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CONTENTS

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NOMENCLATURAL NOTES FOR THE NORTH AMERICAN FLORA. VIII

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ABSTRACT

Cynanchum louiseae Kartesz & Gandhi, *nom. nov.* is proposed to replace *Cynanchum nigrum* (L.) Pers. (a later homonym of *Cynanchum nigrum* Cav.). *Kuhnia eupatorioides* L. var. *gracilis* Torr. & Gray is treated as a synonym of *Brickellia eupatorioides* (L.) Shinners var. *eupatorioides*. The following new combinations are proposed: **Asclepias uncialis** E. Greene ssp. **ruthiae** (Maguire) Kartesz & Gandhi; **Baptisia bracteata** Muhl. *ex* Ell. var. **leucophaea** (Nutt.) Kartesz & Gandhi; **Descurainia incana** (Bernh. *ex* Fisch. & C.A. Mey.) Dorn ssp. **incisa** (Engelm. *ex* A. Gray) Kartesz & Gandhi; **D. incana** (Bernh. *ex* Fisch. & C.A. Mey.) Dorn ssp. **procera** (E. Greene) Kartesz & Gandhi; **D. incana** (Bernh. *ex* Fisch. & C.A. Mey.) Dorn ssp. **viscosa** (Rydb.) Kartesz & Gandhi; **Evax verna** Raf. var. **drummondii** (Torr. & Gray) Kartesz & Gandhi; **Lathyrus japonicus** Willd. var. **maritimus** (L.) Kartesz & Gandhi; **Phacelia hastata** Dougl. *ex* Lehmann var. **dasyphylla** (Jepson) Kartesz & Gandhi; **Pilosocereus robinii** (Lemaire) Byles & Rowley var. **deeringii** (Small) Kartesz & Gandhi; **Silphium compositum** Michx. var. **venosum** (Small) Kartesz & Gandhi; **Townsendia alpigena** Piper var. **caelilinensis** (Welsh) Kartesz & Gandhi.

KEY WORDS: Floristics, nomenclature, Asclepiadaceae, Asteraceae, Brassicaceae, Cactaceae, Fabaceae, Hydrophyllaceae, *Asclepias, Cynanchum, Baptisia, Brickellia, Descurainia, Erigeron, Evax, Lathyrus, Phacelia, Pilosocereus, Pisum, Silphium, Sisymbrium, Sophia,* and *Townsendia.*

Introduction

Continuing with the "NOMENCLATURAL NOTES FOR THE NORTH AMERICAN FLORA" (Kartesz & Gandhi 1989, 1990a, 1990b, 1990c, 1991a, 1991b, 1991c), an eighth note in the series is presented here toward advancing our understanding of North American plant names.

ASCLEPIADACEAE

Asclepias uncialis ssp. *ruthiae*

Maguire (*in* Maguire & Woodson, Ann. Missouri Bot. Gard. 28:246. 1941) stated that *Asclepias ruthiae* Maguire was closely related to a species complex including *A. uncialis* E. Greene. He characterized *A. ruthiae* as having broadly ovate leaves and short, lateral hood lobules. We believe that the above characters are inconsistent and conclude that *A. ruthiae* represents only a geographical variation of *A. uncialis*. Since Maguire's plant is found in Nevada, southern Utah, and northern Arizona, with *A. uncialis* occurring somewhat east of that range (*i.e.*, in eastern Arizona, Colorado, and New Mexico), we treat *A. ruthiae* as a subspecies of *A. uncialis* and propose the following new combination.

Asclepias uncialis E. Greene ssp. **ruthiae** (Maguire) Kartesz & Gandhi, *comb. & stat. nov.* BASIONYM: *Asclepias ruthiae* Maguire *in* Maguire & Woodson, Ann. Missouri Bot. Gard. 28:245. 1941. TYPE: UNITED STATES. Utah: Emery Co., Calf Springs Canyon, 10 May 1940, *R. & B. Maguire 18310* (UTC).

Cynanchum louiseae

The European black swallow-wort has been known as either *Cynanchum nigrum* (L.) Pers. or *Vincetoxium nigrum* (L.) Moench. Authors who recognize both genera, characterize *Cynanchum* L. by its ten free segments constituting a double corona and characterize *Vincetoxium* N.M. Wolf by its five lobed, single corona. Unfortunately, the binomial *C. nigrum* (L.) Pers. is a later homonym of *C. nigrum* Cav., and is thus illegitimate. Since we recognize *Cynanchum* sens. lat. (including *Vincetoxium*), we provide a new name for the black swallow-wort in *Cynanchum*.

Cynanchum louiseae Kartesz & Gandhi, *nom. nov.* Based on: *Asclepias nigra* L., *Sp. Pl.* 216. 1753. *Vincetoxium nigrum* (L.) Moench, *Meth. Suppl.* 313. 1802. *Cynanchum nigrum* (L.) Pers., *Syn. Pl.* 1:274. 1805, *non* Cav., 1793.

Note: The epithet *louiseae* is used here to honor Louise Kartesz, mother of the first author. Lectotypification of *Asclepias nigra* is being studied.

ASTERACEAE

Brickellia eupatorioides var. *gracilis*

In their treatments of *Brickellia eupatorioides* (L.) Shinners (based on *Kuhnia eupatorioides* L.), neither Shinners (1971) nor Turner (1989) accounted for the trinomial *K. eupatorioides* L. var. *gracilis* Torr. & Gray. Torrey & Gray (1841, vol. 2:78) described the lower cauline leaves as being lanceolate and other leaves as being linear. Gray (1884, vol. 1(2):103) described the leaves as being lanceolate to narrowly linear and gave the distribution as Carolina, Florida, and Alabama. Based upon its phytogeography and leaf morphology, we speculated that Torrey and Gray's variety might represent the typical expression of *B. eupatorioides*. Our speculation was confirmed by the study of the type specimen. On typification, we provide the following information.

In their work, Torrey & Gray associated the Greek symbol γ with the epithet *gracilis*. They cited *Kuhnia critonia* sensu Ell. (*non* Willd.) and *K. paniculata* Cass. as synonyms. We found that for their var. *gracilis*, Torrey & Gray studied Gates' collection from Alabama. The label bears the name "*Kuhnia eupatorioides* γ." Above the label, a hand written name: var. *gracilis* (possibly by Gray?) is found, followed by "Syn. Fl. North America."

Gates' collection bears Shinners' (two) 1945 annotations: 1) type and 2) "var. typica" of *Brickellia eupatorioides*. The specimen also bears two other annotations: 1) by Flyr (in 1970) as *Kuhnia eupatorioides* var. *eupatorioides*; and 2) by Boufford (in 1982) as "possible type material of *K. eupatorioides* var. *gracilis*." Since Torrey & Gray cited *K. paniculata* as a synonym and since they did not designate a type, Gates' collection can not serve as a holotype; hence, var. *gracilis* needs lectotypification. We speculate that Torrey & Gray did not study Cassini's material and that their inclusion of *K. paniculata* as a synonym was based on Cassini's description. We, therefore designate Gates' collection as the lectotype.

Brickellia eupatorioides (L.) Shinners var. *eupatorioides*

> *Kuhnia eupatorioides* L. var. *gracilis* Torr. & Gray, *Fl. N. Amer.* 2:78. 1841. LECTOTYPE (chosen here): UNITED STATES. Alabama: *Gates s.n.s.l.* (GH!).

Evax verna var. *drummondii*

In reviewing the taxonomy of *Evax multicaulis* DC. and *E. verna* Raf., we recognize the former to be a taxonomic synonym of the latter. For the southeast United States, Cronquist (1980) used the name *E. multicaulis* without mention of *E. verna*, whereas Gandhi & Thomas (1989) accepted *E. verna*

and cited *E. multicaulis* as a synonym. Torrey & Gray (1842, vol. 2:263) also considered these to be conspecific. We transfer *E. multicaulis* var. *drummondii* to *E. verna* and propose the following new combination.

Evax verna Raf. var. **drummondii** (Torr. & Gray) Kartesz & Gandhi, *comb. nov.* BASIONYM: *Filaginopsis drummondii* Torr. & Gray, *Fl. N. Amer.* 2:263. 1842. *Evax multicaulis* DC. var. *drummondii* (Torr. & Gray) A. Gray, *Syn. Fl. N. Amer.* 1(2):229. 1884. *Filago verna* (Raf.) Shinners var. *drummondii* (Torr. & Gray) Shinners, Sida 1:253. 1964. ?Isotype: UNITED STATES. Texas: *Drummond ?176* (PH; microfiche!).

Silphium compositum var. *venosum*

Cronquist (1980) treated *Silphium venosum* Small as a synonym of *S. compositum* Michx. Although we agree that these two taxa are closely related, we believe that Small's plant with pinnate or pinnatifid leaves can be differentiated from the typical expression of *S. compositum*, with mostly pedately divided leaves. Sweeney & Fisher (1970) treated the infraspecific taxa within *S. compositum* at subspecific rank: *S. compositum* ssp. *compositum* and ssp. *venosum* (Small) Sweeney & Fisher. Although these two taxa are sympatric in the northern range of ssp. *venosum*, both remain morphologically unique. Hence, we recognize *S. venosum* at varietal rank, and propose the following new combination.

Silphium compositum Michx. var. **venosum** (Small) Kartesz & Gandhi, *comb. & stat. nov.* BASIONYM: *Silphium venosum* Small, Bull. Torrey Bot. Club 25:478. 1898. *Silphium compositum* Michx. ssp. *venosum* (Small) Sweeney & Fisher, Ohio J. Sci. 70:232. 1970. TYPE: UNITED STATES. Georgia: Charlton Co., Okefenokee Swamp & the valley of the St. Mary's River, 12-15 Jun 1895, *Small s.n.* (NY; microfiche!).

Townsendia alpigena var. *caelilinensis*

Since Jones (Zoe 4:262. 1893) proposed *Townsendia montana* as a provisional name ("Other forms that may eventually prove to be *T. scapigera* I have given the provisional name of *T. montana.*"), he did not validate the binomial (*nom. invalid.*; Greuter *et al.* 1988; ICBN Art. 34.1[b]). We concur with Larsen (1927) and Beaman (1957) that the name *T. alpigena* Piper (Bull. Torrey Bot. Club 27:394. 1900) refers to the same species. If *T. montana* was

accepted and used in a publication prior to Piper's publication, then this binomial would have been validated. However, we were unable to locate such literature and therefore accept Piper's binomial. We transfer *T. montana* var. *caelilinensis* Welsh to *T. alpigena* with the following combination proposed.

Townsendia alpigena Piper var. **caelilinensis** (Welsh) Kartesz & Gandhi, *comb. nov.* BASIONYM: *Townsendia montana* M.E. Jones var. *caelilinensis* Welsh, Great Basin Naturalist 43:370. 1983. TYPE: UNITED STATES. Utah: San Pete Co., Flagstaff Limestone, 13 Jul 1977, *Welsh & Clark 15385* (BRY).

BRASSICACEAE

Descurainia incana

At the Berlin Congress, it was ruled that names of new species proposed in Sweet's *Hortus Brittanicus* and other such works are invalid, since the new species were not provided with validating descriptions or diagnoses (ICBN Art. 32.1, Ex. 3). However, several new combinations and new names in Sweet's publications are considered valid since Sweet made references to earlier descriptions or validly published basionyms (ICBN Art. 32.1c), such as *Oenothera nuttallii* Sweet (*Hort. Brit.*, ed. 2. 199. 1830), *nom. nov.* for *O. albicaulis* Nutt. 1818, *non* Pursh 1814.

Although Al-Shehbaz (1988, p. 235) and Detling (1939, p. 491) recognized the name *Descurainia richardsonii* "(Sweet) Schulz" (based on *Sisymbrium richardsonii* Sweet 1830), Dorn (1988, p. 302) rejected *S. richardsonii* and remarked that the name "was effectively invalidated by the 1987 International Congress." Dorn (p. 296) made the combination *D. incana* (Bernh. *ex* Fisch. & C.A. Mey.) Dorn, which was based on *S. incanum* Bernh. *ex* Fisch. & C.A. Mey. (the second oldest binomial, published in 1835, in this complex).

In our study, we found that in the protologue of *Sisymbrium richardsonii*, Sweet did not propose *S. richardsonii* as a new species, but proposed it as a *nomen novum* for "(*S.*) *canescens.* Richardson. *non* Nutt." For its validation, Sweet's binomial requires an effectively published description. Unfortunately Richardson provided no description for the preceding name. The following is quoted from Richardson (1823a, p. 16; *in* Franklin 1823, p. 744; *in* Brown 1825, p. 499): "*Sisymbrium canescens* ? Decand. *Syst.* p. 475 ? Nuttall. *Gen. Am.* ii. p. 68. ?" Later, Richardson (1823b, p. 27) mentioned the following: "*Sisymbrium canescens*, Frankl. *Append.* I ed. No. 259, p. 744. *non* Nuttall. *fide* Nuttallio." Both protologues of Richardson's work indicate that Richardson was uncertain regarding the identity of his material. Of the two references mentioned by Richardson, Sweet explicitly excluded Nuttall's

description. In doing so, Sweet indirectly excluded De Candolle's description, since De Candolle's taxonomy was the same as that of Nuttall. In his *British Flower Garden*, ser. 2 (published in 1829-1837), Sweet did not treat *S. richardsonii*.

Hooker (1830, p. 62) referenced Richardson's second edition of *Botanical Appendix* and Nuttall's *Sisymbrium canescens* (with a ?) in the protologue of *S. canescens* var. *major* Hook. Hooker stated that Nuttall was of the opinion that Richardson's plants were distinct from his *S. canescens*. Since both Sweet's and Hooker's publications appeared in the same year, it is likely that neither of them was aware of the other's treatment. G. Don (1831, p. 207) used the name *S. canescens* Nutt. and had no comments on *S. richardsonii*.

From this historical background, it is evident that *Sisymbrium richardsonii* lacked a pre-1835, effectively published description. Until or unless it can be shown that a pre-1835, effectively published description is available for *S. richardsonii*, the combination *Descurainia richardsonii*, which was based on the invalidly published *S. richardsonii*, must be treated as a species novum in Schulz's work, without a parenthetical author and with its priority from 1924 (not from 1830). Based on priority, the binomial *D. richardsonii* must be treated as a synonym of *S. incana* (as indicated by Dorn). We recognize four subspecies within *D. incana* (listed below), with three new combinations.

Descurainia incana (Bernh. *ex* Fisch. & C.A. Mey.) Dorn, *Vasc. Pl. Wyoming* 296. 1988. ssp. *incana*. BASIONYM: *Sisymbrium incanum* Bernh. *ex* Fisch. & C.A. Mey., *Ind. Sem. Hort. Petrop.* 1:38. 1835. *Sisymbrium richardsonii* Sweet, *Hort. Brit.*, ed. 2. 30. 1830, *nom. invalid. Descurainia richardsonii* O.E. Schulz *in* Engler, *Pflanzenr.* Fam. no. IV. 105, heft. no. 86:319. 1924.

Sisymbrium canescens Nutt. var. *major* Hook., *Fl. Bor. Amer.* 1:62. 1830. BASIONYM: *Descurainia incana* (Bernh. *ex* Fisch. & C.A. Mey). Dorn var. *major* (Hook.) Dorn, *Vasc. Pl. Wyoming* 296. 1988.

Descurainia incana (Bernh. *ex* Fisch. & C.A. Mey.) Dorn ssp. **incisa** (Engelm. *ex* A. Gray) Kartesz & Gandhi, *comb. nov.* BASIONYM: *Sisymbrium incisum* Engelm. *ex* A. Gray, Mem. Amer. Acad. Sci. Arts, n.s. 4:8. 1849. *Descurainia richardsonii* O.E. Schulz ssp. *incisa* (Engelm. *ex* A. Gray) Detling, Amer. Midl. Naturalist 22:494. 1939. LECTOTYPE (*vide* Detling, 1939, p. 494): UNITED STATES. New Mexico: Mora River, *Fendler 29* (GH).

Descurainia incana (Bernh. *ex* Fisch. & C.A. Mey.) Dorn ssp. **procera** (E. Greene) Kartesz & Gandhi, *comb. nov.* BASIONYM: *Sophia procera* E. Greene, Pittonia 4:199. 1900. *Descurainia richardsonii* O.E. Schulz ssp. *procera* (E. Greene) Detling, Amer. Midl. Naturalist 22:491. 1939.

TYPE: UNITED STATES. Colorado: Rocky Mountains, Pagosa Peak, Aug 1899, *Baker ?60* (ND-G); Isotype: (NY; microfiche!).

Sophia brevipes Rydb., Bull. Torrey Bot. Club 29:238. 1902. *Descurainia richardsonii* O.E. Schulz var. *brevipes* (Rydb.) Welsh & Reveal, Great Basin Naturalist 37:314. 1978 ("1977").

Descurainia richardsonii O.E. Schulz var. *macrosperma* O.E. Schulz *in* Engler, *Pflanzenr.* Fam. no. IV. 105, heft. no. 86:319. 1924. *Descurainia incana* (Bernh. *ex* Fisch. & C.A. Mey.) Dorn var. *macrosperma* (O.E. Schulz) Dorn, *Vasc. Pl. Wyoming* 296. 1988.

Note: Both *Sophia brevipes* Rydb. and *Descurainia richardsonii* var. *brevipes* (Rydb.) Welsh & Reveal were based on "*Sisymbrium canescens* var. *brevipes* Nutt." In our study, we found that in the protologue of *Sisymbrium canescens*, Torrey & Gray (1838, vol. 1:92) recognized six varieties designated by Greek symbols and the symbol ζ was followed by a statement "(*brevipes* Nutt. MSS)" along with a six word diagnosis provided by Nuttall. In numerous treatments of their work, Torrey & Gray associated Greek symbols with accepted varietal epithets (*e.g.*, p. 85). Since the epithet *brevipes* was parenthetically provided, we believe that Torrey & Gray did not accept the trinomial and that it was invalidly published (ICBN Art. 34.1[a]). Hence, we conclude that although the name *Sophia brevipes* Rydb. was based on a Nuttallean specimen, the priority of the name was established from Rydberg's 1902 usage. Since Welsh & Reveal's variety was also based on Nuttall's specimen, the parenthetical author for Welsh & Reveal's combination must be Rydberg. At varietal rank, the trinomial *D. richardsonii* var. *macrosperma* O.E. Schulz has priority, as recognized by Dorn (1988, p. 108).

Descurainia incana (Bernh. *ex* Fisch. & C.A. Mey.) Dorn ssp. **viscosa** (Rydb.) Kartesz & Gandhi, *comb. nov.* BASIONYM: *Sophia viscosa* Rydb., Bull. Torrey Bot. Club 29:238. 1902. *Descurainia richardsonii* O.E. Schulz ssp. *viscosa* (Rydb.) Detling, Amer. Midl. Naturalist 22:492. 1939. *Descurainia incana* (Bernh. *ex* Fisch. & C.A. Mey.) Dorn var. *viscosa* (Rydb.) Dorn, *Vasc. Pl. Wyoming* 296. 1988. TYPE: UNITED STATES. Idaho: Beaver Cañon, 1895, *Shear 3029* (NY; microfiche!).

CACTACEAE

Pilosocereus robinii var. *deeringii*

We recognize *Pilosocereus* Byles & Rowley and *Cereus* L. as distinct genera. In this connection, we transfer *C. robinii* (Lemaire) L. Benson var. *deeringii* (Small) L. Benson to *P. robinii* (Lemaire) Byles & Rowley and propose the following new combination.

Pilosocereus robinii (Lemaire) Byles & Rowley var. **deeringii** (Small) Kartesz & Gandhi, *comb. nov.* BASIONYM: *Cephalocereus deeringii* Small, J. New York Bot. Gard. 18:201. 1917. *Pilosocereus deeringii* (Small) Byles & Rowley, Cact. Succ. J. Gr. Brit. 19:67. 1957. *Cereus robinii* (Lemaire) L. Benson var. *deeringii* (Small) L. Benson, Cact. Succ. J. (Los Angeles) 41:126. 1969. TYPE: UNITED STATES. Florida: Lower Matecumbe Key, 8 Apr 1916, *Small 7790* (NY).

FABACEAE

Baptisia bracteata var. *leucophaea*

When Larisey (Ann. Missouri Bot. Gard. 27:161. 1940) proposed *Baptisia leucophaea* Nutt. var. *glabrescens* Larisey, she automatically created the autonym *B. leucophaea* var. *leucophaea.* We concur with Isely (1990) that the type of *B. leucophaea* var. *glabrescens* is included within the type variety of *B. leucophaea.* On their transfers to *B. bracteata* Muhl. *ex* Ell. at varietal status, the autonym *B. leucophaea* var. *leucophaea* has priority over *B. leucophaea* var. *glabrescens* (ICBN Art. 57.3). We therefore propose the following new combination.

Baptisia bracteata Muhl. *ex* Ell. var. **leucophaea** (Nutt.) Kartesz & Gandhi, *comb. nov.* BASIONYM: *Baptisia leucophaea* Nutt., *Gen. N. Amer.* 1:282. 1818. var. *leucophaea* (automatically created by *B. leucophaea* Nutt. var. *glabrescens* Larisey). TYPE: UNITED STATES. Missouri: St. Louis, *Nuttall s.n.* (PH; microfiche!).

Baptisia leucophaea Nutt. var. *glabrescens* Larisey, Ann. Missouri Bot. Gard. 27:161. 1940. *Baptisia bracteata* Muhl. *ex* Ell. var. *glabrescens* (Larisey) Isely, Brittonia 30:470. 1928. TYPE: UNITED STATES. Missouri: Iron Co., Pilot Knob, 10 May 1936, *Larisey 4* (MO).

Lathyrus japonicus var. *maritimus*

Ball (*in* Tutin *et al.* 1968, vol. 4:138) recognized two subspecies in *Lathyrus japonicus* Willd. and characterized them as follows: ssp. *japonicus* possessing 2 to 7 flowered racemes, pubescent calyces, and 18-25 mm long corollas, whereas ssp. *maritimus* (L.) Ball possessing 5 to 12 flowered racemes, usually glabrous calyces, and 14-20 mm long corollas. Since these two expressions are morphologically separable, we recognize them at varietal rank. Our study follows.

Fernald (Rhodora 34:181. 1932) transferred *Pisum maritimum* L. var. *glabrum* Ser. to *Lathyrus japonicus* Willd. and made the varietal combination: *L. japonicus* var. *glaber* (Ser.) Fern. However, when Seringe proposed *P. maritimum* var. *glabrum*, he automatically created *P. maritimum* var. *maritimum*. Since we consider them to be convarietal and since the autonym has priority over the taxon that established it (ICBN Art. 57.3), we transfer var. *maritimum* to *L. japonicus* and propose the following new combination.

Lathyrus japonicus Willd. var. **maritimus** (L.) Kartesz & Gandhi, *comb. nov.* BASIONYM: *Pisum maritimum* L., *Sp. Pl.* 2:772. 1753. var. *maritimum* (automatically created by *Pisum maritimum* L. var. *glabrum* Ser.). *Lathyrus maritimus* (L.) Fries, *Fl. Scand.* 106. 1835 (*non* Bigelow 1824). *Lathyrus japonicus* Willd. ssp. *maritimus* (L.) P.W. Ball, Feddes Rep. 79:45. 1968.

Pisum maritimum L. var. *glabrum* Ser. *in* DC., *Prodr.* 2:368. 1825. *Lathyrus japonicus* Willd. var. *glaber* (Ser.) Fern., Rhodora 34:181. 1932. *Lathyrus maritimus* Bigelow, *Fl. Boston.*, ed. 2. 268. 1824.

HYDROPHYLLACEAE

Phacelia hastata var. *dasyphylla*

Since Baker (W. Amer. Pl. 3:9. 1904) proposed *Phacelia dasyphylla* E. Greene as a *nom. nud.* and since Brand (in Engler, *Pflanzenr.* no. IV 251, heft. no. 59:97. 1913) cited *P. dasyphylla* as a synonym of *P. magellanica* (Lam.) Cov. forma minor Brand, neither worker validated the binomial. Although Macbride (Contr. Gray Herb. 49:35. 1917) listed the name without description, the characters that he used in his key pp. 32-33) to distinguish *P. dasyphylla* from the remainder of the *P. magellanica* group, were sufficient to validate the name. Macbride cited Culbertson's 1904 collection as the type.

Without referencing any of the earlier works on *Phacelia dasyphylla*, Jepson (1925) recognized this taxon at varietal rank: *P. heterophylla* Pursh var. *dasyphylla* Jepson. He typified the trinomial by A.L. Grant's 1918 collection. Since Jepson typified his variety by a type different from that of Greene's plant, the status of Jepson's trinomial is questionable. We consider Jepson's trinomial as a var. nov.

Heckard (1960, p. 93) transferred *Phacelia dasyphylla* to *P. frigida* E. Greene at subspecific rank and cited *P. heterophylla* var. *dasyphylla* as a synonym. We treat *P. frigida* to be synonymous with *P. hastata* Dougl. *ex* Lehmann var. *compacta* (Brand) Cronq. and transfer *P. dasyphylla* to *P. hastata*. A new varietal combination is proposed here.

Phacelia hastata Dougl. *ex* Lehmann var. **dasyphylla** (E. Greene *ex* Macbride) Kartesz & Gandhi, *comb. nov.* BASIONYM: *Phacelia dasyphylla* E. Greene *ex* Macbride, Contr. Gray Herb. 49:32,33,35. 1917. *Phacelia frigida* E. Greene ssp. *dasyphylla* (E. Greene *ex* Macbride) Heckard, Univ. California Publ. Bot. 32:93. 1960. TYPE: UNITED STATES. California: Tulare Co., Mt. Whitney, 15 Aug 1904, *Culbertson 4355* (ND-G); Isotypes: (CAS (photocopy)!, NY (microfiche)!).

Phacelia heterophylla Pursh var. *dasyphylla* Jepson, *Man. Fl. Pl. Calif.* 819. 1925. TYPE: UNITED STATES. California: Fresno Co., Silver Pass, 18 Aug 1918, *A.L. Grant 1532* (JEPS).

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TEXAS SPECIES OF *RUELLIA* (ACANTHACEAE)

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ABSTRACT

A taxonomic study of the genus *Ruellia* (Acanthaceae) in Texas is rendered. Eleven species are recognized as native to the state: *R. caroliniensis* (Walt.) Steud., *R. corzoi* Tharp & Barkley, *R. drummondiana* (Nees) A. Gray, *R. humilis* Nutt. (with two varieties), *R. metzae* Tharp, *R. nudiflora* (Engelm. *ex* A. Gray) Urban (with three varieties), *R. occidentalis* (A. Gray) Tharp & Barkley, *R. parryi* A. Gray, *R. pedunculata* Torr. *ex* A. Gray, *R. strepens* L., and *R. yucatana* (Leonard) Tharp & Barkley; in addition, two species, *R. brittoniana* Leonard and *R. malacosperma* Greenman, are commonly cultivated, these sometimes escaping and persisting. A key to all of these taxa is constructed, and distributional maps are given for each. When relevant, their relationship to closely related taxa of northern México is discussed. The following new combination is made: **R. nudiflora** var. **runyonii** (Tharp & Barkley) B. Turner.

KEY WORDS: *Ruellia*, Acanthaceae, Texas

Many years of field work and sporadic attempts to identify the various Texas taxa of *Ruellia* using the treatments of Tharp & Barkley (1949), Wasshausen (1966), and Correll & Johnston (1970) has prompted the present reevaluation. The maps showing distribution are largely based upon a large suite of specimens on deposit at LL and TEX, which includes types of the taxa named by Tharp & Barkley.

According to Long (1970), *Ruellia*, with ca. 250 species, is the second largest genus of the Acanthaceae, rivaled only by *Justicia* with ca. 300 species. It is a difficult genus, some of the taxa showing considerable variation. Much of this complexity is perhaps due to the peculiar reproductive biology of some, if not many, of the species in which both chasmogamous and cleistogamous flowers are commonly produced. No doubt the resulting variation has been

compounded by at least occasional interspecific hybridization, as attested to by the experimental studies of Long (1970, and references therein).

Fernald (1945) rendered a fairly coherent treatment of *Ruellia* for the southeastern U.S.A., which accounts for most of the species of easternmost Texas. He did not, however, attempt to treat the more difficult species of central Texas centering about *Ruellia nudiflora* (Engelm. *ex* A. Gray) Urban, in spite of the earlier cursory treatment of this complex by Leonard (1927).

Tharp & Barkley (1949), in an attempt to make sense of the *Ruellia nudiflora* complex in Texas (and closely adjacent México) provided a detailed study of the Texas material, much of this borrowed from 24 or more institutions, including types. For the time it was an excellent study, more so because the authors were working out of Austin, Texas, and both were rather intimately familiar with populations in the field. Thus, Tharp (and Barkley) repeatedly collected, and called to the fore, the well marked *R. metzae* Tharp, which previous workers had swept under the fabric of a highly variable *R. nudiflora*.

In spite of their familiarity with *Ruellia* in Texas, Tharp & Barkley recognized twenty species as native to Texas. Wasshausen (1966) recognized sixteen of these, excluding several which were known by only a few collections, these seemingly but forms of some of the more widespread taxa. Wasshausen's treatment was largely followed by Correll & Johnston (1970) who recognized fifteen species as native to the state.

In the present treatment I recognize eleven species as native to Texas, several of these possessing varietal elements, as noted in the above abstract. This does not diverge greatly from the treatment of Correll & Johnston, for I treat two of their species as a variety of *Ruellia nudiflora*. In short, I recognize thirteen native populational elements of *Ruellia* in Texas as deserving of nomenclatural recognition, eleven of these acting like species in the field.

Key to Texas species of *Ruellia*

1. Midstem leaves linear ovate to linear lanceolate, 4-10 times as long as wide, mostly 8-20 cm long; cultivated species (sometimes escaping). (2)

1. Midstem leaves variously ovate to elliptic and of various sizes but not as described in the above; native species. ..... (3)

2. Leaves ovate-lanceolate, spreading or somewhat reflexed, but scarcely held erect along the axis of the stem. ..... *R. malacosperma*

2. Leaves linear lanceolate, mostly held erect along the axis of the stem, scarcely spreading. ..... *R. brittoniana*

3. Shrublets to 30 cm high, the stems corky white with age; trans-Pecos Texas. ..... *R. parryi*

3. Suffruticose herbs or green stemmed shrublets. .....(4)

    4. Flowers arranged in open or somewhat congested terminal panicles, except for reduced cleistogamous flowers which are often borne on divaricate branches arising from the base of the plants. .....(5)

    4. Flowers arranged spikelike and terminal, or both axillary and terminal, but not borne in branched open panicles. .....(9)

5. Corollas white, 5-7 cm long. ..... *R. metzae* (see also *R. noctiflora*)

5. Corollas pale lavender to purple, if white then 2-4 cm long. .....(6)

    6. Plants mostly 10-30 cm high, the leaves mostly basal; lower nodes usually producing one or more conspicuous lateral branches with cleistogamic flowers or fruits; calyx lobes mostly 9-12 mm long; Southern Texas. ..... *R. yucatana*

    6. Plants mostly 30-100 cm high, not producing lateral flowering branches from the lower nodes; calyx lobes mostly 12-20 mm long. .....(7)

7. Blades of midstem leaves broadly ovate to subdeltoid, mostly 1.0-2.5 times as long as wide, usually densely pubescent. ..... *R. occidentalis*

7. Blades of midstem leaves ovate, elliptic to obovate, mostly 2.5-3.5 times as long as wide, sparsely to moderately pubescent. .....(8)

    8. Stems mostly stiffly erect, 10-30 cm high; lower internodes with spreading white trichomes 1-3 mm long. ..... *R. corzoi*

    8. Stems mostly 30-100 cm high; lower internodes puberulent to glabrate, but not as described in the above. ..... *R. nudiflora*

9. Leaves sessile or nearly so, those at midstem mostly 3-5 cm long. *R. humilis*

9. Leaves clearly petiolate, those at midstem mostly 5-10 cm long. ....(10)

    10. Calyx lobes, near the middle, mostly 1.0-4.0 mm wide. *R. strepens*

    10. Calyx lobes, near the middle, mostly 0.1-0.5 mm wide. .....(11)

11. Capsules glabrous. .....(12)

11. Capsules hirsutulous. .....(13)

    12. Leaves subsessile, the petioles 1-2 mm long. ..... *R. pedunculata*

    12. Leaves clearly petiolate, the petioles 2-6 mm long. *R. caroliniensis*

13. Midstem leaves mostly 3-6 cm wide; plants of central Texas. ..... *R. drummondiana*

13. Midstem leaves mostly 1-3 cm wide; plants of eastern Texas. ..... *R. pedunculata*

Ruellia brittoniana Leonard, J. Wash. Acad. Sci. 31:96. 1941. Fig. 11.

This taxon is cultivated in Texas and occasionally escapes to marshy or wet areas where it forms small localized rhizomatous colonies. Tharp & Barkley (1944) and Wasshausen (1966) maintained the species but it appears so closely related to *Ruellia malacosperma* Greenman that the two might be combined, the latter representing but a broad leafed populational variant of the former, or vice versa. Correll & Johnston (1970) suggest that *R. malacosperma* is of hybrid origin, perhaps with *R. brittoniana* as one of the parents.

Ruellia caroliniensis (Walt.) Steud., *Nom.*, ed. 2. 481. 1841. Fig. 1.

Ruellia caroliniensis (Walt.) Steud. var. *salicina* Fernald.

Ruellia caroliniensis (Walt.) Steud. var. *semicalva* Fernald.

Ruellia caroliniensis (Walt.) Steud. var. *serrulata* Tharp & Barkley.

This species is largely confined to the eastern U.S.A., but extends into easternmost Texas where it occurs in sandy soils of wooded regions. Tharp & Barkley (1944) and Wasshausen (1966) recognized three varieties for Texas, but these appear to be but habit, leaf, or floral forms of a highly variable *Ruellia caroliniensis*, as amply documented by Long (1971).

Texas material of this species can be readily distinguished from the superficially similar *Ruellia strepens* and *R. drummondiana* by its glabrous capsules, the latter possessing pubescent capsules, at least in Texas.

Ruellia corzoi Tharp & Barkley, Amer. Midl. Naturalist 42:49. 1949.

Ruellia drushelii Tharp & Barkley.

This taxon was accepted as specifically distinct by Wasshausen (1966) and Correll & Johnston (1970). While accepted as a species in the present treatment, my concept of the taxon is not the same as conceived by previous workers. Tharp & Barkley cited specimens from Bexar and Cameron counties, Texas which I would treat as but localized forms (or perhaps hybrid derivatives from *R. nudiflora* x *R. yucatana*, at least in Cameron County). *Ruellia*

corzoi is typified by material from northcentral México, just south of Eagle Pass, Texas. It occurs in close proximity to *R. nudiflora* var. *runyonii* along the Rio Grande River, but I have not examined mixed populations of the two. *Ruellia corzoi* can be readily distinguished from the latter by its calyx lobes, which have glandular hairs much like the var. *nudiflora*, and by its rather stiffly erect stems, dwarf habit, and hirsute lower stems; such variation is perhaps a byproduct of ancestral hybridization with the more southeastern *R. yucatana*. Nevertheless, I have examined very large, exceedingly uniform populations of *Ruellia corzoi* growing in Val Verde Co., Texas (*e.g.*, on rocky calcareous hills near the entrance to Seminole Canyon State Park, *Turner 16026* [TEX]) and no sign of intergradation of these plants toward *R. nudiflora* var. *runyonii* could be detected. The only other species to be found at this site was *R. parryi* . To the east of this area, *Ruellia nudiflora* may be found, mostly in deep calcareous soils.

Ruellia drushelii, the type from Muzquiz, Coahuila, northcentral México, appears to be a form of *R. corzoi* with large corollas. *Ruellia drushelii* var. *macrocarpa*, the type from ca. 40 mi. south of Monterrey, Nuevo León, appears to be a form of *R. yucatana* with unusually pubescent lower nodes. Tharp & Barkley cited a Nealley collection of the *R. drushelii* var. *macrocarpa* from Texas, but I think this must be *R. corzoi* of the present treatment.

The *Ruellia nudiflora* complex (including *R. corzoi*) needs much additional study, especially in México, there being relatively few collections of this taxon in the herbaria from the latter region. Finally, it should be noted that Leonard (1917) cited *R. n.* var. *humilis* (type from Cuba) as occurring in Texas but the specimens cited appear to be *R. corzoi* of the present treatment.

Ruellia drummondiana (Nees *in* DC.) A. Gray, *Syn. Fl. N. Amer.* 2:326. 1886. Fig. 2. BASIONYM: *Dipteracanthus drummondianus* Nees *in* DC.

Dipteracanthus lindheimerianus Scheele.

This species is relatively common in shady wooded areas of central Texas, mainly along the Edwards Plateau where it occurs in relatively deep calcareous soils. It is a robust herb 50-100 cm high, about equally leafy from bottom to top.

Ruellia humilis Nutt., Trans. Amer. Phil. Soc. 5:182. 1837. Fig. 3.

Tharp & Barkley (1944) and Wasshausen (1966) recognized five varieties of this widespread, highly variable species for Texas. I can recognize only two of these varieties for the state, as indicated in the following key.

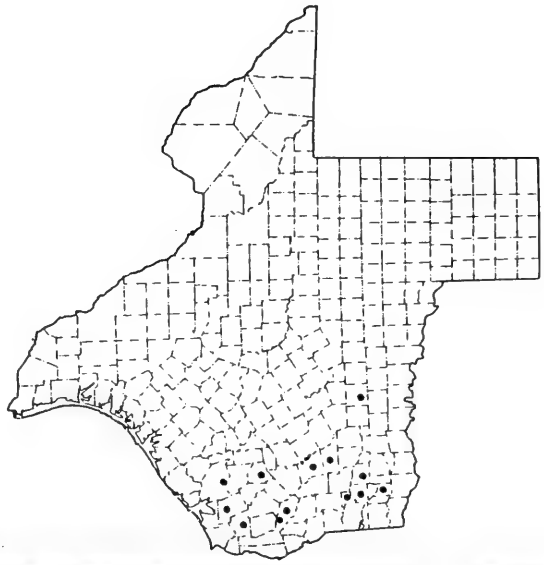

Fig. 1 Distribution of Ruellia carolinensis in Texas.

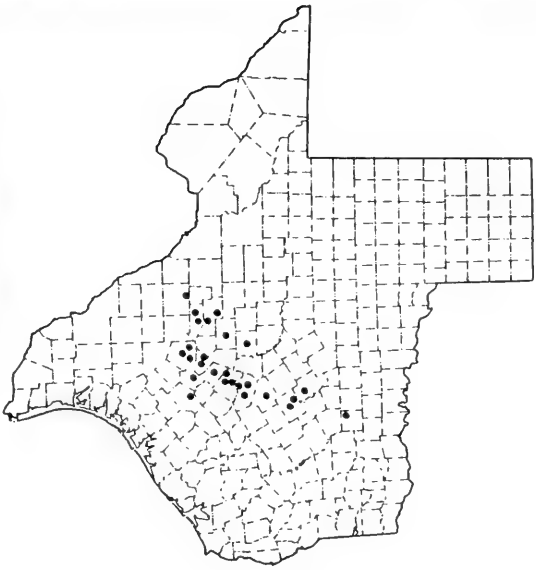

Fig. 2 Distribution of Ruellia drummondiana in Texas.

Fig. 3. Distribution of Ruellia humilis in Texas.

Fig. 4. Distribution of Ruellia metzae in Texas.

1. Plants mostly 20-60 cm high, the primary stems mostly stiffly erect and 2-5 mm in diameter; midstem leaves mostly 1.5-2.5 cm across, moderately to markedly pubescent, the marginal hairs often 1 mm long or more. ..... var. *humilis*

1. Plants mostly 5-20(-30) cm high, the primary stems mostly depauperate, often ascending or recumbent and 1-2 mm in diameter; midstem leaves mostly 0.5-1.5(-2.0) cm across, mostly sparsely pubescent, the marginal hairs only rarely exceeding 1 mm in length. ..... var. *depauperata*

Ruellia humilis Nutt. var. *humilis*.

Ruellia humilis Nutt. var. *expansa* Fernald.

Ruellia humilis Nutt. var. *frondosa* Fernald.

Ruellia humilis Nutt. var. *longiflora* (A. Gray) Fernald.

The several names listed in the above synonymy which have been applied to Texas plants appear to be but forms, sometimes populational, of a widespread highly variable var. *humilis*. This is implicit in the statements of Tharp & Barkley (1944), calling to the fore various and numerous intermediates between these, and more so because any attempt to find geographical integrity for the morphological forms involved becomes mired in guesswork, resulting in a meaningless hodge podge of overlapping distributional maps. It is possible that careful field work might reveal geographical trends that I have not detected, or perhaps the morphological picture has been clouded by occasional hybridization with yet other taxa, but this is not clear from the variation patterns available to me, *Ruellia humilis* itself being a relatively easily recognized species, with its glabrous capsules and nearly sessile leaves.

The var. *humilis* appears to intergrade in southeastern Texas with the var. *depauperata*, the latter a smaller, less pubescent, plant largely confined to the Gulf Coastal Grasslands or gumbo glades in regions of sandy soil. As noted by Wasshausen (1966), most of the plants recognized as *Ruellia ciliosa* Pursh by Tharp & Barkley (1944) belong to what has been called *R. humilis*.

Ruellia humilis Nutt. var. *depauperata* Tharp & Barkley, Amer. Midl. Naturalist 42:74. 1944.

As noted in the above account, and by the map showing distribution, this taxon is largely confined to clay soils of southeastern Texas. It intergrades over relatively short distances into the var. *humilis*, which largely occurs on lighter alluvial or sandy soils. The variety is only weakly differentiated and perhaps does not merit recognition.

Ruellia malacosperma Greenman, Proc. Amer. Acad. Arts 34:572. 1909. Fig. 11.

This cultivated taxon was maintained by both Tharp & Barkley (1949) and Wasshausen (1966) as distinct from *Ruellia brittoniana* but, as noted under the latter, these two Mexican taxa are probably no more than regional populational leaf variants of the same species. The type of *R. brittoniana* is from Xalapa, Veracruz and that of *R. malacosperma* is from San Luis Potosí.

Ruellia metzae Tharp, Amer. Midl. Naturalist 42:19. 1949. Fig. 4.

Ruellia metzae Tharp var. *marshii* Tharp & Barkley.

Ruellia muelleri Tharp & Barkley.

This is a very distinct taxon, readily distinguished by its low habit and large white flowers with tubes 3-5 cm long. It is largely confined to calcareous soils of central and northcentral Texas, but extends into northern México. Wasshausen (1966) reduced both *Ruellia metzae* var. *marshii* and *R. muelleri* to synonymy under this species, as do I. While their types are both from near Muzquiz, Coahuila, Tharp & Barkley cited specimens as occurring in Texas. Clearly the few specimens cited for these two names are but forms possessing characters attributable to an imaginary or artificial species.

Ruellia noctiflora (Nees) A. Gray, *Syn. Fl. N. Amer.* 2:326. 1878.

Tharp & Barkley (1949) cited a single questionable collection of this taxon from Texas. Wasshausen (1966) did not account for the species in his treatment of the Texas taxa, nor did Correll & Johnston (1970). Long (1971) mapped the species as occurring from southwesternmost Louisiana to southern Georgia and adjacent Florida, but did not note any collections from Texas, where it might yet be found in the swampy forestlands of Newton or Orange counties. The species should be readily recognized in this region by its large, white corollas (8-9 cm long).

Ruellia nudiflora (Engelm. *ex* A. Gray) Urban, *Symb. Antill.* 7:382. 1912. Fig. 5.

In Texas this is a commonly encountered, widespread, exceedingly variable species, distributed from central Texas, more or less east and south of the Edwards Plateau, occurring in mostly deep calcareous or alluvial soils. Leonard

(1927) also noted its considerable variability, commenting "The species is extremely variable in habit, in size and shape of flowers and leaves, and in the nature of the pubescence. These variations are sufficiently constant to permit the maintenance of several varieties." He thereupon provided a key and descriptions for eight varieties, three of these from Texas (*Ruellia nudiflora* var. *nudiflora*, the type from near Houston, Texas in Harris County; *R. n.* var. *occidentalis*, and *R. n.* var. *humilis*; the var. *occidentalis* is here treated as a distinct species, while his var. *humilis*, typified by material from Cuba, appears not to be part of the Texas complex, although Leonard cites two sheets from Texas, both of which apply to the *R. corzoi* of the present treatment).

Leonard's treatment of the *Ruellia nudiflora* complex was constructed without knowledge of populational variation in the field. A radically different, and much better, treatment of the complex was provided by Tharp & Barkley (1949), who, for the most part, had populational concepts of their species. These two authors recognized ten species from this complex as occurring in Texas, most of these newly described. Wasshausen (1966), in his treatment of *Ruellia* for the *Flora of Texas*, largely followed Tharp & Barkley's treatment, having himself at least some familiarity with populations in the field, although this is not apparent from his rather stereotyped published account of the complex. Correll & Johnston (1970) largely accepted Wasshausen's account of *Ruellia* in their treatment of the genus for the *Manual of the Vascular Plants of Texas*.

The *Ruellia nudiflora* complex was also studied by Long & Broome (unpublished), to judge from annotations of material housed at LL and TEX. These two authors were apparently not especially familiar with Texas populations of the group. Indeed, some of their annotations are incomprehensible, populationally speaking, for they have annotated almost identical specimens from southern Texas as either *R. nudiflora* or *R. glabrata* (Leonard) Tharp & Barkley.

I have been casually interested in the Texas ruellias for 30 years or more, both in the herbarium and in the field. Often frustrated with my attempts to use the treatments of Tharp & Barkley and Wasshausen, I finally decided to attempt an original reevaluation of the complex for Texas and closely adjacent México.

Key to Texas varieties of *R. nudiflora*

1. Corollas (of chasmogamous flowers) mostly 4-5 cm long; calyx lobes having glandular hairs with the stalks elongate, 2-5 times as long as the capitate glands; pubescence of capsule not glandular pubescent throughout, or nearly so. ..... var. *nudiflora*

1. Corollas mostly 3-4 cm long; calyx lobes having glandular hairs with the stalks short, about as long as or 1-2 times as long as the capitate

glands; pubescence of capsule glandular pubescent throughout, or nearly so. ..... var. *runyonii*

Ruellia nudiflora (Engelm. *ex* A. Gray) Urban var. *nudiflora*

Dipteracanthus nudiflora Engelm. *ex* A. Gray

According to Leonard (1927), the type of this taxon is from near Houston, Texas in Harris County. The variety is largely restricted to eastcentral Texas where it commonly occurs in grasslands on heavy alluvial soils or in gumbo glades in the more eastern portion of its range. Southwards it appears to grade into the var. *runyonii*, which is largely restricted to the drier, calcareous or sandy calcareous, soils of the Tamaulipan Biotic Province. Intermediates seemingly occur along a relatively narrow belt from San Antonio in Bexar County southeastwards to about Corpus Christi. Both taxa appear to commingle to some extent along the coastal regions south of Corpus Christi, occasional specimens having characters of both taxa. Tharp & Barkley used corolla length as almost the sole criterion by which to distinguish between varieties *nudiflora* and *runyonii*, but as shown in my key, corolla length also correlates with yet other characters, and I have no doubt that the two taxa are regionally distinct. Nevertheless, occasional specimens of what appear to be var. *nudiflora* will possess short corollas, and vice versa, usually along regions of contact, but occasional specimens with either short or long corollas are found well removed from areas of immediate contact.

Finally it should be noted that *Ruellia nudiflora* (both varieties!) occur sympatrically with *R. yucatana* and *R. occidentalis* in southernmost Texas, and certainly these are likely to hybridize, given the opportunity; thus morphological evaluation of plants from this region are likely to be complicated by spurious variation resulting from such crosses, making difficult the ready interpretation of character states as presented in the above key.

Ruellia nudiflora (Engelm. *ex* A. Gray) Urban var. **runyonii** (Tharp & Barkley) B. Turner, *stat. & comb. nov.* BASIONYM: *Ruellia runyonii* Tharp & Barkley, Amer. Midl. Naturalist 42:52. 1949.

Ruellia runyonii Tharp & Barkley var. *berlandieri* Tharp & Barkley.

Tharp & Barkley (1949) and Wasshausen (1966) recognized this taxon as a distinct species, but it has all the attributes of an allopatric or partially sympatric variety which intergrades in regions of near sympatry or parapatry. This is discussed in more detail under the var. *nudiflora*.

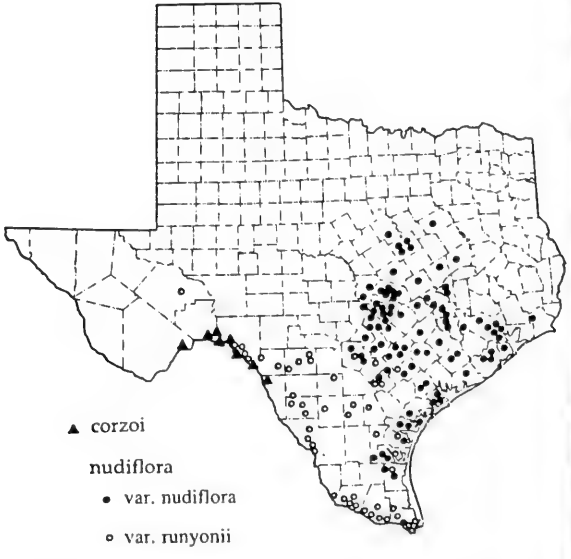

Fig. 5. Distribution of Ruellia nudiflora and R. corzoi in Texas.

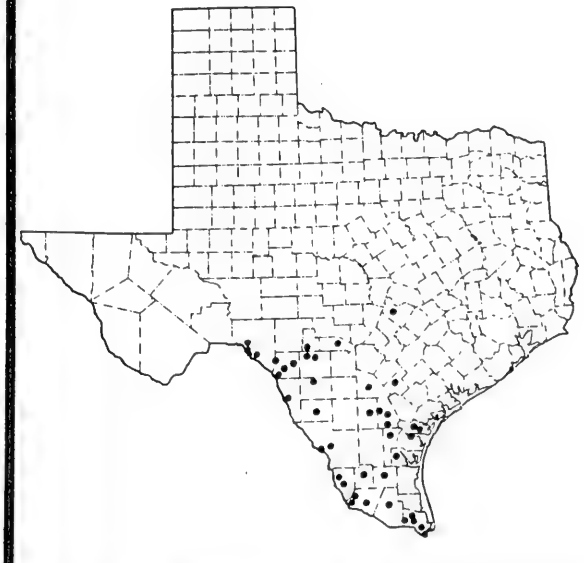

Fig. 6. Distribution of Ruellia occidentalis in Texas.

The var. *runyonii*, as noted in the above key, is recognized by a syndrome of characters, with occasional character states being intermediate, the latter occurring in regions of overlap. It should also be reemphasized here that var. *runyonii* may occur at a given site with both *Ruellia nudiflora* var. *nudiflora* and *R. yucatana* (e.g., Nueces Co.: Petronila Creek, 26 May 1946, *Wolcott & Barkley 16394, 16395T, 16397T, 16398T* (TEX). Collectors of the aforementioned material were apparently unaware of the mixed collections at the site concerned at the time of their collections, but Tharp subsequently correctly annotated these, there being no clear indication that gene exchange might be taking place. Nevertheless, other collections from the same region suggests that gene exchange or intergradation between at least var. *nudiflora* and var. *runyonii* occurs, as exemplified by *Correll 20401* (LL) from Nueces County, near Corpus Christi, which has characters of both varieties.

The var. *berlandieri* appears to be a form of the species with very pubescent foliage, perhaps derived from hybridization with *R. occidentalis*. Finally, it should be noted that at least two collections of *R. nudiflora* examined by myself, both from the Dominican Republic in the Caribbean area, appear to belong to the var. *runyonii*, at least by the characters emphasized here. These may prove to be introductions to the region from southern Texas or adjacent México. Leonard (1927) assigned such plants to *R. nudiflora* var. *insularis* Leonard (type from Cuba), distinguishing these from the Texas-Mexican material, which he assigned to var. *nudiflora* (sensu lato), by the large open panicles and smaller corollas (ca. 3 cm long vs. 3-4 cm). If my surmise that *R. n.* var. *insularis* is synonymous with *R. n.* var. *runyonii*, then the former must serve as the correct name of the mainland populations. Regardless, at the present time, it appears more appropriate to recognize the Caribbean elements as a closely related but distinct variety.

Ruellia occidentalis (A. Gray) Tharp & Barkley, Amer. Midl. Naturalist 42:25. 1949. Fig. 6. BASIONYM: *Ruellia tuberosa* L. var. *occidentalis* A. Gray. *Ruellia nudiflora* (Engelm. *ex* A. Gray) Urban var. *occidentalis* (A. Gray) Leonard.

Ruellia occidentalis (A. Gray) Tharp & Barkley var. *wrightii* Tharp & Barkley.

Ruellia davisiorum Tharp & Barkley.

Ruellia strictopaniculata Tharp & Barkley.

This highly variable species is readily distinguished from its closest relative, *Ruellia nudiflora*, by its mostly taller habit, densely glandular pubescent vestiture and larger ovate to subdeltoid leaves. Plants with congested panicles and relatively small leaves have been segregated as *R. davisiorum*; the latter was retained by both Wasshausen (1966) and Correll & Johnston (1970), but such plants appear to be but forms of a variable *R. occidentalis*. *Ruellia strictopaniculata* was also included by the latter workers as a synonym of *R. occidentalis*, the name being applied to forms of the latter with a compact inflorescence. *Ruellia occidentalis* var. *wrightii* was not accounted for by either Wasshausen or Correll & Johnston, but the type (*Wright 431*, w/o locality, but probably from southcentral Texas) and only cited specimen, appears to be a large leafed variant of an otherwise typical *R. occidentalis*.

The types of *Ruellia davisiorum* and *R. strictopaniculata*, both from southernmost Texas, occur in a region where the closely related *R. occidentalis*, *R. nudiflora*, and *R. yucatana* are sympatric and abundant. Field work in this area is needed to help resolve the populational interplay of these taxa. It appears likely that hybridization, followed by cleistogamic reproduction of selected clones, accounts for at least some of the aberrant variation in this region, and perhaps elsewhere.

Ruellia parryi A. Gray, *Syn. Fl. N. Amer.* 2:326. 1878. Fig. 7.

This western taxon is readily recognized by its low, stiffly branched habit, and the leaves rather small, somewhat indurate and mostly 1-2 cm long. The capsules may be either pubescent or glabrous. As noted under *Ruellia corzoi*, it occurs mixed with the latter on rocky limestone hills in Val Verde Co., Texas.

Ruellia pedunculata Torr. *ex* A. Gray, *Syn. Fl. N. Amer.* 2:325. 1878. Fig. 8.

This species is relatively common in sandy soils in wooded areas of easternmost Texas and is readily recognized by its peculiar branching propensity, the chasmogamous flowers borne single on mostly widely ascending lateral branches. Occasional depauperate plants resemble *Ruellia humilis*. Specimens with glabrous fruits and subsessile leaves were recognized by Tharp & Barkley (1949) as *R. pinetorum* Fernald; the latter species was maintained for Texas by Wasshausen (1966) but he annotated most of the sheets concerned as *Ruellia pedunculata* (TEX, 1965). I agree with his initial assessment. *Ruellia pinetorum* is a taxon of the southeastern U.S.A. and has been treated as a subspecies of *R. pedunculata* by Long (1970). It is possible that the plants recognized in Texas as *R. pinetorum* are but hybrid derivatives of an occasional cross between *R. pedunculata* and *R. humilis*, at least the characters which

Fig. 7. Distribution of Ruellia parryi in Texas.

Fig. 8. Distribution of Ruellia nudiflora in Texas.

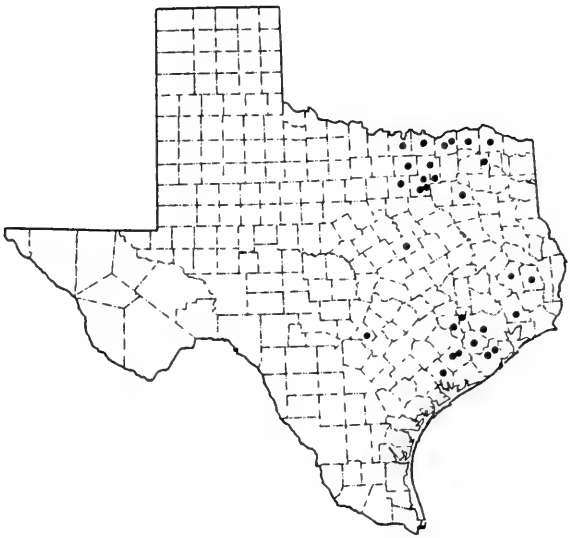

Fig. 9. Distribution of Ruellia strepens in Texas.

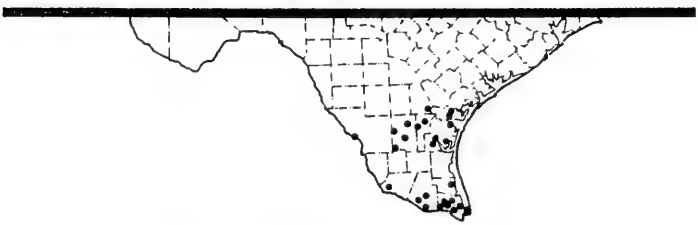

Fig. 10. Distribution of Ruellia yucatana in Texas.

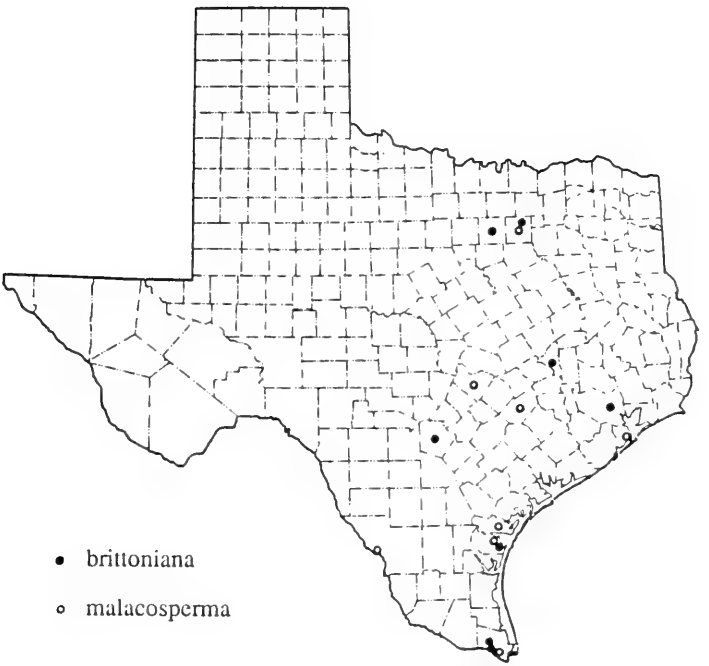

Fig. 11. Distribution of Ruellia brittoniana and R. malacosperma in Texas (both cultivated).

are said to mark *R. pinetorum* are found in *R. humilis*, and the hypothetical parents are mostly sympatric, at least in Texas.

Ruellia strepens L., *Sp. Pl.* 634. 1753. Fig. 9.

Ruellia strepens L. var. *cleistantha* A. Gray.

This species is largely confined to wooded floodplains in eastern Texas. Cleistogamic forms with fruits tightly clustered in the axils of leaves, and with shorter, usually broader, calyx lobes were treated at the varietal level by Tharp & Barkley (1944) and Wasshausen (1966), but in Texas these have no geographic integrity and clearly represent but forms of a widespread variable species.

Ruellia yucatana (Leonard) Tharp & Barkley, Amer. Midl. Naturalist 42:56. 1949. Fig. 10. BASIONYM: *Ruellia nudiflora* (Engelm. *ex* A. Gray) Urban var. *yucatana* Leonard.

This taxon extends along the Gulf Coastal Region from southernmost Texas to the Yucatán Peninsula of México. It is readily recognized by its tendency to produce prominent lateral branches from the lower nodes which produce cleistogamous flowers. I have treated as *Ruellia yucatana* some of the specimens annotated as *R. corzoi* by both Tharp & Barkley (1949) and Wasshausen (1966).

ACKNOWLEDGMENTS

I am grateful to Dr. Guy Nesom and Dr. T. Ramamoorthy for reviewing the manuscript.

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Phytologia (October 1991) 71(4):300-303.

A NEW SPECIES OF *PANICUM* (GRAMINEAE) FROM ARIZONA

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ABSTRACT

Panicum mohavense is described as new from Mohave Co., Arizona, U.S.A. It appears to be most closely allied to the Capillaria group of the genus, but differs in being less than 10 cm tall, having panicles which are overtopped by the leaves, and upper glume and sterile lemma which scarcely cover the upper floret rather than being pointed beyond it.

KEY WORDS: Gramineae, *Panicum*, Arizona

In 1986, Ralph K. Gierisch sent collections of a tiny unnamed *Panicum* to the University of Arizona Herbarium. Because of the small size and congested growth habit of these plants, we considered them to be depauperate forms of some known species, and were reluctant to suggest a name until more material was available. Subsequent collections by Gierisch in 1988 and 1989, from the same general area, were essentially identical to those first received in 1986.

Before deciding whether the tiny plants represented a known species or were new to science, we were anxious to see them in the field. To this end, Gierisch kindly supplied us with detailed instructions on how to reach his collection site, and in September and October of 1990 we were able to see this little *Panicum* in its native habitat. Fortunately, we were able to find it in good condition in several localities, all within a somewhat restricted area. Along with herbarium specimens, small plants were preserved in the standard 3:1 absolute alcohol:acetic acid fixative for cytological examination. Aceto-carmine squashes of anthers revealed that the plants are diploid with $2n = 18$ chromosomes. After seeing the plants in the field and studying our collections, along with those of Gierisch, in detail, we have concluded that they represent a species new to science; it is described below.

Panicum mohavense J. Reeder, *sp. nov.* TYPE: UNITED STATES. Arizona: Mohave Co., Arizona Strip: Main Street Valley, ca. 1.5 km S of

the jct. of the Colorado City road with the Main Street Valley road. Low hills with limestone terraces, ca. 1525 m, 11 Oct 1990, *J.R. & C.G. Reeder 8630* (HOLOTYPE: ARIZ; Isotypes: US,K,MO).

Gramen annuum ad 10 cm altum; panicula confertiflora foliis superata; spiculae circiter 2 mm longae, gluma inferior $\frac{1}{3}$ spiculae aequans; apex lemmatis superioris apicem glumae superioris et lemmatis inferioris aequans vel vix brevior.

Annual, much branched at base, 2-6(-8) cm tall. Culms 1 noded, papillose-pilose, mostly obscured by the leaves. Leaves: sheaths prominently veined, papillose-pilose; ligule 0.2 mm long, membranous, with short cilia; blades 1-4 cm x (1-)2-3 mm, flat, tapering from about the middle to an acuminate apex, glabrous on both surfaces, or sometimes papillose-pilose abaxially, the margins with long papilla based cilia. Inflorescences short congested panicles, partially included in the sheaths, never exceeding the tips of the longest leaves. Spikelets ca. 2 mm long, plump; lower glume uninerved, ca. $\frac{1}{3}$ as long as the spikelet, clasping, the apex rounded, obtuse, or acute; upper glume and lemma of the lower floret equal, 7 nerved, covering, but scarcely exceeding the apex of the upper floret, the lemma lacking a palea; upper floret ca. 1.5 mm long, smooth and shining, yellow or brownish when mature; stigmas and anthers purple, the latter ca. 1 mm long. The species appears to be endemic to limestone terraces in Mohave County, Arizona.

Additional collections of *Panicum mohavense*, all from the Main Street Valley area, Mohave Co., Arizona: Rocky loam from limestone, slope ± 20% SW, 5000 ft. (1525 m) T38N R11W S15, 6 Oct 1986, *R.K. Gierisch 4923* (ARIZ,ASU); Rocky gravelly loam-limestone, slope ± 10% NW, late season - leaves dry, 22 Oct 1988, *R.K. Gierisch 5108* (ARIZ,ASU); Rocky gravelly loam-limestone, slope ± 10% W to NW 5000 ft. (1525 m), 24 Oct 1989, *R.K. Gierisch & J. Rappleye 5114* (ARIZ). Along the St. George to Mt. Trumbull road, ca. 1 km N of its jct. with the Colorado City road, on limestone terraces of a gentle WSW facing slope with scattered sagebrush, 1525 m, 19 Sep 1990, *J.R. & C.G. Reeder 8607* (ARIZ); 10 Oct 1990, *8620* (ARIZ). Along the Colorado City road, 6 km E of its jct. with the St. George to Mt. Trumbull road, on limestone terraces of a moderate NW facing slope with scattered sagebrush, 1450 m, 19 Sep 1990, *J.R. & C.G. Reeder 8610*, chromosome voucher (ARIZ); 10 Oct 1990, *8625* (ARIZ). Along the Colorado City road, ca. 5 km E of its jct. with the Main Street Valley road; scattered plants on terraces on both sides of canyon, 1450 m, 10 Oct 1990, *8623* (ARIZ). Along the Colorado City road, ca. 7 km E of its jct. with the Main Street Valley road. The most easterly of the limestone hills and slopes between Main Street Valley and the open grassy flats, 1370 m, 11 Oct 1990, *J.R. & C.G. Reeder 8634* (ARIZ).

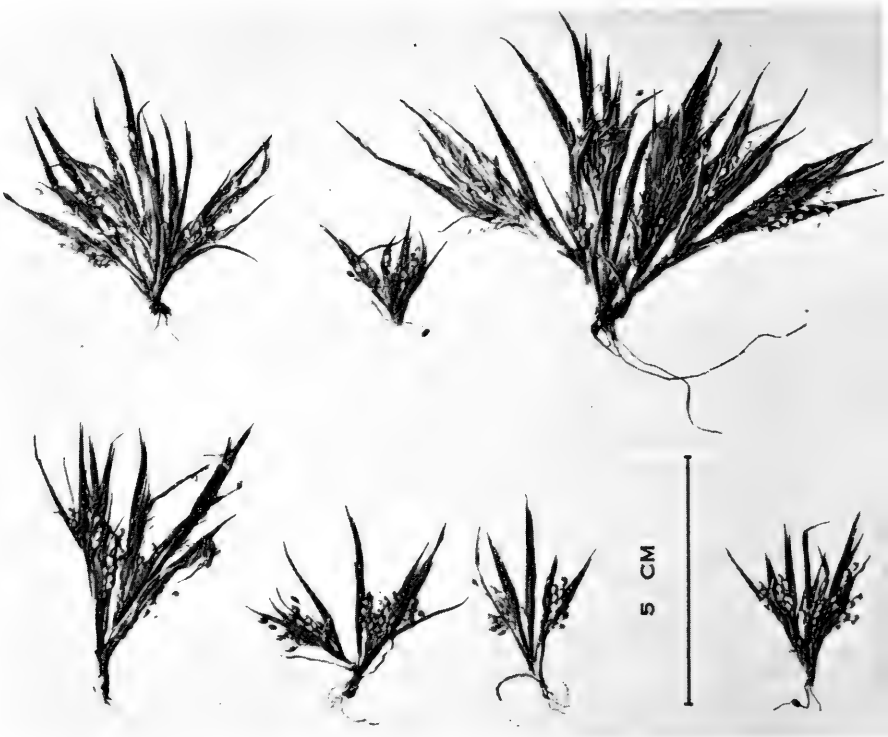

Figure 1. Plants of the type collection of *Panicum mohavense* (*J.R. & C.G. Reeder 8630*).

ACKNOWLEDGMENTS

I am indebted to Ralph Gierisch, who first collected this interesting species and sent samples to ARIZ, to Richard Felger and Lawrence Toolin, who reviewed the manuscript, and to my wife, Charlotte G., who assisted me in the field and in preparation of the paper. Dan Nicolson reviewed the Latin diagnosis and made important suggestions for improvement which are much appreciated.

Phytologia (October 1991) 71(4):304-306.

A NEW SPECIES OF *SENECIO* (ASTERACEAE) FROM CHIAPAS, MÉXICO

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ABSTRACT

A new species, **Senecio tonii** B. Turner, from Chiapas, México is described. It belongs to the series *Palmatinervii* and is superficially similar to *S. oaxacanus* Hemsley, differing from the latter in having tomentulose pubescence, non flexuous stems, and pubescent corollas.

KEY WORDS: *Senecio*, Asteraceae, Mexico

Routine identification of Mexican Asteraceae has revealed the following novelty.

Senecio tonii B. Turner, *sp. nov.* Fig. 1.

Senecioni oaxacano Hemsley similis sed caulibus non flexilibus, involucris tomentellis, et corollis pubescentibus differt.

TYPE: MÉXICO. Chiapas: Mpio. San Cristóbal de Las Casas, Santa Cruz en San Felipe, 15 Nov 1986, *Alonso Mendez Ton 9481*, with María C. Mtz. de Lopez (HOLOTYPE: TEX!).

Shrub ca. 2 m high. Stems straight, moderately arachnoid pubescent with an understory of short glandular hairs. Larger leaves mostly 10-15 cm long, 8-12 cm wide; petioles 2-4 cm long; blades palmately nervate, puberulo-tomentose beneath at first, but subglabrate with age, 7-9 lobate, the lobes broader than long, the margins denticulate. Heads numerous, arranged in terminal corymbose panicles, the ultimate peduncles tomentose, mostly 4-10 mm long. Involucres 5.5-7.0 mm high, the bracts 8, tomentose below, beneath the vestiture scattered minute glandular hairs occur; the calyculus of 1-4 linear scales 1-3 mm long. Ray florets 3-5, pistillate, fertile, the tubes pubescent, the ligules 3-6 mm long, yellow. Disk florets 8-10, the corollas ca. 8 mm long, yellow, the tube 3-4 mm long, pubescent throughout with minute glandular

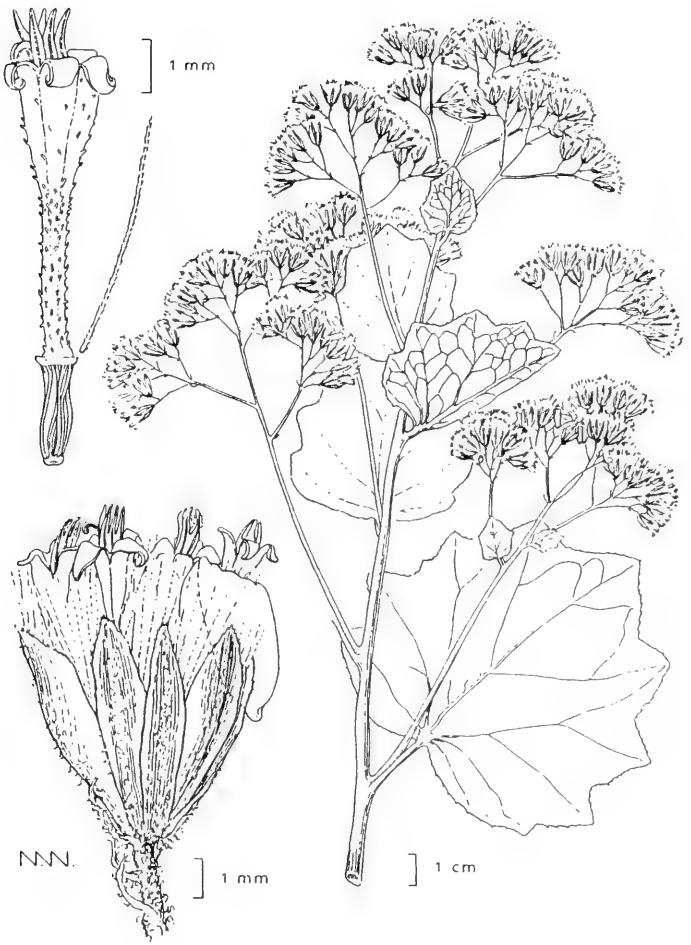

Fig. 1. Senecio tonii, from holotype

hairs, the lobes 1.0-1.5 mm long. Achenes (immature) glabrous, the pappus of numerous white, readily detached bristles 5-6 mm long.

ADDITIONAL SPECIMEN EXAMINED: MÉXICO. Chiapas: Mpio. San Cristóbal de Las Casas, "Steep slope with *Quercus* and *Drimys* on Cerro Huitepec," 2700 m, 5 Dec 1971, *Breedlove 23034* (LL).

This taxon belongs to the series *Palmatinervii* of *Senecio* and is superficially similar to the widespread and highly variable *S. oaxacanus* Hemsley (which includes *S. cordovensis* Hemsley, *S. cristobalensis* Greenm., *S. macrobtrys* Hemsley, and yet other previously proposed taxa). *Senecio tonii* differs from *S. oaxacanus* in having decidedly tomentulose involucres and peduncles, non flexuous tomentulose stems, and pubescent corollas. It is possible that the plants concerned are hybrid derivatives between *S. oaxacanus* and some, as yet, unidentified parent, perhaps *S. acutangulus* Hemsley, which is similar to *S. oaxacanus* but possesses tomentulose stems and pubescent achenes. Neither of the latter two taxa possess pubescent corollas (as does *S. tonii*); it is possible, however, that the latter character is transgressive. Regardless, to my knowledge, neither putative parent was collected with plants referable to *S. tonii*, thus the proposed species seems reasonably justified on evidence available at present.

Dr. T. Barkley (pers. comm.) suggested that *Senecio tonii* might be part of the variation of a widespread *S. acutangulus*, but it differs from the latter in possessing: smaller, pubescent corollas; shorter involucral bracts (5.5-7.0 mm vs. 8-9 mm high) which are pubescent with both small glandular hairs and a loose puberulence (vs. glabrous or nearly so, except for a loose puberulence at the very base; and stems straight, striate-terete, both minutely glandular pubescent and puberulent (vs. flexuous, 5 angulate, and tomentulose to glabrate). He agrees, however, that the combination of characters alluded to in the above, especially the pubescent corollas, are not matched by sheets to his disposal (or mine!) in *S. acutangulus*.

ACKNOWLEDGMENTS

I am grateful to Guy Nesom for the Latin diagnosis, and to him and Ted Barkley for reviewing the manuscript. Nancy Webber provided the illustration.

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A NEW SPECIES OF RANUNCULACEAE FROM GANSU (CHINA)

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&

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ABSTRACT

A new species of *Aconitum* is described from central Gansu which differs significantly from other taxa in its inflorescence having 3-5 glabrous carpels. Other species of interest include *Aconitum tatsienense* Finet & Gagnepain and *A. sungpanense* Hand.-Mazz. var. *leucanthum* (Reichb.) W.T. Wang which also have inflorescences with 3-5 carpels. Other species of *Aconitum* from western China include *A. alboviolaceum* Kom. and *A. apetalum* (Huth) B. Fedsch. which usually only have three carpels, while in *A. stylosum* Stapf and *A. yachiangense* W.T. Wang, the inflorescences usually have five carpels. The new species belongs in the series *Stylosa* and section *Aconitum* of the genus *Aconitum* and is most closely related to *A. yachiangense*.

KEY WORDS: Ranunculaceae, China, *Aconitum*

Aconitum jinchengense L.C. Wang et J. Silba, *species nova*. TYPE: CHINA. Gansu: Lanzhou, Xiguoyuan xiang alt. 2450 m, gully, VII. 6. 1990. leg. *L.C. Wang no. 90020* (HOLOTYPUS: in Herb. Dept. Biol. Northwest Norm. Univ.)

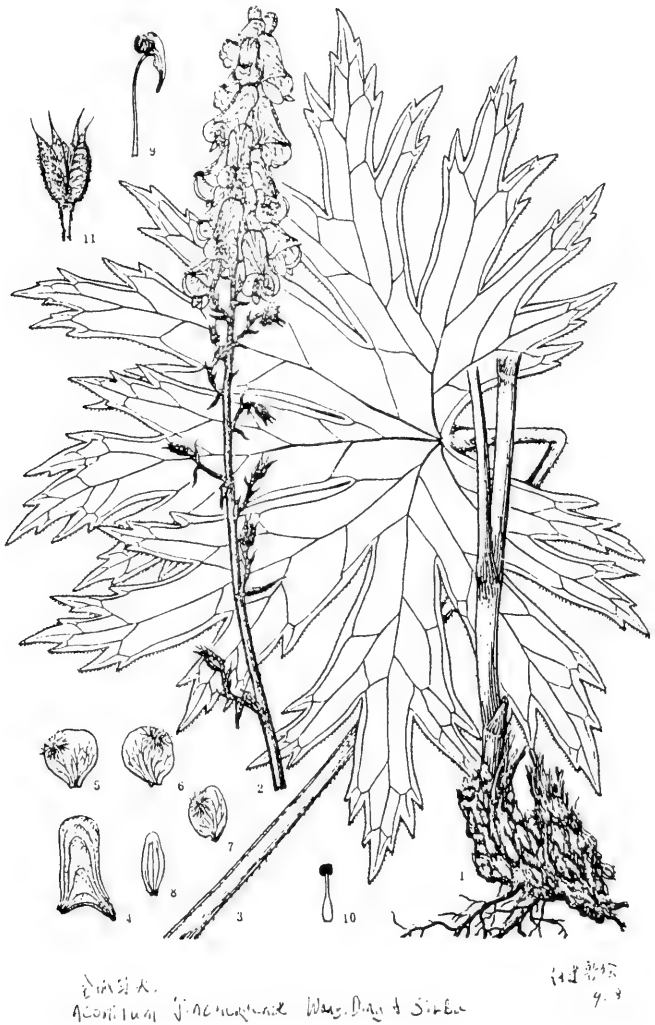

Figure 1. Illustration of *Aconitum jinchengense* L. Wang & J. Silba from *Wang 90020* (Holotype). 1-Tuber; 2-inflorescence; 3-leaf; 4-8-lower and upper sepals; 9-10-anthers; 11-fruit. Figure by Hian-lu Bai (NWN Univ.).

Affine *A. yachiangense* W.T. Wang, a quo tuberibus 2-3; foliis reniformibus vel rotundato-reniformibus; cassibus cylindracis, sepalis inferioribus inaequalibus, sepalis lateralibus et majioribus sepalis inferioribus intus barbatis; carpellis 3-5, glabris differt.

Tubera 2-3, cylindrata, circ. 4-10 cm longa, ad 1.5 cm diam. Caules erecti ad 1.2 m alti, 5-15 mm diam., pilosi, fistulosi, 4-6 foliati. Folia radicalia et caulina inferiora longe petiolata; petioli usque ad 70 cm longi, lamina ambitu reniformis vel orbiculato-reniformis, ad 17 cm longam et circ. 30 cm latam, profunde palmatim 3-partita usque ad $\frac{4}{5}$ partes longitudum laminarum, medio partilione late rhomboideocuneata, lateralibus obliquo-flabelliformibus, 3-fidis, lobis apice acuminatis; margine lobis parvis paucis vel dense acutis triangularibus irregularibus; superficies glabra, infra nervos pilosos non nisi; folia caulina similia radicalia, sed supera minora, petiolata brevia, lobis apiibus acuminatis. Racemi multiflori, ad 60 cm longi, circ. 45 flori, inferioramiferi; bracteae inferiores foliaceae, sed superiores lineares; rachis cum pedicellis patente alba puberula; pedicelli 3-30 mm longi; supra medium bibracteolatis; bracteolae lineares 3-9 mm longae, pilis papatulis brevibus. Sepala alba, extus puberula; cassis cylindracea, 8-20 mm longa, circ. 5 mm crassa; sepala lateralia subrotundata, circ. 8 mm lata, intus alba barbata; sepala inferiora inaequalia, magnisepala late ovalis-rotundata circ. 6 mm longa et 5 mm lata, intus alba barbata, microsepala angustiovata circ. 6 mm longa et 3 mm lata, intus glabra. Petalis glabris, circ. 15 mm longis, calcaribus circ. 4 mm longis, circinatis, lobis labiatis circ. 4 mm longis, 2-lobatis, unguibus circ. 10 mm longis. Stamina circ. 28, glabra, circ. 4 mm longa, filamentum a medio abrupte dilatatis, margo integer. Carpella 3-5, glabra. Folliculi circ. 1.2 cm longi, breviter pilosi, in juvenalibus densioribus. Semen obovatum, triquetrum, circ. 4 mm longum dense transversum angustialatum. Fl. et Fr. 7-8.

In the spermatophyte flora of Gansu, this province can be classified into five geographic regions. Namely, the Hosi Kalidor to the upper north; the North Qilian mountain region to the lower north; the Gannan region to the southwest which includes the Yellow River and Taohe River region; the loess plateau region which includes Lanzhou; and lastly, the south Gansu region which includes the west Qinling-Bashan mountain region (Wang & Ding 1990).

The relationship between the flora distributed in Gansu and Shanxi appears to have many related taxa. Interestingly though, the flora distributed in Gansu and Sichuan appear to have even closer relationships between species. In the two regions, namely the Gansu-Shanxi flora and the Gansu-Sichuan flora, the similarity coefficient of genera appears to be approximately 76.8% and 74.3%

respectively (Kung 1962; Wu 1979).

The new, previously undetected species *Aconitum jinchengense* is native to central Gansu at moderate elevations. This species is related to *A. yachiangense* W.T. Wang, though it differs in having 2-3 tubers; the leaves are reniform or orbicular-reniform; the corolla cylindrical, the lower sepals reduced, the lateral sepals larger than the lower sepals and provided with beard like cilia or pubescence; the carpels being 3-5 in number and are glabrous.

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Phytologia (October 1991) 71(4):311-314.

TWO NEW SPECIES OF *AGERATINA* (ASTERACEAE-EUPATORIEAE) FROM NORTHEASTERN MÉXICO

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ABSTRACT

Two new species of *Ageratina* are described from the Sierra Madre Oriental of northeastern México: **A. ilicifolia** B. Turner, from near Galeana, Nuevo León, and **A. zapalinama** B. Turner, from near Saltillo, Coahuila. The former belongs to a glutinous species complex centering about *A. espinosarum* (A. Gray) R.M. King & H. Robins.; the latter has no obvious relatives, but appears closest to *A. hyssopina* (A. Gray) R.M. King & H. Robins. An illustration is provided for *A. zapalinama*.

KEY WORDS: Asteraceae, Eupatorieae, *Ageratina*, México

Routine identification of Mexican Asteraceae has revealed the following novelties.

Ageratina ilicifolia B. Turner, *sp. nov.*

Ageratinae espinosarum (A. Gray) R.M. King & H. Robins. similis sed plantis nanis (ca. 20 cm altis), marginibus foliorum aculeati-spinulosis, et capitulis minoribus (4-5 mm altis vs. 6-8 mm) differt.

TYPE: MÉXICO. Nuevo León: Mpio. Rayones, 19 km from Galeana along the road to Rayones, rock crevices, 1660 m, *Hinton et al. 20837* (HOLOTYPE: TEX).

Woody shrublets to 20 cm high. Young stems glutinous, minutely roughened with callose "blisters," the older stems corky blackened, with well developed bark. Leaves opposite, mostly 3-5 cm long, 1.5-3.0 cm wide, glutinous throughout; petioles mostly 7-15 mm long; blades broadly ovate-deltoid, glabrous, varnished, trinervate to subpinnately nervate, the margins decidedly irregularly prickly-serrate, resembling that of holly. Heads 10-50 in terminal

subfasciculate cymes, nearly overtopped by the leaves, the ultimate peduncles glutinous, 3-10 mm long. Involucres turbo-campanulate, glutinous, ca. 4 mm high, the bracts ca. 13, subequal. Florets ca. 20 per head, the corollas glabrous, white. Achenes (immature) ca. 1.5 mm long, sparsely hispid but clearly glutinous, the pappus of 20-30 barbellulate bristles mostly ca. 3 mm long.

This dwarf shrublet is seemingly most closely related to *Ageratina espinosarum* (A. Gray) R.M. King & H. Robins., but is readily distinguished from the latter by its dwarf woody habit, hollylike leaves, and smaller heads.

Ageratina zapalinama B. Turner, *sp. nov.* Fig. 1.

> *Ageratinae hyssopinae* (A. Gray) R.M. King & H. Robins. similis sed foliis plerumque deltoideis dentibus acute serratis (vs. linearilanceolatis ac integris) et lobis corollarum dense pubescentibus (vs. glabris vel glabratis) differt.
>
> TYPE: MÉXICO. Coahuila: Mpio. Arteaga, Sierra Zapaliname, on limestone ridges, 2770 m, 22 Aug 1990, *Hinton et al. 20499* (HOLOTYPE: TEX).

Stiffly erect shrubs to 60 cm high. Stems reddish brown, puberulent, unbranched (except in, or just below, the capitulescence). Leaves alternate, gradually reduced upwards, those at midstem mostly 3-5 cm long, 2.5-3.5 cm wide; petioles 2-5 mm long; blades broadly ovate to deltoid, glabrescent, except for a fine puberulence along the major veins, 3-5 nervate from or near the base, the margins serrate. Heads campanulate, ca. 10 mm high, 9 mm wide, sometimes subtended by much reduced leaves; involucral bracts 6-8 mm long, biseriate, eximbricate, puberulent, the apices acute. Receptacles plane, glabrous, epaleate, ca. 3.5 mm across. Florets 40-50 per head, the corollas white, ca. 6 mm long, the tube glabrous, ca. 2 mm long; the throat glabrous, tubular, the lobes ca. 1 mm long, acute, clearly pubescent with spreading hairs. Anther appendages longer than wide. Stylar appendages linear, minutely papillose, the apical region somewhat expanded and nearly smooth. Achenes columnar, 4-5 sided, carbonized, 3-4 mm long, sparsely hispidulous; pappus of 40-60 persistent barbellulate bristles, mostly 3-4 mm long, purplish below; carpopodium well developed, only weakly merging into the ribs, if at all.

Ageratina zapalinama, is a very distinct species, having no obvious relatives among the subgenus *Neogreenella*, where I would position the taxon, largely because of its columnar achenes with persistent pappus and elongate tubular limb. The lobes of the corolla, however, are markedly pubescent, as occurs in most species of the subgenus *Ageratina*. I have compared *A. zapalinama* with *A. hyssopina* (A. Gray) R.M. King & H. Robins., the latter having markedly alternate leaves and similar achenes and corollas. It differs from *A. hyssopina*

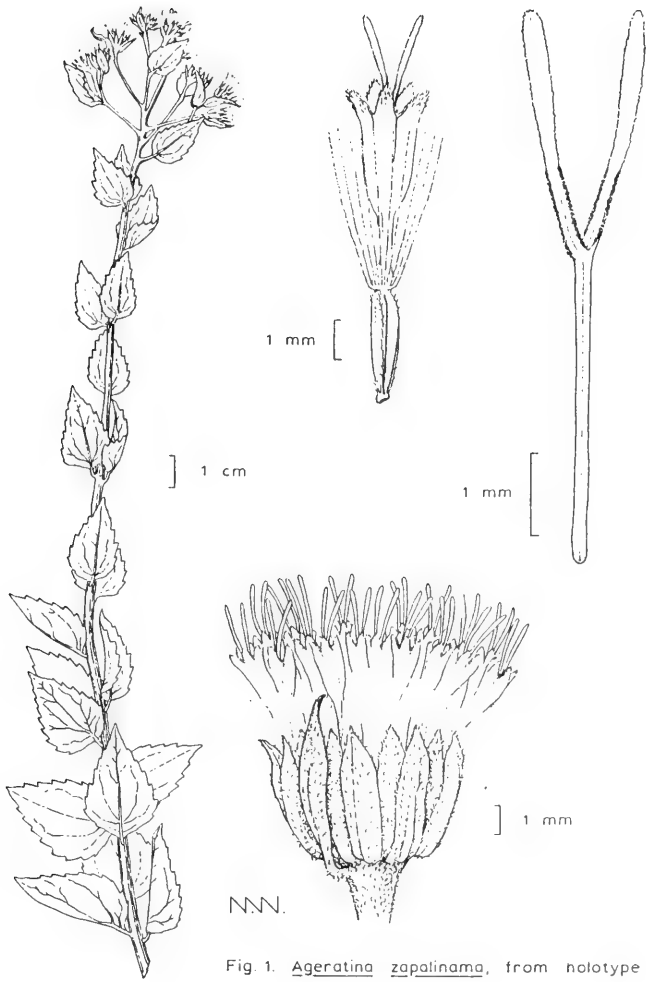

Fig. 1. Ageratina zapalinama, from holotype

in having very deltoid, serrate leaves (vs. linear-lanceolate and entire) and pubescent corolla lobes (vs. glabrous or nearly so).

ACKNOWLEDGMENTS

I am grateful to Guy Nesom for the Latin diagnosis, and to him and T.P. Ramamoorthy for reviewing the manuscript.

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PERYMENIUM HINTONIORUM (ASTERACEAE, HELIANTHEAE) A NEW SPECIES FROM NUEVO LEÓN, MÉXICO

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ABSTRACT

A new species from Nuevo León, México, **Perymenium hintoniorum** B. Turner, is described and illustrated. Because of its stiffly erect habit and terete stems, it is believed to be most closely related to *P. tamaulipense* B. Turner. It differs from the latter in having herbaceous involucral bracts and a glandular pubescent vestiture.

KEY WORDS: Asteraceae, Heliantheae, *Perymenium*, México

Routine identification of Mexican Asteraceae from some of the more poorly explored areas of Nuevo León, México, has revealed the following novelty.

Perymenium hintoniorum B. Turner, *sp. nov.* Fig. 1.

Perymenio tamaulipensi B. Turner similis sed involucris herbaceis et caulibus ac petiolis stipitati-glandulosis differt.

TYPE: MÉXICO. Nuevo León: Mpio. Rayones, bushy limestone hillside ca. 24 km from Galeana along the road to Rayones, 1230 m, 17 Oct 1990, *Hinton et al. 20788* (HOLOTYPE: TEX).

Perennial herbs to 60 cm high. Stems terete, the vestiture densely glandular pubescent within which are interspersed a scattering of longer, white, acicular trichomes 0.5-2.0 mm long. Leaves opposite, mostly 4-6 cm long, 2-3 cm wide; petioles 5-10 mm long, pubescent like the stems; blades ovate, coarsely and densely pilose-hispid above and below with erect hairs, minutely atomiferous glandular on the lower surface, 3-5 nervate from somewhat above the base, the margins serrate. Capitulescence a broad open cyme of 4-20 heads, the ultimate peduncles glandular pubescent, 4-8 cm long, the individual branches with 1-5 heads. Involucres campanulate, ca. 7 mm high, 8-9 mm wide, the outer

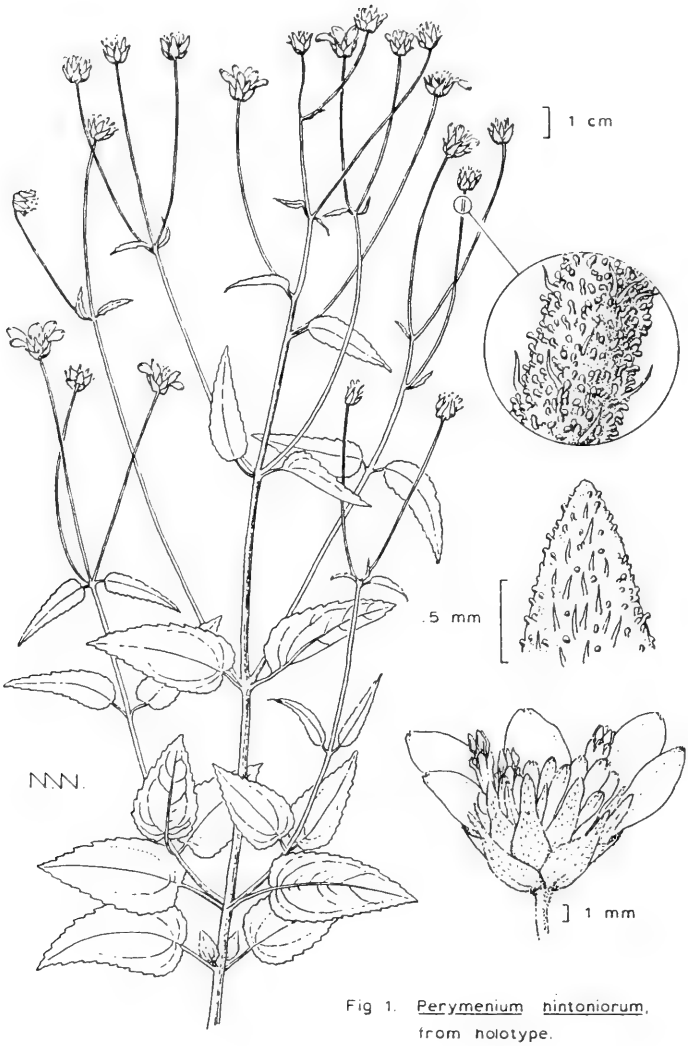

Fig 1. Perymenium nintoniorum, from holotype.

two series of bracts 10-12, herbaceous throughout, strigose, ovate, subequal, grading into the receptacular bracts, the apices narrowly obtuse to acute. Ray florets 8, fertile; corolla tubes ca. 1.5 mm long, the ligules yellow, 8-10 mm long, 3-5 mm wide. Disc florets ca. 20; corollas yellow, ca. 6 mm long, the tubes ca. 1-5 mm long, the lobes coarsely hispid, ca. 0.6 mm long. Achenes (immature) ca. 2.5 mm high, the pappus of 20-30 deciduous bristles 0.5-3.0 mm long.

Perymenium hintoniorum is clearly closely related to *P. tamaulipense* B. Turner, both possessing similar habits, terete stems, and a lax, open capitulescence, the ultimate peduncles 4-8 cm long. The former is readily distinguished from the latter by its glandular pubescence and ovate-linear, nonscarious involucral bracts. *Perymenium hintoniorum* might also relate to the poorly known, more southern, *P. cornutum* Brandegee. The latter is one of only two species (the other being *P. glandulosum* Brandegee) to have glandular foliage (Fay 1978). *Perymenium hintoniorum*, a third glandular species, differs from *P. cornutum* in possessing terete stems (vs. 4 sided) and larger heads (involucres ca. 7 mm high, 8-9 mm wide; vs. 5-6 mm high, and 5 mm wide).

The species is named for the remarkable Hinton family: George B. Hinton (1882-1943), whose numerous excellent collections from southern México are widely distributed and well known to botanists working in that area generally (cf. Hinton & Rzedowski 1975); his son, Jaimie Hinton (currently residing with his family on Rancho Aguililla near the foot of Cerro Potosí, Nuevo León) who has extended his father's botanical endeavors through the assembly of a large collection of excellent specimens from Cerro Potosí and environs, and from other regions as well; and to Jaimie's son, George Hinton, named for his grandfather, and who has assisted his father in the botanical exploration of remote regions of México and has taken upon his shoulders the continuance of such activity–a continuation that is likely to extend over three generations and beyond. I mention all of this here because I am aware that there already exists a *Perymenium hintonii* Fay, named for the grandfather, but, in view of the dedication of the family as a whole, I think it appropriate to apply the present eponym so as to call attention to this trigenerational phenomenon.

ACKNOWLEDGMENTS

I am grateful to Dr. Guy Nesom for the Latin diagnosis, and to him and Dr. Andrew McDonald for reviewing the manuscript. Nancy Webber provided the illustration.

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HIERACIUM GYPSOPHILUM (ASTERACEAE, LACTUCEAE), A NEW SPECIES FROM NORTHEASTERN MÉXICO

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ABSTRACT

A new species, **Hieracium gypsophilum** B. Turner, is described from Nuevo León, México. It is largely confined to gypseous substrates and superficially resembles the widespread *H. pringlei* A. Gray, from which it can be distinguished by its taller, more robust, habit, long pilose basal pubescence and smaller achenes.

KEY WORDS: Asteraceae, Lactuceae, *Hieracium*, México, gypsum

In spite of the recent treatment of *Hieracium* for México by Beaman (1990), new taxa continue to be brought to the fore, as noted by Turner (1991) and the present contribution.

Hieracium gypsophilum B. Turner, *sp. nov.*

Hieracio pringlei A. Gray similis sed differt plantis altioribus (a 80 cm) caulibus crassioribus, foliorum rosulis basalibus plerumque persistentibus, caulibus ac foliis inferis dense longi-pilosis (non lanatis) trichomatibus grossioribus non implicitis, et acheniis longioribus (3.4-)3.8-4.1 mm longis (vs. 2.7-3.4 mm).

TYPE: MÉXICO. Nuevo León: Mpio. Galeana, 5.6 mi. S of the junction of highway 51 and 58, along highway 51 to Dr. Arroyo, dry canyon with pinyon pines, 6400 ft., 26 Oct 1981, *L.J. Dorr et al. 2103* (HOLOTYPE: TEX; Isotype: MEXU).

Stiffly erect robust perennial herbs, mostly 35-100 cm high, arising from thick rhizomes. Stems moderately to sparsely long pilose, the lower portions especially so, the hairs white to tawny white, up to 2 cm long but rarely if ever intertwining. Leaves mostly basal, mostly 4-15 cm long, 2-5 cm wide, broadly

elliptical to elliptical oblanceolate, sparsely to moderately long pilose, like the stems, the stem leaves much reduced and few, only 1 or 2(-3) widely spaced along the nearly naked scapes. Heads campanulate, mostly 5-20, arranged in stiffly branching cymes, the ultimate peduncles 1-7 cm long, sparsely pubescent with white glandular trichomes, these interspersed among a fine tomentum of branched or substellate white hairs. Involucral bracts mostly 8-10 mm long, sparsely pubescent with glandular trichomes, these interspersed among a persistent white tomentum. Florets 20-30 per head, the corollas yellow. Achenes columnar, not tapering apically, reddish brown to brown, (3.0-)3.2-4.0 mm long, glabrous, the pappus of numerous white bristles 5-7 mm long.

ADDITIONAL SPECIMENS EXAMINED: MÉXICO. Nuevo León: Mpio. Galeana, Santa Rita, 2010 m, gypsum hills, 14 May 1981, *Hinton et al. 18238* (TEX); Santa Rita, ravine in gypsum hills, 1980 m, 4 Jul 1981, *Hinton et al. 18300* (TEX); La Becerra, 2150 m, gypsum hills, 21 Oct 1989, *Hinton et al. 19905* (TEX); La Becerra, gypsum hillside, 2290 m, 1 May 1990, *Hinton et al. 20239*; 68 mi. N of Zaragosa along highway 61, gypsum soils, 2000 m, 7 Jul 1987, *Soule 1519, 1520* (MEXU, TEX); ca. 20 km S of Galeana, 2100 m, gypseous soils, 12 Jun 1985, *Villarreal 3030* (TEX). Mpio. Dr. Arroyo, Sierra El Soldado Puerto Pinos (Camino San Antonio Peña Nevada to Zaragoza), "suelo calcareo en partes bajas de la vereda Cerro Peña Nevada," 2600-2650 m, 25 Aug 1989, *Villarreal et al. 5033* (TEX).

All of the above cited collections were obtained from gypseous soils in the vicinity of Galeana, except for *Villarreal 5033*, which is reportedly from calcareous soils on Cerro Peña Nevada, near Dr. Arroyo. The latter area, however, is known to contain gypseous as well as calcareous substrates.

Beaman annotated several of the above cited sheets, including the holotype, as questionably *Hieracium pringlei* A. Gray, referring these to the latter in his published treatment of the genus for México. *Hieracium gypsophilum* differs from the latter in possessing a coarse vestiture of long pilose hairs on the lower stems and basal leaves (*i.e.*, not clearly lanate), markedly elongate stems (to 80 cm high) with only 1 or 2 much reduced leaves, and larger achenes (mostly 3.8-4.1 mm long vs. 2.7-3.8 mm long). I have also included in my concept of *H. gypsophilum*, two rather depauperate specimens with smaller achenes (ca. 3.4 mm long), as follows: Nuevo León, 15 mi. E of San Rafael, *Wells & Nesom 93* (TEX); and Cerro Peña Nevada, *Wells & Nesom 317, 403* (TEX). Beaman annotated all of these as questionable *H. pringlei*, which they superficially resemble. Indeed, I have not examined indubitable material of *H. pringlei* from the Sierra Madre Oriental of northeastern México and it is probable that all of the material which Beaman (1990) cited as occurring in this area are referable to *H. gypsophilum*.

ACKNOWLEDGMENTS

I am grateful to Guy Nesom for the Latin diagnosis, and to him and Jacqui Soule for reviewing the manuscript.

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A NEW SPECIES OF *SARCOCHILUS* R. Br. (ORCHIDACEAE) FROM AUSTRALIA

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ABSTRACT

A new species of *Sarcochilus* R. Br. is described for the forthcoming *Flora of New South Wales.*

KEY WORDS: *Sarcochilus*, New South Wales, Australia, Orchidaceae

INTRODUCTION

The genus *Sarcochilus* in Australia comprises about sixteen species distributed along the east coast. A taxon, suspected to be an undescribed species and known to orchid growers for some years, was studied in the field and compared with related taxa. That taxon is described here at species rank.

Sarcochilus aequalis D. Jones et M. Clements; species nova affinis *S. hartmannii* F. Muell. a qua floribus fulvis et racemis perbrevioribus differt.

TYPUS: cultivated Australian National Botanic Gardens, ex Eudales Trail, north-west of Werrikimbe National Park, *L. Barton s.n.*, (*D.L. Jones 2952*), 6 October 1988 (HOLOTYPUS: CBG; Isotypi: CBG, NSW).

Lithophyte forming small to extensive, crowded clumps. Stems 10-20 cm long, erect to decumbent, sparsely branched, old parts covered with frayed leaf sheaths. Leaves 4-8 per stem, 8-12 cm x 1.5-2.0 cm, linear-oblong, spreading to slightly recurved, conduplicate, straight to slightly falcate, coriaceous, usually yellowish green. Racemes 1-4 per stem, 6-12 cm long, erect or semi-erect,

Figure 1. *Sarcochilus aequalis.* a, flowering plant; b, flower from front; c, flower from side; d, labellum from above; e, labellum from side; f, longitudinal section of labellum; g, column from side. Scale bar for all = 5 mm.

bearing 5-10, crowded flowers; peduncle about equal in length to rachis. Flowers 2.0-2.5 cm across, cream with a few reddish spots towards the base of the perianth segments and red bars on the labellum; perianth segments cupped to spreading. Floral bracts ca. 2 mm x 2 mm, ovate, acuminate. Pedicels 8-12 mm long, mottled and spotted with dark purple. Ovary 3-5 mm long, linear-ovoid. Dorsal sepal 9-12 mm x 5-7 mm, broadly elliptical, obtuse, imbricate, narrowed to base. Lateral sepals 9-12 mm x 4.5-7.0 mm, elliptical to broadly elliptical, divergent, obtuse to subacute, narrowed to base. Petals 7.5-12.0 mm x 2.5-4.0 mm, oblong-spathulate, obtuse. Labellum 7-8 mm across when flattened, hinged at the base on a short claw; midlobe ca. 0.8 mm x 1 mm, yellowish; spur ca. 1.5-2.0 mm long, subconical, fleshy, obliquely decurved; callus consisting of a fleshy ridge extending along the center line of the midlobe, anvil shaped in longitudinal section; lateral lobes ca. 2.5-3.0 mm x 2.5-3.0 mm, orbicular, prominently striped with red. Column ca. 1.5 mm long, projected forwards from the ovary. Column foot ca. 1.5-2.0 mm long, at right angles to column, incurved near apex. Anther ca. 1.5 mm x 1.5 mm, with a very short, upcurved rostrum. Stigma ca. 0.6 mm across, sunken. Pollinarium ca. 1.7 mm x 1.2 mm; pollinia ca. 0.7 mm x 0.5 mm, orbicular, orange, waxy; stipe ca. 0.6 mm long; viscidium ca. 0.3 mm long. Capsule not seen.

Specimens Examined: No herbarium specimens occur apart from the type collection.

Distribution and Habitat: Reported by orchid growers to occur in suitable sites on the Northern Tablelands of New South Wales between the Clarence River and the Manning River. This species occurs in gorges and along steep slopes, growing on rock outcrops, usually in semishade or filtered sun. Plants have also been found growing on rocks adjacent to waterfalls.

Flowering period: August and September.

Affinities: *Sarcochilus aequalis* is closely related to *S. hartmannii* F. Muell., the type of which was collected from Spring Bluff near Toowoomba in southern Queensland (Clements 1989). Both species have been cultivated for many years and *S. aequalis* has been known by orchid growers as the southern form of *S. hartmannii*. It is easily distinguished from that species by its cream flowers which are borne on relatively short, stiffly erect racemes in which the peduncle and rachis are of similar length. In *S. hartmannii* the white flowers are borne on long, arching racemes, the peduncle of which is much longer than the rachis. When grown together in collections, growers report that *S. aequalis* consistently flowers two or three weeks earlier than *S. hartmannii*. The two species are not sympatric and in fact are separated by a distance of about 400 km.

Notes: *Sarcochilus aequalis* has been used in breeding programs to produce hybrid progeny.

Conservation Status: *Sarcochilus aequalis* is present in National Parks but is still threatened by collectors; suggested status is 3RC according to the cri-

teria of Briggs & Leigh (1988).

Etymology: From the Latin '*aequalis*', of uniform or similar size; in reference to the similar size of the peduncle and rachis of the inflorescence.

ACKNOWLEDGMENTS

We wish to thank Lex Barton for discussions about this species and assistance in the field, John Roberts for information and specimens from cultivated plants, and Barbara Jones for processing the manuscript.

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SENECIO PINACATENSIS (ASTERACEAE), A NEW SPECIES FROM THE PINACATE REGION OF SONORA, MÉXICO

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ABSTRACT

Senecio pinacatensis, a new species in the *Suffruticosi* complex, is described and illustrated. It is the only taxon endemic to the Pinacate volcanic complex of northwestern Sonora and might be a Pleistocene relict.

RESÚMEN

Se describe **Senecio pinacatensis** como especie nueva en el complejo *Suffruticosi*. Es el único taxón endémico del complejo volcánico del Pinacate en el noroeste del estado de Sonora, y quizá es un relicto del Pleistoceno.

KEY WORDS: *Senecio*, Asteraceae, Sonoran Desert, México

During the preparation of the flora of the Pinacate region of northwestern Sonora, México (Felger, in prep.) a new species of *Senecio* was discovered. It is illustrated and described below.

Senecio pinacatensis Felger, *sp. nov.* (Fig. 1).

Herbae perennes suffruticosae ramis rectis fragilibus, striatis frondosisque, foliis carnosis sessilibus, plerumque 3.0-6.2 cm longis pinnatisectis, pinnis anguste linearibus patentibus aequaliter dispositis; inflorescentia pluricapitata campanulato-cylindracea; phyllaria 5.5-9.0 mm longa, incrassata, sulcata et dura ubi exsiccata,

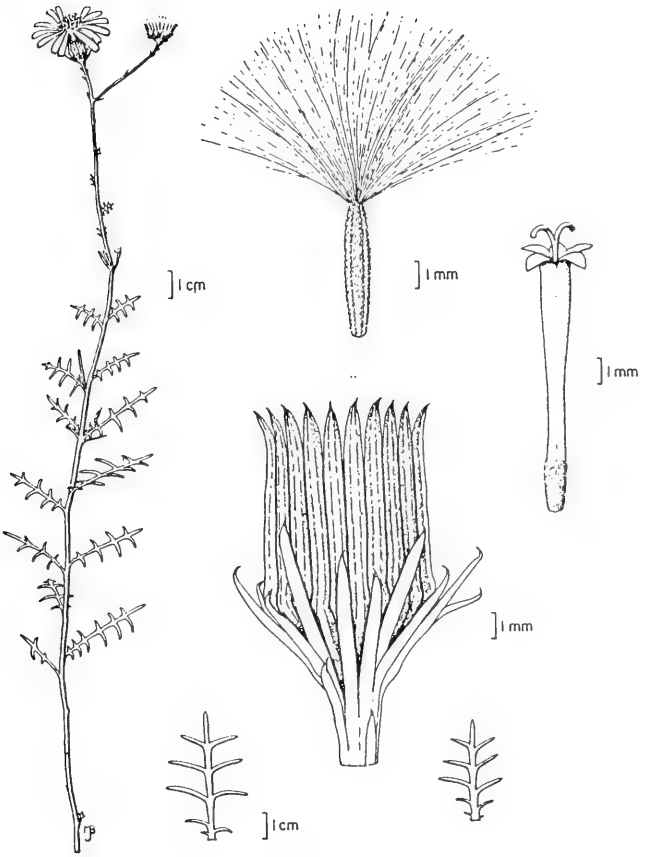

Figure 1. *Senecio pinacatensis* (from *Felger, Baker, & Joseph 87-54*). Drawing by Matthew B. Johnston.

apice calloso et saepe minutebarbulato; bracteae calyculatae phyllariis similes; ligulae 9-15+ mm longae; achaenia 4-6 mm longa, canescentia, pappi setae capillares albae. Chromosomatum numerus $2n = 40$. (Fig. 1).

TYPE: MEXICO: Sonora, Pinacate Region, 1.1 km N of Pinacate Peak, 31°47'10"N, 113°29'18"W, 935 m, 13 Oct 1986, $2n = 40$, *Felger & Joseph 86-426* (HOLOTYPE: ARIZ; Isotypes: CAS, KSU,MEXU,RSA).

Short lived perennials to ca. 1.5 m tall, shrubby or semishrubby, flowering in first season or year, mostly sparsely branched. Stems straight, brittle, striate, and leafy; young herbage mostly densely white woolly, sometimes sparsely pubescent with soft white hairs or occasionally glabrate, at least a portion of each plant usually woolly; older herbage usually moderately white woolly to moderately to sparsely pubescent with soft white hairs, these tangled (arachnoid) to separate and appressed to spreading, or the stems sometimes glabrate or glabrous. Leaves fleshy, sessile, 3.0-6.2 cm long, pinnatisect with 3-7 pairs of widely and evenly spaced perpendicular linear segments, plus 1 or 2 very reduced basal pairs, the lowermost pair subulate and stipulelike, the longer segments of larger leaves (7-)10-20 mm long, 0.7-1.3 mm wide, opposite to subopposite; leaf rachis narrowly winged, 0.9-1.6 mm wide; leaf rachis and lobes grooved adaxially, thickish and somewhat flattened (appearing involute when dried), each segment terminating with a greenish white to pale yellowish (drying tan) conical callous tip 0.2-0.7 mm long.

Heads one to several at the tips of straight leafy stems, the peduncles often subtended by reduced leafy bracts, these evenly scattered or borne distally on peduncle. Involucre cylindrical, cylindrical campanulate to often slightly urceolate, 7.5-11.0 mm wide at the top when fresh, about as wide to slightly wider at the base; phyllaries 5.5-9.0 mm long, 19, 20, 21 or 24 in number, stiff, thickish, and succulent and green when fresh, more or less imbricate (the marginal portions of adjacent phyllaries mostly gripping each other in a tongue and groove pattern); phyllary midribs glabrous, more succulent than the margins, often invaginating when dry so that the phyllaries appear grooved; phyllary margins with minute trichomes, white tomentose or with arachnoid hairs, becoming thickened, yellowish and hardening when dry, the marginal areas themselves bordered with thin membranous and nearly transparent wings; phyllary apices short to long callous tipped and often with a small tuft of hairs; calyculate bracts (3-)4.0-5.5(-7) mm long, about as many as the phyllaries and of similar texture, color and morphology, intergrading with the peduncular bracts.

Corollas bright yellow; ray florets 11-14, the ligules 7.5-15.0+ mm long, 3.0-4.0 mm wide, minutely trilobed at tips, with 4 or 5 veins below, the veins clear yellow when fresh, becoming more prominent and brownish when dry,

the rays apparently largest in the relatively warmer fall season and smaller in the relatively cooler spring season; disk florets numerous, ca. (59-)70-78+ in number, ca. 8 mm long, the corollas tubular-salviform, the lower one half tubular, upper half moderately expanded into a throat. Styles faintly yellow below, darker above, the stigma branches yellow with few minute papillae at tips. Anthers linear, sagittate. Achenes 4-6 mm long, light brown, nearly cylindrical, appressed canescent with hairs in longitudinal rows on the low ridges. Pappus bristles 10-12 mm long, capillary, white, barbellate, nearly as long to slightly longer than the disk florets, ca. 95-105 in number. Flowering at least February to May, and again in October and November. Chromosome number, $2n = 40$ (D. Pinkava, 13 Jun 1988, from cultivated plant grown from *Felger 87-54*).

Paratypes: MÉXICO: Sonora. Pinacate Region: Near base of n side of large cinder cone, ca. 2 km nw of Pinacate Peak, 780 m, 23 Mar 1970, *Felger 19293* (ARIZ); sw slope of Carnegie Peak, 1050 m, steep cinder slope, scattered, weakly perennial, 21 Apr 1970, *Felger 19812* (ARIZ); Steep n facing cinder slope, ca. 0.5 km se of Carnegie Peak, 975 m, 21 Apr 1970, *Felger 19943* (ARIZ); ca. 0.5 km e of base of Carnegie Peak, ca. 930 m, 21 Apr 1970, *Felger, Sakaki, & Tucker 19917* (ARIZ,CAS,KSU,MEXU,TEX); 1.1 km n of Pinacate Peak, 31°47′05″N, 113°29′25″W, 950 m, 13 Oct 1986, *Felger & Joseph 86-435* (ARIZ,ASU,CAS,KSU,MEXU,RSA,TEX); e side of Sierra Pinacate, 31°46′N, 113°37′50″W, 650 m, in cinder soil, 1 Mar 1987, $2n = 40$ (D. Pinkava), *Felger, Baker, & Joseph 87-54* (ARIZ,ASU,CAS,MEXU,RSA,SD,UC). Cinder slopes of Pinacate Peak, 800 m, 31°46′N, 113°30′W, 25 Feb 1984, *Starr 730* (ARIZ).

Senecio pinacatensis is a member of the *Suffruticosi* group, which includes the *S. flaccidus* Less. complex (= *S. douglasii* DC. complex). Ediger (1970) recognized five species in the *Suffruticosi* group. Barkley (1978) placed six species in the group, adding *S. lyonii* A. Gray. However, there are serious unresolved taxonomic problems, especially among the *S. flaccidus-monoensis* complex in Sonora, and the entire group needs revision (T.M. Barkley, pers. comm. 1991). *Senecio pinacatensis* seems closely allied to the widespread *S. flaccidus* complex. There are no other members of the *Suffruticosi* in the immediate region (northwest Sonora, including the Pinacate region, west of México Highway 8, which extends from Sonoyta to Puerto Peñasco).

In the new species the appearance of the leaves, their texture, width of the segments, color, and pubescence most closely resembles that of some specimens of the *S. flaccidus* complex (see Turner & Barkley 1990). Noteworthy distinctions in *S. pinacatensis* are the relatively permanent, woolly pubescence, the leaves with their evenly spaced perpendicular segments (spreading at right angles), the rigid, straight stems, open, sparsely branched shrubs with branching at near right angles, and unusual habitat. The phyllaries of the Pinacate plants are similar to those of other members of the *S. flaccidus* complex. Unlike members of the *S. flaccidus* group, the pattern of stem branching in the

new species is not one of arching upward from the base. The high number of pappus bristles seems striking but it is not known if this is an unique feature. It seems appropriate to describe the new taxon at the species level rather than infraspecific rank because it stands out as morphologically and geographically isolated, the distinctions being as strong as between other members of the *Suffruticosi* complex.

The new species is known only from higher elevations of the main mountain mass of the Pinacate volcanic complex (Sierra Pinacate or Sierra Santa Clara) in northwestern Sonora where it occurs from about 750 m to nearly peak elevation at 1290 m. It is locally common in scattered places on cinder soils and among rocks on the north and northeast side of the mountain, often on steep slopes. During favorable years I have found a few individuals at 650 m or even lower. In contrast to the new species, most members of the *Suffruticosi* group occur on sandy soils of outwashes, alluvial fans, stream bottoms, and valley floors (T.M. Barkley, pers. comm. 1991).

The Pinacate region is within Shreve's (1951) Lower Colorado phytogeographic region of the Sonoran Desert. The higher elevations of the Pinacate complex are surrounded by extremely arid, expansive lowland desert with unpredictable precipitation (Ezcurra, Equihua, & Lopez-Portillo 1987; Felger 1980; Lynch 1981, Ezcurra & Rodrigúes 1986). The higher elevations undoubtedly receive significantly greater and more predictable rainfall than the lowland regions, and temperatures are certainly cooler with a number of nights of freezing weather each year (May 1973; Ezcurra & Rodrigúes 1986).

The almost chaparral-like desert vegetation at higher elevations of the Pinacate volcanic complex contains a number of isolated taxa not found regionally at lower elevations, and many of them do not occur elsewhere in Sonora or mainland México. These mountaintop islandlike populations, mostly with Californian phytogeographic affinities, for the most part are probably Pleistocene relicts (Van Devender *et al.* 1990). Other species, presumably also Pleistocene relicts, regionally isolated at higher elevations on this mountain include: *Artemisia ludoviciana* Nutt., *Astrolepis cochisensis* (Goodd.) Benham & Windham ssp. *chihuahuensis* Benham, *Astrolepis sinuata* (Lag.) Benham & Windham, *Berberis haematocarpa* Woot., *Bothriochloa barbinodis* (Lag.) Herter, *Bromus berterianus* Colla (= *B. trinii* Desv.), *Cleome isomeris* E. Greene, *Gutierrezia sarothrae* (Pursh) Britt. & Rusby, *Keckiella antirrhinoides* (Benth.) Straw ssp. *microphylla* (A. Gray) Straw, *Opuntia chlorotica* Engelm. & Bigel., *Pellaea mucronata* D.C. Eaton var. *mucronata*, *Penstemon pseudospectabilis* M.E. Jones var. *pseudospectabilis*, *Rafinesquia californica* Nutt., *Rhus aromatica* Aiton var. *trilobata* (Nutt.) A. Gray, *Salazaria mexicana* Torr., *Salvia mohavensis* E. Greene, *Stipa speciosa* Trin. & Rup. var. *speciosa*, *Teucrium glandulosum* Kell., *Zephyranthes longifolia* Hemsl.

The Pinacate volcanic complex supports a flora of approximately 300 native species (Felger, in prep.), of which *Senecio pinacatensis* is the only endemic

taxon. Other regional endemics are low elevation plants from the surrounding dune system, e.g., *Astragalus magdalenae* E. Greene var. *piersonii* (Munz & McBurney) Barneb., *Chamaesyce platysperma* (Engelm.) Shinn., *Croton wigginsii* Wheeler, *Heterotheca thiniicola* (Rzedowski & Ezcurra) B.L. Turner, and *Stephanomeria schottii* (A. Gray) A. Gray (Felger 1980, in prep.; Rzedowski & Ezcurra 1986).

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