

campanulate, about 1 mm. long and 2 mm. wide, appressed-puberulent; corolla hypocrateriform, its tube slender, cylindric, about 2 mm. long, densely appressed-puberulent on the outside, more conspicuously so upwards, the limb about 8 mm. wide, densely puberulent on both surfaces.

The type of this species was collected by José Schunke V. (no. 908) in a low forest in Neshuya, at 250 m. altitude, Loreto, Peru, on October 2, 1965, and is deposited in the Britton Herbarium at the New York Botanical Garden. The collector describes the color of the corollas as "2.5P5/8".

ADDITIONAL NOTES ON THE GENUS VERBENA. XI

Harold N. Moldenke

VERBENA [Dorst.] L.

Additional synonymy: Veraena Lam. ex Tawada, Biol. Mag. Okinawa [Okinawa Seibutsugakki] 4 (6): 36, sphalm. 1967.

Additional & emended bibliography: Matth., Disc. Valgr., ed. 1, 2: 399 & 1107 (1585) and ed. 2, 2: 1107. 1586; Schröder, Pharm. Med.-Chem., ed. 2, 4: 167--168. 1649; Micheli, Cat. Plant. Hort. Caes. Florent., ed. 1, 98 & 182. 1748; Lanfossi, Giorn. Fis. Chim. Stor. Nat. Med. & Art., ser. 2, 10: 48. 1827; Micheli, Cat. Plant. Hort. Caes., Florent., ed. 2, 98 & 182. 1831; Jan, Elench. Pl. 1. 1831; Moris, Fl. Sard. 3: 342--343. 1859; P. M. Rodríguez, Pl. Med. Parag. 1915; Tischler, Tabul. Biol. 4: 24. 1927; Furusato, Bot. & Zool. Theoret. & Appl. Tokyo 8: 1303--1311. 1940; Covas & Schnack, Revist. Argent. Agron. 14: 229 & 231, fig. 32. 1947; Darlington & Wylie, Chrom. Atl., pr. 1, 322--323 & 518. 1956; Schnack, Fehleisen, & Cocucci, Revist. Argent. Agron. 24: 129--135. 1957; Cabrera, Revist. Invest. Agríc. 11: 332 & 398. 1957; Rattenbury, Madroño 15: 50--51. 1959; Schnack, Fehleisen, & Cocucci, Revist. Fac. Agron. La Plata 35: [47]--56, fig. 1--3. 1959; Lens, Sarracenia 5: 79. 1960; Lewis & Oliv., Am. Journ. Bot. 48: 638--643, fig. 1--26. 1961; Martin & Barkley, Seed Ident. Man. 37, 58, 194--195, & 221, fig. 260, pl. 234--236 & 397. 1961; Rattenbury, Madroño 17: 116. 1963; Ruiz Leal, Revist. Facult. Cienc. Agrar. Mendoza 11: 173 & 174, fig. 8. 1964; Banerji, Rec. Bot. Surv. India 19: 75. 1965; Huynh, Schweiz. Naturforsch. Ges. Mém. Soc. Helvet. Sci. Nat. 85: 1--178. 1965; Tawada, Biol. Mag. Okinawa [Okinawa Seibutsugakki] 4 (6): 36--37. 1967; T. H. Everett, Living Trees World 297. 1968; M. Martinez, Pl. Med. Mex., ed. 5, 340--341, 505, & 579. 1969; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 715--717. 1969; Angely, Fl. Anal. Fitogeogr. Est. S. Paulo, ed. 1, 4: 825, 838--840, & xix. 1970; Troncoso, Darwiniana 16: [613]--621, fig. 1--3. 1971; Vyas & Agarwal, Phytton 28: 1--5. 1971; Anon., Biol. Abstr. 53 (1): B.A.S.I.C. S.

267. 1972; D. Burpee, Burpee Seeds 1972: 1, 28, 56, & 57, pl. 3177 & 4345. 1972; W. J. Park, Park's Flower Book 1972: 87. 1972; Vyas & Agarwal, Biol. Abstr. 53: 499. 1972; Moldenke, Phytologia 23: 191--196. 1972.

Additional excluded species are:

Verbena foemina Brunf. = Senecio vulgaris L., Carduaceae

Verbena foemina Trag. = Sisymbrium officinale L., Brassicaceae

Verbena recta sive mas Fuchs = Sisymbrium officinale L., Brassicaceae

The Tawada reference in the bibliography above is sometimes cited as "1968", but the date, December 25, 1967, appears both on the title-page of the number and on the first page of Tawada's paper. The Madroño references (1959, 1960, 1962) are sometimes cited as "Solbrig, Madroño...." or "Darlington, Document. Chrom. Numb. Pl.....", but actually are in several continuations of Rat-tenbury's original enumeration, with no new author or compiler indicated. The Tischler (1927) reference is sometimes cited as "Tischler, Pflanzl. Chrom....."

VERBENA ABRAMSI Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 65 (1971) and 2: 649, 679, & 912. 1971; Moldenke, Phytologia 22: 458--459. 1972.

xVERBENA ADULTERINA Hausskn.

Additional bibliography: Moldenke, Fifth Summ. 1: 206 (1971) and 2: 686, 699, 710, & 912. 1971; Moldenke, Phytologia 23: 459. 1972.

VERBENA ALATA Sweet

Additional synonymy: Verbena elata Jan, Elench. Pl. 1. 1824.

Additional bibliography: Jan, Elench. Pl. 1. 1824; Moldenke, Fifth Summ. 1: 177, 189, & 369 (1971) and 2: 649 & 912. 1971; Moldenke, Phytologia 22: 459. 1972.

VERBENA ALATA f. ALBA Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 177 (1971) and 2: 912. 1971; Moldenke, Phytologia 22: 459. 1972.

VERBENA AMBROSIFOLIA Rydb.

Additional bibliography: Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 716. 1969; Moldenke, Phytologia 23: 182, 188, & 190. 1972.

VERBENA AMBROSIFOLIA f. EGLANDULOSA Perry

Additional bibliography: Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 716. 1969; Moldenke, Fifth Summ. 1: 50, 52, 57, 61, 63, & 74 (1971) and 2: 649, 650, 658, & 912. 1971; Moldenke, Phytologia 22: 461--462 (1972) and 23: 188 & 190. 1972.

VERBENA AMOENA Paxt.

Additional bibliography: Moldenke, Fifth Summ. 1: 74 & 399 (1971) and 2: 672 & 912. 1971; Moldenke, *Phytologia* 22: 462. 1972.

VERBENA ANDALGALENSIS Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 200 (1971) and 2: 912. 1971; Moldenke, *Phytologia* 22: 462. 1972.

VERBENA ANDRIEUXII Schau.

Additional bibliography: Moldenke, Fifth Summ. 1: 74, 205, & 369 (1971) and 2: 651 & 912. 1971; Moldenke, *Phytologia* 22: 463. 1972.

VERBENA ARENARIA Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 200 (1971) and 2: 912. 1971; Moldenke, *Phytologia* 22: 463. 1972.

xVERBENA ARGENTINA Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 200 (1971) and 2: 912. 1971; Moldenke, *Phytologia* 22: 463. 1972.

VERBENA AURANTIACA Speg.

Additional bibliography: Moldenke, Fifth Summ. 1: 192 & 200 (1971) and 2: 912. 1971; Moldenke, *Phytologia* 22: 463 & 464. 1972.

VERBENA AURANTIACA var. *GLABERRIMA* Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 200 (1971) and 2: 912. 1971; Moldenke, *Phytologia* 22: 464--465. 1972.

VERBENA AURANTIACA f. *ROSEA* Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 200 (1971) and 2: 912. 1971; Moldenke, *Phytologia* 22: 465. 1972.

VERBENA AUSTRALIS Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 177 (1971) and 2: 912. 1971; Moldenke, *Phytologia* 22: 465. 1972.

xVERBENA BAILEYANA Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 369 (1971) and 2: 672, 673, 686, 697, 700, 702, & 912. 1971; Moldenke, *Phytologia* 22: 465. 1972.

VERBENA BAJACALIFORNICA Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 74 (1971) and 2: 912. 1971; Moldenke, *Phytologia* 22: 465. 1972.

VERBENA BALANSAE Briq.

Additional bibliography: Moldenke, Fifth Summ. 1: 177, 187, & 200 (1971) and 2: 702 & 912. 1971; Moldenke, *Phytologia* 22: 465. 1972.

Recent collectors have found this plant fruiting in September

and December, growing in "pastizal" and on high campos with Butia yatay (Mart.) Becc. The corollas are described as "blue" on Krapovickas, Cristóbal, Arbo, Maruflak, Maruflak, & Irogoyen 17113 and "clear lilac" on Krapovickas & Cristóbal 16028.

Additional citations: ARGENTINA: Corrientes: Krapovickas & Cristóbal 16028 (Rf); Krapovickas, Cristóbal, Arbo, Maruflak, Maruflak, & Irogoyen 17113 (Ac).

VERBENA BALLSII Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 200 (1971) and 2: 912. 1971; Moldenke, Phytologia 22: 465. 1972.

VERBENA BANGIANA Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 184 (1971) and 2: 912. 1971; Moldenke, Phytologia 22: 465. 1972.

VERBENA BARBATA Grah.

Additional bibliography: Moldenke, Fifth Summ. 1: 74 (1971) and 2: 653 & 912. 1971; Moldenke, Phytologia 22: 466. 1972.

xVERBENA BEALEI Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 369 (1971) and 2: 674, 680, & 912. 1971; Moldenke, Phytologia 22: 466. 1972.

VERBENA BERTERII f. ALBIFLORA Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 143 & 192 (1971) and 2: 653 & 912. 1971; Moldenke, Phytologia 22: 466. 1972.

xVERBENA BINGENENSIS Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 64 (1971) and 2: 656, 679, & 912. 1971; Moldenke, Phytologia 22: 466--467. 1972.

VERBENA BIPINNATIFIDA Nutt.

Additional synonymy: Verbena bipinnatifolia Nutt. ex Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 716, sphalm. 1969.

Additional & emended bibliography: Lewis & Oliv., Am. Journ. Bot. 48: [639]--641, fig. 6. 1961; Rattenbury, Madroño 16: 267. 1962; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 716. 1969; Vyas & Agarwal, Phytol. 28: 1--5. 1971; Moldenke, Fifth Summ. 1: 27, 32, 33, 36, 41, 43, 45, 47, 49, 51, 52, 57, 61, 63, 74, & 369 (1971) and 2: 521, 652--654, 658, 665, 671, 690, 708, & 912. 1971; Moldenke, Phytologia 22: 460, 461, 467--474, & 497 (1972) and 23: 188 & 190. 1972; Vyas & Agarwal, Biol. Abstr. 53: 499. 1972; Anon., Biol. Abstr. 53 (1): B.A.S.I.C. S.267. 1972.

Emended illustrations: Lewis & Oliv., Am. Journ. Bot. 48: 640, fig. 6. 1961.

Solbrig (1962) reports the chromosome number for this species as $2n = 30$. In this he agrees with Lewis & Oliver (1961), but

disagrees with his own previous finding which may have been based on a misidentification or on a specimen representing one of the many forms which have at times been given taxonomic standing. If the latter is the case, this would be most important information.

The Madroño (1962) reference in the bibliography above is cited as "Darlington, Document. Chrom. Numb. Pl. 1962" by Bolkhovskikh and his associates (1969).

Vyas & Agarwal (1971) report on the effect of thiourea and ascorbic acid on the seed germination of this species, both individually and jointly. The seeds are positively photoblastic and possess embryo dormancy. Both positively photoblastic and ascorbic acid at 200 ppm. concentration have a promoting effect. Thiourea makes the seeds light-indifferent, while ascorbic acid causes negative photoblastic response in these seeds. Two roles of ascorbic acid have been observed: one is the synergism with thiourea in stimulating germination and the other is the antagonism to the stimulatory effect of thiourea in light. It is most probable that the plant used by these authors was V. tenuisecta Briq., not V. bipinnatifida as they claim.

The corollas are described as having been "purple" on Perino & Perino 429.

Additional citations: OKLAHOMA: Roger Mills Co.: Perino & Perino 429 (Au--302808). MEXICO: Chihuahua: Townsend & Barber 139 (Au--292048).

VERBENA BIPINNATIFIDA var. LATILOBATA Perry

Additional bibliography: Moldenke, Fifth Summ. 1: 45, 53, 57, 61, 63, 74, & 369 (1971) and 2: 654 & 912. 1971; Moldenke, Phytologia 22: 473--474. 1972.

xVERBENA BLANCHARDI Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 16, 21, 34, 38, 43, 53, & 369 (1971) and 2: 651, 654, 672--674, 695, & 912. 1971; Moldenke, Phytologia 22: 474. 1972.

VERBENA BONARIENSIS L.

Additional & emended bibliography: Jan, Elench. Pl. 1. 1824; Noack, Biol. Zentralbl. 57: 383--388. 1937; Rosengurtt, Estud. Prad. Nat. Urug. 3: 325 & 326. 1943; Covas & Schnack, Revist. Argent. Agron. 14: 229. 1947; Schnack, Fehleisen, & Cocucci, Revist. Fac. Agron. La Plata 35: 49, [54], & 55, fig. 3. 1959; Lems, Sarcocolla 5: 79. 1960; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 716. 1969; Moldenke, Phytologia 23: 182. 1972.

Additional illustrations: Schnack, Fehleisen, & Cocucci, Revist. Fac. Agron. La Plata 35: [54], fig. 3. 1959.

Walker found this species in low waste places on Okinawa. Lems (1960) records it from thickets with Arundo donax on Gomera and Tenerife islands of the Canaries and cites Lems 2806. Schnack and his associates (1959) report that V. bonariensis is apomictic in its natural reproduction.

Additional citations: ARGENTINA: Buenos Aires: Erizuela 1459 (Au--121764), 1564 (Au--121757), 1638 (Au--121758). RYUKYO ISLAND ARCHIPELAGO: Okinawa: E. H. Walker 8133 (W--2619388).

VERBENA BONARIENSIS f. ALBIFLORA Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 177 & 200 (1971) and 2: 912. 1971; Moldenke, Phytologia 22: 479. 1972.

VERBENA BONARIENSIS var. CONGLOMERATA Briq.

Additional bibliography: Moldenke, Fifth Summ. 1: 16, 25, 39, 65, 92, 177, 187, 189, 200, 350, & 369 (1971) and 2: 912. 1971; Moldenke, Phytologia 22: 478 & 479. 1972.

VERBENA BRACTEATA Lag. & Rodr.

Additional & emended bibliography: Jan, Elench. Pl. 1. 1824; Reiche & Phil., Fl. Chil. 5: 296. 1910; Graves, Eames, Bissell, Andrews, Harger, & Weatherby, Bull. Conn. Geol. & Nat. Hist. Surv. 14: [Cat. Flow. Pl.] 331. 1910; Noack, Biol. Zentralbl. 57: 383--388. 1937; Rattenbury, Madroño 15: 51 (1959) and 15: 220. 1960; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 716. 1969; Moldenke, Fifth Summ. 1: 15--19, 21--23, 27, 30, 32, 34, 36--43, 45, 47, 49--51, 53, 57, 63--65, 75, 203--205, 369, & 396 (1971) and 2: 656, 657, 659, 664, 672, 673, 677, 679, 691, 693, 697, 698, 705, 736, 766, 913, & 967. 1971; Moldenke, Phytologia 22: 461, 467, 479--488, 490, 499, & 501 (1972) and 23: 188, 195, & 196. 1972.

The Madroño (1959, 1960) references given in the bibliography above are sometimes attributed to Solbrig, while Bolkhovskikh and his associates (1969) cites them as "Darlington, Document. Chrom. Numb. Pl...." Actually they appear in the periodic continuation of a series started by Rattenbury, with no more subsequent compiler mentioned.

The corollas of V. bracteata are described as "very pale-violet, tube purplish" on Twisselmann 8948. Twisselmann reports the plant as "locally common in low areas flooded by May and June storms in the Lower Sonoran grasslands" of Kern County, California. The R. M. Stewart 1180, distributed as V. bracteata, is actually V. plicata Greene.

Additional citations: CALIFORNIA: Kern Co.: Twisselmann 8948 (Au--297797).

VERBENA BRACTEATA f. ALBIFLORA (Cockerell) Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 51 & 64 (1971) and 2: 657 & 913. 1971; Moldenke, Phytologia 22: 488. 1972.

VERBENA BRASILIENSIS Vell.

Additional & emended bibliography: Lewis & Oliv., Am. Journ. Bot. 48: [639]--641, fig. 22. 1961; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 716. 1969; Moldenke, Phytologia 23: 182. 1972.

Emended illustrations: Lewis & Oliv., Am. Journ. Bot. 48: 640, fig. 22. 1961.

Recent collectors describe this as an erect perennial herb, to 1.5 m. tall, growing in hedgerows and cultivated fields. Ellison found it an "abundant population on roadbanks of train track in disturbed habitat, full sun" in North Carolina. The corollas were "lavender" on Ellison 817 and "purple" on Mexia 5275.

Additional citations: BRAZIL: Minas Gerais: Mexia 5275 (Au--121763). São Paulo: I. S. Gottsberger 143 [4] (Ft).

VERBENA BRASILIENSIS var. SUBGLABRATA Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 192 (1971) and 2: 913. 1971; Moldenke, Phytologia 22: 490. 1972.

VERBENA CALIFORNICA Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 65 & 370 (1971) and 2: 913. 1971; Moldenke, Phytologia 22: 490--491. 1972.

VERBENA CALLIANTHA Briq.

Additional bibliography: Moldenke, Fifth Summ. 1: 177, 184, 187, & 200 (1971) and 2: 658, 662, 667, 683, & 913. 1971; Moldenke, Phytologia 22: 491. 1972.

VERBENA CALLIANTHA var. MICROSOMA Briq.

Additional bibliography: Moldenke, Fifth Summ. 1: 187 (1971) and 2: 913. 1971; Moldenke, Phytologia 22: 491. 1972.

VERBENA CAMERONENSIS L. I. Davis

Additional & emended bibliography: Lewis & Oliv., Am. Journ. Bot. 48: [639]--641, fig. 7. 1961; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 716. 1969; Moldenke, Fifth Summ. 1: 57 & 75 (1971) and 2: 658, 682, & 913. 1971; Moldenke, Phytologia 22: 491--492. 1972.

Emended illustrations: Lewis & Oliv., Am. Journ. Bot. 48: 640, fig. 7. 1961.

Johnston and Davis collected this plant on the coastal lowlands of Veracruz, Mexico, in 1946 and comment that this was "apparently the first record from Veracruz", but this statement is obviously incorrect since the species was collected in that Mexican state by Henri Guillaume Galeotti in 1840 -- 106 years earlier!

Additional citations: MEXICO: San Luis Potosí: Davis & Johnston s.n. [13 April 1946] (Au--278272). Veracruz: Johnston & Davis s.n. [20 April 1946] (Au--278281).

VERBENA CAMPESTRIS Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 177 (1971) and 2: 912. 1971; Moldenke, Phytologia 22: 492. 1972.

VERBENA CANADENSIS (L.) Britton

Additional & emended bibliography: Jan, Elench. Pl. 1. 1824;

Noack, Biol. Zentralbl. 57: 383--388. 1937; Rattenbury, Madroño 15: 51. 1959; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 715 & 716. 1969; Moldenke, Phytologia 23: 183. 1972.

There is disagreement among cytologists as to the chromosome number in this species. It is given as 30 by Junell (1934), Dermen (1936), Noack (1937), and Solbrig (1959), but as 10 by Sharma & Mukhopadhyay (1963). It would be most interesting to see if herbarium vouchers were kept by these workers and then to ascertain whether the last-mentioned report is not perhaps based on a misidentification. Verbena tenuisecta Briq., a commonly cultivated and escaped species, is the one that is most often misidentified in India.

The Madroño reference cited in the bibliography above is often credited to Solbrig, while Bolkhovskikh (1969) cites it as "Darlington, Document. Chrom. Numb. Pl...."

The corollas are described as having been "purple" on Perino & Perino 377 and these collectors describe the plant as "common" in Pushmataha County, Oklahoma.

The Kibler 26, distributed as V. canadensis, is actually V. halei Small.

Additional citations: OKLAHOMA: Pushmataha Co.: Perino & Perino 377 (Au--302806).

VERBENA CANADENSIS f. CANDIDISSIMA (Haage & Schmidt) Palmer & Steyerl.

Additional bibliography: Moldenke, Fifth Summ. 1: 43, 45, 58, & 370 (1971) and 2: 653, 658, 659, 784, & 913. 1971; Moldenke, Phytologia 22: 498. 1972.

VERBENA CANESCENS H.B.K.

Additional bibliography: Lewis & Oliv., Am. Journ. Bot. 48: [639]- & 641. 1961; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 716. 1969; Moldenke, Fifth Summ. 1: 51, 58, & 75 (1971) and 2: 659--661, 684, 694, 767, 769, & 913. 1971; Moldenke, Phytologia 22: 485 & 498--501. 1972.

Lewis & Oliver (1961) report the diploid chromosome number for this species as 14. Recent collectors have found it growing in matorral formation in Mexico. The corollas are described as "purple" on Ventura A. 1574.

Additional citations: MEXICO: Oaxaca: Johnston & Davis s.n. [27 July 1947] (Au--278287). Puebla: Ventura A. 1574 (Au--294666).

VERBENA CANESCENS f. ALBIFLORA Moldenke

Additional bibliography: Moldenke, Fifth Summ. 1: 75 (1971) and 2: 913. 1971; Moldenke, Phytologia 22: 500. 1972.

VERBENA CANESCENS var. ROEMERIANA (Scheele) Perry

Additional & emended bibliography: Lewis & Oliv., Am. Journ. Bot. 48: [639]--641, fig. 13. 1961; Moldenke, Fifth Summ. 1: 58,

65, & 75 (1971) and 2: 659--661, 693, 702, & 913. 1971; Moldenke, *Phytologia* 22: 485 & 499--501. 1972.

Emended illustrations: Lewis & Oliv., *Am. Journ. Bot.* 48: 640, fig. 13. 1961.

Recent collectors describe this plant as a perennial and found it growing on gravelly knolls. The corollas are described as having been "blue" on Rollins & Tryon 5841.

Additional citations: MEXICO: Nuevo León: Rollins & Tryon 5841 (Au--300250).

VERBENA CANIUENSIS Moldenke

Additional bibliography: Moldenke, *Fifth Summ.* 1: 177 (1971) and 2: 660 & 913. 1971; Moldenke, *Phytologia* 22: 501. 1972.

VERBENA CAROLINA L.

Additional bibliography: Jan, *Elench. Pl.* 1. 1824; Lewis & Oliv., *Am. Journ. Bot.* 48: [639]--641, fig. 14. 1961; Bolkh., Grif, Matvej., & Zakhar., *Chrom. Numb. Flow. Pl.* 716. 1969; Moldenke, *Phytologia* 23: 183--186. 1972.

Emended illustrations: Lewis & Oliv., *Am. Journ. Bot.* 48: 640, fig. 14. 1961.

Runyon describes this plant as "common in waste places" in the state of México. The corollas are said to have been "purple" on R. Runyon 1360.

Additional citations: MEXICO: México: R. Runyon 1360 (Au--290200). Oaxaca: Johnston & Davis s.n. [1 July 1947] (Au--278268).

VERBENA CILIATA Benth.

Additional & emended bibliography: Lewis & Oliv., *Am. Journ. Bot.* 48: [639]--641, fig. 8. 1961; Bolkh., Grif, Matvej., & Zakhar., *Chrom. Numb. Flow. Pl.* 716. 1969; Moldenke, *Phytologia* 23: 186--190 & 192. 1972.

Emended illustrations: Lewis & Oliv., *Am. Journ. Bot.* 48: 640, fig. 8. 1961.

The J. Rzedowski 4344, distributed as V. ciliata, is actually V. elegans H.B.K.

Additional citations: MEXICO: Chihuahua: Pennington 42 (Au--287710). Nuevo León: Kenoyer C.48 (Au--122037).

VERBENA CLOVERAE Moldenke

Additional & emended bibliography: Lewis & Oliv., *Am. Journ. Bot.* 48: [639]--641, fig. 15. 1961; Bolkh., Grif, Matvej., & Zakhar., *Chrom. Numb. Flow. Pl.* 716. 1969; Moldenke, *Phytologia* 23: 190 & 192--193. 1972.

VERBENA CORYMBOSA Ruiz & Pav.

Additional bibliography: Bolkh., Grif, Matvej., & Zakhar., *Chrom. Numb. Flow. Pl.* 716. 1969; Moldenke, *Phytologia* 23: 194. 1972.

VERBENA CUMINGII Moldenke

Additional bibliography: Moldenke, *Phytologia* 13: 191. 1966; Moldenke, *Fifth Summ.* 1: 192 (1971) and 2: 621 & 914. 1971.

VERBENA DELTICOLA Small

Additional & emended bibliography: Lewis & Oliv., *Am. Journ. Bot.* 48: [639]--641, fig. 9 & 10. 1961; Bolkh., Grif, Matvej., & Zakhar., *Chrom. Numb. Flow. Pl.* 716. 1969; Moldenke, *Phytologia* 23: 196. 1972.

Emended illustrations: Lewis & Oliv., *Am. Journ. Bot.* 48: 640, fig. 9 & 10. 1961.

Recent collectors have found this plant growing in roadside ditches, in mountain meadows, and in Acacia-Prosopis communities, often in dark soil. Runyon describes it as an "erect or ascending herb, in open ground, occasionally along highways, clay soil, the flowers with no odor, blooming in April and May, the leaves nearly trifold, ovate in outline, fruit a small capsule [actually it is a schizocarp], bark green, roots fibrous" and "flowers in terminal panicles [actually spikes], growing in sandy loam of open ground and fields, the leaves ovate in outline, lobed, abundant, forms colonies sometimes covering large areas."

Fleetwood reports that it is "common in dry clayey loam" in Hidalgo County, Texas, while Ton has found it on shrubby and steep heavily wooded slopes in Chiapas -- the latter a notable southward extension of the known range of the species! Sikes & Babcock report it as "abundant" in Sonora. Rickett (1969) avers that it blossoms in Texas from February to August, growing "in sandy or clay soil in open ground, often very profuse, in southern Texas and northern Mexico". He describes the corollas as ranging "from pink to magenta, lavender, and purple". Pennington tells us that in Sonora the plant is boiled and salted.

The corolla is described as "light-blue" on Sikes & Babcock 161, "pink-purple" on C. L. Lundell 10680, "red" on R. Runyon 2587, and "purple" on R. Runyon 2625.

Material of V. delticola has been misidentified and distributed in herbaria as V. stricta Vent., while the Pladeck s.n. [May 5, 1940], distributed as V. delticola, is actually V. cloverae Moldenke and Pennington 27 is xV. hybrida Voss.

Additional citations: TEXAS: Cameron Co.: C. L. Lundell 10680 (N); R. Runyon 2587 (Au--268721). Hidalgo Co.: Fleetwood 8157 (W--2518783); R. Runyon 2625 (Au--268719). MEXICO: Chiapas: Ton 1863 (Z), 2210 (Rf). Coahuila: E. G. Marsh 1184 (Au--212082), 1592 (Au--213301), 2147 (Au--213083). Hidalgo: V. H. Chase 7116 (N); Johnston & Davis s.n. [17 April 1946] (Au--278290). Nuevo León: Atwood 2059 (N); Diaz L. s.n. [10/IX/1959] (Ip), s.n. [16. IX.1959] (Ip); L. C. Higgins 2683 (Mi); Johnston & Davis s.n. [7 April 1946] (Au--278279, Au--278291); H. M. Parker 501 (Au--302752). Sonora: Pennington 312 (Au--264257); Sikes & Babcock

161 (Au--259161, Au--284540), Tamaulipas: Stanford, Lauber, & Taylor 2100 (Se--149132).

VERBENA DELTICOLA f. LILACINA L. I. Davis

Additional synonymy: Verbena delticola lilacina L. I. Davis ex Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1876. 1970.

Additional bibliography: Moldenke, Phytologia 9: 64--65. 1963; Moldenke in Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1316 & 1323. 1970; Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1876. 1970; Moldenke, Fifth Summ. 1: 58 (1971) and 2: 665 & 914. 1971.

VERBENA DEMISSA Moldenke

Additional bibliography: Moldenke, Phytologia 13: 247. 1966; Moldenke, Fifth Summ. 1: 137 (1971) and 2: 914. 1971.

This plant has been collected at altitudes of 2550 to 3700 meters, flowering and fruiting in April, July, and September. The Rose, Pachano, & Rose 22851, cited below, was previously misidentified and cited as V. glabrata H.B.K. Material has also been misidentified and distributed in some herbaria under the name V. polystachya H.B.K.

Additional citations: ECUADOR: Azuay: Asplund 17801 (N); Rose, Pachano, & Rose 22851 (N, W--1022448). Cañar: Játiva & Epling 260 (N).

xVERBENA DERMENI Moldenke

Additional bibliography: Moldenke, Phytologia 10: 104. 1964; Moldenke, Résumé Suppl. 17: 3. 1968; Moldenke, Fifth Summ. 1: 143, 184, 187, 200, & 370 (1971) and 2: 655, 665, 674, & 914. 1971.

Steinbach describes this plant as "locally common", with the corollas "bright-violet, rose-purple at base outside". It has been collected in fruit in February and April, in addition to the months previously reported. Vargas Calderón 19493 is a mixture with V. parvula var. gigas Moldenke

Additional citations: PERU: Arequipa: López Guillén 249 (Rf); Vargas Calderón 19493, in part (Ac). Ayacucho: Soukup 5501 (Z). BOLIVIA: Cochabamba: R. F. Steinbach 64 (N). ARGENTINA: Formosa: I. Morel 4614 (N).

VERBENA DISSECTA Willd.

Additional & emended synonymy: Verbena laciniata Kuntze ex Moldenke, Suppl. List Invalid Names 9, in syn. 1941 [not V. laciniata Briq., 1960, nor (L.) Briq., 1904, nor (Lam.) Briq., 1939, nor Raf., 1833, nor Sessé & Moc., 1940]. Glandularia dissecta (Willd. ex Spreng.) Schnack & Covas apud J. A. Clark, Card Ind. Gen. Sp. Var. issue 183. 1944.

Additional & emended bibliography: Reiche & Phil., Fl. Chil. 5: 289 & 292. 1910; J. A. Clark, Card Ind. Gen. Sp. Var. issue 183.

1944; Cabrera, Man. Fl. Alred. Buenos Aires 396--398, fig. 148 f-n. 1953; J. F. Macbr., Field Mus. Publ. Bot. 13 (5): 614, 619, & 629. 1960; Martínez-Crovetto, Bonplandia 1: 291 & 314. 1964; Angely, Fl. Anal. Paran., ed. 1, 571. 1965; Martínez-Crovetto, Bonplandia 2: 19. 1965; Troncoso in Cabrera, Fl. Prov. Buenos Aires 5: 132 & 138. 1965; Meyer & Weyrauch, Inst. Mig. Lill. Misc. 23: 64 & 123. 1966; Martínez-Crovetto, Bonplandia 2: 130. 1967; Moldenke, Phytologia 16: 51. 1968; Solbrig, Passani, & Glass, Am. Journ. Bot. 55: 1238. 1968; Bolkh., Grif, Matvej., & Zakhar., Chrom. Mumb. Flow. Pl. 715 & 716. 1969; R. F. V. Cooper in Pastore, Bol. Soc. Argent. Hort. 157: 124 & 125. 1969; Schnack & Rubens, Bol. Soc. Argent. Bot. 13: 206. 1970; Moldenke, Fifth Summ. 1: 177, 184, 189, 192, 200, & 370 (1971) and 2: 521, 621, 655, 662, 666, 667, 673, 700, 708, & 914. 1971.

Additional illustrations: Cabrera, Man. Fl. Alred. Buenos Aires 396, fig. 148 f--n. 1953; R. F. V. Cooper in Pastore, Bol. Soc. Argent. Hort. 157: 124. 1969.

It should be pointed out here that the Verbena laciniata (H.B.K.) Briq., referred to in the synonymy above, is a synonym of V. laciniata (L.) Briq., while V. laciniata Raf. is probably xV. perriana Moldenke.

Macbride (1960) credits V. dissecta to "Willd. ex Schauer in DC. Prodr. 11: 552. 1847", but the name actually goes back to Sprengel in L., Syst. Veg., ed. 16, 2: 750 (1825). He cites a Meyen s.n. from Pisacoma, Puno, Peru, but I doubt very much that V. dissecta occurs at all in Peru. Meyen's plant is probably V. laciniata (L.) Briq., as Macbride himself suggests. He gives the distribution of V. dissecta as "To Uruguay. Chile; Bolivia; Brazil". Troncoso (1965) gives its distribution as "Brasil meridional, Uruguay y Argentina. En praderas arenosas y en las barrancas del Paraná y del litoral bonaerense". She cites Burkart 3082 and Rodrigo 2339 in the San Isidro herbarium.

Martínez-Crovetto (1964, 1965) record the Chaco Amerind names "imalák labé (hoja azul)" and "uompé chak(o)líp" for this species; Cooper (1969) calls it "lilac verbena". The corollas are described as "rose" on B. L. Müller 152, 190, 203, & 209, "lilac" on Collector undetermined 311 and Luna 132, 241, & 547, "purple" on R. M. Aguilar 286, "bluish" on Herb. Inst. Miguel Lillo 981, "blue" on Olea 4, "blue-violet" on Semper 138, "reddish" on B. L. Müller 165, "bluish-lilac" on Varela 404, and "violet" on P. Garcia s.n.

Additional citations: BRAZIL: Rio Grande do Sul: Palacios & Cuezco 2519 (N). ARGENTINA: Catamarca: Brizuela 628 (N), 1037 (N); B. L. Müller 152 (N), 165 (N), 190 (N); O'Donnell s.n. [IV-44] (N); Pierotti 11529 [Herb. Inst. Miguel Lillo 28312] (N), "H" [12/III/44] (N), "H" [15/V/44] (N), "h" [La Merced, 19/V/44] (N). Chaco: Buratovich 69 (N). Córdoba: Varela 404 (N); Villafañe 120 (Se--130302), 642 (N). Formosa: I. Morel 4391 (N); Pierotti 6543

(N). La Rioja: B. L. Müller 203 (N), 209 (N). Mendoza: Semper 138 (N). Salta: R. M. Aguilar 286 (N); Luna 132 (N), 547 (N); M. R. Malvárez 179 (N), 302 (N); O'Donell 3094 (N). Santiago del Es-tero: Balegno 103 (N); P. García s.n. [Herb. Inst. Miguel Lillo 714] (N), s.n. [Herb. Inst. Miguel Lillo 981] (N); Luna 241 (N); T. Meyer 6838 (N); Pierotti "H" [11/IV/1944] (N), "h" (N); Viet-Martínez s.n. [Herb. Inst. Miguel Lillo 5] (N). Tucumán: Collector undetermined 311 (N); M. R. Malvárez 70 (N); Olea 4 (N), 190 (N); Rocha 3818 (Au--122073).

VERBENA DISSECTA f. ALBA Moldenke

Additional bibliography: Moldenke, *Phytologia* 16: 51. 1968; Moldenke, *Fifth Summ.* 1: 200 & 370 (1971) and 2: 914. 1971.

xVERBENA DISSOLUTA Moldenke

Additional bibliography: Moldenke, *Phytologia* 11: 455. 1965; Moldenke, *Fifth Summ.* 1: 370 (1971) and 2: 521, 667, 678, 689, 700, & 914. 1971.

VERBENA DOMINGENSIS Urb.

Additional bibliography: Ciferri, *Mycopathologia* 7: 89. 1954; Hansford, *Sydowia Ann. Myc.*, ser. 2, Beih. 2: 684. 1961; Moldenke, *Phytologia* 11: 455. 1965; Moldenke, *Fifth Summ.* 1: 98 & 370 (1971) and 2: 666, 686, & 914. 1971.

Recent collectors describe this plant as slender, herbaceous, erect, and 30--50 cm. tall, or sometimes decumbent, the rhizome creeping. The corollas are described as having been "violet" on Gastory, Jones, & Norris 363 and Liogier 12077 & 12197 and "blue" on Holdridge 834 and Jiménez 4831. The species has been found along trails through rocky pine forests; Liogier found it "in open places near rivers.....in mostly secondgrowth vegetation" and calls it "common in pine barrens in rocky mountains". It has been collected at altitudes of 500 to 2710 meters. The cultivated material from California was grown from seeds of Liogier 12077 and 12197.

Ciferri (1954) records the fungus, Meliola aciculosa var. verbenae Cif., from this host plant on the basis of Ekman 3161 from Hispaniola.

Additional citations: HISPANIOLA: Dominican Republic: Gastory, Jones, & Norris 363 (N, N); Jiménez 4831 (N); Liogier 12077 (N, N, N, Z), 12197 (N, Rf). Haiti: Holdridge 834 (Sd--61805).

CULTIVATED: California: A. R. Moldenke 3395 (Ac, Z).

VERBENA DUSENII Moldenke

Additional bibliography: Angely, *Fl. Anal. Paran.*, ed. 1, 571. 1965; Moldenke, *Phytologia* 13: 194. 1966; Moldenke, *Fifth Summ.* 1: 177 (1971) and 2: 914. 1971.

Hatschbach 17637 is described by the collector as having had violet flowers "dos brejos".

Additional citations: BRAZIL: Paraná: Hatschbach 17637 (Ft, W-2536534).

VERBENA EHRENBERGIANA Schau.

Additional & emended bibliography: Howell & McClintock in Kearney & Peebles, Ariz. Fl., ed. 2, 726 & 727. 1960; Lewis & Oliv., Am. Journ. Bot. 48: [639]. 1961; Hocking, Excerpt. Bot. A. 6: 91. 1963; Moldenke, Phytologia 16: 186--187. 1968; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 716. 1969; Gibson, Fieldiana Bot. 24 (9): 232. 1970; Rickett, Wild Fls. U. S. 4 (3): 540 & 799. 1970; Moldenke, Fifth Summ. 1: 63 & 75 (1971) and 2: 667 & 914. 1971; Moldenke, Phytologia 23: 184. 1972.

The only record of this species from the United States is a sheet of Stalmach 198 in the herbarium of the University of Texas labeled merely "Arizona". Gibson (1970) states that all Guatemalan specimens so identified are actually V. carolina L.

Verbena ehrenbergiana has been found growing in association with Cerastium, Llavea, Penstemon, and Romanschultzia in Hidalgo, Mexico. Sullivan found it growing in humid Quercus-Liquidambar forests on limestone karst topography in Tamaulipas, flowering in June.

Material of this species has frequently been misidentified and distributed in some herbaria under the names V. urticaefolia L. or V. urticifolia L. On the other hand, the Mears 492, distributed as V. ehrenbergiana, is actually V. litoralis H.B.K.

Additional citations: MEXICO: Hidalgo: Mears 299a (Au--254970). Tamaulipas: J. R. Sullivan 409 (Au--298185), 475 (Au--298182), 554 (Au--298174). State undetermined: Schnée s.n. [Mexique, VI-X] (Mi, N, S, W--2546669).

VERBENA ELEGANS H.B.K.

Additional synonymy: Verbena elegans Humb. & Bonpl. ex Steud., Nom. Bot. Phan., ed. 1, 873. 1821. Glandularia elegans H.B.K. ex Solbrig, Passani, & Glass, Am. Journ. Bot. 55: 1235. 1968. Verbena elegans (H.B.K.) Raf. ex Moldenke, Résumé Suppl. 18: 14, in syn. 1969. Glandularia elegans Solbrig, Princ. & Meth. Pl. Biosystem. 148. 1970.

Additional bibliography: Steud., Nom. Bot. Phan., ed. 1, 873. 1821; Lewis & Oliv., Am. Journ. Bot. 48: [639] & 641, fig. 11. 1961; Hocking, Excerpt. Bot. A. 6: 91. 1963; Moldenke, Phytologia 16: 187. 1968; Solbrig, Passani, & Glass, Am. Journ. Bot. 55: 1235--1239. 1968; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 716. 1969; Solbrig, Passani, & Glass, Biol. Abstr. 50: 4151. 1969; Syngé, Suppl. Dict. Gard., ed. 2, 548. 1969; El-Gazzar & Wats., New Phytol. 69: 483 & 485. 1970; Moldenke in Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1316, 1317, & 1323. 1970; Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1876. 1970; Solbrig, Princ. & Meth. Pl. Biosystem. 148. 1970; Moldenke, Fifth Summ. 1:

63, 75, 205, & 370 (1971) and 2: 521, 658, 667, 679, 684, & 914. 1971; Moldenke, *Phytologia* 22: 461 & 471. 1972.

Recent collectors have encountered this plant on very wet slopes, riolitic slopes with disturbed oak vegetation, coniferous woods, in oak forests on wet mountainsides, on grassy slopes with Quercus, and on limestone mountains, as well as in oak woods and in Abies woods, at altitudes of 1000 to 3230 meters. Mears found it growing in association with Cornus, Drymaria, Dudleya, Heuchera, Lobelia, Maurandya, Piqueria, and Reseda, the Andersons refer to it as a "common roadside herb", and Beaman found it to be "common on open meadows in pine forests". It has been collected in fruit in November, in addition to the months previously reported in these notes. The vernacular name, "verbena", has been recorded for it. A tea made from the leaves is taken for stomach disorders in Chihuahua.

The corollas are said to have been "lavender" on Ton 1113, "mauve" on Anderson & Anderson 4658, "purple" on Díaz Luna 11 and J. Rzedowski 7971, and "brilliant crimson-lavender" on Beaman 2704. Lewis & Oliver (1961) report the chromosome number as $2n = 30$.

Solbrig and his associates (1968, 1969, 1970) have crossed this species with material which they have identified as V. peruviana (L.) Britton, V. stellarioides Cham., and V. pulchella Sweet, for all of which, as well as for the hybrids, they employ the generic name Glandularia, although in some cases I cannot find that the combinations have ever been proposed validly in accord with the present very complicated International Rules of Botanical Nomenclature. "Analysis of the behavior of chromosomes at meiosis in the hybrid indicated that the chromosomes of G. pulchella are similar to one of the genomes of G. elegans. Non-homologous pairing and presence of multivalents also indicated that G. elegans is a segmented allohexaploid derived most likely from So. Amer. ancestors." They found pure V. elegans seeds to show 99 percent fertility, but the hybrid from less than 5 to over 70 percent.

Material of V. elegans has been misidentified and distributed in some herbaria under the names V. elegans var. asperata Perry and V. prostrata R. Br. On the other hand, the Detling 9642 and J. Rzedowski 21919, distributed as V. elegans, are actually V. bipinnatifida Nutt., while Johnston & Davis s.n. [7 April 1946] and H. M. Parker 501 are V. delticola Small and S. Sanderson 262 is V. elegans var. asperata Perry.

Additional citations: MEXICO: Chiapas: Ton 1114 (N, W-- 2556725), 1489 (N). Federal District: Huerta s.n. [8/VIII/1962] (Ip). Hidalgo: Anduaga A. 3 (N); M. R. Díaz 27 (Ac); González Quintero 1933 (Ac), 2167 (Ip, Rf), 2710 (Ip), 2868, in part (Mi); Hidalgo & Anda s.n. [25/VI/1967] (Mi, Mi, Mi); L. I. Davis s.n.

[7 July 1944] (Au--278267); Mears 265a (Au--255309), 307a (Au--256227); Medellín s.n. [7/VIII/1954] (Ip); J. Rzedowski 17002 (Au--243525); Vela G. 1397 (Ip). Michoacán: Díaz Luna 11 (Ip). Nuevo León: Beaman 2704 (Au--240747, W--2575374); Johnston & Davis s.n. [21 April 1946] (Au--278283). San Luis Potosí: Anderson & Anderson 4658 (Mi); Johnston & Davis s.n. [16 June 1947] (Au--278273, Au--278274); J. Rzedowski 4344 (Au--169899), 7971 (Ip). Tamaulipas: M. B. Webster 138 (Au--241511).

VERBENA ELEGANS H.B.K. x V. PERUVIANA (L.) Britton ex Moldenke, Fifth Summ. 1: 370 (1971) and 2: 914. 1971.

Synonymy: Glandularia elegans x peruviana Solbrig in Solbrig, Passani, & Glass, Am. Journ. Bot. 55: 1236--1238. 1968.

Bibliography: Solbrig, Passani, & Glass, Am. Journ. Bot. 55: 1236--1238. 1968; Solbrig, Passani, & Glass, Biol. Abstr. 50: 4151. 1969; Solbrig, Princ. & Meth. Pl. Biosystem. 148. 1970; Moldenke, Fifth Summ. 1: 370 (1971) and 2: 914 & 970. 1971.

Solbrig and his associates (1968, 1969, 1970) speak of the artificial crosses which they have made between these two species, producing a tetraploid hybrid which showed less than 5 percent fertility and a segmental allooctoploid hybrid which showed over 70 percent fertility. A binomial designation has not yet been proposed for these hybrids.

VERBENA ELEGANS H.B.K. x V. PULCHELLA Sweet ex Moldenke, Fifth Summ. 1: 370 (1971) and 2: 914 & 970. 1971.

Synonymy: Glandularia elegans x pulchella Solbrig in Solbrig, Passani, & Glass, Am. Journ. Bot. 55: 1236--1238. 1968. Verbena pulchella Sweet x V. elegans H.B.K. ex Moldenke, Fifth Summ. 1: 370 (1971) and 2: 919 & 970. 1971.

Bibliography: Solbrig, Passani, & Glass, Am. Journ. Bot. 55: 1236--1238. 1968; Solbrig, Passani, & Glass, Biol. Abstr. 50: 4151. 1969; Solbrig, Princ. & Meth. Pl. Biosystem. 148. 1970; Moldenke, Fifth Summ. 1: 370 (1971) and 2: 914 & 970. 1971.

Solbrig and his associates (1968, 1969, 1970) speak of the crosses which they have made between these two species, producing a tetraploid hybrid showing less than 10 percent fertility. I am not certain whether their concept of V. pulchella is the same as mine or is that of some modern Argentine botanists, so it seems best not to propose a binomial name for their hybrid until the exact parentage is verified by examination of herbarium vouchers.

VERBENA ELEGANS H.B.K. x V. STELLARIOIDES Cham. ex Moldenke, Fifth Summ. 1: 370 (1971) and 2: 914 & 970. 1971.

Synonymy: Glandularia elegans x stellaroides Solbrig in Solbrig, Passani, & Glass, Am. Journ. Bot. 55: 1236 & 1237. 1968.

Bibliography: Solbrig, Passani, & Glass, Am. Journ. Bot. 55: 1236 & 1237. 1968; Moldenke, Fifth Summ. 1: 370 (1971) and 2: 914 & 970. 1971.

Solbrig and his associates (1968) speak of the hybrid which they have produced between these two species, but it seems best not to propose a binomial designation for this hybrid until the parentage can be verified by examination of herbarium vouchers. It is possible that one of the parents may have been V. sessilis (Cham.) Kuntze instead of V. stellarioides Cham., since the differences between these two species are not always obvious.

VERBENA ELEGANS var. ASPERATA Perry

Additional synonymy: Verbena elegans var. asperate Perry ex Moldenke, Résumé Suppl. 18: 14, in syn. 1969.

Additional & emended bibliography: Lewis & Oliv., Am. Journ. Bot. 48: [639] & 641, fig. 11. 1961; Turrill in Curtis, Bot. Mag. 174: pl. 409. 1963; Hocking, Excerpt. Bot. A.6: 91. 1963; Moldenke, Phytologia 15: 492 & 493 (1968) and 16: 62. 1968; Syngé, Suppl. Dict. Gard., ed. 2, 548. 1969; Moldenke in Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1316, 1317, & 1323. 1970; Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1876 & 1877. 1970; Moldenke, Fifth Summ. 1: 58, 75, 204, 205, & 370 (1971) and 2: 667 & 914. 1971; Moldenke, Phytologia 22: 461. 1972.

Additional & emended illustrations: Lewis & Oliv., Am. Journ. Bot. 48: 651, fig. 11. 1961; Turrill in Curtis, Bot. Mag. 174: pl. 409 [as V. wrightii] (in color). 1963.

Recent collectors have encountered this variety along roadsides, by streams, and in both Quercus and Abies woods. Breedlove found it on slopes with Arbutus, Pinus, and Quercus, while with Kawahara he encountered it on wooded banks of streams with Alnus sp., Padus serotina, Pinus engelmanni, and Quercus spp. Rzedowski reports it from "ladera margosa con vegetación de matorral secundario abierto", "ladera caliza con vegetación de zacatal", "ladera caliza con vegetación de encinar", "ladera riolitica con vegetación de bosque de pino-encino", and "matorral de Cordia boissieri". It has been collected at altitudes of 710 to 3000 meters, and, in addition to the months previously reported by me, in flower and fruit in November.

The corollas are described as "lavender" on Breedlove 15558, "deep-rose" on Breedlove & Kawahara 16890, and "purple" on Breedlove 14418 and J. Rzedowski 24493 & 24842. Lot describes the plant as herbaceous, to 40 cm. tall, and notes "flor lila".

The color plate presented by Turrill (1963) as illustrative of V. wrightii A. Gray is very obviously V. elegans var. asperata instead.

Material of V. elegans var. asperata has been misidentified and distributed in some herbaria under the name V. prostrata R. Br. On the other hand, the Mendiola s.n. [Saltillo Torreón], distributed as V. elegans var. asperata, is really V. ambrosifolia Rydb., while J. Rzedowski 7971 is typical V. elegans H.B.K.

Additional & emended citations: MEXICO: Chiapas: Breedlove

14418 (N, Ws). Hidalgo: Chávez 0. s.n. [4.VIII.63] (Ip); González Quintero 2868, in part (Ip), 3252 (Rf), 3288 (Ac), s.n. [21.VI.1964] (Ip). San Luis Potosí: J. Rzedowski 6389 (Ip), 10243 (Ip), 24493 (Ip), 24676 (Ac), 24842 (Ac), 24865 (Ip); S. Sander-son 262 (Au--297634). Sinaloa: Breedlove 15558 (Rf); Breedlove & Kawahara 16890 (Rf). Sonora: Tucker 3478 (Se--6079); R. M. Turner 59-50 (Sd--65667). Tamaulipas: Stanford, Lauber, & Taylor 2486 (Se--149113); M. B. Webster 155 (Au--241557). Veracruz: Lot 429 (G). GERMANY: Gizantoro s.n. [9.66] (Lu).

xVERBENA ENGELMANNII Moldenke

Additional & emended synonymy: Verbena hastata γ oblongifolia Nutt. ex A. Wood, Class-book, ed. 2, pr. 1, 412. 1847. Verbena hastato-urticifolia Bebb, in herb.

Additional & emended bibliography: A. Wood, Class-book, ed. 2, pr. 1, 412 (1847), ed. 2, pr. 2, 412 (1848), ed. 10, pr. 1, 412 (1848), ed. 10, pr. 2, 412 (1849), ed. 10, pr. 3, 412 (1850), ed. 17, 412 (1851), ed. 23, 412 (1851), ed. 29, 412 (1853), ed. 35, 412 (1854), ed. 41, pr. 1, 412 (1855), and ed. 41, pr. 2, 412. 1856; Poindexter, Trans. Kans. Acad. Sci. 65: 409, 410, 416, & 417. 1962; Radford, Ahles, & Bell, Guide Vasc. Fl. Carol. 282. 1964; Moldenke, Phytologia 16: 52 & 90. 1968; Moldenke, Résumé Suppl. 16: [1]. 1968; F. C. Seymour, Fl. New Engl. 456. 1969; Domville & Dunbar, John Burroughs Nat. Hist. Soc. Bull. 8: 94. 1970; Moldenke, Fifth Summ. 1: 15--23, 34, 36--40, 43, 45, 53, & 370 (1971) and 2: 649, 667, 673--675, 688, 697, 704, 705, 783, & 914. 1971.

Wood's (1847) description of Nuttall's V. hastata γ oblongifolia is "Lvs. lance-ovate or lance-oblong, sharply serrate; spikes filiform, loosely paniculate; fls. smaller. -- Penn. to Ia. & Mo. I have frequently observed this tall (4--6 f.) variety, and many others, on the sandy plains of Indiana. They appear to be hybrids between V. hastata and V. urticaefolia!" He regards V. paniculata Lam. as a synonym, but most workers regard Lamarck's name as applying to the non-hastate leaved form of V. hastata L.

Morley found the hybrid "scattered in creek bottoms" in Kansas, while Wharton found it "associated with V. hastata in waste ground" in Kentucky. Domville & Dunbar (1970) report it "rare" in Ulster County, New York, where it blooms in the "summer" and is simply called "vervain". Radford, Ahles, & Bell (1964) describe it as a "rare hybrid" between V. scabra Vahl and V. urticifolia L., but in this they are in error, since it is actually a hybrid between V. hastata L. and V. urticifolia L. and occurs commonly in areas not inhabited by V. scabra. They record it from Ashe County, North Carolina. Seymour (1969) found it at Leicester (Addison County) and Pownal (Bennington County), Vermont. The corollas on Wharton 5633a are described as having been "blue".

The H. R. Bennett 2707, distributed as this hybrid, seems to be typical V. hastata L. Three color photographs of this hybrid in situ (A. R. Moldenke 1261 & 1278) are preserved in my personal herbarium.

Additional citations: NEW JERSEY: Somerset Co.: Moldenke & Moldenke 25635 (Ps--674). ILLINOIS: Cass Co.: Geyer s.n. [Beardstown, July 1842] (Ws--isotype). Tazewell Co.: V. H. Chase 3230 (Se--204860). Winnebago Co.: M. S. Bebb s.n. [Fountaindale, 1871] (Pa). KENTUCKY: Madison Co.: Wharton 5633a (Mi). KANSAS: Republic Co.: Morley 820 (N). MISSOURI: St. Louis: Engelmann s.n. [St. Louis, Aug. 1842] (Ws), s.n. [Prairies, 12 August 1877] (Pa).

xVERBENA ENGELMANNII f. ALBIFLORA Moldenke

Bibliography: Moldenke, Résumé Suppl. 3: 2. 1962; Moldenke, Phytologia 9: 97. 1963; Moldenke, Fifth Summ. 1: 18 (1971) and 2: 914. 1971.

VERBENA EPHEDROIDES Cham.

Additional bibliography: Angely, Fl. Anal. Paran., ed. 1, 571. 1965; Moldenke, Phytologia 16: 52. 1968; Moldenke, Fifth Summ. 1: 177, 189, & 200 (1971) and 2: 678, 705, 706, & 914. 1971.

xVERBENA FABRICATA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 457. 1965; Moldenke, Fifth Summ. 1: 370 (1971) and 2: 674, 705, & 914. 1971.

VERBENA FASCICULATA Benth.

Additional bibliography: J. F. Macbr., Field Mus. Publ. Bot. 13 (5): 613, 614, 620, 625, & 629. 1960; Moldenke, Phytologia 14: 281 & 282. 1967; Moldenke, Fifth Summ. 1: 143 (1971) and 2: 682, 686, & 914. 1971.

According to Macbride (1960), the type of V. fasciculata was collected by Richard Brinsley Hinds at "Huamantango", which he says is "probably Huamantamba near Canta, Lima, which is in the scope of Cuming's brief visit". He cites only Cuming 954 "fide Bentham" from "On the coast" of Peru. He attempts to keep V. fasciculata Benth. and V. matthewsii Briq. apart as separate species, keying them as follows:

Leaves "3-divided nearly to the base, rarely in part entire or bifurcate" V. fasciculata
 Leaves "more or less trifid but obviously cuneate-based or petiolately narrowed, the segments variously serrate and pinnate or dissected, rather entire" V. matthewsii
 As reported by me previously, Edgar Milne-Redhead has compared the types of both species at Kew and reports that they cannot be distinguished from each other.

In his discussion of what he calls V. matthewsii Macbride says "Neighbor of V. Berterii (Meisn.) Schauer and V. clavata R. & P. with procumbent branches, the former too with shorter bracts, the

latter with 3-divided leaves, the segments pseudoverticillate (author). — Type was distributed as V. laciniata (L.) Briq. and doubtfully a distinct species but as here listed leaf-segments broader, in type seen acute but Lima and Huánuco specimens with more obtuse segments could be placed here. Species name here spelled with two t's, as it was sometimes spelled by the collector. F. M. Neg. 24691." He cites the following Peruvian specimens: Ancash: Macbride 2539. Ayacucho: Ferreya 5470. Cajamarca: Stork & Horton 10032. Junín: Soukup 3537. Lima: Mathews 498, Stork & Vargas 9341.

Verbena fasciculata has been collected at altitudes of 400 to 3900 meters. Recent collectors have found it flowering in October and November and fruiting in October.

Additional citations: PERU: Ancash: Vargas Calderón 10276 (Ac). Arequipa: Vargas Calderón 18246 (Ac).

xVERBENA FECUNDA Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A.1: 430. 1959; Moldenke, Phytologia 14: 282. 1967; Moldenke, Fifth Summ. 1: 370 (1971) and 2: 658, 782, & 914. 1971.

xVERBENA FERAX Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A.1: 430. 1959; Moldenke, Phytologia 14: 283. 1967; Moldenke, Fifth Summ. 1: 370 (1971) and 2: 658, 692, & 914. 1971.

VERBENA FERREYRAE Moldenke

Additional bibliography: J. F. Macbr., Field Mus. Publ. Bot. 13 (5): 613, 620—621, & 624. 1960; Moldenke, Phytologia 11: 457—458. 1965; Moldenke, Fifth Summ. 1: 143 (1971) and 2: 914. 1971.

VERBENA FILICAULIS Schau.

Additional bibliography: Angely, Fl. Anal. Paran., ed. 1, 571. 1965; Moldenke, Phytologia 16: 52—53. 1968; Moldenke, Fifth Summ. 1: 177 & 200 (1971) and 2: 690 & 914. 1971.

Hatschbach describes this plant as decumbent, growing in acid turf-covered soil. It has been collected in anthesis in April and October, in addition to the months previously reported. The corollas are described as having been "violet" on Hatschbach 14192 & 20082.

Additional citations: BRAZIL: Paraná: Hatschbach 14192 (W—2564173), 20082 (N), 22719 (N). Santa Catarina: Smith & Klein 13390 (N).

VERBENA FLAVA Gill. & Hook. in Hook., Bot. Misc. 1: 170. 1829.

Additional synonymy: Verbena flava var. flava Troncoso in Böcher, Hjerting, & Rahn, Dansk Bot. Arkiv 22 (1): 109. 1963.

Additional & emended bibliography: Reiche & Phil., Fl. Chil. 5: 295 & 463. 1910; Hauman, Anal. Soc. Cien. Argent. 86: 150. 1918; J. A. Clark, Card Ind. Gen. Sp. Var. issue 183. 1944;

Troncoso in Böcher, Hjerting, & Rahn, Dansk Bot. Arkiv 22 (1): 109. 1963; Moldenke, Phytologia 16: 53. 1968; Moldenke, Résumé Suppl. 16: 6. 1968; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 715 & 717. 1969; Schnack & Rubens, Bol. Soc. Argent. Bot. 13: 206. 1970; Moldenke, Fifth Summ. 1: 200 (1971) and 2: 521, 668, & 914. 1971.

Böcher, Hjerting, & Rahn (1963) collected this plant at 2150 meters altitude (no. 2138).

Additional citations: ARGENTINA: Neuquen: E. Ammann 113 (N).

VERBENA FLAVA var. AUGUSTILOBA Speg.

Additional bibliography: Moldenke, Phytologia 9: 122--123. 1963; Moldenke, Fifth Summ. 1: 200 (1971) and 2: 668 & 914. 1971.

VERBENA FLAVA var. LATILOBA Speg.

Additional bibliography: Hauman, Anal. Soc. Cienc. Argent. 86: 150. 1918; Troncoso in Böcher, Hjerting, & Rahn, Dansk Bot. Arkiv 22 (1): 109. 1963; Moldenke, Phytologia 9: 123. 1963; Moldenke, Fifth Summ. 1: 200 (1971) and 2: 668 & 914. 1971.

Troncoso (1963) states that this variety was collected by Hicken at 2000 meters altitude in the Diamante area.

VERBENA FLAVA var. LATILOBA f. ABORTIVA Hicken

Additional bibliography: Moldenke, Phytologia 9: 123. 1963; Moldenke, Fifth Summ. 1: 200 (1971) and 2: 914. 1971.

VERBENA GALAPAGOSSENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 11: 458 (1965) and 16: 342. 1968; Wiggins & Porter, Fl. Galáp. Isls. 997. 1971; Moldenke in Wiggins & Porter, Fl. Galáp. Isls. 503--505 & 509. 1971; Moldenke, Fifth Summ. 1: 138 (1971) and 2: 914. 1971.

VERBENA GENTRYI Moldenke

Additional bibliography: Moldenke, Phytologia 11: 458. 1965; Moldenke, Fifth Summ. 1: 75 (1971) and 2: 914. 1971.

Breedlove & Thorne found this plant growing on dry slopes with Bursera, Ipomoea, Lysiloma, and Quercus, at 3800 feet altitude, flowering in September. The corollas are described as having been white on Breedlove & Thorne 18073.

Additional citations: MEXICO: Sinaloa: Breedlove & Thorne 18073 (Z).

VERBENA GLABRATA H.B.K.

Emended synonymy: Verbena glabrata Humb. & Bonpl. ex Steud., Nom. Bot. Phan., ed. 1, 873. 1821.

Additional & emended bibliography: Steud., Nom. Bot. Phan., ed. 1, 873. 1821; J. F. Macbr., Field Mus. Publ. Bot. 13 (5): 615 & 621. 1960; Hocking, Excerpt. Bot. A.7: 456. 1964; Moldenke, Biol. Abstr. 49: 1325 (1968) and 49 (3): B.A.S.I.C. S.185. 1968; Moldenke, Phytologia 16: 53, 98, 211, & 341. 1968; Moldenke, Résumé Suppl. 16: 5. 1968; Hocking, Excerpt. Bot. A.14: 206. 1969; Molden-

ke, Biol. Abstr. 50: 418. 1969; Wiggins & Porter, Fl. Galáp. Isls. 26 & 997. 1971; Moldenke in Wiggins & Porter, Fl. Galáp. Isls. 503--505 & 609. 1971; Moldenke, Fifth Summ. 1: 120, 137, & 143 (1971) and 2: 671 & 914. 1971.

Macbride (1960) credits this binomial to "HBK. Nov. Gen. & Sp. 2: 276. 1818", but it actually dates back to "ed. folio, 2: 223--224. 1817". He says of the plant "To 1 meter tall, corolla tube red, blue-violet above, fruit red-maroon (Metcalf). Schauer says this is more compact, more glabrate than V. litoralis HBK. var. pycnostachys Schauer; compare V. bonariensis L., V. brasiliensis Vell." He cites only Metcalf 30294 from Ayacucho, but records the species also from Cuzco and Lima, Peru, and gives its extralimital distribution as "Venezuela; Ecuador." I have never seen any material of it from Venezuela and cannot believe that it is found there.

Recent collectors have encountered this plant growing among lakeshore vegetation, on old airfields, and in secondary cloud-forests. Holm-Nielsen & Jeppesen found it in "both humid and more dry places near road in meadows". The corollas on Asplund 17227 are described as having been "pale-lilac", while those on Asplund 19923 were "pale bluish-violet".

The Rose, Pachano, & Rose 22851, previously cited by me as V. glabrata, is actually V. demissa Moldenke, while Rose, Pachano, & Rose 22939 is V. parvula Hayek.

Additional citations: ECUADOR: Cotopaxi: Holm-Nielsen & Jeppesen 1147 (Ac). Imbabura: Asplund 20189 (N). Loja: Sparre 16664 (S). Napo: Sparre 17690 (S). Pastaza: Sparre 17525 (S). Pichincha: Asplund 16030 (N), 16139 (N), 17227 (N), 20151 (N); Sparre 16899 (S). Tungurahua: Asplund 19923 (N). PERU: La Libertad: Sagástegui A. 7192 (N).

VERBENA GLABRATA var. TENUISPICATA Moldenke

Additional bibliography: Moldenke, Phytologia 16: 53, 211, & 341. 1968; Moldenke, Résumé Suppl. 16: 5. 1968; Moldenke, Biol. Abstr. 49: 1325 (1968), 49 (3): B.A.S.I.C. S. 185 (1968), and 50: 418. 1969; Hocking, Excerpt. Bot. A.14: 206. 1969; Wiggins & Porter, Fl. Galáp. Isls. 26 & 997. 1971; Moldenke in Wiggins & Porter, Fl. Galáp. Isls. 503--505 & 509. 1971; Moldenke, Fifth Summ. 1: 138 (1971) and 2: 914. 1971.

Additional citations: GALAPAGOS ISLANDS: James: C. Darwin s.n. (Cu).

VERBENA GLANDULIFERA Moldenke

Additional bibliography: Moldenke, Phytologia 13: 196. 1966; Moldenke, Fifth Summ. 1: 200 (1971) and 2: 521 & 914. 1971.

In addition to months previously reported by me, this plant has also been found in fruit in January. The corollas on Varela 699 are described as having been "sky-blue".

Additional citations: ARGENTINA: Catamarca: Luna Risso 505 (N).

San Luis: Varela 699 (N). Santiago del Estero: Pierotti "h" [31/III/44] (N), "h" [3/IV/44] (N).

VERBENA GLUTINOSA Kuntze

Additional bibliography: Briq. in Chod. & Wilczek, Bull. Herb. Boiss., sér. 2, 2: 544. 1902; Troncoso in Böcher, Hjerting, & Rahn, Dansk Bot. Arkiv 22 (1): 109. 1963; Moldenke, Phytologia 14: 283 & 287. 1967; Schnack & Rubens, Bol. Soc. Argent. Bot. 13: 207. 1970; Moldenke, Fifth Summ. 1: 184 & 200 (1971) and 2: 521, 668, & 914. 1971.

Briquet (1902) cites Wilczek 54. Schnack & Rubens (1970) report the species from La Pampa and Neuquén, Argentina, while Troncoso (1963) cites Böcher, Hjerting, & Rahn 676 & 768, but notes that the material of the former number is "not typical". These collectors found the plant growing in riverbeds and describe the flowers as "yellow or flesh-coloured".

Additional citations: ARGENTINA: Mendoza: H. H. Bartlett 19521 (N).

xVERBENA GONZALEZI Moldenke

Additional bibliography: Moldenke, Phytologia 13: 196. 1966; Moldenke, Fifth Summ. 1: 370 (1971) and 2: 522, 689, 694, & 914. 1971.

VERBENA GOODINGII Briq.

Additional & emended synonymy: Glandularia goodingii (Briq.) Solbrig ex Rattenbury, Madroño 15: 50. 1959. Verbena bracteata goodingii Ferris in Abrams & Ferris, Illustr. Fl. Pacific States, pr. 1, 4: 730, in syn. 1960.

Additional & emended bibliography: Rydb., Fl. Rocky Mtns., ed. 1, 739 & 740 (1917) and ed. 2, pr. 1, 739 & 740. 1922; Tidestr., Contrib. U. S. Nat. Herb. 25 [Fl. Utah & Nev.], pr. 1, 469. 1925; E. C. Jaeger, Desert Wild Fls., ed. 1, 219 & 220, fig. 508 (1940) and ed. [2], pr. 1, 219 & 220, fig. 508. 1941; Abrams, Illustr. Fl. Pacif. States, pr. 1, 3: 610, 612, & 616, fig. 4347. 1951; Rydb., Fl. Rocky Mtns., ed. 2, pr. 2, 739 & 740. 1954; J. A. Clark, Card Ind. Gen. Sp. Var. issue 231. 1959; Rattenbury, Madroño 15: 50. 1959; Ferris in Abrams & Ferris, Illustr. Fl. Pacific States, pr. 1, 4: 651 & 730. 1960; Howell & McClintock in Kearney & Peebles, Ariz. Pl., ed. 2, 725-727. 1960; Lewis & Oliv., Am. Journ. Bot. 48: [639]. 1961; Munz, Calif. Desert Wildfls., ed. 1, 47 & 122, pl. 62. 1962; Hocking, Excerpt. Bot. A.6: 91 (1963) and A.7: 456. 1964; Ferris in Abrams & Ferris, Illustr. Fl. Pacific States, pr. 2, 4: 651 & 730. 1965; G. Taylor, Ind. Kew. Suppl. 13: 61. 1966; Abrams, Illustr. Fl. Pacific States, pr. 2, 3: 610, 612, & 616, fig. 4347. 1967; L. C. Higgins, Fl. Beaver Dam Mtns. 223. 1967; E. C. Jaeger, Desert Wild Fls., ed. 2, pr. 9, xxvii, 219, & 220, fig. 508. 1968; Moldenke, Phytologia 16: 187, 202, & 215. 1968; Munz & Keck, Calif. Fl. 687, 688, & 1679, fig. 65. 1968; Munz, Suppl. Calif. Fl. 101. 1968; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 715 & 717. 1969; Munz, Calif.

Desert Wildfls., ed. 2, 47 & 122, pl. 62. 1969; Rickett, Wild Fls. U. S. 3 (2): 362 & [363], pl. 110. 1969; Rydb., Fl. Rocky Mtns., ed. 2, pr. 3, 739 & 740. 1969; Tidestr., Contrib. U. S. Nat. Herb. 25 [Fl. Utah & Nev.], pr. 2, 469. 1969; Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1876 & 1877. 1970; Moldenke in Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1317 & 1325—1326. 1970; Rickett, Wild Fls. U. S. 4 (3): 539, [541], & 799, pl. 176. 1970; Moldenke, Fifth Summ. 1: 32, 50, 51, 53, 58, 62, 63, 65, 75, & 370 (1971) and 2: 521, 654, 656, 671, 706, 708, & 915. 1971; Moldenke, Phytologia 22: 485 & 497 (1972) and 23: 188. 1972.

Additional & emended illustrations: E. C. Jaeger, Desert Wild Fls., ed. 1, 220, fig. 508 (1940) and ed. [2], pr. 1, 220, fig. 508. 1941; Munz, Calif. Desert Wildfls., ed. 1, 47, pl. 62 (in color). 1962; Munz & Keck, Calif. Fl. 687, fig. 65. 1968; E. C. Jaeger, Desert Wild Fls., ed. 2, pr. 9, 220, fig. 508. 1968; Munz, Calif. Desert Wildfls., ed. 2, 47, pl. 62 (in color). 1969; Rickett, Wild Fls. U. S. 3 (2): [363], pl. 110 (in color) (1969) and 4 (3): [541], pl. 176 (in color). 1970.

The Madroño (1959) reference in the bibliography above is sometimes credited to Solbrig, while Bolkhovskikh and his associates (1969) cite it as "Darlington, Document. Chrom. Numb. Pl....", but it seems actually to be a continuation of a series started by Rattenbury and not otherwise accredited.

Recent collectors describe this plant as having dark-green foliage and have found it growing in dry mesquite deserts and roadsides. Moran reports it as "rather scarce" at 1650 meters altitude in Baja California, while Gentry & Fox found it "scattered along moister bottomland of open canyon bottoms" in the same state. The Mearses describe it as "common with Astragalus, Cenchrus, and Gaillardia" in Santa Cruz County, Arizona, "common with Cowania, Eriodictyon, Mirabilis, and Penstemon" in Clark County, Nevada, and as growing with Juniperus and Yucca baccata in San Bernardino County, California. Higgins (1967) confirms its presence in Washington County, Utah. Jaeger (1968) informs us that it is known in California from dry limestone canyons and slopes of the Clark and Providence Mountains and from there eastward to Texas. Howell & McClintock (1960) aver that it is found "throughout the state [of Arizona] mostly below 5,000 feet, dry slopes & mesas, flowering throughout the year; commonest and most widespread species in Arizona". They cite Jones 3901, from Yucca, Mohave County, as the type collection of V. arizonica Briq., which is correct, but it represents var. nepetifolia Tidestr. rather than the typical form of the species. They cite also N. C. Wilson 95, from Diamond Creek, Mohave County, as the type collection of V. verna A. Nels.; this is also now regarded as var. nepetifolia.

The following vernacular names are recorded for V. gooddingii in addition to those previously reported by me: "desert vervain" and "Goodding verbena".

Lewis & Oliver (1961) give 30 as the diploid chromosome number

for this species, while Solbrig is said by Rattenbury (1959) to have found it to be 20. It should be noted, however, that the Lewis & Oliver record was for var. nepetifolia rather than the typical form of the species.

The corollas on Gentry & Fox 11789 are described as having been "pink", those on Beatley 9969 were "deep blue-lavender", and those on R. V. Moran 10993 were "pale-lavender". Rickett (1969) describes the species as "densely hairy". The leaves are cleft into three lobes which are coarsely toothed or jaggedly cleft. The corolla may be pink, lavender, or blue, the lobes spreading 1/3 - 1/2 inch across", says that it blossoms from "February to October" and is found "in sandy soil and mountains from southwestern Texas to California and Nevada; and in Baja California".

Material of this species has been misidentified and distributed in some herbaria as V. neomexicana (A. Gray) Small. On the other hand, the O. M. Clark 11428, distributed as V. gooddingii, is actually var. nepetifolia Tidestr., Wiggins & Thomas 187 is V. lilacina Greene, and H. V. Moran 11476 is V. plicata Greene.

Additional citations: NEVADA: Clark Co.: Mears & Mears 1895 (Au--258463). Nye Co.: Beatley 9969 (N). TEXAS: Brewster Co.: Nelson & Nelson 5025 (Se--118764). ARIZONA: Coconino Co.: Coffey 25 (Ac); DeLuna 19 (Rf). Mohave Co.: N. D. Atwood 1730 (N, W--2599146); X. M. Gaines 1361 (Se--228422); C. L. Hitchcock 25614 (N, Se--235128, W--2580550); Munz 11691 (Se--126728). Pima Co.: C. L. Hitchcock 25540 (N, Se--236480, W--2580529). Pinal Co.: A. Davis 32 (Fg). Santa Cruz Co.: Keil, Pinkava, & Lehto 9334 (N); Mears & Mears 1691 (Au--257979). Yavapai Co.: Blalock 21 (Rf); Demaree 43883 (Rf); Greenwell 63 (Ac); C. F. Harbison 41178 (Sd--28992); D. F. Howe s.n. [24 April 1966] (Sd--64277). CALIFORNIA: San Bernardino Co.: M. Beal 514 (Se--161257); Letcher s.n. [San Bernardino, March 31, 1929] (Sd--41006); Moldenke & Moldenke 3206 (Ac); Munz 12860 (Se--162774); Munz, Johnson, & Harwood 4254 (Se--162773); C. B. Wolf 7021 (Se--137467), 9680 (Sd--42496, Se--122997), 10718 (Au--122112). MEXICO: Baja California: Gentry & Fox 11789 (Mi); R. V. Moran 10993 (Sd--53867), 13532 (Sd--63646); I. L. Wiggins 15074 (Se--208881); Wiggins & Wiggins 16073 (Au--238501). CULTIVATED: California: Balls 18900 (Se--157360).

VERBENA GOODDINGII var. NEPETIFOLIA Tidestr.

Additional synonymy: Verbena gooddingii nepetifolia Tidestr., in herb.

Additional & emended bibliography: Tidestr., Contrib. U. S. Nat. Herb. 25 [Fl. Utah & Nev.], pr. 1, 469. 1925; Lewis & Oliv., Am. Journ. Bot. 48: [639]. 1961; Hocking, Excerpt. Bot. A.6: 91. 1963; Moldenke, Phytologia 16: 187. 1968; Munz, Suppl. Calif. Fl. 101. 1968; Tidestr., Contrib. U. S. Nat. Herb. 25 [Fl. Utah & Nev.], pr. 2, 469. 1969; Moldenke, Fifth Summ. 1: 50, 51, 63, 65, & 75 (1971) and 2: 652, 654, 663, 671, 706, 773,

& 915. 1971; Moldenke, Phytologia 22: 485 & 497 (1972) and 23: 188. 1972.

Recent collectors have found this variety growing in arroyos, among dry rocks, and among eroded granite boulders. Moran found it to be "occasional along arroyos" in Baja California, while Moran, Witham, & Hommersand report it "locally common in disturbed areas" and Henrickson says it was found "in edge of deeply cut erosion areas in clay soil" in the same state. Mears calls it "common in canyons with Agrostis, Erythrina, and Rhus" in Arizona. The corollas are said to have been "rose" on R. V. Moran 7893 and "rose-purple" on Henrickson 2311.

Material has been misidentified and distributed in some herbaria under the names V. bracteata Lag. & Rodr. and "V. cilliata Benth." On the other hand, the Diaz L. s.n. [16.IX.1959], distributed as this variety, is actually V. delticola Small, while Jarabek s.n. [June 1945] is not even verbenaceous.

Additional citations: ARIZONA: Mohave Co.: Pinkava, Lewis, Noble, & Lehto 11249 (N). Pima Co.: L. M. Andrews 259a (N); J. A. Mears 1744 (Au--258005). Yavapai Co.: Toumey 305 (Sd--52238). County undetermined: O. M. Clark 11428 [S. Bateswell, Grawley Mtns.] (Au--122113). MEXICO: Baja California: Bell & Newcomb 1356 (Se--148592); Bratstrom s.n. [March 17, 1951] (Sd); C. F. Harbison 27283 (Sd--27283), 41549 (Sd--41549), s.n. [April 2, 1950] (Sd--43850); Hastings & Turner 63-192 (Sd--56502); Henrickson 2311 (Mi); Huey s.n. [June 16, 1947] (Sd--41944); R. V. Moran 7893 (Sd--60711), 10226 (Sd--54554); Moran, Witham, & Hommersand 16541 (Mi). Sonora: I. L. Wiggins 7225 (Se--168335), 11775 (Sd--47325).

xVERBENA GOODMANI Moldenke

Synonymy: Verbena halei Small x V. stricta Vent. ex Moldenke, Fifth Summ. 2: 672, in syn. 1971. Verbena stricta Vent. x V. halei Small ex Moldenke, Fifth Summ. 2: 698, in syn. 1971. Verbena goodmanii Moldenke, in herb.

Additional bibliography: Moldenke, Phytologia 14: 283. 1967; Moldenke, Fifth Summ. 1: 53 (1971) and 2: 672, 698, & 915. 1971.

Additional citations: OKLAHOMA: Marshall Co.: Goodman 7233 (Se--212514).

VERBENA GOYAZENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 9: 147--148. 1963; Moldenke, Fifth Summ. 1: 177 (1971) and 2: 915. 1971.

VERBENA GRACILESCENS (Cham.) Herter

Additional & emended bibliography: Cabrera, Man. Fl. Alred. Buenos Aires 394 & 395. 1953; Troncoso in Cabrera, Fl. Prov. Buenos Aires 5: 128 & 131. 1965; Meyer & Weyrauch, Inst. Mig. Lill. Misc. 23: [Guia Excurs. Biol. Tucum.] 64 & 123. 1966; Mar-

tínez-Crovetto, *Bonplandia* 2: 131. 1967; Moldenke, *Phytologia* 16: 55 & 102. 1968; Bolkh., Grif, Matvej., & Zakhar., *Chrom. Numb. Flow. Pl.* 717. 1969; Moldenke, *Fifth Summ.* 1: 177, 184, 187, 189, & 200 (1971) and 2: 651, 671, 672, 687, & 915. 1971.

The corollas of this species are described as having been "rose" on A. T. Hunziker 6318, "lilac" on Burkart 13841 and Luna 370 & 451, and "blue" on Ibarrola 2169. The plant has been collected in fruit from July to December. Troncoso (1965) gives its distribution as "Sudamérica templada. Común en campos bajos y húmedos" and cites Burkart 3656, Cabrera 5701 & 7223, and Venturi 59 from Buenos Aires, deposited in the San Isidro and La Plata herbaria.

Additional citations: ARGENTINA: Córdoba: Balegno 256 (N); Burkart 13841 (N); A. T. Hunziker 6318 (N). Corrientes: Ibarrola 2169 (N). Formosa: I. Morel 16 (N), 3459 (N), 3648 (N), 3667 (N), 3723 (N), 3778 (N). Jujuy: A. Reales 633 (N), 969 (N). Salta: Luna 451 (N); T. Meyer 8403 (N). Santa Fé: Ruiz Huidobro 3080 (Se--129885). Santiago del Estero: Luna 370 (N), 415 (N). Tucumán: O'Donell 5417 (N). PARAGUAY: T. Rojas 102b (Ws). URUGUAY: Rosengurtt Gurvich & Gallinal 5803 (Se--122506).

VERBENA GRACILIS Desf.

Additional & emended bibliography: Rydb., *Fl. Rocky Mtns.*, ed. 2, pr. 1, 739 & 740. 1922; Tidestr., *Contrib. U. S. Nat. Herb.* 25 [Fl. Utah & Nev.], pr. 1, 469. 1925; Rydb., *Fl. Rocky Mtns.*, ed. 2, pr. 2, 739 & 740. 1954; Howell & McClintock in *Kearney & Peebles, Ariz. Fl.*, ed. 2, 726 & 728. 1960; Moldenke, *Phytologia* 16: 55. 1968; Moldenke, *Résumé Suppl.* 16: 2. 1968; Rydb., *Fl. Rocky Mtns.*, ed. 2, pr. 3, 739 & 740. 1969; Tidestr., *Contrib. U. S. Nat. Herb.* 25 [Fl. Utah & Nev.], pr. 2, 469. 1969; Rickett, *Wild Fls. U. S.* 4 (3): 540 & 799. 1970; Moldenke, *Fifth Summ.* 1: 50, 63, 75, & 370 (1971) and 2: 652, 688, 693, & 915. 1971; Moldenke, *Phytologia* 22: 485 & 499. 1972.

The type of V. arizonica A. Gray was collected by John Gill Lemmon in Tanner's Cañon, near Fort Huachuca, Cochise County, Arizona, in 1882, and is deposited in the Gray Herbarium at Harvard University. Howell & McClintock (1960) state that the species grows at altitudes of 4500--6500 feet in Arizona and flowers there from June to October. Recent collectors have found it in flower and fruit also in December, growing in abandoned fields and on inundated ground. The Matthews describe it as "very abundant throughout open fields along railroad tracks" in Sonora, Urueta found it in "pastizales" in México, Stuessy calls it "scarce" in Chihuahua, Holguín found it on "ladera basáltica con vegetación de matorral de Opuntia, Zaluzania y Mimosa" in México, and Rzedowski in "charcos cercanos a la carretera" in México and "ladera riolítica con vegetación de zacatal" in San Luis Potosí.

Material has been misidentified and distributed in some herbaria as V. halei Small. The González Quintero 1908 and J. Rze-

dowski 15671 represent a small-bracted densely fruited form of the species. The corollas on Stuessy 1013 are described as having been "blue" and on J. Rzedowski 1352, 1473, 11225, & 11265 as "purple". The P. O. Schallert s.n. [6/16/43], distributed as V. gracilis, is actually V. bracteata Lag. & Rodr.

Additional citations: ARIZONA: Cochise Co.: W. W. Jones s.n. [Aug. 10, 1926] (Sd--47326). MEXICO: Chihuahua: Stuessy 1013 (Ip). Federal District: J. Rzedowski 1352 (Au--241293, Ip--1615), 1473 (Ip--1614). Hidalgo: González Quintero 1908 (Ip). México: Holguin s.n. [4/VII/1965] (Ac); J. Rzedowski 15671 (Ip), 20288 (Rf); Urueta 32 (Rf). San Luis Potosí: J. Rzedowski 3429 (Ip), 7995 (Ip), 11225 (Ip), 11265 (Ip). Sonora: Matthews & Matthews 487 (Au--259934).

VERBENA GRISEA Robinson & Greenm.

Additional bibliography: Moldenke, *Phytologia* 16: 55--56 & 342. 1968; Moldenke in Wiggins & Porter, *Fl. Galáp. Isls.* 503 & 505. 1971; Wiggins & Porter, *Fl. Galáp. Isls.* 997. 1971; Moldenke, *Fifth Summ.* 1: 138 (1971) and 2: 915. 1971.

VERBENA GUARANITICA (Troncoso) Moldenke, *Phytologia* 23: 211. 1972.

Synonymy: Glandularia guaranitica Troncoso, *Darwiniana* 16: 618--621, fig. 3. 1971.

Bibliography: Troncoso, *Darwiniana* 16: [613], 614, & 618--621, fig. 3. 1971; Moldenke, *Phytologia* 23: 211. 1972.

Illustrations: Troncoso, *Darwiniana* 16: [619], fig. 3. 1971.

This species is based on A. Burkart 8028, collected at Tres Cerros, dept. San Martín, Corrientes, Argentina, on November 8, 1936, and is deposited in the herbarium at San Isidro. Mrs. Burkart records for it the vernacular name "margarita" and gives its geographic distribution as "Misiones y Corrientes en la Argentina; Paraguay. Habita en rozados y terrenos altos a orillas de bosques." She makes the following comments: "Agradezco al Ing. Benno Schnack de la Universidad Nacional de La Plata, los ejemplares de Misiones y de Corrientes de esta especie y sus afines, que me proporcionó para su estudio, así como varias observaciones sobre las mismas, las que tiene en cultivo en el jardín experimental de la Facultad de Agronomía de La Plata.... G. guaranitica además de su afinidad ya señalada con G. megapota mica y G. phlogiflora, podría confundirse por su hábito y aspecto con G. incisa (Hook.) Tronc., especie que difiere fundamentalmente por sus inflorescencias que se alargan en forma notable después de la antesis, por la ausencia de glándulas conectivas y por sus flores de color rojo-solferino.... Hassler, en Chod. et Hassl., *Pl. Hassler*: 477. 1904, reconoce Verbena megapotamica var. tweediana O. Ktze. Su interpretación de esta variedad correspondería a Glandularia guaranitica. Me baso para afirmarle en uno de los ejemplares citados por este autor (Hass-

ler 3293 de Paraguay, Caraguatay), que he visto en el herbario de Kew."

She cites the following specimens: PARAGUAY: Fiebrig 6452, Hassler 1466 & 3293, Osten 13571, T. Rojas 1882. ARGENTINA: Corrientes: Burkart 8028 (type collection). Misiones: Grondona & Spegazzini 1231, Issouribehere s.n. [Posadas], A. de Llamas s.n. [Santa Ana, Candelaria], F. M. Rodriguez 30.

VERBENA GYNOBASIS Wedd.

Additional & emended bibliography: Reiche & Phil., Fl. Chil. 5: 285 & 286. 1910; J. F. Macbr., Field Mus. Publ. Bot. 13 (5): 617 & 618. 1960; Moldenke, Phytologia 14: 284. 1967; Moldenke, Fifth Summ. 1: 143, 184, & 193 (1971) and 2: 653 & 915. 1971; Moldenke, Phytologia 23: 191. 1972.

Recent collectors have found this plant growing at altitudes of 400 to 3400 meters, flowering and fruiting in October and November, in addition to months previously reported. Macbride (1960) reduces the species to synonymy under V. calcicola Walp., but I regard V. calcicola as a synonym of V. clavata Ruiz & Pav. and quite distinct from the present taxon.

Additional citations: PERU: Arequipa: Vargas Calderón 18227 (Ac). Tacna: Vargas Calderón 13068 (Rf). CHILE: Tarapacá: Zollner 4088 (Go).

VERBENA GYNOBASIS var. STRIGOSA Wedd.

Additional bibliography: Moldenke, Phytologia 11: 459. 1965; Moldenke, Fifth Summ. 1: 143 (1971) and 2: 672 & 915. 1971.

VERBENA HALEI Small, Bull. Torrey Bot. Club 25: 617--618. 1898.

Additional synonymy: Verbenna halei Small ex Moldenke, Fifth Summ. 2: 708, in syn. 1971.

Additional & emended bibliography: J. K. Small, Bull. Torrey Bot. Club 25: 617--618. 1898; Hocking, Excerpt. Bot. A.1: 430. 1959; Howell & McClintock in Kearney & Peebles, Ariz. Fl., ed. 2, 726 & 728. 1960; Lewis & Oliv., Am. Journ. Bot. 48: [639]--641, fig. 16. 1961; Hocking, Excerpt. Bot. A.6: 91. 1963; Radford, Ahles, & Bell, Guide Vasc. Fl. Carol. 281 & 282. 1964; Shinners, Sida 3: 182. 1967; Moldenke, Phytologia 16: 187 & 190. 1968; Moldenke, Résumé Suppl. 16: 2. 1968; Pullen, Jones, & Wats., Castanea 33: 332. 1968; Bolkh., Grif, Matvej., & Zakhar., Chrom. Mumb. Flow. Pl. 717. 1969; D. F. Costello, Prairie World 24. 1969; Muehlenbach, Ann. Mo. Bot. Gard. 56: 169--170. 1969; Rickett, Wild Fls. U. S. 3 (2): 364 (1969) and 4 (2): 540 & 799. 1970; Moldenke in Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1314 & 1318--1319. 1970; Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1876 & 1877. 1970; Shinners, Sida 3: 554. 1970; Moldenke, Fifth Summ. 1: 23, 25, 27, 30, 32, 33, 45, 47, 49, 53, 58, 62, 63, 75, & 370 (1971) and 2: 663, 672, 674, 679, 680, 685, 686, 698, 708, & 915. 1971; Moldenke, Phytologia 23: 193.

1972.

Emended illustrations: Lewis & Oliv., Am. Journ. Bot. 48: 640, fig. 16. 1961.

Recent collectors describe this plant as an annual herb with fibrous roots or an erect perennial, slender and wiry, 45-60 cm. tall, branched from the base, the branches erect, to 45 cm. long, the leaves shiny-green, the inflorescence very slender, and the flowers small. The corollas are described as having been "pale-blue" on R. Ruryon 2358, "light-blue" on Pilcher 196 & 236, "blue" on B. Hutchins 1049, Pilcher 30, and Stuessy 1013, "lavender-blue" on M. D. McCracken 90, "bluish-lavender" on Ellison & Ellison 1010, "lavender" on B. Hutchins 453 & 1101 and Jeter 11, "light-lavender" on Correll & Mitchell 34452, "violet" on Gipson 81 and McDaniel 3501, and "purple" on Gutiérrez R. 218 and R. Ruryon 2181.

Demaree 58109 is anomalous, tall, the lower leaves numerous on the stem and only sparsely dentate, hardly lobed, and quite pilose beneath -- it may represent a hybrid, possibly with V. simplex Lehm. Jones & Reynolds 11740 has some of its spikes fasciated. Wood 721 bears a notation that "plants similar to nos. 692 and 693 but less hairy". B. Hutchins 453 is accompanied by a photograph; Nixon G.60 is an "ecological voucher", according to its collector, while Cumbie 173 is a "voucher for anatomical study".

Rickett (1969) states that "There are several spikes, with rose, blue, lavender, or purple flowers scarcely more than 1/3 inch long", and gives its distribution as "in meadows and woodland and on prairies and hills and roadsides practically throughout the state [of Texas], eastward to Alabama, northward to Oklahoma, and in Mexico", flowering in Texas from "February to November". The species has been found growing at altitudes of 9--5800 feet. Additional common names recorded for it are "slender verbena" and "vervain".

Recent collectors have found the plant growing in loose red or red sandy loam, loose sand in woods around bogs, calcareous clay-loam, sandy-clay of river-bottoms, sandy loam or calcareous clay loam of barditch highways, limestone soil, or in soil derived from granite, in sandy loam, open pasturelands, open oak-mequite woodlands, or open fields and disturbed areas, in fine sandy soil, deciduous tropical woods, low moist areas of rolling plains, wet spots along highways, and in irrigation ditches, along railroad tracks, in Prosopis-Opuntia communities, on road shoulders and sandy weedy beaches, along the edges of upland mixed hardwoods, and in hilly areas with serpentine mounds vegetated mainly by grasses. Pilcher reports it "occasional among weeds and grasses", while the Ellisons describe it as a "perennial in full sun, sandy soil, abundant local population with V. brasiliensis but no hybridization evident".

In Arkansas it is called "common in waste areas" by Demaree.

Stuessy found it "scarce" in Chihuahua, while in Mississippi Rogers found it "in full sun along roadside and in openings" and McDaniel says that it is "common along roadsides in longleaf pine and oak associations". Mears found it growing with Ambrosia, Cardiospermum, Solanum, and Spartina, while Cory describes it as "frequent" or "infrequent" on roadsides, "frequent in sandy soil of grasslands and onion fields", and "infrequent on highway shoulders". In the state of Texas Strother describes it as a "weed in overgrown lots" (Brown Co.), Waller found it to be "occasional in sandy clay loam of oak woodlands" (Mason Co.), Jeter calls it "common on blackland prairies" (Ellis Co.), and Runyon found it to be "frequent to abundant in open ground" or "occasional in sandy loam" (Kenedy Co.) and comments that it "flowers throughout the summer months, frequent throughout the region" (Cameron Co.).

Stanford reports V. halei from "mostly grassland of sandy to sandy-loam soil in the Campestrian Biotic Province, frequent in all areas" of Wichita Co., Texas. Shinnery (1967) records it from Garza County, citing his nos. 453, 1049, & 1101. Kibler encountered it at 2000 feet altitude in Nuevo León, Mexico.

Howell & McClintock (1960) cites Peebles & Harrison 4224 from Pinal Co. and Goodding & Lusher 186-45 from Pima Co., Arizona. Pullen, Jones, & Watson (1968) record it from Amite, Clarke, Covington, Harrison, Jackson, Jasper, Jefferson Davis, Lauderdale, Marion, Scott, Stone, Wayne, and Wilkinson Counties, Mississippi. Radford, Ahles, & Bell (1964) report it as infrequent along roadsides and in pastures in Warren County, North Carolina, and in Aiken and Sumter Counties, South Carolina, flowering there from April to June.

Muehlenbach (1969) has found this species as an adventive in two freight yards in St. Louis, Missouri, in 1957, 1958, and 1960, but in a letter to me dated March 20, 1970, he says "I tried in the last years desperately to rediscover in St. Louis Verbena halei, but in vain. I left even once two specimens uncollected, but nevertheless this plant disappeared in the following summer. But that is nothing astonishing -- so frequently adventive plants vanish on the railroads without obvious reasons."

The H. M. Parker 424, cited below, was collected in a thorn forest and dry stream bed on limestone and shale substratum and was misidentified as Phryma leptostachya L. It is an anomalous specimen which does not have the appearance of typical V. halei.

Material of this species has also been misidentified and distributed in some herbaria under the names V. canadensis L., V. runyoni Moldenke, and Phryma sp. On the other hand, the Sosa 332, distributed as V. halei, is actually V. cloverae Moldenke; Stuessy 1013 is V. gracilis Desf.; E. G. Marsh 684 is V. neomexicana var. hirtella Perry; Matthews & Matthews 310 is V. perennis Wootton; Cuesta 61, N. C. Henderson 61-944, and J. O. Perez 44 are V. plicata Greene; and Thomas, Thomas, Thomas, & Thomas 3347 is

V. xutha Lehm.

Additional citations: SOUTH CAROLINA: Aiken Co.: Ellison & Ellison 1010 (N). MISSISSIPPI: Forrest Co.: S. McDaniel 3501 (N). Hancock Co.: S. B. Jones 11867 (N). Jackson Co.: K. E. Rogers 1093 (N). Lawrence Co.: Jones & Reynolds 11740 (Au--260968). Pearl River Co.: F. H. Sargent 7745 (Go). ARKANSAS: Clark Co.: Demaree 58570 (Ac). Little River Co.: Demaree 58109 (Rf), 58166 (Ac). Miller Co.: Demaree 58076 (Ac), 58081 (Ac), 58083 (Rf). Nevada Co.: Demaree 60103 (Rf). LOUISIANA: Caddo Par.: Demaree 55579 (Ac). Ouachita Par. R. D. Thomas 2825 (N). OKLAHOMA: A-toka Co.: Hopkins, Nelson, & Nelson 1092 (Se--136591). Johnston Co.: G. T. Robbins 2410 (N). Love Co.: Nelson, Nelson, Goodman, & Waterfall 5706 (Se--136609). Pontotoc Co.: G. T. Robbins 2486 (N). TEXAS: Anderson Co.: K. E. Smith s.n. [Palestine, 4/21/35] (Lk). Bastrop Co.: Westlund, Rowell, & Barkley 17216 (Ip). Bell Co.: M. Latham 7 (Au--247766, Au--248044). Bexar Co.: J. O. Perez 21 (Au--245152, Ip). Bosque Co.: Pilcher 236 (Lk). Bowie Co.: Correll & Mitchell 34452 (Ld). Brazoria Co.: Fleetwood 9010 (Au--260420), 9110 (Au--260428). Brazos Co.: Cory 50627 (Mi); Fryxell 976 (N). Brown Co.: Calhoon 6 (Lk); M. A. Cole 120 (Lk); R. Norton 8 (Au--248404); Strother 10 (Lk); J. Wheeler 14 (Au--247691). Burnet Co.: Cumbie 173 (Lk). Caldwell Co.: Mears 670 (Au--255128). Cameron Co.: R. Ruryon 2181 (Au--268811), 2368 (Au--268612). Culberson Co.: Cory 53037 (Mi, N). Dimmit Co.: Atwood 2030 (N, N); Ramirez & Cardenas 3 (Au--245212, Ip). Duval Co.: Alvarez, Guajardo, Salazar, & McCart 7671 (Lk). Eastland Co.: Wheless 17 (Au--247705). Ellis Co.: Jeter 11 (Lk). Frio Co.: Alvarez, Guajardo, Salazar, & McCart 8020 (Se--220475); Drews 6 (Au--247890); Ramirez & Cardenas 25 (Au--245196, Ip). Galveston Co.: Cory 51017 (Mi); Mears 761 (Au--255271), 793 (Au--255508). Garza Co.: B. Hutchins 453 (Lk), 1049 (Lk), 1101 (Lk). Gillespie Co.: Nixon G.60 (Au--253187), S.37 (Au--253234). Harris Co.: E. Hall 432 (N). Hidalgo Co.: Holloway 21 (Au--257886). Jim Hogg Co.: Botello & Ayala 12 (Au--245005). Kenedy Co.: R. Ruryon 2358 (Au--266158, Au--268613). Kleberg Co.: Cory 51322 (Mi). Lavaca Co.: Strother 185 (Au--238141). Mason Co.: Gipson 81 (Lk); Waller 1701 (Lk). Matagorda Co.: Cory 51091 (Mi); Mears 1149 (Au--254959). McLennan Co.: L. D. Smith 388 (Au--122207). Medina Co.: J. Cope 26 (Au--247823). Mueces Co.: Bolen 80 (Lk); Pilcher 30 (Lk). Palo Pinto Co.: Mahler 1660 (Au). Robertson Co.: Rowell 8077 (Au--122260). Rusk Co.: M. D. McCracken 90 (Lk). San Patricio Co.: Cory 51259 (Mi, Se--123672); Gould & Hycck 7990 (Lk); S. Sanderson 94 (N). San Saba Co.: L. J. Jones 18 (Au--247795, Au--248124). Starr Co.: Pilcher 196 (Lk); A. D. Wood 721 (Au--247064, Au--262610). Taylor Co.: Mahler 3393 (Au--248882). Tra-

vis Co.: Tharp s.n. [Austin, 5/2/35] (Lk), s.n. [Austin, 5/9/35] (Lk). Webb Co.: Novoa & Cantu 10 (Au--244815, Ip); E. Rodriguez 5 (Au--245037, Ip). Wichita Co.: J. W. Stanford 291 (Lk). Willacy Co.: Cory 51489 (Mi). Wilson Co.: Edw. Palmer 1043 (Pa). Young Co.: Vollum s.n. [Fort Belknap, 1855] (Pa). El Toro Island: Tharp 49098 (Au--122208, N), 49236 (Au--122206). MEXICO: Chihuahua: Stuessy 1013 (Au--257717, N). Coahuila: E. G. Marsh 1625 (Au--213416); E. M. Marsh 2128 (Au--213864). Guanajuato: R. Pearce 2276 (Lk). Nuevo León: Kibler 26 (Au--297427); H. M. Parker 381 (Au--302762), 424 (Au--302763). Veracruz: García Saucedo 45 (Ip); Gutiérrez R. 218 (Ac).

VERBENA HALEI f. ALBIFLORA L. I. Davis

Synonymy: Verbena halei albiflora L. I. Davis ex Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1876. 1970.

Additional bibliography: Moldenke, Phytologia 9: 175. 1963; Moldenke in Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1314 & 1319. 1970; Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1876. 1970; Moldenke, Fifth Summ. 1: 59 (1971) and 2: 672 & 915. 1971.

VERBENA HALEI f. ROSEIFLORA (Benke) Moldenke

Additional synonymy: Verbena halei roseiflora (Benke) Moldenke ex Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1876. 1970.

Additional bibliography: Moldenke, Phytologia 10: 210. 1964; Moldenke in Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1314 & 1319. 1970; Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1876. 1970; Moldenke, Fifth Summ. 1: 59 (1971) and 2: 672, 687, & 915. 1971.

VERBENA HASSLERANA Briq.

Additional synonymy: Glandularia hassleriana Schnack & Rubens, Bol. Soc. Argent. Bot. 13: 205. 1970.

Additional bibliography: Angely, Fl. Anal. Paran., ed. 1, 571. 1965; Moldenke, Phytologia 14: 284. 1967; Schnack & Rubens, Bol. Soc. Argent. Bot. 13: 205. 1970; Moldenke, Fifth Summ. 1: 177, 187, & 201 (1971) and 2: 672, 688, 689, 773, & 915. 1971.

The species has been collected in anthesis in January, in addition to the months previously reported, and Hatschbach describes it as an "erva do brejo". The corollas are said to have been "violet" on Hatschbach 18321 and "red" on G. J. Schwarz 615.

Additional citations: BRAZIL: Paraná: Hatschbach 18321 (Ft, N, W--2536532). ARGENTINA: Misiones: Ruiz Huidobro 4753 (Se--129884); G. J. Schwarz 615 (N), 5162 (N).

VERBENA HASSLERANA var. OVATIFOLIA Moldenke

Additional bibliography: Moldenke, Phytologia 13: 199. 1966;

Moldenke, Fifth Summ. 1: 177 (1971) and 2: 915. 1971.

VERBENA HASTATA L.

Additional & emended synonymy: Verbena americana, spici multiplici, foliis urticae angustissimis, floribus purpureis Tourn., Compl. Herb. 358. 1719. Verbena hastata β pinnatifida A. Wood, Class-book, ed. 2, pr. 1, 412. 1847. Verbena hastata f. hastata Seymour, Fl. New Engl. 456. 1969. Verbena urticifolio-hastata Bebb, in herb.

Additional & emended bibliography: Tourn., Compl. Herb. 358. 1719; Crantz, Inst. Rei Herb. 1: 573. 1766; [Retz.], Nom. Bot. 11: 1772; J. F. Gmel. in L., Syst. Nat., ed. 13, pr. 1, 2 (1): 42 (1789) and ed. 13, pr. 2, 2 (1): 42. 1796; Balbis, Cat. Pl. Hort. Bot. Taur. 48. 1804; Balbis, Cat. Stirp. Hort. Acad. Taur. 80. 1813; Pers., Sp. Pl. 3: 346 & 347. 1819; Steud., Nom. Bot. Phan., ed. 1, 873. 1821; Jan, Elench. Pl. 1. 1824; Beck, Bot., ed. 1, 283--284. 1833; A. Wood, Class-book, ed. 1, 268 (1845) and ed. 2, pr. 1, 412. 1847; Beck, Bot., ed. 2, pr. 1, 285. 1848; A. Gray, Man. Bot., ed. 1, 311. 1848; A. Wood, Class-book, ed. 2, pr. 2, 412 (1848), ed. 10, pr. 1, 412 (1848), ed. 10, pr. 2, 412 (1849), ed. 10, pr. 3, 412 (1850), ed. 17, 412 (1851), ed. 23, 412 (1851), ed. 29, 412 (1853), ed. 35, 412 (1854), ed. 41, pr. 1, 412 (1855), and ed. 41, pr. 2, 412. 1856; Beck, Bot., ed. 2, pr. 2, 285. 1856; A. Gray, Man. Bot., ed. 2, pr. 1, 298 (1856), ed. 2, pr. 2, 298 (1858), and ed. 2, pr. 3, 298. 1859; A. Wood, Class-book, [ed. 42], pr. 1, 537. 1861; A. Gray, Man. Bot., ed. 3, 298 (1862) and ed. 4, pr. 1, 298. 1863; A. Wood, Class-book, [ed. 42], pr. 2, 537. 1863; A. Gray, Man. Bot., ed. 4, pr. 2, 298. 1864; A. Wood, Class-book, [ed. 42], pr. 3, 537. 1865; Darby, Bot. South. States 474. 1866; A. Gray, Man. Bot., ed. 5, pr. 1, 340. 1867; A. Wood, Class-book, [ed. 42], pr. 4, 537. 1867; Beck, Bot., ed. 2, pr. 3, 285. 1868; A. Gray, Man. Bot., ed. 5, pr. 2, 340. 1868; A. Wood, Class-book, [ed. 42], pr. 5, 537. 1868; A. Gray, Field For. & Gard. Bot., ed. 1, pr. 1, 242 (1868) and ed. 1, pr. 2, 242. 1869; A. Wood, Class-book, [ed. 42], pr. 6, 537 (1869) and [ed. 42], pr. 7, 537. 1870; A. Gray, Man. Bot., ed. 4, pr. 3, 298. 1870; A. Wood, Am. Bot. & Flor., ed. 1, pr. 1, 236 (1870) and ed. 1, pr. 2, 236. 1871; A. Wood, Class-book, [ed. 42], pr. 8, 537. 1872; A. Wood, Am. Bot. & Flor., ed. 1, pr. 3, 236 (1872), ed. 1, pr. 4, 236 (1873), ed. 1, pr. 5, 236 (1874), and ed. 1, pr. 6, 236. 1875; A. Wood, Class-book, [ed. 42], pr. 9, 537. 1876; A. Gray, Man. Bot., ed. 5, pr. 8, 340 (1878) and ed. 5, pr. 8 [9], 340. 1880; A. Gray, Field For. & Gard. Bot., ed. 1, pr. 3, 242. 1880; A. Wood, Class-book, [ed. 42], pr. 10, 537. 1881; Meyncke, Bull. Brooksville Soc. Nat. Hist. 1: [Fl. Franklin Co.] 31. 1885; S. Wats. & Coult. in A. Gray, Man. Bot., ed. 6, pr. 1, 402. 1889; O. R. Willis in A. Wood, Am. Bot. & Flor., ed. 2, 236. 1889; S. Wats. & Coult. in A. Gray, Man. Bot., ed. 6, pr. 2, 402. 1890; Gattinger, Med. Pl. Tenn. 64. 1894; L. H. Bailey in A. Gray, Field For. & Gard. Bot., ed. 2, 341. 1895;

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