov.

Planta robusta succulenta glabra; caulibus 2–3 mm. crassis pluribus decumbentibus vel ascendentibus 15–20 cm. longis sparse ascender

ramosis foliosis e radice supra breviter crasseque ramosa erumpentibus; foliis glaberrimis 1–3 cm. distantibus 4–6 cm. longis, 1.5–2.5 mm. crassis linearibus basim versus compressis et 1.5–2.5 mm. longe vaginatis; capitulis 5–7 caules et ramulos terminantibus ca. 8 mm. altis, involucri cylindrico-turbinato ca. 6.6 mm. longo et 4.5 mm. crasso; tegulis viridibus ad 6 mm. longis 3.5 mm. latis ellipticis apice rotundis; floribus ligulatis ca. 5, tubo 4 mm. longo et 0.5 mm. crasso, lamina 3.5–4 mm. longa et 2.5 mm. lata apice minute bidentata; floribus disci 30–40 ca. 5 mm. longis, faucibus ca. 1.5 mm. longis ad 1 mm. crassis, lobis papillatis triangularibus ad 0.5 mm. longis erectis; achaeneis ad 2 mm. longis nigris ca. 15-costatis, costis angustis elevatis pilos ascendentes gerentibus.

COAHUILA: 3 miles south of Cuatro Ciénegas, succulent plant on salt land, 2400 ft. alt., July 18–20, 1939, *Stephen S. White* 1923 (TYPE, Gray Herb.).

In its habit of growth, coarse stems, very coarse large succulent leaves, and large heads, this species is readily distinguished from *H. Greggii*, the only other species described for the genus. It is a robust plant with coarse widely spreading pale annual stems springing from a very coarse perennial root. The florets are more numerous than in its relative, and with the exception of the blade of its ligules, they are larger than in its relative.

The type of *H. Greggii* was collected by Gregg at "Ciénega Grande," Coahuila, a locality now called Ciénega del Carmen. This is located in the hilly country 30 kilometers northeast of Parras, along the old road to Saltillo. *Haploesthes Greggii* is a plant of gypsum. The newly proposed species comes from saline soils at lower altitudes.

### **Perityle Castillonii**, sp. nov.

Planta perennis ad faciem scopulorum adpressa 1–5 dm. diametro minus quam 1 dm. alta; caulibus pluribus fruticulosus e caudice lignoso saepe crasso erumpentibus; ramulis hornis foliosis 4–20 cm. longis gracilibus ad 1 mm. crassis sparse laxaque ramosis subcinereis minute villosulis, internodiis 3–30 mm. longis quam lamina foliorum longioribus; foliis oppositis; lamina deltoideo-ovata 5–25 mm. longa 4–25 mm. lata glandulis sessilibus aureis obsita sparse villosa, margine utrinque denticulis crassis 3–4 acutiusculis, basi truncata vel reniformi; petiolo quam lamina saepe brevior 3–15 mm. longo breviter villosulo; capitulis ramulos foliatis terminantibus discoideis 5–6.5 mm. altis 5–15 mm. longe pedunculatis; tegulis ca. 10 sub-biseriatis 3–5 mm. longis 0.4–1 mm. latis praesertim infra medium naviculatis unicarinatis apicem acutum



vel obtusum versus villosa-ciliatis alibi saepe sparse villosis; floribus 25–30 flavis; corolla 3–3.5 mm. longi, tubo ca. 1 mm. longo ad 0.5 mm. crasso glandulis stipitatis dense obsito, faucibus ca. 1.5 mm. longis ad 1 mm. crassis purpurascens sparse glanduliferis; lobis triangularibus ad 0.6 mm. longis; lobis styli ad 1.5 mm. longis subulatis supra medium barbellatis; filamentis ca. 0.9 mm. longis; antheris ca. 1.2 mm. longis appendiculas 0.3–0.5 mm. longas proferentibus; achaeniis ad 2.9 mm. longis nigrescentibus ca. 0.7 mm. latis, margine incrassatis haud vel vix ciliolatis, latere convexis minute et saepe adpresse hispidulis, apice haud coronatis epapposis vel rariter setam solitariam 0.5–2.5 mm. longam proferentibus.

COAHUILA: Canyon del Indio Felipe, Sierra Hechiceros, frequent in crevices of cliffs in deep canyon, Sept. 18, 1940, *Johnston & Muller 1359* (TYPE, Gray Herb.); Canyon del Indio Felipe, common in crevices of cliffs, Sept. 27, 1940, *R. M. Stewart 10* (G). CHIHUAHUA: dry sunny cliffs near "Virulento," 16 miles south of Trincheras, 1940, *Johnston & Muller 1430* (G).

The precise relationship of this species is uncertain. In Rydberg's treatment, No. Am. Fl. 34: 11–27 (1914), of the *Perityle-Laphamia* complex, it might fall in either *Monothrix* or *Leptopharynx*, keying out to *Monothrix Palmeri*, of northwestern Arizona, or to *Leptopharynx Lemmoni*, of southern Arizona. Of these two species, the latter most suggests *P. Castillonii*, but differs in its broader tegules, larger corollas, and different indument.

The present species is one of the small depressed suffrutescent cliff-plants which Gray and Watson placed in *Laphamia*. The differences in habit of growth and in the breadth and keeling of tegules, which have been used to separate *Perityle* and *Laphamia*, so completely intergrade, that I am unable to find any real difference between the two genera. Rydberg attempted to sort the species of *Perityle* and *Laphamia* among six genera. Unfortunately, these segregate genera also intergrade and what is more serious seem to be flagrantly unnatural. I am forced to the conclusion that *Laphamia* and *Perityle* should be united and, accordingly, I am describing the present "*Laphamia*" as a species of *Perityle*.

The species appears to be restricted to the elevated igneous country of extreme northeastern Chihuahua and adjacent Coahuila. This highland is about 25 km. wide and nearly 100 km. long with a long axis roughly paralleling the Rio Grande which lies about 50 km. to the north. Its eastern end, the rhyolitic Sierra Hechiceros, extends into Coahuila north of Castillon. Its western end, the bedded lavas of the Sierra Coyote, extends to Trincheras, south of Ojinaga. The species was found at both

ends of this highland, at "Virulento," 26 km. south of Trincheras, where it was abundant, rooting in crevices of sunny basalt cliffs, and in and near the Canyon del Indio Felipe, in the Sierra Hechiceros, 35 km. north of Castillon. In the Sierra Hechiceros it was frequent on shaded cliffs in the Canyon del Indio Felipe, just within Coahuila and in the branch of that canyon leading to Rancho Encampanada, within Chihuahua. The plant is evidently a long-lived perennial. Rooted in crevices it forms a coarse dense woody caudex that may become a gnarled woody mass as big as a man's fist. The slender leafy branches are flattened against the face of the cliff. The material from the shaded cliffs of the Sierra Hechiceros have leaf-blades 10–25 mm. long, whereas those from the exposed cliffs at "Virulento," though of similar outline, are only 5–9 mm. long. The differences are evidently ecological.

This interesting plant is named in honor of Sr. Tirso Castillon, of Castillon, to whom I am indebted for a memorable trip, with him and Mr. Robert Stewart, into the Sierra Hechiceros. During this trip, near the northernmost point in the properties of the Hacienda de Castillon, at the head of the gorge of the Canyon del Indio Felipe, I obtained my first collections of the species.

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