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## NOMENCLATRURAL CHANGES IN *VIOLA* (VIOLACEAE)

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### ABSTRACT

*Viola purpurea* Kellogg var. *grisea* Jepson is recognized as a subspecies of *V. pinetorum* E. Greene. *Viola quercetorum* M. Baker & J. Clausen is recognized as a subspecies of *V. purpurea*. *Viola lobata* Benth. var. *integrifolia* S. Watson, and *V. sororia* Willd. var. *affinis* L.E. McKinney are changed to subspecific rank for the purpose of consistency.

KEY WORDS: *Viola*, Violaceae, California

A revision of the California Violaceae for the Jepson Manual Project has resulted in the need to make the following nomenclatural changes:

*Viola pinetorum* E. Greene subsp. *grisea* (Jepson) R.J. Little, *stat. et comb. nov.* BASIONYM: *Viola purpurea* Kellogg var. *grisea* Jepson, *Fl. Calif.* Vol. 2:521. 1936. TYPE: U.S.A. California: Tulare Co., Templeton Meadows, near Kern Peak, 8500 ft, 5 July 1912, *W.L. Jepson 4977* (HOLOTYPE: JEPS!).

*Viola purpurea* Kellogg subsp. *quercetorum* (M. Baker & J. Clausen) R.J. Little, *stat. et comb. nov.* BASIONYM: *Viola quercetorum* M. Baker & J. Clausen, *Leafl. W. Bot.* 5:101-102. 1948. TYPE: U.S.A. California: Kern Co., 2.4 mi west of Glenville, on road to Woody, near summit (just W of Linn Valley), 2800 ft, 12 April 1935, *D.D. Keck & J. Clausen 3186* (HOLOTYPE: CAS!; Isotypes: GH,MO,NY,UC!,US).

In keeping with the use of subspecies in the *Viola* treatment for the Jepson Manual Project, the following changes in status are made:

**Viola lobata** Benth. subsp. **integrifolia** (S. Watson) R.J. Little, *stat. et comb. nov.* BASIONYM: *Viola lobata* Benth. var. *integrifolia* S. Watson, *Bot. California* 1:57. 1876.

**Viola sororia** Willd. subsp. **affinis** (J.E. Le Conte) R.J. Little, *stat. et comb. nov.* BASIONYM: *Viola sororia* Willd. var. *affinis* (J.E. Le Conte) L.E. McKinney, *Sida Botanical Miscellany*, No. 7. 1992.

#### ACKNOWLEDGMENTS

I thank Dr. Barbara Ertter and Dr. Elizabeth Neese of the University Herbarium, University of California, Berkeley, for reviewing this paper.

## A NOMENCLATURAL CHANGE IN *VIOLA* (VIOLACEAE)

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### ABSTRACT

*Viola primulifolia* L. var. *occidentalis* A. Gray is changed to subspecific rank.

KEY WORDS: *Viola*, Violaceae

In keeping with the use of subspecies in the *Viola* treatment for the Jepson Manual Project, *V. primulifolia* var. *occidentalis* is changed to subspecific rank.

*Viola primulifolia* L. ssp. *occidentalis* (A. Gray) L.E. McKinney & R.J. Little, *comb. nov.* BASIONYM: *Viola primulifolia* L. var. *occidentalis* A. Gray, Bot. Gaz. (Crawfordsville) 11:255. 1886.

### ACKNOWLEDGMENTS

We thank Dr. Barbara Ertter and Dr. Elizabeth Neese of the University Herbarium, University of California, Berkeley, for reviewing this paper.

## NOMENCLATURAL NOTES FOR THE NORTH AMERICAN FLORA. X.

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### ABSTRACT

The nomenclature of *Ceratotheca triloba* (Bernh.) E. Mey. ex Hook. f., *Linaria vulgaris* Miller, *Pediomelum digitatum* (Nutt. ex Torr. & Gray) Isely, *P. hypogaeum* (Nutt. ex Torr. & Gray) Rydb. var. *scaposum* (A. Gray) Mahler, *P. hypogaeum* var. *subulatum* (Bush) Grimes, *P. pentaphyllum* (L.) Rydb., *Symplocarpus* R.A. Salisbury ex Nutt., and *S. foetidus* Nutt. is discussed. Six new combinations are proposed: **Draba arctica** Vahl ssp. **ostenfeldii** (Ekm.) Kartesz & Gandhi and var. **ostenfeldii** (Ekm.) Kartesz & Gandhi; **Ipomopsis congesta** (Hook.) V. Grant ssp. **nevadensis** (Tidestrom) Kartesz & Gandhi; **Penstemon crandallii** A. Nels. ssp. **taosensis** (Keck) Kartesz & Gandhi; **Physalis subulata** Rydb. var. **neomexicana** (Rydb.) Waterfall ex Kartesz & Gandhi; and **Senna artemisioides** (Gaudichaud ex A.DC.) Kartesz & Gandhi. *Cardamine bulbosa* (Schreb. ex Muhl.) B.S.P., *Carissa macrocarpa* (Eckl.) A. DC., *Evolvulus arizonicus* A. Gray, and *Kalanchoe marmorata* Baker are recognized in place of *Cardamine rhomboidea* (Pers.) DC., *Carissa grandiflora* (E. Mey.) A. DC., *E. laetus* A. Gray, and *K. grandiflora* A. Rich., respectively. The quadrinomial *Lupinus parviflorus* Nutt. ex Hook. & Arn. ssp. *myrianthus* (E. Greene) Harmon var. *myrianthus* is treated as two trinomials: *L. parviflorus* ssp. *myrianthus* (E. Greene) Harmon and *Lupinus parviflorus* var. *myrianthus* (E. Greene) Harmon.

KEY WORDS: Apocynaceae, Araceae, Brassicaceae, Convolvulaceae, Crassulaceae, Fabaceae, Pedaliaceae, Polemoniaceae, Scrophulariaceae, Solanaceae, *Cardamine*, *Carissa*, *Ceratotheca*, *Draba*, *Evolvulus*, *Ipomopsis*, *Kalanchoe*, *Linaria*, *Lupinus*, *Pediomelum*, *Penstemon*, *Physalis*, *Senna*, *Symplocarpus*

## INTRODUCTION

Continuing with the "NOMENCLATORIAL NOTES FOR THE NORTH AMERICAN FLORA" (Kartesz & Gandhi 1989, 1990a, b, c, 1991a, b, c, d, 1992), a tenth note in the series is presented here toward advancing our understanding of North American plant names.

## APOCYNACEAE

*Carissa macrocarpa*

The amatungulu, a coastal shrub of South Africa, belonging to the genus *Carissa* L., has become established in some areas of southern Florida. Palmer & Pitman (1972, p. 1901) and Retief (in Gibbs Russell *et al.* 1987, p. 152) assigned the name *C. macrocarpa* (Eckl.) A. DC. (based on *Arduina macrocarpa* Eckl.; published in 1830) to amatungulu, whereas Rosatti (J. Arnold Arbor. 70:346. 1989.) used the name *C. grandiflora* (E. Mey.) A. DC. (based on *A. grandiflora* E. Mey.; published in 1836). Although Rosatti cited Palmer & Pitman's usage of the name *C. macrocarpa*, he provided no reason for accepting *C. grandiflora*. Based on priority, we assert that *C. macrocarpa* is the correct name to be used.

*Carissa macrocarpa* (Eckl.) A. DC., *Prodr.* 8:336. 1844. BASIONYM: *Arduina macrocarpa* Eckl., *S. African Quart. J.* 1:372. 1830.

*Arduina grandiflora* E. Mey., *Comm. Pl. Afr. Austr.* 191. 1836. *Carissa grandiflora* (E. Mey.) A. DC., *Prodr.* 8:335. 1844.

## ARACEAE

*Symplocarpus foetidus*

Regarding the usage of the conserved generic name *Symplocarpus* R.A. Salisbury *ex* Nuttall, *Gen. N. Amer.* 1:105. Jul 1818. (*vide* Stafleu 1978, p. 305), Mabberley (Taxon 29:601. 1980.) amended the author and bibliographic citation: "[Salisb. *ex*] Barton, *Med. Bot.* 1:124. 1817." We agree with Mabberley regarding the correct bibliographic citation, but disagree with his author citation. Our discussion follows on the authorship of the generic name and on the combination *S. foetidus*.

On p. 123, W. Barton introduced the combination *Symplocarpus foetidus*, ascribed it to Salisbury, and cited numerous references (pp. 123-124), including "Lin. *Sp. Pl.* p. 1372" (which refers to the basionym *Dracontium foetidum*

L.) and "Nuttall, *Gen. Am. plants*, p. 105." Since W. Barton mentioned the correct page number from Nuttall's work seven months prior to its publication, we assume that W. Barton had access to page proof of Nuttall's manuscript. Moreover, of the many references cited by W. Barton, Nuttall alone used the combination *S. foetidus*.

On p. 124, W. Barton treated the genus *Symplocarpus*, ascribed the generic name to Salisbury, and provided Nuttall's Latin diagnosis (copied verbatim from Nuttall's manuscript), which was followed by a description of its reproductive parts, copied from his uncle B. Barton (*Fl. Virginica*). We consider that Nuttall's generic diagnosis is fundamental in validating the generic name. Benjamin Barton's description of it must be considered of secondary importance. Since Nuttall ascribed the generic name *Symplocarpus* to Salisbury, the complete author citation is: R.A. Salisbury *ex* Nuttall. In personal communication, both D. Nicolson (US) and S. Thompson (CM) concurred with this authorship.

The authorship of *Symplocarpus foetidus* is more complicated. On p. 124, W. Barton provided an elaborate treatment of *S. foetidus*. He mentioned the six word description of Michaux (given under the name *Pothos foetida* [L.] Ait.) along with a detailed description quoted verbatim from Nuttall. However, a formal description was unnecessary for the validation of the name *S. foetidus*. For this reason, Nicolson and Thompson (pers. comm.) attributed the combination to: R.A. Salisbury *ex* W. Barton. However, we do not accept their conclusion for the following reasons.

Although W. Barton ascribed both the generic and specific names to Salisbury, W. Barton admitted (p. 126) that he had not seen Salisbury's work and that he relied on Nuttall for the names. Had Barton not referenced Nuttall in the protologue of *Symplocarpus foetidus*, then W. Barton would be credited as the correct author for the species. However, that was not the case. First, W. Barton relied upon Nuttall for the generic and specific names in discussion (i.e., *Symplocarpus* and *S. foetidus*); second, he had access to galley proof of Nuttall's work; and third, he copied Nuttall's description. Therefore, we assert that W. Barton inadvertently published the combination for Nuttall; thus, Nuttall must be credited for the authorship of the specific name. Since Nuttall did not ascribe the combination to anyone else, he alone is the combining author.

*Symplocarpus* R.A. Salisbury *ex* Nuttall in Barton, *Med. Bot.* 1:124. Dec 1817.

*Symplocarpus foetidus* (L.) Nuttall in Barton, *Med. Bot.* 1:124. Dec 1817.

## BRASSICACEAE

*Cardamine bulbosa* and *C. rhomboidea*

Presently, *Cardamine bulbosa* (Schreb. ex Muhl.) B.S.P. and *C. rhomboidea* (Pers.) DC. are considered to be conspecific. Al-Shehbaz (1988, p. 94) accepted the name *C. rhomboidea* for this complex and cited "*Arabis rhomboidea* Pers., *A. bulbosa* Schreber ex Muhl. (*nomen nudum*), *C. bulbosa* (Schreber ex Muhl.) BSP." as synonyms. Regarding the nomenclature for these two epithets, our analysis follows.

Merrill & Hu (1949, pp. 42-43) discussed the nomenclature of *Arabis bulbosa*, but they were uncertain regarding its validity in Muhlenberg's work (Trans. Amer. Philos. Soc. 3:174. 1793.). Although Muhlenberg provided no description for *A. bulbosa*, he cited the following reference: "Clayton 99, n. 45." This citation refers to Clayton's composite work: Gronovius' *Flora Virginica*, ed. 2, which was based primarily on Clayton's collections as indicated on the title page. On p. 99, Gronovius described six *Arabis* species, one of which was based on Clayton's collection (no. 45). Since Gronovius used polynomials (e.g., "*Arabis foliis ovatis denticulatis glabris*" on p. 99), names in his work are considered as invalidly published (Greuter 1988, *ICBN Art.* 23.6c); albeit, his descriptions (e.g., "*Hesperis flore specioso albo, . . . siliqua longa tenui. Tota planta Cochleariae sapore praedita.*" for Clayton's plant) were effectively published. Since Muhlenberg cited a direct reference to an effectively published description, he indeed met the requirements for valid publication (*ICBN Arts.* 32.1c, 32.3, and 32.4). Therefore, the name *A. bulbosa* was validly published by Muhlenberg in 1793 and has priority over the name *A. rhomboidea*.

*Cardamine bulbosa* (Schreb. ex Muhl.) B.S.P., *Pre. Cat.* 4. 1888. BASIONYM: *Arabis bulbosa* Schreb. ex Muhl., Trans. Amer. Philos. Soc. 3:174. 1793. HOLOTYPE: U.S.A. Virginia: Clayton 45 (BM).

*Arabis rhomboidea* Pers., *Syn. Pl.* 2:204. Nov 1806. *Cardamine rhomboidea* (Pers.) DC., *Syst. Nat.* 2:246. 1821.

*Draba arctica* ssp. *ostenfeldii* and var. *ostenfeldii*

Bocher (Biol. Skr. 14(7):19. 1966.) proposed the following combination: *Draba arctica* Vahl ssp. *ostenfeldii* (Ekm.) Bocher. Under ssp. *ostenfeldii*, he (p. 28) recognized two varieties: var. *ostenfeldii* (without an author) and var. *oviboviana* Ekm. However, for his new subspecific combination, Bocher failed to provide complete bibliographical particulars of the basionym as required by *ICBN Art.* 32.3. Hence, Bocher's two combinations remain invalidly published. Since we follow Bocher's treatment of this complex, we simultaneously validate Bocher's usage of subspecific and varietal names below (as allowed by *ICBN Art.* 34.3).

*Draba arctica* Vahl ssp. *ostenfeldii* (Ekm.) Bocher ex Kartesz & Gandhi and var. *ostenfeldii* (Ekm.) Bocher ex Kartesz & Gandhi, ssp. et var. *comb. nov.* BASIONYM: *Draba ostenfeldii* Ekm., Sv. Bot. Tidskr. 23:491. 1929.

Note: Dr. Ekman cited several specimens. To the best of our knowledge, no lectotype has been designated.

## CONVOLVULACEAE

### *Evolvulus arizonicus*

Austin (Sida 14:278. 1990.) used the name *Evolvulus laetus* A. Gray (Proc. Amer. Acad. Arts 17:228. 1882.) and cited *E. arizonicus* A. Gray ("Syn. Fl. N. Amer. 2, 1:218. 1886.") as a synonym. Prior to Austin's publication, *E. arizonicus* was the accepted name for this taxon. Gray's "Syn. Fl. N. Amer. vol. 2(1)" was first issued in 1878 and was reissued in 1886 as a second edition, under the title *The Gamopetalae* (Staffleu & Cowan 1976, p. 992). The name *E. arizonicus* was validly published in the first edition (*i.e.*, in 1878), and thus has priority over the name *E. laetus*.

We communicated our finding to Mr. Barney Lipscomb (editor of Sida), who in turn communicated this information to Austin (for the purpose of providing accurate nomenclature within that journal). Based on our finding, Austin (Sida 14:447. 1991.) correctly cited the date of publication of *Evolvulus arizonicus* and reinstated it in place of *E. laetus*.

*Evolvulus arizonicus* A. Gray, *Syn. Fl. N. Amer.* 2(1):218. 1878.

*Evolvulus laetus* A. Gray, *Proc. Amer. Acad. Arts* 17:228. 1882.

## CRASSULACEAE

### *Kalanchoe marmorata*

For the plants commonly referred to as lifeplant, Austin & McJunkin (J. Arnold Arbor. 59:62. 1978.) used the name *Kalanchoe grandiflora* A. Rich. (published in 1847-48). Unfortunately, these authors failed to realize that Richard's name is a later homonym of *K. grandiflora* Wall. ex Wight & Arn. (published in 1839). Since *K. grandiflora* A. Rich. is an illegitimate name, it is replaced by *K. marmorata* Baker (published in 1892).

*Kalanchoe marmorata* Baker, *Gard. Chron.* 2:300. 1892.

*Kalanchoe grandiflora* A. Rich., *Tent. Fl. Abyss.* 1:310. 1847-48, *non* Wall. ex Wight & Arn. 1839.

## FABACEAE

*Lupinus parviflorus* ssp. *myrianthus* and var. *myrianthus*

Following Kartesz & Gandhi (1991e), the quadrinomial *Lupinus parviflorus* Nutt. ex Hook. & Arn. ssp. *myrianthus* (E. Greene) Harmon var. *myrianthus* is recognized with two trinomials as given below.

*Lupinus parviflorus* Nutt. ex Hook. & Arn. ssp. *myrianthus* (E. Greene) Harmon and var. *myrianthus* (E. Greene) Harmon, Trans. Missouri Acad. Sci. 6:161. 1973. BASIONYM: *Lupinus myrianthus* E. Greene, Pittonia 4:134. 1900.

*Pediomelum*

Grimes (1990) made many new combinations in *Pediomelum* Rydb. Unfortunately, three of those names were made prior to 1990 by other authors. Since Grimes based his new combinations on the same types used by previous authors, his new combinations "*P. digitatum* (Nutt. ex Torr. & Gray) Grimes," "*P. hypogaeum* (Nutt. ex Torr. & Gray) Rydb. var. *scaposum* (Gray) Grimes," and "*P. pentaphyllum* (L.) Grimes" must be treated as isonyms (neither as superfluous names nor as later homonyms; Nicolson 1975). Additional discussion is provided below, under the respective *pediomelums*.

*Pediomelum digitatum* (Nutt. ex Torr. & Gray) Isely, Sida 11:430. 1986; Grimes, Mem. New York Bot. Gard. 61:71. 1990. BASIONYM: *Psoralea digitata* Nutt. ex Torr. & Gray, 1:300. 1841.

Note: Although Isely made the above combination in 1986, he (1990, p. 129) apparently overlooked his own combination and attributed it to Grimes. Isely's attribution to Grimes must be treated as a bibliographical error. For his "new combination," Grimes cited *Pediomelum digitatum* var. *parvifolium* (Shinners) Gandhi & L.E. Brown as a synonym. The preceding trinomial should have alerted Grimes to the fact that prior to his 1990 work, the use of the binomial *Pediomelum digitatum* was indeed established.

*Pediomelum hypogaeum* (Nutt. ex Torr. & Gray) Rydb. var. *scaposum* (A. Gray) Mahler, Sida 12:250-251. 1987; Grimes, Mem. New York Bot. Gard. 61:76. 1990. BASIONYM: *Psoralea hypogaea* Nutt. ex Torr. & Gray var. *scaposa* A. Gray, Boston J. Nat. Hist. 6:173. 1850.

*Pediomelum hypogaeum* var. *subulatum*

Grimes (1990, p. 76) transferred *Pediomelum subulatum* (Bush) Rydb. (based on *Psoralea subulata* Bush) to *Pediomelum hypogaeum* (Nutt. ex Torr. & Gray) Rydb. at varietal rank and made the combination *Pediomelum hypogaeum* var. *subulatum* (Bush) Grimes. He cited *Psoralea subulata* var. *minor* Shinnners as a synonym. Superficially, some workers may believe that Grimes erred in choosing the epithet *subulata* over the epithet *minor*, since the latter existed as a varietal name, and since a name has priority only within its own rank (ICBN Art. 60.1). However, we assert that Grimes was correct in his treatment, and that any confusion of the nomenclature may be attributed to an absence of a discussion of the nomenclature of this taxon and to the incomplete citation of basionym details within Grime's treatment. A discussion is provided here.

When Shinnners (Field & Lab. 19:23. 1951.) proposed *Psoralea subulata* var. *minor*, he automatically created *P. subulata* var. *subulata* (ICBN Art. 26.2). If these two varieties represent a single taxon, then the autonym (var. *subulata*) has priority over var. *minor* (ICBN Art. 57.3).

*Pediomelum hypogaeum* (Nutt. ex Torr. & Gray) Rydb. var. *subulatum* (Bush) Grimes, Mem. New York Bot. Gard. 61:76. 1990. BASIONYM: *Psoralea subulata* Bush (Annual Rep. Missouri Bot. Gard. 17:120. 1906.) var. *subulata* (automatically created by *Psoralea subulata* Bush var. *minor* Shinnners).

*Psoralea subulata* Bush var. *minor* Shinnners, Field & Lab. 19:23. 1951.

*Pediomelum pentaphyllum* (L.) Rydb., N. Amer. Fl. 24:23. 1919, as to the type, but not as to the description; Grimes, Mem. New York Bot. Gard. 61:82. 1990. BASIONYM: *Psoralea pentaphylla* L., *Sp. Pl.* 764. 1753.

Note: Since Rydberg's description for *Pediomelum pentaphyllum* applied to a decumbent pediomelum (endemic to México), and since the type of its basionym (*Psoralea pentaphylla*) applied to the acaulescent species of *Pediomelum* found in sw United States (se Arizona, sw New Mexico, Trans-Pecos area of Texas) and adjacent México (Ockendon 1965), Grimes perhaps believed that *Pediomelum pentaphyllum* (L.) Rydb. was invalidly published. Grimes (pp. 82-83), therefore proposed "*Pediomelum pentaphyllum* (L.) Grimes."

It is unfortunate that Grimes failed to realize the following. On the transference of *Psoralea pentaphylla* to *Pediomelum* by Rydberg, the resultant combination, *Pediomelum pentaphyllum*, must be retained for the species to which the type of *Psoralea pentaphylla* belongs, and that *Pediomelum pentaphyllum*

must be attributed to Rydberg, even though Rydberg applied his combination erroneously to a Mexican species (*ICBN* Art. 55.2).

### *Senna artemisioides*

The Australian legume, *Cassia artemisioides* Gaudichaud ex A. DC., has become established as a weed in Arizona and California (Isely 1975, p. 64). In their generic treatments of American Cassinae (*Cassia* L., *Chamaecrista* Moench, and *Senna* P. Mill.), Irwin & Barneby (1982) did not include this Australian legume. Based on its characteristics (*e.g.*, fertile stamens 10 with terminal poricidal dehiscence; absence of bracteoles), we assign this legume to *Senna* and propose the following combination.

***Senna artemisioides* (Gaudichaud ex A. DC.) Kartesz & Gandhi, *comb. nov.*** BASIONYM: *Cassia artemisioides* Gaudichaud ex A. DC., *Prodr.* 2:495. 1825. TYPE: *Gaudichaud* (P).

## PEDALIACEAE

### *Ceratotheca triloba*

*Ceratotheca triloba*, a south African native, has become naturalized in se U.S.A. This binomial has been attributed to E. Meyer (Soil Conservation Service 1982, p. 262); to E. Meyer ex Bernh. (Stapf in Dyer 1904); to Bernh. (Jackson 1895); and to (Bernh.) Hook. f. (Abels 1975, p. 199; Welman in Gibbs Russell *et al.* 1987, p. 187). Our analysis follows.

Bernhardi (Linnaea 16:41. 1842.) proposed *Sporledera* as a segregate genus from *Ceratotheca* Endl. and proposed *S. triloba* as a *sp. nov.* Although *Sporledera* Bernh. is a later homonym of *Sporledera* Hampe 1837, and thus illegitimate, the binomial *S. triloba* Bernh. must be considered for purpose of priority (*ICBN* Art. 68.1). In its protologue, Bernhardi cited *C. triloba* E. Mey., a manuscript name, as a synonym. At that stage, the correct authorship of *C. triloba* was: E. Mey. ex Bernh., *pro syn.* (*ICBN* Rec. 50A.1, Ex. 1). In their treatment of the genus *Ceratotheca*, Bentham & Hooker (*Gen. Pl.* 2:1059. 1876.) mentioned the name *S. triloba*, but did not make the combination; hence, they did not validate the name *C. triloba* (*ICBN* Art. 33 Ex. 2). Apparently, Hooker (*Bot. Mag.* 114: t. 6974. 1888.) was the first to validate the combination *C. triloba* and he ascribed the name to E. Mey.

*Ceratotheca triloba* (Bernh.) E. Mey. ex Hook. f., *Bot. Mag.* 114: t. 6974. 1888. BASIONYM: *Sporledera triloba* Bernh., *Linnaea* 16:42. 1842.

## POLEMONIACEAE

*Ipomopsis congesta* ssp. *nevadensis*

Cronquist (in Cronquist *et al.* 1984, p. 128), who recognized *Gilia nevadensis* Tidestrom at specific rank, remarked that Tidestrom's plant appeared to be a compact expression of *G. congesta* Hook. ssp. *palmifrons* A. Brand, and deserved to be treated as an infraspecific taxon of *G. congesta*. Kartesz (1988, pp. 961-963) recognized the genus *Ipomopsis* Michx. as distinct from the genus *Gilia* Ruiz & Pavon and treated Tidestrom's plant at subspecific rank within *Ipomopsis congesta* (Hook.) V. Grant. He remarked that ssp. *nevadensis* represented a unique expression within the *I. congesta* complex. Kartesz's treatment is maintained here. Since the combination *I. congesta* ssp. *nevadensis* needs validation, it is formally proposed below.

***Ipomopsis congesta* (Hook.) V. Grant ssp. *nevadensis* (Tidestrom) Kartesz & Gandhi, *comb. et stat. nov.* BASIONYM: *Gilia nevadensis* Tidestrom, Proc. Biol. Soc. Wash. 38:15. 1925. TYPE: U.S.A. Nevada: Toiyabe Natl. Forest, Bunker Hill, A. Hitchcock 865 (?).**

## SCROPHULARIACEAE

*Linaria vulgaris*

*Linaria vulgaris* (toadflax), an Eurasian native, has become naturalized in temperate North America. Chater *et al.* (in Tutin *et al.* 1972, p. 232) and Dorn (1988, p. 282) attributed the name to Miller (*Gard. Dict.*, ed. 8. *Linaria* no. 1. 1768), whereas Holmgren (in Cronquist *et al.* 1984, p. 460) attributed the name to Hill. Our analysis follows.

Hill (*Brit. Herb.* 108. 1756) based *Linaria vulgaris* on *Antirrhinum linaria* L. However, he did not use the Linnaean system of binary nomenclature in this work. Whatever "binomials" may be found within that work are not true binomials, but mere descriptive phrases reduced to two words (see ICBN Art. 23.6c, Ex. 9). Therefore, the name *L. vulgaris* was not validly published in Hill's work. Apparently, unaware of this fact, Holmgren (*l.c.*) erroneously used Hill as the author. To the best of our knowledge, Miller was the first to validate the name *L. vulgaris*.

*Linaria vulgaris* [Hill, *Brit. Herb.* 108. 1756, *nom. invalida*]; Mill., *Gard. Dict.*, ed. 8. *Linaria* no. 1. 1768.

*Antirrhinum linaria* L., *Sp. Pl.* 616. 1753. *Linaria linaria* (L.) Karsten, *Deutsche Fl.* 947. 1882 (Tautonym).

*Penstemon crandallii* ssp. *taosensis*

We concur with Nisbet & Jackson (Univ. Kansas Sci. Bull. 41(5):726. 1960.) on their transfer of *Penstemon linarioides* A. Gray ssp. *taosensis* Keck to *P. crandallii* A. Nels. at infraspecific rank. However, we do not follow their varietal recognition of Keck's taxon and reinstate its subspecific rank.

***Penstemon crandallii* A. Nels. ssp. *taosensis* (Keck) Kartesz & Gandhi, *comb. et stat. nov.* BASIONYM: *Penstemon linarioides* A. Gray ssp. *taosensis* Keck, Bull. Torrey Bot. Club 64:373. 1937. *Penstemon crandallii* A. Nels. var. *taosensis* (Keck) Nisbet & R.C. Jackson, Univ. Kansas Sci. Bull. 41(5):726. 1960. TYPE: U.S.A. New Mexico: Taos Co., 30 Jul 1932, *Nelson & Ruth 158* (UC).**

## SOLANACEAE

*Physalis subulata* var. *neomexicana*

Waterfall (in Correll & Johnston 1970, p. 1392) proposed the combination *Physalis subulata* Rydb. var. *neomexicana* (Rydb.) Waterfall and cited the basionym. Unfortunately, Waterfall failed to provide the complete bibliography of the basionym, and thus did not meet the requirements for validation of a new combination (ICBN Art. 33.2). Prior to proposing the preceding combination, Waterfall (Rhodora 60:168-169. 1958.) treated Rydberg's plant as a variety of *P. foetens* Poir. and lectotypified Rydberg's binomial. We accept Waterfall's 1970 treatment and provide the bibliography of the basionym to validate the combination.

***Physalis subulata* Rydb. var. *neomexicana* (Rydb.) Waterfall ex Kartesz & Gandhi, *comb. nov.* BASIONYM: *Physalis neomexicana* Rydb., Mem. Torrey Bot. Club 4:325. 1896. *Physalis foetens* Poir. var. *neomexicana* (Rydb.) Waterfall, Rhodora 60:168. 1958. LECTOTYPE (*vide* Waterfall, Rhodora 60:168-169. 1958.): *Fendler 678* (GH).**

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*CYNODON NLEMFUENSIS*, (POACEAE: CHLORIDEAE) PREVIOUSLY  
UNREPORTED IN TEXAS

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ABSTRACT

*Cynodon nlemfuënsis* var. *nlemfuënsis*, previously unreported in Texas has been found in Kenedy County. A key for the Texas species of *Cynodon* is included.

KEY WORDS: *Cynodon*, *Cynodon nlemfuënsis*, Chlorideae, Poaceae, Texas

*Cynodon* L. Rich., is a genus of nine species and ten varieties (Harlan *et al.* 1970). Clayton & Renvoize (1986) listed  $\pm$  eight species in the Old World, with one species being pantropical and extending into warm temperate regions. The species occupy inhabited, grazed, or other disturbed places. *Cynodon nlemfuënsis* Vanderyst var. *nlemfuënsis* is native to Africa from Ethiopia to Rhodesia (= Zimbabwe) and Angola (Harlan *et al.* 1970). *Cynodon nlemfuënsis* was not listed as occurring in Texas by Cory & Parks (1937), Correll & Johnston (1970), Gould (1975), Hatch *et al.* (1990), nor Lonard (in press). There are now three species of *Cynodon* reported for Texas: *dactylon* (L.) Pers., *C. aethiopicus* Clayton & Harlan, and *C. nlemfuënsis* var. *nlemfuënsis*. The following key to Texas *Cynodon* is modified from Clayton & Harlan (1970).

KEY TO TEXAS *CYNODON*

1. Plants with rhizomes and stolons. .... *C. dactylon* (L.) Pers.

1. Plants without rhizomes, but with stolons. .... (2.)
  2. (1.) Culms woody, very hard; racemes in 2-5 whorls (rarely 1), stiff, frequently red or purple. .... *C. aethiopicus* Clayton & Harlan
  2. Culms not woody (stolons may be woody), soft, racemes in 1 whorl (occasionally 2), flexuous, frequently green. ....  
 . .... *C. nlemfuënsis* Vanderyst var. *nlemfuënsis*

Harlan *et al.* (1970) provide the following description of *Cynodon nlemfuënsis* var. *nlemfuënsis*: stolons stout with long internodes; rhizomes absent; leaves linear-lanceolate, sometimes with scattered trichomes; whorls of inflorescence 1, rarely 2 or 3 verticillate; racemes (branches) slender, long, often somewhat flexuous, 4-7 cm long; spikelets rather widely spaced on raceme (branch), ca. 4 mm long; glumes subequal, longest ca.  $\frac{3}{4}$  the spikelet length; lemma pointed, pubescent on keel, sometimes lightly pubescent along margins. The growth habit of stout stolons and rather slender culms forms loose mats up to 60 cm high. Chromosome number  $2n = 18$ , rarely 36.

Specimen collected: UNITED STATES. Texas: Kenedy Co., 04 November 1990, *S. & G. Jones 6158* (PAUH, sj [Stanley Jones' personal herbarium], TAES, jw [J.K. Wipff's personal herbarium]). The collection site is 43.9 miles south on US 77 from its junction with Los Olmos Creek, north of Raymondville, *Cynodon nlemfuënsis* was frequently observed for ca. 5 miles south and north along US 77 from the collection site. The habitat is an open mesic coastal prairie (roadside) with the elevation being about 13 feet (4 m) above sea level. The soils are in the Nueces-Sarita series, are light gray fine sands, and are fairly well drained. They have moderately slowly and moderately rapidly permeable lower layers with a reasonable shrink swell potential. The soil is neutral to rather alkaline. The geology of the site is Wind Blown Deposits (Qs) (Recent). Associated species include *Chloris gayana* Kunth, *Pennisetum ciliare* (L.) Link, *Cynodon dactylon*, *Palafozia texana* DC., *Eriogonum multiflorum* Benth., *Sporobolus purpurascens* (Swartz) Hamilt., *S. cryptandrus* (Torr.) A. Gray, *Panicum virgatum* L., *P. capillarioides* Vasey, *Eragrostis secundiflora* Presl, *E. swallenii* Hitchc., *E. lugens* Nees, *Trichoneura elegans* Swallen, *Aristida purpurea* Nutt., *A. longispica* Poir., *Digitaria texana* Hitchc., and *Paspalum plicatulum* Michx. *Cynodon nlemfuënsis* should not be expected to spread outside of region 6 or the southern part of region 1 as defined by Hatch *et al.* (1990) because it will not endure prolonged freezes.

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REDUCTION OF *STREPTOCALYX* (BROMELIACEAE: BROMELIOIDEAE)

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ABSTRACT

*Streptocalyx* is reduced to *Aechmea* and new combinations are provided where necessary.

KEY WORDS: *Aechmea*, *Streptocalyx*, Bromeliaceae

In Flora Neotropica Monograph No. 14 (Smith & Downs 1979), the genera *Aechmea* and *Streptocalyx* are distinguished from one another on the basis of the presence or absence, respectively, of petal appendages. More recently, petal appendages have proven unacceptable as a delimiting generic character in Bromeliaceae where groups of closely related species are segregated solely on the basis of this character. An example is *Streptocalyx*, which in all other respects is identical to *Aechmea* sensu Smith & Kress (1989). Baker (1889) was the first to comment on the artificiality of *Aechmea* versus *Streptocalyx*, and considered them "scarcely worth separating." We agree completely with Baker and here reduce *Streptocalyx* to synonymy. The appropriate names in *Aechmea* for taxa previously treated as *Streptocalyx* follow.

*Aechmea* Ruiz & Pavon, *Fl. Peruv. Prodr.* 47. 1793, *nomen conservandum*.

*Streptocalyx* Beer, *Flora* 37:348. 1854. *syn. nov.*

*Aechmea arenaria* (Ule) Smith & Spencer, *comb. nov.* BASIONYM: *Streptocalyx arenarius* Ule, *Verh. Bot. Brandenb.* 48:134. 1907. TYPE: PERU. *Ule 6335* (HOLOTYPE: B; Isotype: MG).

*Aechmea biflora* (L.B. Smith) Smith & Spencer, *comb. nov.* BASIONYM: *Streptocalyx biflorus* L.B. Smith, *Phytologia* 24:448, pl. 5, figs. 15, 16. 1972. TYPE: ECUADOR. *Dodson & Thien 2070* (HOLOTYPE: WIS).

- Aechmea beeriana* Smith & Spencer, *nom. nov.* Based on: *Streptocalyx poeppigii* Beer, *Bromel.* 141. 1856; non *Aechmea poeppigii* Baker, *Handb. Bromel.* 37. 1889. TYPE: BRAZIL. *Poeppig s.n.* (LECTOTYPE: B).
- Aechmea brachystachya* (Harms) Smith & Spencer, *comb. nov.* BASIONYM: *Streptocalyx brachystachys* Harms, *Notizbl. Bot. Gart. Berlin* 9:1152. 1927. TYPE: PERU. *Tessmann 4645* (HOLOTYPE: B).
- Aechmea colombiana* (L.B. Smith) Smith & Spencer, *comb. nov.* BASIONYM: *Streptocalyx colombianus* L.B. Smith, *Caldasia* [1], No. 5:9, fig. 5. 1942. TYPE: COLOMBIA. *Cuatrecasas 6863* (HOLOTYPE: US; Isotype: COL).
- Aechmea colombiana* (L.B. Smith) Smith & Spencer var. *laxa* (E. Gross) Smith & Spencer, *comb. nov.* BASIONYM: *Streptocalyx colombianus* L.B. Smith var. *laxus* E. Gross, *Trop. Subtrop. Pflanzenwelt* 65:72, figs. 44, 45. 1989. TYPE: COLOMBIA. *Rauh 37422* (HOLOTYPE: HEID).
- Aechmea curranii* (L.B. Smith) Smith & Spencer, *comb. nov.* BASIONYM: *Streptocalyx curranii* L.B. Smith, *Contr. Gray Herb.* 95:44, pl. 11, figs. 7-9. 1931. TYPE: BRAZIL. *Curran 143* (HOLOTYPE: US).
- Aechmea floribunda* Martius *ex* Schultes *f. in* Roemer & Schultes, *Syst.* 7(2): 1271. 1830. TYPE: BRAZIL. *Martius s.n.* (HOLOTYPE: M). *Streptocalyx floribundus* (Martius *ex* Schultes *f.*) Mez *in* Martius, *Fl. Bras.* 3(3):284. 1892.
- Aechmea fuerstenbergii* E. Morren & Wittmack, *Belg. Hortic.* 29:42, pl. 2. 1879. TYPE: BRAZIL. *Porte s.n.* (HOLOTYPE: LG). *Streptocalyx fuerstenbergii* (E. Morren & Wittmack) E. Morren, *Belg. Hortic.* 33:16. 1883.
- Aechmea geminiflora* (Harms) Smith & Spencer, *comb. nov.* BASIONYM: *Streptocalyx geminiflorus* Harms, *Notizbl. Bot. Gart. Berlin* 12:527. 1935. TYPE: ECUADOR. *Diels 1109* (HOLOTYPE: B).
- Aechmea kentii* (Luther) Smith & Spencer, *comb. nov.* BASIONYM: *Streptocalyx kentii* Luther, *Selbyana* 12:83, 86, fig. 14. 1992. TYPE: ECUADOR. *Kent s.n.* (HOLOTYPE: SEL; Isotype: QCA).
- Aechmea lanata* (L.B. Smith) Smith & Spencer, *comb. nov.* BASIONYM: *Streptocalyx lanatus* L.B. Smith, *Contr. Gray Herb.* 95:45, pl. 11, figs. 4, 5. 1931. TYPE: BRAZIL. *Curran 138* (HOLOTYPE: US).
- Aechmea longifolia* (Rudge) Smith & Spencer, *comb. nov.* BASIONYM: *Bromelia longifolia* Rudge, *Guyan.* 1:31. pl. 49. 1805. TYPE: FRENCH

GUIANA. *Martin s.n.* (HOLOTYPE: BM). *Streptocalyx longifolius* (Rudge) Baker, *Handb. Bromel.* 31. 1889.

*Aechmea lugoi* (Gilmartin & Luther) Smith & Spencer, *comb. nov.* BASIONYM: *Streptocalyx lugoi* Gilmartin & Luther, *J. Brom. Soc.* 40(5):208, fig. 8. 1990. TYPE: ECUADOR. *Lugo 308* (HOLOTYPE: S; Isotype: MO).

*Aechmea murcae* (L.B. Smith) Smith & Spencer, *comb. nov.* BASIONYM: *Streptocalyx murcae* L.B. Smith, *Phytologia* 7:110, pl. 1, figs. 20-24. 1960. TYPE: BRAZIL. *Murca-Pires 951* (HOLOTYPE: IAN).

*Aechmea napoensis* Smith & Spencer, *nom. nov.* Based on: *Streptocalyx pallidus* Luther, *J. Brom. Soc.* 30(6):256-258, fig. 1980; non *Aechmea pallida* L.B. Smith, *Mem. New York Bot. Gard.* 10:40, fig. 1964. TYPE: ECUADOR. *Luther s.n.* (HOLOTYPE: SEL).

*Aechmea poitaei* (Baker) Smith & Spencer, *comb. nov.* BASIONYM: *Streptocalyx poitaei* Baker, *Handb. Bromel.* 31. 1889. TYPE: FRENCH GUIANA. *Poiteau s.n.* (HOLOTYPE: K).

*Aechmea seidelii* (Leme) Smith & Spencer, *comb. nov.* BASIONYM: *Streptocalyx seidelii* Leme, *Bradea* 4(39):313. 1987. TYPE: BRAZIL. *Seidel 1056* (HOLOTYPE: HB).

*Aechmea williamsii* (L.B. Smith) Smith & Spencer, *comb. nov.* BASIONYM: *Streptocalyx williamsii* L.B. Smith, *Contr. Gray Herb.* 98:14, pl. 4, fig. 7. 1932. TYPE: PERU. *Williams 2722* (HOLOTYPE: F).

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STUDIES ON THE GENUS *BIDENS* L. (COMPOSITAE) FROM THE EASTERN HEMISPHERE. 2. NEW COMBINATIONS AND A NEW SUBSPECIES FOR THE FLORA OF TROPICAL EAST AFRICA AREA

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ABSTRACT

Four new combinations and a new subspecies are provided for the forthcoming account of the genus *Bidens* for the Flora of Tropical East Africa: *Bidens scopulorum* *comb. nov.* (= *Coreopsis scopulorum*), *Bidens elgonensis* *ssp. morotonensis comb. et stat. nov.* (= *Coreopsis morotonensis*), *Bidens elgonensis* *ssp. cheranganiensis ssp. nov.*, *Bidens odora* *comb. nov.* (= *Coreopsis odora*) and *Bidens acuticaulis* *var. filirostris comb. nov.* (= *Bidens paupercula* *var. filirostris*). A lectotype is selected for the latter name.

KEY WORDS: *Bidens*, *Coreopsis*, Compositae, taxonomy, Africa

*Bidens scopulorum* (Sherff) T.G.J. Rayner, *comb. nov.* BASIONYM: *Coreopsis scopulorum* Sherff, Bot. Gaz. (Crawfordsville) 88:302. 1929. TYPE: KENYA. K1, Northern Frontier Province, summit of Mt. Garguez, 26 Aug. 1911, E. Heller *s.n.* [U.S. Nat. Herb. No. 634308] (HOLOTYPE: US).

*Bidens scopulorum*, known only from the type locality in central Kenya, is a member of a group of closely related species each with a restricted distribution occurring at altitude and endemic to eastern Africa. It is apparently most closely related to *B. chippii* (M.B. Moss) Mesfin Tadesse and *B. isostigmatoides* Sherff, both found only in the Imatong Mts. of southern Sudan. From these two species, *B. scopulorum* may be distinguished by its capitula ca. 1 cm wide at anthesis (2-4 cm in *B. chippii* and *B. isostigmatoides*), outer phyllaries 8 or fewer (not to 20+), inner phyllaries ca. 3 mm long (not to 7 mm), paleae apices obtuse or rounded (not acute), and cypselas setose and biaristate (not nude and exaristate).

*Bidens elgonensis* (Sherff) Agnew ssp. *morotonensis* (Sherff) T.G.J. Rayner, *comb. et stat. nov.* BASIONYM: *Coreopsis morotonensis* Sherff, Amer. J. Bot. 34:157, f. 5. 1947. TYPE: UGANDA. U1, Northern Province, Karamoja, Mt. Moroto, Jun. 1942, *I.R. Dale U-261* (HOLOTYPE: EA; Isotype: K). *Bidens morotonensis* (Sherff) Agnew, *Upland Kenya Wild Flowers*. 466. 1974.

Another member of this group of species is *Bidens elgonensis* from eastern Uganda and central-western Kenya. This species, originally published by Sherff (1925) as *Coreopsis elgonensis*, was based on the single specimen of *R.A. Dummer 3304* at K collected on Mt. Elgon. Later, (Sherff 1947) he described a closely related species, *C. morotonensis*, from the nearby Mt. Moroto. This he distinguished from *C. elgonensis* by its not exserted capitula (exserted in *C. elgonensis*), peduncles 1-2 cm (not 2-9 cm), leaves 2.0-3.5 cm long (not 1.0-1.8 cm), etc. Subsequent collections have maintained these vegetative distinctions and have added a further character, namely specimens collected on Mt. Elgon have at least some internodes 2 cm or more long towards the apices of the flowering branches, whereas specimens collected on Mt. Moroto usually have internodes 1.5 cm or less. Although specimens from these two areas show constant vegetative differences, characters of the inflorescence are uniform throughout the range of the species. Therefore, because differences in characters of the capitula are mostly employed to distinguish between species in African *Bidens*, the distinctions between these two variants are not here considered worthy of specific delimitation. For this reason I have decided to reduce *C. morotonensis* to the level of subspecies within *B. elgonensis*.

*Bidens elgonensis* (Sherff) Agnew ssp. *cheranganiensis* T.G.J. Rayner, *ssp. nov.* TYPE: KENYA. K3, Rift Valley Province, Cherangani, east slope of Kaisungor, Dec. 1971, *D.R. Tweedie 4192* (HOLOTYPE: K).

Subspecies haec a *Bidente elgonensi* (Sherff) Agnew subspecie *elgonensi* et *Bidente elgonensi* subspecie *morotonensi* differt capitulis exsertis, quidem foliis aliquibus duobus centimetris longis plerumque multo longioribus, necnon quidem internodiis aliquibus versus apices caulium florentium plus quam duobus centimetris longis.

*Bidens elgonensis* also occurs in the Cherangani Hills, a large dissected plateau to the east of Mt. Elgon. In this area its distribution is much more widespread and vegetative characters show a greater degree of variation within and between specimens. Populations in this area, however, are distinct from those growing on Mt. Elgon and Mt. Moroto. The internodes toward the apices of the flowering branches are mostly over 2 cm long and the capitula

are exerted on long peduncles, thus resembling *B. elgonensis* ssp. *elgonensis*. The leaves, however, resemble those of *B. elgonensis* ssp. *morotonensis*, but may be as much as 5 cm long. The leaf segments also tend to be much wider.

***Bidens odora*** (Sherff) T.G.J. Rayner, *comb. nov.* BASIONYM: *Coreopsis odora* Sherff, Kew Bull. 11:445. 1957. TYPE: TANZANIA. T7, Southern Highlands Province, Mdapo, Mar. 1954, *S.R. Semsei 1655* (HOLOTYPE: EA; Isotype: K).

*Bidens odora* is restricted to the Njombe district of southern Tanzania, occurring in montane grassland between about 2150 and 2300 m. It is perhaps most closely allied to *B. elgonensis* but may be distinguished from this species by its bipinnatisect leaves with segments to 1 mm wide (tripartite with segments 2-13 mm wide in *B. elgonensis*), capitula several to many in terminal corymbs (not solitary or few at branch apices) and cypselas biaristate and narrowly winged (not exaristate and unwinged).

***Bidens acuticaulis*** Sherff var. ***filirostris*** (P. Taylor) T.G.J. Rayner, *comb. nov.* BASIONYM: *Bidens paupercula* Sherff var. *filirostris* P. Taylor, Hooker's Icon. Pl. 36:t. 3580. 1962. TYPE: TANZANIA. T8, Southern Province, Songea District, ca. 140 km east of Songea, 4 Jun. 1956, *E.W.B.H. Milne-Redhead & P.G. Taylor 10547* (LECTOTYPE [here selected]: K; Isolectotypes: B, BR, EA, K[2 sheets], LISC, P, S, SRGH).

A comparison of the type collections of *Bidens acuticaulis* (1915) and *B. paupercula* (1923) has shown them to be virtually identical. The key distinction used by Sherff (1937) to separate these two species, namely "rami acutissime angulati et fere subalati" for *B. acuticaulis* as opposed to "rami tantum moderate angulati vel subtetragoni" for *B. paupercula*, is wholly unreliable even as a character to distinguish between specimens determined by Sherff himself. Clearly, therefore, *B. paupercula* should be considered a synonym of *B. acuticaulis*. With the uniting of these two names it becomes necessary to rename *B. paupercula* var. *filirostris*. This variety is mainly distinguished from the type variety by the enormously elongated cypselas which may be up to 26 cm long.

Taylor (1962) indicated that the holotype of var. *filirostris* was at K, but here there are three sheets of the type collection *Milne-Redhead & Taylor 10547* bearing parts of at least five plants. As none of these bear any indication by Taylor that they were intended to be the holotype, I do not feel that he has complied with the definition of a holotype as provided by Article 7.3 of the *International Code of Botanical Nomenclature* (Greuter *et al.* 1988). Therefore I consider it is necessary to select a lectotype from among the sheets of the

type collection at K. Of these "Sheet 2" is here chosen as the lectotype. In addition to having mature fruit this sheet, unlike the others, also possesses well preserved leaves.

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A NEW SPECIES OF *COREOPSIS* (ASTERACEAE) FROM SOUTHERN  
MEXICO

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ABSTRACT

A new species, *Coreopsis oaxacensis* B. Turner, is described from southeasternmost Puebla and closely adjacent Oaxaca. It belongs to the sect. *Pseudo-Agarista* where it relates to *C. rhyacophylla*, from which it differs in being a smaller plant, with smaller, more pubescent leaves and smaller heads with shorter rays.

KEY WORDS: *Coreopsis*, Asteraceae, México

Routine identification of Mexican Asteraceae has revealed the following novelty.

*Coreopsis oaxacensis* B. Turner, *sp. nov.* TYPE: MEXICO. Oaxaca: Mpio. de Tamazulapan, Cerro Pericón, 3 km N of San Pedro Nopala on road to Yosocuno, 2600 m, 4 Nov 1991, *J.L. Panero, P. Davila, and P. Tenorio 2606* (HOLOTYPE: MEXU; Isotype: TEX).

*Coreopsi rhyacophilae* Greenm. similis sed foliis multo minoribus (2-5 cm longis vs. 6-12 cm) pariter puberuli-hispidulis (vs. glabris vel fere glabris) et capitulis minoribus corollis radii brevioribus (8-10 mm longis vs. 12-20 mm).

Suffruticose perennial herbs or shrublets to 60 cm high. Leaves semileathery, opposite, sheathing at the very base, mostly 2-6 cm long, 1-3 cm wide, mostly pinnately dissected with 3-5 primary divisions, the ultimate divisions usually shortly trilobed; petioles mostly 3-10 mm long; blades ovate to ovate deltoid in outline, nearly glabrous to conspicuously and evenly hispidulous-puberulous at first but glabrate with age. Heads 2-6, terminal, the ultimate peduncles 1-3 cm long, sparsely puberulous. Involucres turbocampanulate, 6-8

mm high, 10-12 mm wide (pressed), the outer bracts (calyculus) 8-11, linear-ob lanceolate, 3-5 mm long, the inner bracts elliptic to elliptic oblanceolate, 6-7 mm long, 1.5-2.5 mm wide, sparsely puberulent. Receptacle plane to somewhat convex, glabrous or nearly so, the bracts linear-lanceolate, striate, hirsute below. Ray florets 8-11, neuter, the ligules yellow, striate, mostly 8-12 mm long, 2-6 mm wide. Disk florets 30-60 per head, the corollas glabrous, yellow, 4-5 mm long, the tube ca. 2 mm long, the throat ca. 2 mm long. Achenes ca. 4 mm high, 1.5 mm wide, markedly ciliate along the margins and along the midline on the adaxial side, otherwise glabrous; pappus of two persistent hispidulous-ciliate awns 4-5 mm long.

ADDITIONAL SPECIMEN EXAMINED: MEXICO. Oaxaca: Mpio. Zapouila, Portezuelo Majada Grande, Cerro Yolotepec al S de Membrillos (18° 03' N, 97° 32' W), ca. 2400 m, 9 Nov 1986, *Pedro Tenorio L. 12391* (TEX,MEXU). Puebla: Mpio. Caltepec, Cerro Chicamole, al E de Membrillos (18° 08' N, 97° 34' W), ca. 2400 m, 8 Nov 1986, *Tenorio L. 12371* (TEX).

*Coreopsis oaxacensis* belongs to the sect. *Pseudo-Agarista* (sensu Crawford 1976) where it relates to *C. rhyacophila* Greenm. It differs from the latter in being a smaller plant (30-60 cm high vs. ca. 100 cm), having markedly smaller leaves and smaller heads with smaller rays, as noted in the Latin diagnosis. According to its collectors, *Coreopsis oaxacensis* is apparently abundant locally. Type material differs from the remaining collections in having somewhat larger heads and nearly glabrous foliage, otherwise the plants differ but little.

#### ACKNOWLEDGMENTS

I am grateful to Guy Nesom for the Latin diagnosis and to him and Carol Todzia for reviewing the manuscript. José Panero kindly provided his excellent collections to serve as type material.

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A NEW SPECIES OF *PEDICULARIS* (SCROPHULARIACEAE) FROM  
WESTERN MEXICO

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ABSTRACT

*Pedicularis chihuahuensis* *sp. nov.* is described from southern Chihuahua, México. Based on similarities in floral morphology, it is most closely related to the Mexican species *P. mexicana* and *P. orizabae* but differs from both in having tuberous roots, villous vestiture, foliar teeth with aristate apices, and merely toothed (unlobed) floral bracts. The new species is allopatric with both of its putatively close relatives.

KEY WORDS: *Pedicularis*, Scrophulariaceae, México

A taxonomic overview of the Mexican species of *Pedicularis* with pinnately parted leaves was presented by McVaugh & Mellichamp (1975), and another such species was described by McVaugh & Koptur (1978). Yet another previously unknown one, has been collected in southern Chihuahua and is described here.

*Pedicularis chihuahuensis* Nesom, *sp. nov.* TYPE: MEXICO. Chihuahua: Mpio. Guadalupe y Calvo, 55.2 km SW of El Vergel on road between Parral and Guadalupe y Calvo, N side of town of Catedral in valley with moist meadows surrounded by dry hills with pines, fenced area protected from grazing, ca. 2400 m, 23 Aug 1983, G. Nesom 4756 (HOLOTYPE: TEX!; Isotype: MEXU!).

*Pediculari mexicanae* Zucc. *ex* Benth. ac *P. orizabae* Cham. & Schlecht. similis morphologia florali sed a speciebus ambabus differt radicibus tuberantibus, vestimento villosa, et bracteis floralibus marginibus nonlobatis.

Perennial herbs arising from thick, fleshy roots, sometimes apparently tap-rooted or often the main axis of the root with 1-few thick branches; stems single from the base, unbranched, erect, 60-75 cm tall, loosely villous with spreading to deflexed, jointed, white vitreous hairs. Leaves cauline (the basal mostly absent by flowering), 4-10 along the stem, lanceolate to oblanceolate in outline, slightly villous along the veins, once pinnately parted, with 23-30 toothed to lobed segments, the teeth aristate, the petiole and rachis barely if at all winged, lower leaves 15-25 cm long, 1.5-5.0 mm wide (at the widest point), the uppermost greatly reduced in size. Racemes (flowering) 12-15 cm long, (fruiting) 20-35 cm long, 30-40 flowered, with sessile or nearly sessile flowers, the floral bracts ascending, 10-14 mm long, with ciliate, nearly entire to shallowly toothed margins, spatulate with an abruptly narrowed and linear-attenuate apex 3-7 mm long. Calyces campanulate, the tube 4.5-5.0 mm long, with 5 nearly equal lobes ca. 4 mm long. Corollas 20-22 mm long, "pink and yellow," bilabiate, the lower (abaxial) lip 16-18 mm long, the 3 lobes suborbicular, the terminal lobe 5 mm wide, the lateral lobes ca. 6 mm wide, the upper (adaxial) lip (the galea) 12-14 mm long, smoothly incurved from the adaxial side, without a beak, not prolonged beyond the curve. Stamens 4, didynamous. Style arcuate, the stigma slightly exerted at anthesis. Capsules 9-15 mm long, broadly ovoid, slightly raised on a broad stipe 1-2 mm long; seeds blackish, ca. 4 mm long, with reticulate surfaces.

Additional collections examined: MEXICO. Chihuahua: Mpio. Guadalupe y Calvo: along stream in meadow, San Juan, Sierra Chinatu, 8900 ft. (2700 m), flrs. pink and yellow, 8 Oct 1959, *D.S. Correll & H.S. Gentry 22927* (LL); along stream (tributary of Río Soldado) in gorge of conifer forest, near La Rocha, NE slope of Sierra Mohinora, 7500 ft (2270 m), 14 Oct 1959, *D.S. Correll & H.S. Gentry 23060* (LL).

*Pedicularis chihuahuensis* apparently is endemic to the vicinity of Cerro Mohinora and Mt. Chinatu in southern Chihuahua, a relatively small area of high elevation known to harbor numerous other local endemics in a number of different families. The three collections were made within a radius of about 25 kilometers. The only other species of *Pedicularis* that occurs in the same area is *P. angustifolia* Benth., which has linear, undivided leaves and loose, few flowered inflorescences.

McVaugh & Mellichamp (1975) observed that the Mexican species of *Pedicularis* with pinnately parted leaves are not particularly closely related among themselves but divisible instead into three groups, based on floral morphology: (1) the galea prolonged into a linear, recurved-ascending beak (*P. glabra* McVaugh & Mell.; *P. jonesii* Brandeg. [type MO!] also belongs here); (2) the galea downwardly curved, short beaked or merely enlarged and pointed on the lower side (*P. mexicana* Zucc. ex Benth. and *P. orizabae* Cham. & Schlecht., and *P. gordonii* McVaugh & Koptur also apparently belongs here); and (3) the galea clavate, rounded at apex, neither beaked, curved, nor enlarged to

a point on one side (*P. tripinnata* Mart. & Gal. and *P. hintonii* McVaugh & Mell.). Among these, *P. chihuahuensis* clearly is most similar to *P. orizabae* and *P. mexicana* in its short curved galea and to *P. orizabae* with its unbeaked galea and the lobes of its lower corolla lip shorter than the galea. *Pedicularis orizabae* is known from high peaks in the states of México, Veracruz, and Oaxaca; *P. mexicana* is more widespread, occurring from Puebla to Michoacán and central Durango. The new species differs from both in its vestiture, root morphology, foliar teeth apices, and floral bract morphology, but it is compared in the following couplet to *P. mexicana*, because the latter more closely approaches the geographic range of *P. chihuahuensis* than does *P. orizabae*.

1. Roots numerous, thin fibrous; stems, leaves, and floral axes glabrous; foliar teeth with callose-dentate apices; floral bracts trilobed; lower corolla lip as long as the galea, the galea abruptly incurved nearly at a right angle, narrowed beyond the curve into a short, truncate beak; Tlaxcala, Hidalgo, Puebla, Morelos, México, Distrito Federal, Michoacán, apparently disjunct to central Durango. . . . . *P. mexicana*
1. Roots mostly with 1-3 tuberous thickened primary branches; stems, leaves, and floral axes villous; foliar teeth with aristate apices; floral bracts without lateral lobes; lower corolla lip shorter than the galea, the galea smoothly incurved from the adaxial side, without a beak; southern Chihuahua. . . . . *P. chihuahuensis*

Apart from Mexican species that are putatively closely related to it, *Pedicularis chihuahuensis* also is similar and probably closely related to *P. procera* A. Gray, which occurs in the United States from Colorado to northern New Mexico and adjacent Arizona. *Pedicularis procera* also produces a villous vestiture, aristate foliar teeth, and usually unlobed floral bracts, but differs in its thin fibrous roots, much taller plants (8-18 dm tall), longer and denser inflorescences, longer flowers (27-34 mm long), and lanceolate, longer floral bracts (25-35 mm long) that are coarsely villous with stipitate glandular hairs on the surfaces and margins.

#### ACKNOWLEDGMENTS

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## TWO NEW SPECIES OF *VERBESINA* (ASTERACEAE) FROM SOUTHERN MEXICO

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### ABSTRACT

Two new species of *Verbesina* are described from México: *V. fayii* B. Turner from Guerrero and *V. kimii* B. Turner from Veracruz. The former relates to the *V. virgata* complex of central México. The relationship of *V. kimii* is moot since it is a small tree with white rayed flowers and has a columnar receptacle, characters which do not readily position it among the known sections of the genus.

KEY WORDS: Asteraceae, *Verbesina*, México

Routine identification of Mexican Asteraceae has revealed the following novelties.

*Verbesina fayii* B. Turner, *sp. nov.* TYPE: MEXICO. Oaxaca: "Steep, moist, brushy, granitic slopes in deciduous forest region, ca. 23 km N of Putla, and 65 km SW of Tlaxiaco", ca. 1300 m, 30 Oct 1970, A. Cronquist & J. Fay 10856 (HOLOTYPE: TEX!; Isotypes: NY,US!).

*Verbesinae virgatae* Cav. similis sed foliis elliptici-lanceolatis ad extrema duo pariter gradatim descrescentibus, ac paginis inferis aequaliter molliter pubescentibus valde venosisque differt.

Slender shrubs 1-3 m high, stems without wings, densely short pilose. Leaves alternate, markedly venose, mostly 8-12 cm long, 2.5-4.5 cm wide; petioles 1-10 mm long; blades elliptic to elliptic lanceolate, equally tapering at both ends, pinnately nervate, pilose above and below, more so below with somewhat appressed soft hairs, especially along the veins, the margins minutely serrulate to entire. Heads numerous and terminal in broad leafy cymose panicles. Involucres campanulate to somewhat hemispheric, 3-5 mm

high, 6-9 mm wide (pressed), the bracts 2-3 seriate, subgraduate to subequal. Receptacle conical, ca. as high as wide, the bracts linear oblanceolate with acute recurved apices. Ray florets pistillate, fertile, mostly 8-13, the ligules yellow to yellowish orange, 5-10 mm long, 2-4 mm wide. Disk florets numerous (50-100), the corollas yellow, 3-4 mm long, the tube pubescent, ca. 1 mm long, the throat mostly glabrous, ca. 2 mm long, the lobes ca. 0.3 mm long. Anthers yellow, the appendages ovate. Achenes oblanceolate, ca. 2 mm long, 0.8 mm wide, scarcely winged, if at all, appressed pubescent, the pappus of two, readily deciduous awns 1.0-1.5 mm long.

ADDITIONAL SPECIMENS EXAMINED: MEXICO. Guerrero: 11 mi W of Chilpancingo, ca. 6000 ft, 21 Oct 1963, *Cronquist 9711* (TEX,US). Oaxaca: 47 mi S of Sola de Vega, ca. 5700 ft, 7 Nov 1965, *Cronquist & Sousa 10510* (GH,TEX,US); 16 km Oeste de Sola de Vega, 2080 m, 22 Nov 1977, *Delgado S. et al. 630* (TEX); 56 km S of Tlaxiaco, growing in crevices and on vertical cliffs, 2000 m, 9 Nov 1990, *Panero 2105* (TEX); "Cerro Tres Cruces" al S de el Limón el cual esta a 11.1 km al SW del entronque carr. Tehuantepec - Oaxaca - Buenos Aires, Distr. de Tehuantepec, 9 Dec 1983, *Torres C. 4290* (TEX).

*Verbesina fayii* is closely related to the widespread, highly variable, *V. virgata* complex (Fig. 2) but is readily distinguished from among those by its leaves that are broader, elliptic-lanceolate, equally tapering at both ends, and more markedly venose and densely soft pubescent beneath.

The species is named for Dr. John Fay, co-collector of the type material and esteemed monographer of the mostly Mexican genus *Perymenium*.

*Verbesina kinii* B. Turner, *sp. nov.* Fig. 1. TYPE: MEXICO. Veracruz: 3 km S of Cd. Mendoza on road to Tehuacán, mountain summit near the Puebla-Veracruz border, steep limestone slopes, disturbed oak forest (ca. 18° 45' N, 97° 18' W), ca. 3000 m, 13 Jan 1987, *Ki-Joong Kim 10062* (HOLOTYPE: TEX!; Isotype: MEXU).

*Verbesinae chilapanae* B. Turner similis flosculis discii numerosis flavisque et receptaculis conicis sed differt habitu (arbor parva usque ad 5 m alta vs. frutex demissus 0.5-1.0 m altus), capitulis multo minoribus numerosioribusque (30+ vs. 5-7), et floribus radii ligulis albis (vs. flavis).

Trees to 5 m high. Stems thick, pithy, winged, velutinous-tomentose. Leaves alternate, 15-20 cm long, 6-10 cm wide; petioles 3-6 cm long, winged throughout; blades ovate, pinnately nervate, scabrous above, densely velutinous beneath, markedly venose, the margins irregularly serrate with ragged shallow lobes. Heads radiate, numerous in congested terminal cymose panicles,

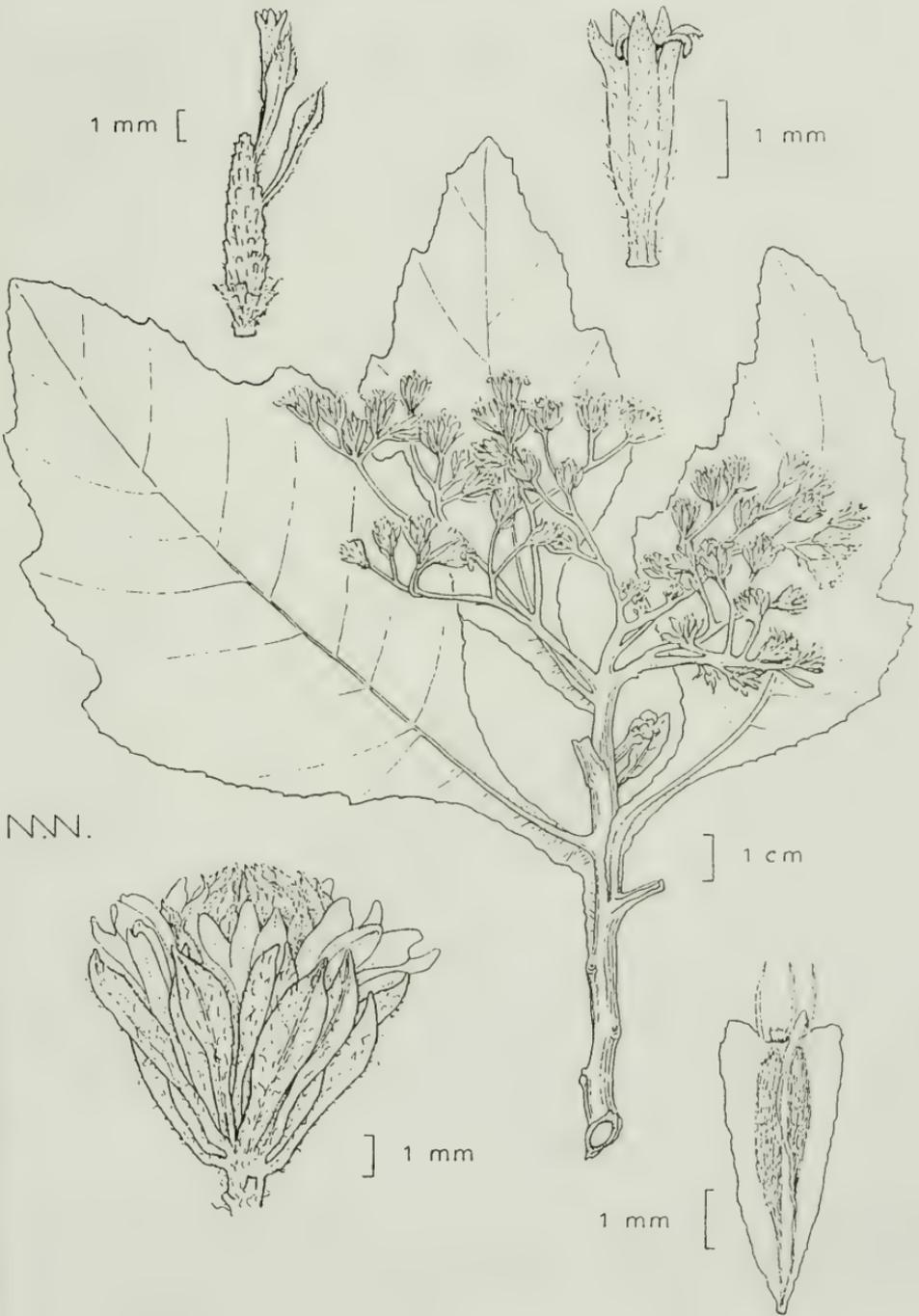


Fig. 1. *Verbesina kimii*, from holotype.



Fig. 2. Distribution of *Verbesina virgata* and closely related taxa. Area occupied by *V. favi* is shown by diagonal lines.

the ultimate peduncles densely pilose, mostly 3-10 mm long. Involucres turbocampanulate, 4-6 mm high, the bracts 2-3 seriate, somewhat graduate to subequal, the outer series pilose, oblanceolate. Receptacles, at maturity, columnar, 4-5 mm high, ca. 0.8 mm wide, the bracts numerous, folded, oblanceolate, pubescent, persistent, the apices erect, acute. Ray florets 13-32, pistillate, fertile; ligules white, 2-4 mm long, ca. 1 mm wide, 3-5 nervate. Disk florets numerous; corollas white (?), ca. 3 mm long, pubescent throughout, the tube ca. 0.8 mm long, the throat ca. 2 mm long, the lobes 0.2-0.4 mm long. Anthers dark (blackish), the appendages narrowly lanceolate, 2-3 times as long as wide. Style branches glabrous or nearly so, the appendages gradually attenuate. Achenes broadly winged, the peripheral achenes 3 sided and 3 winged, the more central achenes flattened and with 2 wings, 4-5 mm long, ca. 3 mm wide, the wings corky, ca. 0.8 mm wide, the pappus of two or rarely 3 persistent awns 1-2 mm long.

Because of its white rays, large alternate leaves and treelike habit, *Verbesina kimii* apparently appears to belong to the section *Ochractinia*, where it has no close relatives. In Blake's (1926) treatment of the trees and shrubs of México, the species will key to the common and widespread *V. turbacensis* H.B.K., which it superficially resembles. In Olsen's (1985) synopsis of section *Ochractinia*, the material concerned will key to the widespread, largely herbaceous, *V. microptera* DC., a common species of the Gulf coastal montane regions of México. *Verbesina kimii* differs from both of these taxa in having a markedly columnar receptacle with numerous florets. Indeed, it is possible that *V. kimii* is more closely related to species of the section *Verbesinaria* (sensu Robinson & Greenman 1899) than it is to section *Ochractinia*, largely because it has numerous disc florets on a pronounced, columnar or conical receptacle, which is found in certain species of the section *Verbesinaria* (e.g., *V. oazacana* DC. and *V. chilapana*).

It is a pleasure to name this extraordinary species for its only collector, Dr. Ki-Joong Kim, an extraordinary doctoral student of mine, a superb synanthrologist and Korean national who monographed *Krigia* for his doctoral dissertation and is currently deeply involved in DNA analyses of the Asteraceae with Dr. Robert Jansen at the University of Texas, Austin.

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NEW SPECIES OF *WEDELIA* (ASTERACEAE, HELIANTHEAE) FROM MEXICO AND CRITICAL ASSESSMENT OF PREVIOUSLY DESCRIBED TAXA

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ABSTRACT

Two new species, *Wedelia pimana* B. Turner and *W. talpana* B. Turner, occurring in Chihuahua and Jalisco, respectively, are described as new. In addition, justification is given for the acceptance of *W. gentryi* B. Turner, and *W. cronquistii* B. Turner, both of which were treated as synonyms of *W. greenmanii* B. Turner, in Strother's (1991) treatment of the genus for North America; evidence is also presented for the submergence of *W. tegetis* Strother in the earlier *W. mexicana* (Schultz-Bip.) McVaugh. When appropriate, distributional maps of these several taxa are provided.

KEY WORDS: *Wedelia*, Asteraceae, México

Appearance of the carefully constructed revisional study of the North American species of *Wedelia* and related groups by Strother (1991) has occasioned the present study, largely because the nomenclature proposed by him has impinged upon my treatment of the Mexican species (Turner & Nesom, in prep.). Strother recognized seventeen species as occurring in México (excluding *W. trilobata* L., which he included in the newly proposed genus *Complaya* Strother). In addition, he recognized seven infraspecific taxa in his concept of the widespread highly variable *W. acapulcensis* Kunth complex, all of these occurring in México. Strother, in his basically conservative treatment, also called to the fore one or more set of specimens which he thought might ultimately prove deserving of specific status.

In my own appraisal of *Wedelia* in North America (largely based upon the study of material at ARIZ,ASU,CAS,F,GH,LL,MEXU,MICH,TEX, and WIS (including most of the types for the names concerned) I would recognize 23 specific taxa as occurring in México (excluding the probably introduced *W. trilobata*), two of these described in the present contribution. Additionally,

while I agree with many of Strother's taxonomic conclusions, I cannot accept his broadly inclusive treatment of *Wedelia acapulcensis*, and yet other taxa. Because of this, I place on record here my reasons for rejecting some of the taxonomy proposed by him, and the nomenclature that might accompany such rejection.

*Wedelia pimana* B. Turner, *sp. nov.* TYPE: MEXICO. Chihuahua: "small grassy area above a small waterfall not more than 100 m from the center of town [Nabogame] ... a somewhat anomalous area in the vicinity, sunlit with a stream flowing right through the middle towards the waterfall. The parent rock material in that area was a purplish-red shale which generally made for richer soil than the siliceous rhyolite on the east side of the valley.", 1800 m, 3 Aug 1987, *J.E. Laferrière 646* (HOLOTYPE: TEX; Isotype: ARIZ). The quoted information is taken from a letter to the present author from the collector, dated 5 Dec 1991.

*Wedeliae scabrae* (Cav.) B. Turner similis sed floribus radii neuteris et foliis valde laceratis differt.

Suffruticose erect herbs to 70 cm high. Stems reddish, pubescent throughout with coarse spreading hairs to 1 mm long, these interspersed among a finer hispidulum of much shorter hairs, some of them uncinately or apically recurved. Leaves opposite, scarcely reduced upwards, mostly 5-7 cm long, 1.5-2.0 cm wide; petioles 2-4 mm long, pubescent like the stems; blades ovate to ovate lanceolate in outline, principal nerves 3, pubescent beneath like the stems, but the surface also subglandular, or glandular, the margins markedly lacerate or sublobate. Heads arranged 3-5 in terminal cymes, the ultimate peduncles mostly 2-6 cm long. Involucres campanulate, ca. 1 cm high, 0.8-1.0 cm wide, the bracts linear-lanceolate, subequal, spreading hirsute with stiff white hairs. Receptacle convex, the pales linear-lanceolate, 8-10 mm long, readily detached, the single dorsal nerve purple, the apices acute. Ray florets ca. 8, neuter; corollas yellow, the tubes glabrous, ca. 3 mm long, the ligules 5-8 mm long, ca. 2 mm wide. Disk florets ca. 35, the corollas yellow, 6-7 mm long, glabrous, the tubes ca. 2.5 mm long, the lobes narrowly acute, ca. 1.5 mm long. Achenes ca. 5 mm long, 2.2-2.5 mm wide, wingless, moderately appressed pubescent, the pappus of 2 principal awns 1-3 mm long, between these a shorter, lacerate, crown of scales, the base with a distinct elaiosome.

Strother (1991) called attention to the present taxon, noting, "I thought that this odd collection [646] might represent a hybrid between the two [*Wedelia chihuahuana* and *W. greenmanii*]. I found pollen stainability ... to be 98% for a single floret from Laferrière. Perhaps the specimen will prove referable to a distinct taxon."

Additional study, and correspondence with Laferrière (cited, in part, above and below) has convinced the present worker that the plant concerned represents a good species, presumably a localized endemic with distant relationships to the widespread *Wedelia scabra* (sensu Turner 1988), to judge from the vestiture, but perhaps equally close to *W. chihuahuana*. I assigned the collection concerned to the latter taxon initially, but *W. pimana* differs in habit, vestiture and details of the disk florets (having glabrous lanceolate lobes vs. hispidulous and deltoid).

I had intended to name this taxon for its only known collector, Dr. Joseph E. Laferrière, who has made a remarkable series of collections of the region concerned in connection with an ethnobotanical study of the Mountain Pima of Chihuahua. However, the collector deigned have his name eponymized, suggesting instead the name *pimana*, which is adopted here.

*Wedelia talpana* B. Turner, *sp. nov.* Fig. 1. TYPE: MEXICO. Jalisco: Mpio. Talpa, km 9 of the road to Minas del Cuale, 1050 m, 7 Mar 1992, J.L. Panero, Lidia Cabrera, & A. Campos 2858 (HOLOTYPE: MEXU; Isotype: TEX).

*Wedeliae rosei* (Greenm.) McVaugh similis sed foliis minoribus (plerumque 2-3 cm longis vs. 3-8 cm) marginibus involutis ac paginis infernis brevi-hispidulis et capitulis plerumque 2-3 subsessilibus (in pedunculis 2-10 mm longis) in aggregatis differt.

Brittle stemmed low shrubs or shrublets 20-30 cm high. Stems densely hispid-pilose. Leaves opposite, mostly 20-30 mm long, 3-8 mm wide; petioles 1-2 mm long; blades narrowly lanceolate to ovate elliptic, harshly pubescent above and below with erect or ascending hairs, the surface itself somewhat glandular-furfuraceous, the margins mostly enrolled and seemingly entire. Heads campanulate, mostly arranged in aggregations of 2-3 nearly sessile heads, when single, the peduncles 2-10 mm long. Involucre mostly 7-11 mm high, the bracts subgraduate to subequal in 2-3 series, the outer series herbaceous and pilose, the inner series scarious, ciliate, and with purple striations. Receptacle convex, the bracts lanceolate with purple midribs. Ray florets 5-8, neuter, sterile; tubes glabrous, ca. 2 mm long; ligules yellow, 5-7 mm long. Disk florets ca. 30; corollas ca. 5 mm long, yellow, glabrous or nearly so, the tubes ca. 1.5 mm long, the limbs 3.0-3.5 mm long, the lobes ca. 0.7 mm long, sparsely hispidulous. Anther sacs black, the appendages yellow. Achenes obovoid, very plump, 3.5-4.0 mm long, ca. 2 mm wide, the surface black and finely striate, rather evenly, but moderately pilose throughout, the base with a well developed elaiosome; pappus a crown of short fimbriate scales arising from a boss or neck ca. 0.4 mm high.

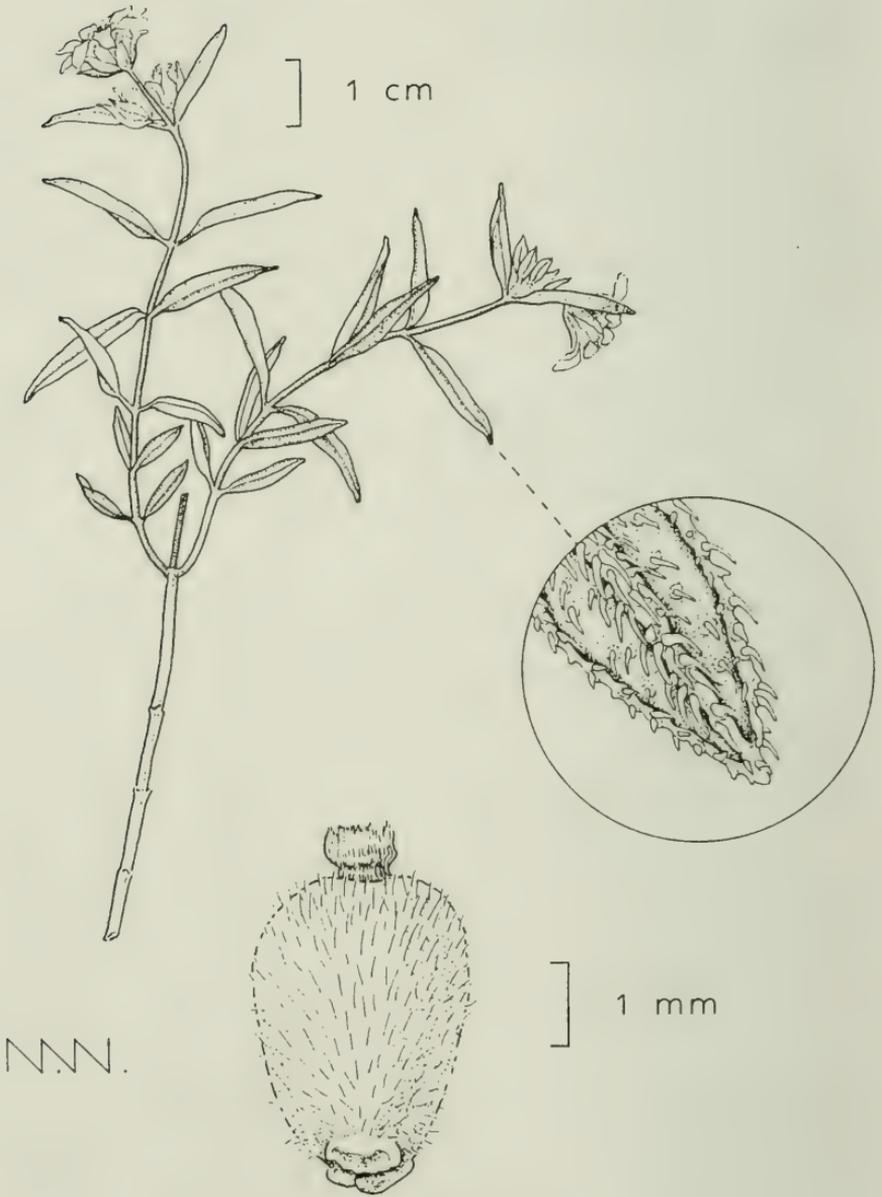


Fig. 1. *Wedelia talpana* (from Diaz L. 20971, TEX).

ADDITIONAL SPECIMENS EXAMINED: MEXICO. Jalisco: Mpio. de Cabo Corrientes, 3-10 km generally east on the road to Mina del Cuale, from the junction 5 km NW of El Tuito, 850-1150 m, 16-19 Feb 1975, *McVaugh 26367* (MICH); Mpio. Talpa, km 18 along the road from El Tuito to La Mina de Zimapán, 1850 m, 14 Oct 1989, *Diaz L. & Lomeli S. 20971* (TEX); between Cumbre del Tejamanil and Cuale, 1790 m, 6 Mar 1971, *R. Gonzales T. 125* (ENCB,MICH).

Strother (1991) called attention to two of the above cited specimens, noting that "On further study, supplemented by additional collections, these may prove to represent a distinct species." With the collection of additional specimens from the area concerned (including the type), which possess all of the characters called to the fore in the above description, I have no hesitation in making formal its recognition. According to J. Panero (pers. comm.), who collected the type, the species was relatively common in the area concerned.

*Wedelia aggregata* (Greenm.) B. Turner

In my transfer of this taxon from the genus *Aspilia* (Turner 1988), not having examined its type, I accepted McVaugh's (1984) viewpoint that *Wedelia aggregata* was but an aberrant form of the well known, widely distributed, *W. rosei*. So treated, the correct name for the taxon would be that of the earlier name, *W. aggregata*. Having now examined type material (GH!) of the latter, I concur with Strother's interpretation: *W. aggregata* appears to be a good morphological species known only from type material.

*Wedelia gentryi* B. Turner

Strother placed this name in synonymy within his concept of *Wedelia greenmanii* B. Turner. I have equivocated in my acceptance of these two taxa (pers. comm. to Strother), largely because at the time of my study Strother had most of the types, and material relating to these, under purview. I have now examined the entire complex and conclude that two good taxa are involved: *W. gentryi* and *W. greenmanii*. The latter is readily distinguished from the former by its very minute, closely appressed, strigose hairs, these occurring in a rather uniform fashion on the foliage, stems and involucre bracts. *Wedelia gentryi* possesses uniformly larger and longer, erect or ascending, hairs on all of its vegetative parts and usually has broader midstem leaves with blades rather clearly trinervate below (vs. mostly uninervate or pinnately nervate, not clearly trinervate below).

So far as known plants referable to *Wedelia greenmanii* and *W. gentryi* have not been found to occur together, nor have I seen clear intermediates between these. That they are sympatric or nearly so, cannot be doubted, as shown in

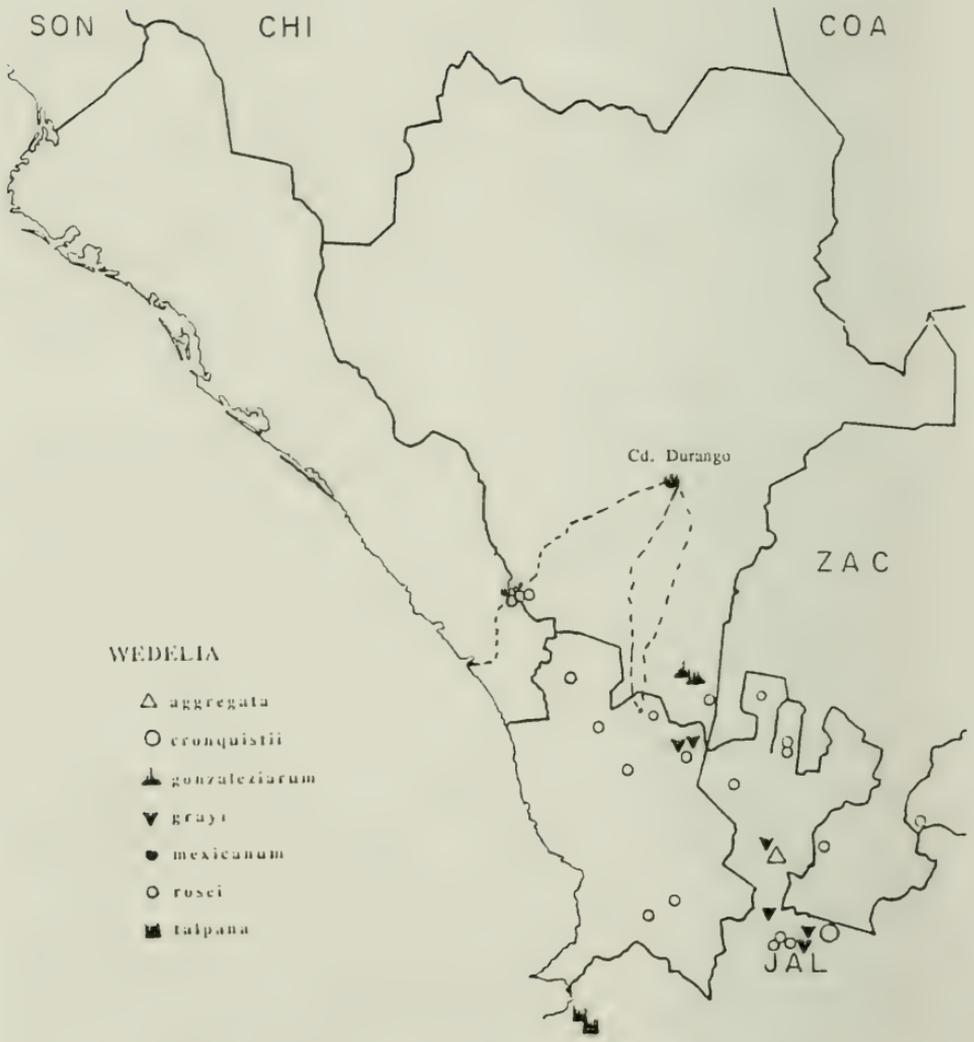


Fig. 2. Distribution of *Wedelia* spp with respect to Seemann's 1849-50 trip to the "Sierra Madre".

Fig. 3. Indeed; since both *W. greenmanii* and *W. gentryi* occur in relatively close proximity in the area of Nabogame, Chihuahua (ca. 28° 30' N, 108° 30' W), both collected by Dr. J.E. Laferrière while engaged in an ethnobotanical study of the region concerned (*W. gentryi* 1101 [ARIZ,TEX]; *W. greenmanii* 1186, 1950 [ARIZ,TEX]), I requested that the collector assess their niche relationships, if any, within this region (including that of *W. pimana*, quoted in the above account). He replied as follows:

Collection #646 [*W. pimana*] was from a small grassy area above a small waterfall not more than 100 m from the center of town. It was a somewhat anomalous area in the vicinity, sunlit with a stream flowing right thru the middle toward the waterfall. The parent rock material in that area was a purplish-red shale which generally made for richer soil than the siliceous rhyolite on the east side of the valley. #1101 [*W. gentryi*] was from a very different area about a mile east, in a riparian pine/oak/*Cupressus arizonica* forest in the rhyolite area. #1186 and #1187 [*W. greenmanii*] were from a dry granitic site about half a mile west of town. That area was composed of many small but steep hills, large boulders, and small cliffs; "the maze" I used to call it because it was often difficult to weave my way thru the broken terrain. I made two separate collections of the *Wedelia* there because the first had reddish stems, the second grayish-brown stems, a slight difference, but in the field it can be hard to tell what is significant ...]

Hence to answer your question about habitats, the three areas were quite different habitats, both in soil and in dominant vegetation. Another difference is that the 646 site was grazed only in the winter, the others all year round. Given the limited number of collections, however, it can be difficult to say whether these observations would hold up if someone went down to make a more detailed survey.

Since the original description of *Wedelia gentryi* (Turner 1988), known then only by the type (collected in Sierra Surotato, Sinaloa), I have examined the above mentioned collection of Laferrière, that of *Breedlove & Thorne 18403* (MICH), and *Pennington 92* (TEX), all of these examined by Strother and cited as *W. greenmanii*. In short, my examination of most of the material examined by Strother that relates to this complex has reaffirmed my original conviction that two taxa are involved, which I opt to treat as species, there being little suggestion, if any, that the characters which mark them intergrade.

Finally, it should be noted that Strother also placed *Wedelia cronquistii* B. Turner in synonymy under his concept of *W. greenmanii*. This is discussed in more detail, as follows.

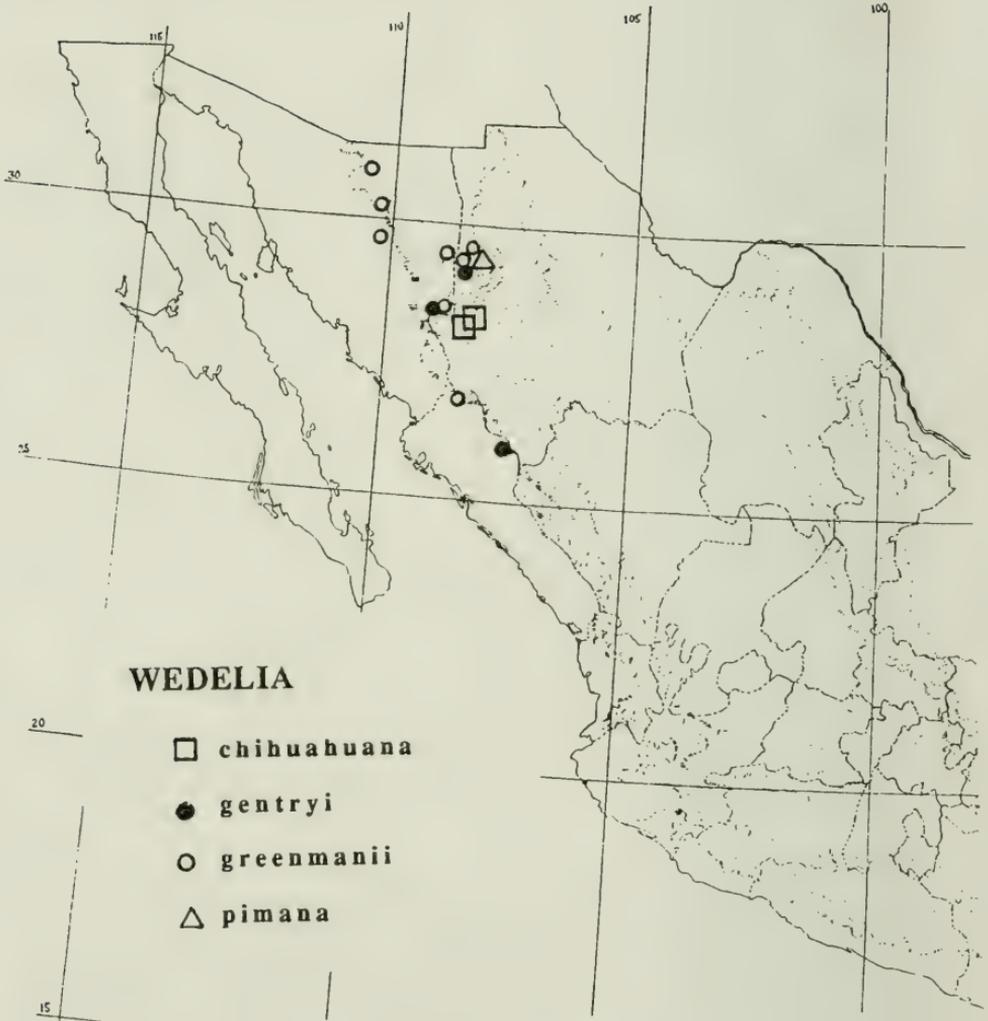


Fig. 3. Distribution of *Wedelia* spp.

*Wedelia cronquistii* B. Turner

This taxon is known only by the type, collected just east of Guadalajara, Jalisco (Fig. 4). Strother contends (p. 77) that the type differs "from other specimens of *Wedelia greenmanii* primarily in the greater density, but not in the quality, of the foliar indument of the plants from the disjunct population in Jalisco." Actually, the leaves, and vestiture on undersurfaces of these, differ markedly from those of both *W. greenmanii* (which, as noted above, has a very minute appressed pubescence) and *W. gentryi* (which has scattered, longer, nonappressed, hispid hairs, these occurring on relatively broad, trinerivate, midstem leaves), having narrow, highly reticulate venose, undersurfaces and a vestiture of closely strigose or closely packed short or suberect conical hairs. In fact, one might more certainly position *W. cronquistii* within an expanded *W. rosei* than within *W. greenmanii*, for its habital aspects are more like the former and, of course, such a position would make better biogeographical sense; indeed, I suspect that more intensive study will show that the population referable to *W. cronquistii* is closer to both *W. rosei* and *W. gonzaleziarum* B. Turner (from southernmost Durango) sensu Strother, than it is to the morphologically and geographically more remote *W. greenmanii*. In short, I intend to retain *W. cronquistii*, believing this to be a localized endemic in the area concerned, much as appears to be the case for *W. aggregata*, *W. gonzaleziarum*, *W. pimana*, and *W. talpana*, all localized and seemingly distinct species.

*Wedelia mexicana* (Schultz-Bip.) McVaugh

Strother recognized this taxon, but believed it to be known only by the type, collected somewhere between Mazatlán, Sinaloa and Cd. Durango, Durango, or possibly between the latter and northern Nayarit, areas traversed by Seemann, who collected in this region from 23 Nov 1849 to 22 Feb 1850 (cf. stippled lines, Fig. 2). Strother distinguished *Wedelia mexicana* from his newly described *W. tegetis* Strother by internode length (mostly 2-5 cm long in *W. mexicana* vs. 0.5-1.5 cm) and shape of leaf blades (mostly deltate to ovate, rounded to subtruncate at base in *W. mexicana* vs. elliptic to lanceolate, cuneate at the base). I do not find these compelling differences; indeed, a photograph of the type collection housed at K (GH!) shows that a range of leaf shapes varying from deltoid to elliptic lanceolate occurs among the several shoots attached to that sheet; in addition, there is much variation in internode length. Besides, nearly all of the species of *Wedelia* are notoriously variable as regards leaf shape and internode length, as any cursory examination of specimens of this or that species will show. In short, I suspect that Strother's *W. tegetis* is the same as *W. mexicana*. Indeed, it is likely that Seemann collected the type of *W. mexicana* in the same general area from which the type of

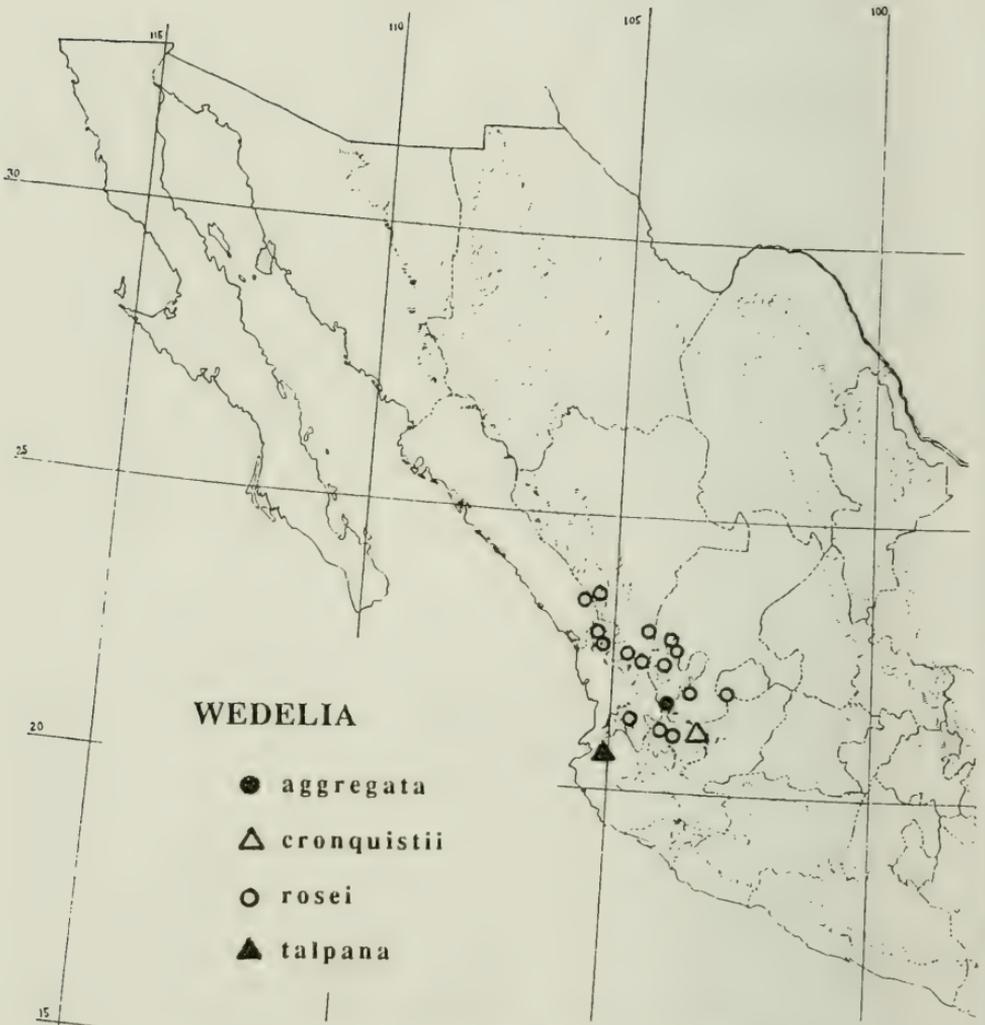


Fig. 4. Distribution of *Wedelia* spp.

*W. tegetis* was obtained, for his journey to Cd. Durango took him directly through the route (along present day Mexican Highway 40) along which the type locality of *W. tegetis* occurs. Numerous recent workers have collected along this route and forms referable to both *W. tegetis* and *W. mexicana* are invariably collected along the Sinaloa-Durango border (Concordia, Sinaloa to El Espinazo del Diablo, Durango). Following his arrival in Cd. Durango, Seemann left the city on 2 Jan 1850, taking a southerly route through Mezquital, Durango, then hence to Santa Maria (northernmost Nayarit) from whence he returned to Cd. Durango via a more westerly route (through La Guajolota, Durango). He returned hastily to Mazatlán over the same route (along present day Highway 40) he had traversed earlier, arriving in that port city on 22 Feb 1850.

The important part of the above, which I have taken from Seemann's own account of his travels as given in the *Voyage of the Herald*, is that the only place *W. tegetis* (or *W. mexicana*) is known to occur in the region traversed by Seemann, is along the Sinaloa-Durango border (Fig. 2). The route south of Cd. Durango to Santa Maria, Nayarit, has now been fairly well collected and only *W. rosei*, *W. gonzalezianum*, or *W. grayi* McVaugh has been obtained near or along this route. Strother, however, cites two white rayed plants (MICH!) of *W. tegetis* from the area near Jesus Maria, Nayarit (Fig. 3) but I would include both of these, somewhat aberrant collections, in my concept of *W. grayi*, which is distinguished from *W. mexicana* by its white rays and longer, more oblanceolate, leaf blades.

The above discourse relating to *Wedelia tegetis* may be more academic than need be, for Strother (p. 83) wisely notes that "As more specimens become available . . . the type of one or more of the names *W. grayi*, *W. hintoniorum* B. Turner, and *W. tegetis* may prove to be conspecific with that of *W. mexicana*." My only quibble here is, that based on the material available at the present time, it is almost certain that *W. tegetis* is the same as *W. mexicana*.

#### ACKNOWLEDGMENTS

I am grateful to Guy Nesom for the Latin diagnoses and to him and T.P. Ramamoorthy for reviewing the manuscript. Special thanks are due Dr. J.E. Laferrière for providing me with information relating to the occurrence of *Wedelia greenmanii*, *W. gentryi*, and *W. pimana* in the area of Nabogame, Chihuahua. Dr. José Panero kindly provided material from his collections (after my preliminary study) for the typification of *W. talpana*.

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TWO NEW SPECIES OF *STEVIA* (ASTERACEAE, EUPATORIEAE) FROM  
MEXICO

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ABSTRACT

*Stevia hintoniorum* B. Turner, a species from near Iturbide, Nuevo León, México and *S. pratheri* B. Turner, from Chiapas, are described as new. The former is related to the locally sympatric *S. incognita* Grashoff, the latter to *S. tomentosa* H.B.K.

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

Routine identification of Mexican Asteraceae has revealed the following novelties.

*Stevia hintoniorum* B. Turner, *sp. nov.* TYPE: MEXICO. Nuevo León: Mpio. Galeana, above Agua Blanca, "oak and pine woods on limestone," 2390 m, 25 Oct 1991, *G.B. Hinton et al. 21611* (HOLOTYPE: TEX).

*Steviae incognitae* Grashoff similis sed foliis majoribus ellipticis vel oblanceolatis fere glabrisque et bracteis involucro sin glandulis stipitatis differt.

Erect or sprawling herbs 40-80 cm high. Stems tawny to purplish, puberulent. Leaves sparsely puberulent to subglabrous, opposite throughout, at mid-stem mostly shorter than the internodes, elliptic ovate to oblanceolate, mostly 4-9 cm long, 2.0-4.5 cm wide; petioles mostly 2-10 mm long; blades trinervate from above the base, glandular punctate on lower surfaces, the margins serrate. Heads sessile and numerous in congested terminal corymbs, the branches below the heads decidedly glandular pubescent. Involucres 7-9 mm high, subglabrous or sparsely puberulent, sometimes atomiferous glandular (*i.e.*, with sessile amber colored resinous glands) but not at all glandular pubescent, the bracts linear-lanceolate with acute apices. Corollas purple, 7-8 mm long, the

tube and throat both sparsely pilose and atomiferous glandular, the lobes more so. Achenes ca. 5 mm long, sparsely hispidulous, the pappus a fimbriate crown 0.3-0.8 mm high.

ADDITIONAL SPECIMENS EXAMINED: MEXICO. Nuevo León: Mpio. Galeana: above Agua Blanca, 2050 m, 25 Oct 1991, *Hinton et al. 21626* (TEX); 10.6 km W of Ejido La Purisima, ca. 2100 m, 27 Oct 1982, *Sundberg 1922* (TEX). Mpio. Iturbide: Iturbide to La Purisima, 2070 m, 25 Oct 1991, *Hinton et al. 21664* (TEX); 3.3 km W of Ejido La Purisima, ca. 1600 m, 27 Oct 1982, *Sundberg 1897* (TEX).

In Grashoff's (1972) account of the North American stevias, the above cited specimens key with ease to *Stevia clinipodioides* Greenm. The latter, however, is a taxon of southcentral and southern México (type from Serrania de Ajusco, Distrito Federal, ca. 3000 m) and is a slender rhizomatous perennial to 35 cm high with oblanceolate, conduplicate, leaves 1.5-3.5 cm long and 0.5-1.2 cm wide. As indicated in the description, *S. hintoniorum* is a robust herb of lower elevations, being 40-80 cm high and having much larger nonconduplicate leaves. Overall, *S. hintoniorum* appears most closely related to the poorly defined, but widespread, *S. incognita* Grashoff. It differs from the latter in having eglandular involucre bracts and mostly elliptic, nearly glabrous leaves. *Stevia incognita* occurs in Nuevo León at higher elevations (e.g., on Cerro Potosí and Peña Nevada) than does *S. hintoniorum* but occasional hybrids between *S. incognita* and *S. hintoniorum* presumably occur, to judge from seemingly intermediate plants from the lower slopes of Peña Nevada (*Ayers 504* [TEX]).

***Stevia pratheri*** B. Turner, *sp. nov.* TYPE: MEXICO. Chiapas: Mpio. Ixtapa, 4.2 km S of Ixtapa along route 195, steep dry slope with *Juniperus*, *Acacia*, and *Pinus*, ca. 1150 m, "Rare in full sun on dry rocky banks of creek," 8 Jan 1992, *Alan Prather 1144* (with J. Soule) (HOLOTYPE: TEX; Isotype: MEXU).

*Steviae tomentosae* Kunth similis sed differt foliis omnino oppositis et capitulis in pedunculis primariis nudiusculia (usque ad 20 cm longis foliis deminutia paribus tantum 2-3).

Perennial herb 30-40 cm high. Stems white tomentose. Leaves opposite throughout, bicolored, mostly 2.5-3.5 cm long, 6-12 mm wide; petioles 8-12 mm long; blades ovate, trinervate, sparsely tomentose above, the lower surfaces densely white felty tomentose, the margins crenulodentate. Heads arranged in an obpyramidal corymbose terminal cluster, these borne on a rather naked primary peduncle ca. 20 cm long, the latter having only 3-4 pairs of reduced leaves, the ultimate peduncles tomentose, 1-3 mm long. Involucres mostly 5-7 mm long, the bracts linear-lanceolate, tomentulose, the apices acute. Florets

5 per head, the corollas white, ca. 5 mm long, the lobes ca. 0.8 mm long, sparsely pubescent and atomiferous glandular on the outer surfaces. Achenes black, somewhat tangentially compressed, sparsely hispidulous, the pappus of 4 of the achenes a minute fimbriate crown ca. 0.3 mm high, the remaining achene with a pair of weak bristles 1-2 mm long, in addition to the fimbriate crown.

Because of its markedly bicolored leaves and head clusters borne upon rather naked primary peduncles, this is a very distinctive species. The somewhat flattened achenes with weakly developed pappus bristles also distinguish the taxon. It will not key in Grashoff's treatment of the genus, but it might be compared with *Stevia tomentosa*, the latter readily distinguished by having stems about equally leafy throughout, the upper leaves mostly alternate, and the pappus bristles more numerous and stouter, up to 6 mm long.

According to Grashoff (1972), *Stevia tomentosa* is distributed from southern Puebla to southern Coahuila, mostly on the Central Plateau. *Stevia pratheri* is apparently restricted to Chiapas, there being nothing like it from Oaxaca or Guatemala (Grashoff 1976).

It is a pleasure to name this species for its primary collector, Mr. Alan Prather, doctoral student at the University of Texas working on a monograph of the genus *Cobaea* (Polemoniaceae).

#### ACKNOWLEDGMENTS

I am grateful to Guy Nesom for the Latin diagnoses and to him and Carol Todzia for reviewing the manuscript.

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## FLORISTICS OF A SANDSTONE GLADE IN WESTERN LOUISIANA

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### ABSTRACT

The floristics, species richness, geology, and edaphic conditions of a western Louisiana sandstone glade are described.

KEY WORDS: Sandstone glade, Kisatchie National Forest, floristics, Louisiana

### INTRODUCTION

The eastern United States is basically a forested region. Within this region, there are occasional permanent forest openings — bogs, savannahs, glades, barrens, balds, prairies— often of small size (*e.g.*, Greller 1988; DeSelm 1986, 1990). These openings are almost always the result of unusual edaphic, geologic, and hydrologic factors.

Sandstone glades are one such open community in the longleaf pine region of western Louisiana. As Martin & Smith (1991) have described them, these are usually ridge tops underlain by Catahoula sandstone with a thin layer of acidic silty clay loam. Glades are open with exposed sandstone boulders and ledges. There is no true overstory or midstory but scattered patches of trees and shrubs with a grass dominated, low diversity herbaceous layer. Ever since the Louisiana Natural Heritage Program began rating communities, this one has received rankings from critically imperiled to rare or uncommon (Craig *et al.* 1987; Smith 1988; Martin & Smith 1991). Within Louisiana, the community is restricted to a small part of the western section of the state and little is known about it; in fact, the entire previous literature on this and related communities in the western gulf coastal plain can be found in Smith 1988; Bridges & Orzell 1989; Orzell 1990; Martin *et al.* 1990, and Martin & Smith 1991. Sandstone glades of the type we are describing here are not to be confused with calcareous prairies or other prairielike communities, often

referred to as barrens, glades, or prairies, occurring in this area (Bridges & Orzell 1989; Marietta & Nixon 1984; Smith *et al.* 1989; George & Nixon 1990).

The purpose of this paper is to describe the floristics and species richness (number of species) of one glade. Additionally, we will make some observations on biotic, edaphic, and climatic conditions of glades.

## STUDY SITE AND METHODS

Sandstone glades are locally common in the Kisatchie Ranger District of the Kisatchie National Forest, Natchitoches Parish, Louisiana. "Flat Glade," the one we studied, is located about 11 km WSW of Cloutierville, Louisiana, on the eastern edge of T6N R7W S12. Its exact location is given by Martin & Smith (1991:288-291). It is approximately 100 meters above sea level. While the specific fire history of Flat Glade is uncertain, it is embedded in the pyrogenic longleaf pine community and thus probably has burned with regularity in the past (Smith 1991). It did not burn the year prior to this study.

We visited Flat Glade every two weeks between March and December 1991 to sample vascular plants. We follow MacRoberts (1984, 1989) for botanical nomenclature. We measured species richness in three randomly selected permanent one meter square plots, pine seedling success (number of seedlings surviving to November) in two permanent four meter square plots, and pine seedling numbers in ten randomly selected nonpermanent one meter square plots. We ran a transect through Flat Glade in which we counted number of trees and measured diameter at breast height (dbh) of each tree. The transect was 213 meters long and three meters wide, and ran through the longest part of the glade. Soil samples were taken from the upper 15 cm of the glade and were analyzed by A. & L. Agricultural Laboratories, Memphis, Tennessee. We made increment borings of "relic" (predate the massive cutover of the early 1900's) longleaf pine trees to assess age and counted rings in a number of smaller trees. We looked at many other glades in the area to familiarize ourselves with variations in the community type.

## RESULTS

A profile of Flat Glade is shown in Figure 1. The glade measures about 1.9 hectares and is larger than most glades in the area. It is a mesalike outcrop rising in two tiers of about seven meters each above the surrounding upland longleaf pine forest. The transition from glade to longleaf forest is not usually abrupt. Pines are scattered over Flat Glade and are stunted and dwarfed. The largest are not over twelve meters tall, are flat topped, and have sparse crowns. Canopy cover is about ten percent overall. A few oaks occur in Flat Glade.

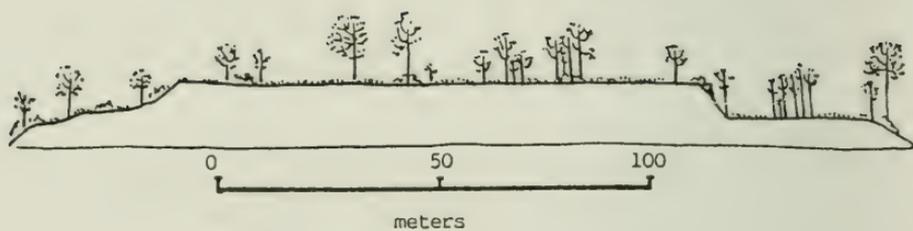


Figure 1. Profile of Flat Glade

These are also stunted, gnarled, and scarcely rise above the few shrubs, *Ilex vomitoria* Ait. and *Vaccinium* spp.

There were 25 trees 1.5 meters tall or taller in the 639 square meter transect: 15 longleaf pine, 9 loblolly pine, and one oak. This translates into one tree per 26 square meters. These trees had a mean dbh of 11.32 cm (range 2.4-38.0 cm, s.d. 9.1 cm). In these measurements of trees, Flat Glade lies between hillside seepage bogs and longleaf pine forest in the area. Hillside seepage bogs have a more open habitat while longleaf pine forest is much less open (MacRoberts & MacRoberts 1990).

Why are glades open? Possible answers are poor seed production, poor seed germination, high seed predation, or high seedling mortality. While we have been studying this and will report on it more fully elsewhere, some data collected at Flat Glade are germane to this paper. To begin with, all pine species occurring on Flat Glade produce abundant cones. This is evident from the cones seen on trees and those on the ground from previous years. Also seeds readily sprout. On July 6, 1991 in ten one meter square plots randomly selected on the top of Flat Glade, we found two longleaf pine and nineteen loblolly pine seedlings. From these observations and from our general survey of the glade, there were undoubtedly thousands of seedlings on the 1.9 ha area. In the two four meter square plots described above, we counted 26 and 27 loblolly pine seedlings in May. By November there were ten alive in one plot and none in the other. All of the dead seedlings appeared to have succumbed to desiccation and to scorching as they were without shade. And this occurred even though it was one of the wettest years in recorded history but by no means the hottest (pers. comm., National Weather Service). The seedlings that were still alive showed some signs of stress (brown lower needles). In many of the glades we visited, we noticed that trees had fallen, exposing shallow roots. The causes for this appeared to be shallow depth of the impermeable sandstone layer resulting in shallow rooting and susceptibility to windthrow.

In order to examine growth rate, we cut four small longleaf pines (diameter 4.5-7.0 cm at ground level) and made increment borings in some of the largest longleaf pines present (dbh 29-38 cm) and compared these with trees from the surrounding longleaf pine habitat. We found that longleaf pines grow slowly in Flat Glade. In the four small trees, average ring width was slightly less than 1 mm (11 rings to 1 cm), and in the larger trees it was comparable but an average was harder to determine because the rings were sometimes so packed that counting was difficult. Nonetheless, the growth rate of trees in Flat Glade was about one-third that of trees in local longleaf pine forest. All of the large trees at Flat Glade appear to be "old growth" being easily in excess of one hundred years and probably much older.

Soil information on Flat Glade is given in Table 1. Three samples were taken: two from the top and one from the middle mesa. The soil is highly acidic and essentially infertile. The surface geology is resistant beds of Catahoula

TABLE 1. Soil Characteristics

Sample	Exchangeable Ions (ppm)					
	pH	P	K	Ca	Mg	OM%
K-1	4.9	4	65	900	260	0.3
K-2	4.8	4	44	53	135	1.9
K-3	4.5	5	127	730	233	4.0

sandstone overlain with Kisatchie soil — dark to light grey silty loam (fine montmorillonitic, thermic Typic Hapludalfs) (Martin *et al.* 1990:104). Part of Flat Glade is severely eroded, forming irregular sandstone studded gullies and minigorges of exposed soil. Although the soil is always thin and shallow, on the stable areas prairielike vegetation dominates, while on the more sparse and rocky areas where the soil is either very thin or absent, lichens and mosses are commonly the major ground cover. Plant roots are limited by the rock below.

The soil moisture conditions of glades range from saturated and sticky after rains especially during winter and spring, to dry cracked and hard during summer and fall following droughts. Water runoff is fairly rapid. The year of this study, 1991, was one of the wettest in recorded history with about 170 cm of precipitation (43 cm above normal) (pers. comm., Natchitoches Station, National Weather Service), and only occasionally did Flat Glade dry out. In most years it would have been dry for periods of at least two to three weeks and possibly longer during the hottest months, July, August, and September. In July and August soil surface temperatures become very high, there being little or no shade. Additional climatic data for the area are given in Martin *et al.* 1990.

The vascular plants found in Flat Glade are listed in Table 2. We recorded 63 taxa representing 46 genera and 26 families. The dominant species were rayless goldenrod (*Bigelovia nuttallii* Anderson) and little bluestem (*Schizachyrium scoparium* [Michx.] Nash). The dominant families were grasses and composites, accounting for a third of the taxa. The three one meter plots had 9, 9, and 11 species, which is about half the richness of comparable plots in local hillside seepage bogs (MacRoberts & MacRoberts 1991). Herbaceous plant ground cover was not always 100 percent, with many bare areas of rock or soil often with numerous lichens and mosses.

Flat Glade, like other glades we have observed, clearly has plants associated with other communities, notably upland longleaf pine forest and sand woodlands (Martin & Smith 1991). These communities tend to be dry. Quite spectacularly, about ten percent of the species characterize hillside seepage bogs: *Aletris*, *Drosera*, *Pinguicula*, *Platanthera*, *Sabatia gentianoides*, and *Asclepias longifolia* Michx. (MacRoberts & MacRoberts 1991). In the glades, these plants take advantage of the open, seasonally saturated soils caused by

underlying sandstone "catchments" and ephemeral seepage areas. *Pinguicula* is notorious in bogs for blooming for about nine months a year. In Flat Glade, *Pinguicula* bloomed in late spring and early summer and again in December.

As mentioned in the introduction, glades are quite variable from one to another. During the course of the year we visited many glades which ranged from prairielike with many grasses to bare sandstone outcrops almost totally devoid of vegetation. Interesting species not found at Flat Glade but common at other glades include: *Eryngium yuccifolium* Michx., *Fimbristylis puberula* (Michx.) Vahl., *Hedyotis nigricans* (Lam.) Fosberg, *Lechea tenuifolia* Michx., *Selaginella arenicola* Underw. ssp. *riddellii* (Van Eselt.) Tryon, *Silphium laciniatum* L., and *Talinum parviflorum* Nutt. ex Torrey & Gray.

### DISCUSSION/SUMMARY

A major factor controlling plant community structure and composition of glades is stress. The thin, nutrient poor acidic loam soils underlain by impermeable sandstone characterized by high erosion, quick alternation of wet and very dry periods, occasional burning, and high summer temperatures, combine to produce a unique community — dwarfed and sparse, slow growing woody vegetation and hydric, mesic, and xeric herbaceous plants in relatively low numbers with large expanses of bare, or lichen or moss covered ground. While we have carefully investigated only one example of a glade community, we have looked at many of them and recognize that these communities differ in many ways undoubtedly depending on variations in soil, hydrology, and geology. Some have no hydric plants; others have many. Some have no trees because of a lack of soil, while others have many. Clearly, therefore, the habitat needs further investigation.

### ACKNOWLEDGMENTS

We acknowledge the staff of the Kisatchie National Forest for their help and cooperation in this, as in all of our work on the National Forest. We especially thank Karen Belanger, Wildlife Biologist, and Tom Fair, District Ranger, Kisatchie Ranger District. Latimore Smith and Nelwyn McInnis, Louisiana Natural Heritage Program, made many helpful comments on earlier drafts of this paper.

Table 2. Taxa present in Flat Glade.

- AMARYLLIDACEAE — *Hypoxis rigida* Chapm.  
 CYPERACEAE — *Rhynchospora globularis* (Chapm.) Small, *R. plumosa* Ell., *Scleria ciliata* Michx.  
 JUNCACEAE — *Juncus marginatus* Rostk.  
 LILIACEAE — *Aletris aurea* Walt., *A. farinosa* L., *Allium canadense* L.  
 ORCHIDACEAE — *Platanthera nivea* (Nutt.) Luer, *Spiranthes tuberosa* Raf., *S. vernalis* Engelm. & Gray.  
 PINACEAE — *Pinus echinata* P. Mill., *P. palustris* P. Mill., *P. taeda* L.  
 POACEAE — *Andropogon elliotii* Chapm., *A. ternarius* Michx., *Anthraenantia villosa* (Michx.) Beauv., *Aristida virgata* Trin., *Dichantherium aciculare* (Desv. ex Poir.) Gould & Clark, *D. sphaerocarpon* (Ell.) Gould, *Schizachyrium scoparium* (Michx.) Nash, *Schizachyrium tenerum* Nees, *Sporobolus junceus* (Michx.) Kunth.  
 ASCLEPIADACEAE — *Asclepias longifolia* Michx., *A. obovata* Ell.  
 ASTERACEAE — *Aster dumosus* L., *A. linariifolius* L., *Bigelovia nuttallii* Anderson, *Eupatorium leucolepis* (DC.) Torrey & Gray, *Helianthus angustifolius* L., *Heleastrum hemisphericum* (Alex.) Shinnery, *Heterotheca graminifolia* (Michx.) Shinnery, *Liatris pycnostachya* Michx., *L. squarrosa* (L.) Michx., *Senecio tomentosus* Michx., *Solidago nitida* Torrey & Gray, *Vernonia texana* (A. Gray) Small.  
 AQUIFOLIACEAE — *Ilex vomitoria* Ait.  
 CAMPANULACEAE — *Lobelia* sp.  
 CLUSIACEAE — *Hypericum gentianoides* (L.) B.S.P., *H. hypericoides* (L.) Crantz.  
 DROSERACEAE — *Drosera brevifolia* Pursh.  
 ERICACEAE — *Vaccinium arboreum* Marsh, *V. corymbosum* L., *V. stamineum* L.  
 EUPHORBIACEAE — *Euphorbia corollata* L.  
 FABACEAE — *Stylosanthes biflora* (L.) B.S.P., *Tephrosia virginiana* (L.) Pers.  
 FAGACEAE — *Quercus falcata* Michx., *Q. marilandica* Muenchh., *Q. stellata* Wang.  
 GENTIANACEAE — *Sabatia gentianoides* Ell.  
 LENTIBULARIACEAE — *Pinguicula pumila* Michx.  
 LINACEAE — *Linum medium* (Planch.) Britt.  
 LOGANIACEAE — *Gelsemium sempervirens* (L.) St. Hill.  
 MYRICACEAE — *Myrica cerifera* L.  
 POLYGALACEAE — *Polygala mariana* P. Mill., *P. nana* (Michx.) DC.  
 RUBIACEAE — *Diodia teres* Walt.  
 SCROPHULARIACEAE — *Agalinus obtusifolia* Raf., *Aureolaria pectinata* (Nutt.) Penn., *Penstemon tubaeiflorus* Nutt.  
 VIOLACEAE — *Viola pedata* L.

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## TWO NEW INTRODUCED SPECIES IN THE ALASKAN FLORA

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### ABSTRACT

Two taxa previously unreported from Alaska have been found in the Fairbanks area. These are *Conyza canadensis* (L.) Cronquist and *Sonchus uliginosus* Bieb.

KEY WORDS: Asteraceae, *Conyza*, *Sonchus*, Alaska

Weedy species are often overlooked in the field. In Alaska, collectors tend to focus on the native arctic flora giving little attention to disturbed areas with introductions from more southerly regions of North America.

With the development in Alaska during the last 50 years, invasive plants common in the U.S. Pacific Northwest and the north central plains areas of Canada and the contiguous United States, have been introduced into the most intensely developed areas. The pioneer seeds are probably carried by way of vehicles traveling the Alaska Highway from the Yukon Territories, British Columbia, and Alberta in Canada, and Washington and Montana in the United States into the interior of Alaska. From there they may be spread further south along the Parks, Richardson, and Glenallen Highways toward the Anchorage metropolitan area.

The other possible means by which these introductions may be appearing is the increase in agricultural establishments in the Fairbanks, Big Delta, and Matanuska Valley regions. Within the grain and vegetable crops raised in these areas, there are most certainly seeds of weedy taxa which themselves are capable of producing seeds able to survive the long winter. These may then spread to roadsides and other disturbed areas.

Recent studies of disturbed areas in the Fairbanks area have led to the discovery of two species previously unrecorded in Alaska. Two members of the Asteraceae, *Conyza canadensis* (L.) Cronquist and *Sonchus uliginosus* Bieb. are new introductions to the state.

*Conyza canadensis* (L.) Cronquist

SPECIMEN EXAMINED: UNITED STATES. Alaska: Fairbanks Quad., Fairbanks, Eton Blvd., 64° 54' N, 147° 42' W, 214 m, 22 August 1990, *Grant 90-01273* (ALA).

*Conyza canadensis*, a native of North America has become a semicosmopolitan weed. For this reason it is not too surprising to see it arriving in Alaska.

*Sonchus uliginosus* Bieb.

SPECIMENS EXAMINED: UNITED STATES. Alaska: Fairbanks Quad., Fairbanks. Corner of Taku Rd. and Farmers Loop Rd. near the University of Alaska campus, 64° 51' 30" N, 147° 49' 20" W, 24 August 1988. *Grant 88-200* (ALA); Corner of Taku Rd. and Farmers Loop Rd. near the University of Alaska campus, 64° 51' 30" N, 147° 49' 20" W, 22 August 1990, *Grant 90-01281* (ALA,US); corner of Lathrop Rd. and Mitchell Expressway, 64° 50' N, 147° 43' W, 22 August 1990, *Grant 90-01291* (ALA,US); Corner of S. Cushman and Van Horn Rd., 64° 50' N, 147° 43' W, 22 August 1990, *Grant 90-01292* (ALA,US).

*Sonchus uliginosus* has been naturalized throughout the northeastern United States from Europe and is moving westward and northward with continued development.

## ACKNOWLEDGMENTS

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THELECHITONIA CUATRECASAS, AN OLDER NAME FOR COMPLAYA  
STROTHER (ECLIPTINAE-HELIANTHEAE-ASTERACEAE)

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ABSTRACT

New combinations are made for the four species belonging to the genus *Thelechiton* Cuatr., based on *T. muricata* Cuatr. (= *Wedelia brachycarpa* Baker). The genus includes the three species recently placed in *Complaya* Strother, based on *Silphium trilobatum* L. (= *Wedelia trilobata* [L.] Hitchc.).

KEY WORDS: Asteraceae, Heliantheae, *Thelechiton*, *Complaya*, *Wedelia trilobata*

Recent considerations of the *Wedelia* group of the Heliantheae subtribe Ecliptinae have brought out two points of significance regarding the genus *Thelechiton* Cuatrecasas (1954). Cuatrecasas has noted, but not published, the fact that the type species of his genus, *T. muricata* Cuatr. of Colombia, has proven to be the same as the mostly central South American *Wedelia brachycarpa* Baker based on examining a fragment of the type collection of the latter, *Balansa 8550* (US) and other specimens at US. Cuatrecasas and Dr. Cabrera of Argentina had corresponded and agreed on the topic in 1965 (Cabrera, Cuatrecasas, personal communications). Also, it is noted that *Wedelia brachycarpa*, according to personal observations, was a fourth species of the genus *Complaya* Strother that has been omitted by Strother (1991) in the delimitation of his genus. The Baker species, which occurs mostly in Paraguay and adjacent regions, had all the characteristics cited by Strother for his segregate of *Wedelia* Jacq., including the prostrate habit with roots at the nodes, the solitary terminal heads that become laterally displaced, the black anther appendages, the thickened and often roughened achene walls, and the rostra and pappi that are obscured in mature achenes by development of a corky collar. As illustrated in the publication of *Thelechiton* (Cuatrecasas 1954), the bases

of the achenes in *Wedelia brachycarpa* are often more narrowly pointed than illustrated by Strother (1991), but the bases vary in the species. The leaves of *Wedelia brachycarpa* are not so succulent as those of some material cited by Strother, but many noncoastal specimens of the common *Wedelia trilobata* (L.) Hitchc. have leaves that are equally herbaceous.

The result of the observations cited above is that *Thelechiton* is an older name for *Complaya* Strother. Since it has been the intention to follow most of the Strother alignments in the treatments of the Heliantheae in the Floras of Ecuador and Perú now in preparation by Robinson, new combinations are needed. The three species included in *Complaya* by Strother have been checked, and all three are transferred here. The fourth species also needs a combination since the name for the type species described by Cuatrecasas (1954) is not the oldest available name for the species.

*Thelechiton* Cuatrecasas, Bull. Soc. Bot. France 101:242. 1954. TYPE: *Thelechiton muricata* Cuatrecasas (= *T. brachycarpa* (Baker) Robinson & Cuatrecasas.

*Complaya* Strother, Syst. Bot. Monogr. 33:10. 1991. TYPE: *Complaya trilobata* (L.) Strother.

The genus contains the following four species.

*Thelechiton brachycarpa* (Baker) H. Robinson & Cuatrecasas, *comb. nov.* BASIONYM: *Wedelia brachycarpa* Baker in Martius, *Flora Brasiliensis* 6(4):181. 1884 (1885). Bolivia, Brasil, Colombia, Paraguay, Argentina, Venezuela. Specimens seen from Venezuela were determined as *Wedelia paludosa* var. *villosa*.

*Thelechiton chinensis* (Osbeck) H. Robinson & Cuatrecasas, *comb. nov.* BASIONYM: *Solidago chinensis* Osbeck, *Dagb. Ostind. Resa* 241. 1757. Eastern Asia.

*Thelechiton gracilis* (Richard in Persoon) H. Robinson & Cuatrecasas, *comb. nov.* BASIONYM: *Wedelia gracilis* Richard in Persoon, *Syn. Pl.* 2:490. 1807. Antilles.

*Thelechiton trilobata* (L.) H. Robinson & Cuatrecasas, *comb. nov.* BASIONYM: *Silphium trilobatum* L., *Syst. Nat.* ed. 10, 2:1233. 1759. Pantropical. Synonyms include *Wedelia brasiliensis* (Sprengel) S.F. Blake and *Wedelia paludosa* DC.

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NEW COMBINATIONS IN *ELAPHANDRA* STROTHER  
(ECLIPTINAE-HELIANTHEAE-ASTERACEAE)

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ABSTRACT

*Aspilia* Thouars is formally reduced to synonymy, and the previous placement of *Gymnolomia* H.B.K. in synonymy under *Aspilia* is corrected. The type of *Aspilia*, *A. thouarsii* DC., is transferred to *Wedelia*, and the lectotype of *Gymnolomia*, *G. tenella* H.B.K., is transferred to *Eleutheranthera* Poit. ex Bosc. Nine species from northern South America are transferred to *Elaphandra* Strother from *Aspilia*, and *Elaphandra paucipunctata* is described as new from Ecuador.

KEY WORDS: Asteraceae, Heliantheae, *Elaphandra*, *Aspilia*, *Wedelia*, *Eleutheranthera*, *Gymnolomia*

The recent study of various members of the *Wedelia* relationship of the Heliantheae (Strother 1991) is the culmination of a series of studies of the limits of *Wedelia* Jacq. and *Zezmenia* La Llave (Becker 1975a, 1975b, 1979; Rindos 1980; McVaugh 1972, 1984; Robinson 1978, 1984a, 1984b; Strother 1987, 1989a, b; Villaseñor & Strother 1989). One aspect of the Strother study, as well as the previous McVaugh (1972, 1984) studies, is the dismissal of the traditional concept of *Aspilia* Thouars, which has contained *Wedelia*-like species with neutral rays. Most of the neutral rayed species within the Strother study area have been transferred by McVaugh (1972) and Strother (1991) directly into *Wedelia*. However, one newly described Panamanian species is placed by Strother in his new genus *Elaphandra*, and some additional South American species were mentioned and annotated as possible members of the new genus. Unfortunately, Strother, like Rindos (1980), chose not to publish a number of the combinations that were the inevitable result of his study.

*Elaphandra* Strother was rather well defined within the limited geography of the Strother (1991) paper by its erect to scrambling habit, lateral leaf

veins reaching near the leaf tip, lack of resinous glandular punctations on the leaves, herbaceous outer involucre bracts, neutral rays, black anther appendages, and narrow rather stipitate based achene bases with no elaiosomes and small carpodia. The base of the achene lacking an elaiosome and lacking a large carpodium is a primary distinction from the Strother concept of *Wedelia*. There are also three tendencies found in some but not all species of *Wedelia* that are not known in *Elaphandra*: fertile rays such as those of typical *Wedelia* yellow anther appendages, and resinous glandular punctations on the leaves. Some emphasis is given by Strother to the unique nonrostrate or scarcely rostrate, epappose or shortly bicornute apex of the achene in the type of the genus *Elaphandra*, *Elaphandra bicornis* Strother, but Strother suggests probable close relationship to the Colombian species named by Blake as *Aspilia quinquenervis* in which the rostrum and corona are more highly developed. The lack of tuberculae on the achene is also used by Strother as a key character distinguishing *Elaphandra* from *Eleutheranthera* Poit. ex Bosc. and *Thelechiton* Cuatr. (= *Complaya* Strother).

The Strother separation of *Elaphandra* from *Wedelia* is accepted here. The separation from *Aspilia* is also accepted on the basis of the original description of that genus (Petit-Thouars 1806) and the description and illustration of the type *A. thouarsii* DC. by Humbert (1963), which indicate that *Aspilia* is a synonym of *Wedelia*. The following combination formalizes the reduction of *Aspilia* to synonymy under *Wedelia*. The eventual dispositions of many species presently placed in *Aspilia* still need to be resolved.

*Wedelia thouarsii* (A.DC.) H. Robinson, *comb. nov.* BASIONYM: *Aspilia thouarsii* A.DC., *Prodr.* 5:561. 1836.

The species of *Elaphandra* belong to neither *Wedelia* nor *Aspilia* among the pre-existing genera, but the problem of distinguishing the Strother concept of *Elaphandra* from *Eleutheranthera* Poit. ex Bosc. and *Gymnolomia* H.B.K. is not as easily solved. One of the key differences from *Eleutheranthera* used by Strother (1991) is the lack of tuberculae on the achenes of the former, but a number of the potential members of *Elaphandra* from South America have tuberculae. A second difference used by Strother, the lack of rays in *Eleutheranthera*, fails if the Colombian *Aspilia tenella* (H.B.K.) S.F. Blake is transferred to that genus, as suggested by Strother in his annotations of specimens. Nevertheless, four characteristics have been noted in this study that distinguish the expanded concept of *Elaphandra* from the expanded concept of *Eleutheranthera*. First, as noted by Strother, *Elaphandra* lacks resinous glandular punctations on the leaves, but they are present in *Eleutheranthera*. Second, the disk corollas of *Elaphandra* always have distinct fiber sheaths along the veins of the throat, a feature lacking in *Eleutheranthera*. Third, the anther

appendages of *Elaphandra* are of ordinary oblong-ovate shape with no glands. The appendages of *Eleutheranthera* are very blunt, wider than long, and have glands abaxially. Fourth, the style branches of *Elaphandra* are blunter and more densely papillose distally. The style tips of *Eleutheranthera* are attenuate with sparse spreading papillae.

A secondary effect of the expanded concept of *Eleutheranthera* is the resolution of the genus *Gymnolomia*. The latter genus was originally credited with four species. Three of the species were transferred to *Aspilia* by Blake (1924), and two proved to be *Aspilia tenella*, which Blake selected as the lectotype of *Gymnolomia*. The fourth species, *G. rudbeckioides* H.B.K., was transferred by Blake to *Hymenostephium* Benth. and was transferred later by Robinson (1977) to *Viguiera* H.B.K. The lectotypification of *Gymnolomia* by *G. rudbeckioides*, as was belatedly suggested by D'Arcy (1975, p. 1156-1157), was contrary to D'Arcy's own suggestion that *Gymnolomia* might be the correct name for much of the New World material placed in the genus *Aspilia*. Thus, *Gymnolomia*, which has been previously placed in the synonymy of *Aspilia*, proves to be a synonym of *Eleutheranthera*.

The following summary of the resolution of *Eleutheranthera* and *Gymnolomia* is possible.

*Eleutheranthera* Poit. ex Bosc., *Nouv. Dict. Hist. Nat.*, ed. 1. 7:498. 1803.

LECTOTYPE: *Eleutheranthera ovata* Poit. ex Steud., *nom. nud.* (= *Eleutheranthera ruderalis* [Swartz] Schultz-Bip.).

*Ogiera* Cass., *Bull. Soc. Philom.* 1818:32. 1818. TYPE: *Ogiera triplinervis* Cass. (= *Eleutheranthera ruderalis* [Swartz] Schultz-Bip.).

*Gymnolomia* H.B.K., *Nov. Gen. Sp.*, ed. fol. 4:170. 1818. LECTOTYPE: *Gymnolomia tenella* H.B.K. (Blake 1924).

*Fingalia* Schrank, *Syll. Ratisb.* 1:87. 1824. TYPE: *Fingalia hexagona* Schrank.

*Gymnopsis* A. DC., *Prodr.* 5:561. 1836. *nom. superfl.* for *Gymnolomia*.

*Kegelia* Schultz-Bip., *Linnaea* 21:245. 1848. TYPE: *Kegelia ruderalis* (Swartz) Schultz-Bip.

*Eleutheranthera tenella* (H.B.K.) H. Robinson, *comb. nov.* BAsIONYM: *Gymnolomia tenella* H.B.K., *Nov. Gen. Sp.*, ed. fol. 4:171. 1818.

*Gymnolomia hondensis* H.B.K., *Nov. Gen. Sp.*, ed. fol. 4:171. 1818.

*Aspilia tenella* (H.B.K.) S.F. Blake, Contr. U.S. Natl. Herb. 22(8): 620. 1924.

The expanded concept of *Elaphandra* consists at this time, of species lacking resinous glandular punctations on their leaves. having lateral leaf veins reaching the distal fourth of the leaf, bearing neutral rays or no rays, having fiber sheaths on the veins of the disk corolla throat, having black, ovate anther appendages without glands, having style branches densely papillose to the tip, and having achenes narrowed at the base without obvious elaiosomes or carpodia. The bases of the achenes are usually not so elongated as in the type of the genus. As such, the genus is enlarged from the single species of Strother (1991) to include four additional groups of species previously placed in the genus *Aspilia*. One group is of apparent immediate relatives of the type, such as *A. quinquenervis* S.F. Blake that was mentioned by Strother (1991). A second group includes species notable for black spots on their leaves or black lines in their involucre bracts. A member of the group, *A. verbessinoides* (A.DC.) S.F. Blake, was annotated by Strother as a possible *Elaphandra*. The third group consists of an Ecuadorian species that is notable for a lack of rays. A fourth group consists of a recently described Venezuelan species with comparatively small heads and pointed pales. Also, in an effort to provide for all names known to be needed for the Flora of Ecuador treatment, the opportunity is taken to describe an additional species from that country which belongs to the second group.

*Elaphandra* Strother, Syst. Bot. Monogr. 33:17. 1991. TYPE: *Elaphandra bicornis* Strother, eastern Panamá.

#### Group I.

*Elaphandra macrolepis* (S.F. Blake) H. Robinson, *comb. nov.* BASIONYM: *Aspilia macrolepis* S.F. Blake, Contr. U.S. Natl. Herb. 22:617. 1924. This seems closest to the type of the species being transferred, but the outer involucre bracts are longer and narrower, and the corona of the achene is more developed. Colombia.

*Elaphandra quinquenervis* (S.F. Blake) H. Robinson, *comb. nov.* BASIONYM: *Aspilia quinquenervis* S.F. Blake, J. Wash. Acad. Sci. 18:26. 1928. The species is variable in the density and inclination of hairs on the lower leaf surface, and the Ecuadorian specimens have generally broader and shorter outer involucre bracts. Colombia and Ecuador.

## Group II.

**Elaphandra archeri** (H. Robinson & Brettell) H. Robinson, *comb. nov.* BASIONYM: *Aspilia archeri* H. Robinson & Brettell, *Phytologia* 32:419. 1975. Colombia.

**Elaphandra eggersii** (Hieron.) H. Robinson, *comb. nov.* BASIONYM: *Aspilia eggersii* Hieron., *Bot. Jahrb. Syst.* 28:606. 1901. A related species is described below based on material once identified as this species. Ecuador.

**Elaphandra lucidula** (S.F. Blake) H. Robinson, *comb. nov.* BASIONYM: *Aspilia lucidula* Proc. Biol. Soc. Wash. 36:52. 1923.

*Aspilia steinbachii* H. Robinson & Brettell, *Phytologia* 32:420. 1975.

Bolivia.

**Elaphandra ulei** (Hieron.) H. Robinson, *comb. nov.* BASIONYM: *Aspilia ulei* Hieron., *Verh. Bot. Ver. Brandenb.* 48:205. 1906. (1907). Western Brazil.

**Elaphandra verbesinoides** (A. DC.) H. Robinson, *comb. nov.* BASIONYM: *Gymnopsis verbesinoides* A. DC., *Prodr.* 5:561. 1836.

*Aspilia nigropunctata* S.F. Blake, *Proc. Biol. Soc. Wash.* 24:119. 1911.

*Aspilia verbesinoides* (A. DC.) S.F. Blake, *Proc. Biol. Soc. Wash.* 34:120. 1921.

Trinidad, Tobago, Venezuela.

## Group III.

**Elaphandra pastazensis** H. Robinson, *comb. nov.* BASIONYM: *Aspilia pastazensis* H. Robinson, *Phytologia* 55:417. 1984. Ecuador.

## Group IV.

**Elaphandra falconiensis** (Badillo) H. Robinson, *comb. nov.* BASIONYM: *Aspilia falconiensis* Badillo, *Ernstia* 9:13. 1983. Venezuela.

## New species of Group II.

***Elaphandra paucipunctata*** H. Robinson, *sp. nov.* HOLOTYPE: ECUADOR. El Oro Prov.: 5 km W of Piñas on the road to Saracay, elev. 3600 ft., low spreading shrub 0.5 m tall, ray florets yellow, disk florets black but the lobes yellow, 4 Feb. 1979, *King & Almeda 7969* (US). PARATYPE: ECUADOR. El Oro Prov.: Road from Piñas to Sta. Rosa, km 16, elev. 620 m, creeping vine in shrubs, flowers yellow, 7 Oct. 1979, *Dodson, Gentry, & Shupp 8943* (US).

Plantae volubiles vel patentiter frutescentes ad 0.5 m altae; caules erecte vel leniter retrorse hirsutuli. Folia opposita, petiolis 6-12 mm longis; laminae ovatae plerumque 5-10 cm longae et 2.5-5.5 cm latae base breviter acutae margine serrulatae apice breviter acuminatae supra scabridulae subtus antrorse pilosae et pauce nigropunctatae fere ad basem distincte trinervatae. Inflorescentiae unicapitatae longe pedunculatae, pedunculis saepe 5-12 cm longis leniter retrorse hirsutulis. Capitula ca. 1 cm alta sine radii 1.0-1.5 cm lata; squamae involucri exteriores herbaceae oblongo-ovatae 9-10 mm longae et ca. 5 mm latae apice breviter acutae extus dense pilosulae, bracteae interiores sensim membranaceae obovatae ca. 10 mm longae ad 6.5 mm latae pauce nigropunctatae apice late rotundatae extus dense scabridulae; paleae scariosae stramineae apicae breviter acutae suberosae extus glabrae. Flores radii ca. 8; corolla flavae glabrae, tubis ca. 2 mm longis, limbis oblongis ca. 17 mm longis et 6 mm latis apice distincte bilobatis. Flores disci ca. 35; corollae nigrescentes inferne et in lobis flavescentiores extus glabrae, tubis 1.5-2.0 mm longis faucibus ca. 3 mm longis, lobis ca. 1 mm longis in marginis interioribus dense longe papillois; thecae et appendices antherarum nigrescentes, thecae ca. 2 mm longae. Achaenia immatura.

The new species is related to the more widespread Ecuadorian *Elaphandra eggersii* with the same darkened corollas of the disk florets. The species differs by the much shorter tips of the leaves, the sparse occurrence of black spots on the undersurface of the leaves, and the much shorter outer involucre bracts. The black spotting of the leaves is obvious compared to the unspotted condition seen in *E. eggersii*, but is still much less obvious than that seen in species like *E. archeri*, *E. verbesinoides*, or *E. lucidula*.

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***XYRIS ISOETIFOLIA* KRAL (XYRIDACEAE) NEW TO ALABAMA AND ITS  
RANGE AND HABITATS IN FLORIDA**

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ABSTRACT

*Xyris isoetifolia* Kral was previously thought to be a narrow endemic of the Florida panhandle and was represented by collections from six stations. It is here reported as new to Alabama, from the sandy margin of a sinkhole pond in Covington County. The habitats of five newly discovered Florida panhandle stations are discussed and related to the Alabama station.

KEY WORDS: *Xyris isoetifolia*, Xyridaceae, Alabama, limesink ponds

*Xyris isoetifolia* Kral was described in 1966 from northwest Florida as occurring in Bay and Gulf counties (Kral 1966) and has been reported as endemic to Florida (Muller *et al.* 1989; Anderson 1989). Kral (1966; 1983) described the habitat for *X. isoetifolia* as moist sands or sandy peats of savanna bogs, flatwoods pond margins, and shores of limesink ponds and lakes. Anderson (1989) reported that the Gulf County record (Kral 1966; Clewell 1985) was in error, and that the only other record for *X. isoetifolia* was actually from Washington County. There is a Washington County specimen at VDB, "Sandy shore of Chain Lakes, W of Greenwood," *Godfrey & Henderson 62954*, 6 July 1963; which is also cited in Kral's unpublished list of exsiccatae for his 1966

*Xyris* monograph. Anderson made additional collections from either side of an unimproved timber access road that straddles the Gulf and Bay county line. Anderson (1989, p. 501) erroneously reported his collections #11,713 and #11,776 as a county record for Gulf County, since the labels indicate that these numbers are actually from Bay County. However, Anderson did collect *X. isoetifolia* in Gulf County, but the collections are numbered 11,712 and 11,775, based upon our examination of specimens at the FSU herbarium. In summary, *X. isoetifolia* had previously been known from six collections at four Bay County stations (Kral 15651 [holotype], Kral 23193, Godfrey & Houk 61551, Godfrey & Kral 62425, Anderson 11713, Anderson 11776), one Washington County station, and two collections from a single station in Gulf County (Anderson 11712 and 11775). Our collections have added five new stations for Florida; four in Bay County (Orzell & Bridges 14218, 15240, 17107, and 18278) and one in Washington County (Orzell & Bridges 9784).

Our Florida collections are from three distinct community types: seepage herb bogs or seepage savannas (Bay and Gulf counties), coastal scrubby flatwoods (Bay County), and margins of sandy limesink ponds (Washington County). The Bay and Gulf county seepage habitats are dominated by *Pleea tenuifolia* Michx. In these areas *Xyris isoetifolia* grows in association with *Bigelovia nudata* (Michx.) DC., *Burmannia capitata* (Walt.) Mart., *Cliftonia monophylla* (Lam.) Britt. ex Sarg., *Dichantheium dichotomum* (L.) Gould, *Drosera capillaris* Poir., *Drosera tracyi* MacFarlane, *Erigeron vernus* (L.) Torrey & Gray, *Eriocaulon compressum* Lam., *Eriocaulon decangulare* L., *Fuirena breviseta* (Coville) Coville in Harper, *Gaylussacia mosieri* Small, *Hypericum brachyphyllum* (Spach) Steud., *Lachnanthes caroliniana* (Lam.) Dandy, *Lachnocaulon anceps* (Walt.) Morong, *Lachnocaulon digynum* Körn., *Lachnocaulon minus* (Chapman) Small, *Linum medium* (Planch.) Britt. var. *texanum* (Planch.) Fern., *Lophiola aurea* Ker-Gawl., *Lycopodium alopecuroides* L., *Lycopodium prostratum* Harper, *Panicum rigidulum* Bosc ex Nees, *Physostegia godfreyi* Cantino, *Pinguicula lutea* Walt., *Polygala lutea* L., *Rhexia alifanus* Walt., *Rhexia lutea* Walt., *Rhynchospora baldwinii* A. Gray, *Rhynchospora chapmanii* M.A. Curtis, *Rhynchospora curtissii* Britt. ex Small, *Rhynchospora filifolia* A. Gray, *Rhynchospora oligantha* A. Gray, *Rhynchospora plumosa* Ell., *Sarracenia flava* L., *Sarracenia psittacina* Michx., *Scleria reticularis* Michx., *Smilax laurifolia* L., *Syngonanthus flavidulus* (Michx.) Ruhl., *Tofieldia racemosa* (Walt.) B.S.P., and *Xyris ambigua* Beyr. ex Kunth.

Within less than one mile of the Gulf of Mexico and its embayments in coastal Bay County, *Xyris isoetifolia* can be locally abundant along disturbed sandy road embankments through scrubby flatwoods. Scrubby flatwoods occur where a relatively deep sandy surface overlies an impervious spodic layer, resulting in alternating conditions of subsurface saturation and drought. These flatwoods typically have a pine canopy with a dense tall shrub layer primarily of evergreen scrub oaks and ericaceous shrubs. Closely associated plants in these

habitats include *Xyris brevifolia* Michx., *X. elliotii* Chapm., and *Lachnocaulon anceps*. Other associates recorded at scrubby flatwoods in coastal Bay County include: *Asclepias cinerea* Walt., *Carphephorus odoratissimus* (J.F. Gmel.) Hebert, *Conradina canescens* (Torrey & Gray) A. Gray, *Euphorbia telephioides* Chapman, *Hypericum tetrapetalum* Lam., *Ilex glabra* (L.) A. Gray, *Kalmia hirsuta* Walt., *Liatris tenuifolia* Nutt., *Lyonia ferruginea* (Walt.) Nutt., *Lyonia lucida* (Lam.) K. Koch, *Pinus palustris* P. Mill., *Polygonella gracilis* (Nutt.) Meisn., *Quercus minima* (Sarg.) Small, *Rhynchospora plumosa*, *Smilax auriculata* Walt., *Cyrtilla racemiflora* L., and *Gratiola subulata* Baldw. Where seepage emerged on a road embankment through scrubby flatwoods in coastal Bay County, the following associates were recorded: *Anthaenantia rufa* (Ell.) Schultes, *Bigelovia nudata*, *Burmannia capitata*, *Carphephorus pseudoliatris* Cass., *Drosera capillaris*, *D. tracyi*, *Erigeron vernus*, *Hypericum brachyphyllum*, *Juncus scirpoides* Lam., *Lachnocaulon anceps*, *Lobelia puberula* Michx., *Lycopodium carolinianum* L., *Pleea tenuifolia*, *Polygala cruciata* L., *Polygala lutea*, *Rhexia alifanus*, *Rhexia lutea*, *Rhexia mariana* L., *Rhynchospora chapmanii*, *Rhynchospora oligantha*, *Rhynchospora plumosa*, *Sarracenia flava*, *Scleria reticularis*, *Syngonanthus flavidulus*, *Utricularia juncea* Vahl, and *Xyris elliotii*.

At our Washington County site *Xyris isoetifolia* grows on the upper margin of a relatively steep sided sinkhole lake, where seepage emerging from a nearby steephead stream saturates the exposed sandy lakeshore. Both the seasonal and long term fluctuating water levels of this sinkhole lake and others characteristic of the Greenhead Slope physiographic region, in Bay and Washington counties, keep the upper shoreline from being invaded by most woody plants, thereby producing an intermittently exposed sandy margin which varies in width according to the lake water level. During extended periods of low water conditions at this sinkhole lake, *X. isoetifolia* is abundant and grows in close association with *Amphicarpum muhlenbergianum* (Schultes) A.S. Hitchc. *Centella asiatica* (L.) Urban, *Drosera filiformis* Raf. (at one of its few stations south of North Carolina), *Fuirena scirpoidea* Michx., *Hypericum reducedum* P. Adams, *Lachnocaulon minus*, *Rhynchospora pleiantha* (Kukenth.) Gale *Sagittaria isoetiformis* J.G. Sm., *Syngonanthus flavidulus*, *Utricularia cornuta* Michx., *U. subulata* L., *Woodwardia areolata* (L.) T. Moore, *Xyris baldwiniana* Schultes, *X. drummondii* Malme, and *X. longisepala* Kral. *Clethra alnifolia* L. *Cliftonia monophylla*, and *Ilex glabra* form a scrubby zone at the mean seasonal high water level of the lake, just upslope from the *X. isoetifolia*. *Hypericum lissophloeus* P. Adams can occur as scattered shrubs in association with *X. isoetifolia*. During our visits to the site (Sept. 1989, Aug. 1991) when high lake water levels inundated the bare sandy margin, we did not observe any *X. isoetifolia*.

While conducting floristic studies on the Gulf Coastal Plain we collected *Xyris isoetifolia* in southern Alabama at a site about 120 km northwest of the

nearest known locality for it in Florida. The collection data for our Alabama specimens are as follows:

*Xyris isoetifolia* Kral (Xyridaceae). UNITED STATES. Alabama: Covington Co.: Sandy fluctuating shoreline of limesink pond on N shore of Blue Pond, at picnic area at end of FS Rd. to E of AL Hwy. 137 at a point 1.1 mi N of jct. with Covington Co. Rd. 24; Conecuh Wildlife Management Area in Conecuh National Forest; NWQ, NEQ, Sec. 28, T2N R15E, Wing 7.5' Quad.; 31° 06' 51" N, 86° 33' 11" W; Elev. 214-220 ft.; 12 May 1989, Orzell & Bridges 9820 (VDB,TEX,USF). Same locality, 11 Sept 1989, Orzell & Bridges 11711 (FSU,GA,MO,NCU,NY,VDB,TEX,WIS).

*Xyris isoetifolia* occurs on the upper sandy margin of a limesink pond just below the perennial graminoid dominated zone at the Alabama site. It grows in small tufts on moist, exposed sand in association with *X. longisepala*, *Lachnocaulon minus* and occasionally *X. jupicai* L.C. Rich. *Eupatorium leptophyllum* DC. and *Hypericum fasciculatum* Lam. occur in this zone as scattered individuals and partially shade *Xyris isoetifolia*.

The Blue Pond location has been the source of several new and interesting plant records for Alabama (Kral 1973; Kral 1976; McGinty 1983). Kral (1973; 1976) reported several plant taxa new to Alabama from Blue Pond, including *Eupatorium leptophyllum* (Kral 1976) and *Xyris longisepala* (Kral 1973) which are associates of *X. isoetifolia*. Kral (1973) also mentioned several other rare taxa for Alabama which occur at Blue Pond (*Rhexia salicifolia* Kral & Bostick, *Eriocaulon lineare* Small, *Lachnocaulon minus*, and *Sagittaria isoetiformis*). A search by the authors of nearby limesink ponds in the vicinity of Blue Pond has thus far failed to locate any additional populations of *X. isoetifolia*.

Based upon our field observations in Florida and Alabama, and the relative abundance of *Xyris isoetifolia* at these stations, it appears to be most frequent on the outer coastal terraces of Bay County, Florida. Within the Gulf Coastal Lowlands region of the Florida panhandle, it occurs in seepage herb bogs and seepage savannas in both Bay and Gulf counties and in scrubby flatwoods of coastal Bay County. It is also locally abundant further inland on seepage saturated exposed sandy margins of steep sided, seasonally fluctuating limesink ponds in Bay and Washington counties on the sandy upland of the Greenhead Slope. Here, *X. isoetifolia* is often found in association with a number of endemic vascular plants of these habitats. In southern Alabama it is apparently rare and presently known only from the sandy margin of a similar limesink pond in Covington County. *Xyris isoetifolia* occurs abundantly within microhabitats where there is some periodic seepage or capillary saturation of sand or sandy peat. It appears to be most abundant where either natural (i.e., fire, soil slumping) or artificial disturbance of the habitat (i.e., occasional soil disturbance due to roadside maintenance, clearcutting, etc.) has occurred in the

recent past. *Xyris isoetifolia* thrives where such disturbance reduces competition from the surrounding herbaceous vegetation. Within these microhabitats it can form small tufts, which under favorable conditions can form small areas of turf. Here it may be locally dominant, but it is unlikely to persist as a long term component in severely disturbed habitats once taller perennial vegetation becomes established. Additional localities for this infrequently collected *Xyris* should be sought in similar habitats elsewhere in the southeastern Coastal Plain.

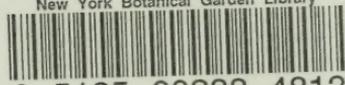
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