

MATERIALS TOWARD A MONOGRAPH OF THE GENUS VERBENA. XIX

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VERBENA MONTEVIDENSIS Spreng.

Pedersen found this species in grasslands on malezal (low frequently flooded ground).

Additional citations: URUGUAY: Osten 3165 (Ug), 3335 (Ug), 3684 (N, Ug, Ug); Rosa-Mato 313 (Ug--9808), 399 (Ug--9810), 400 (Ug--9811); Seijo s.n. [Montevideo, 16 Nov. de 1884] (Ug); Sellow s.n. [Montevideo; Macbride photos 17432] (Kr--photo of type, N--photo of type, N--photo of type); Teisseire 4481 (Ug). ARGENTINA: Buenos Aires: A. Alvarez 453 (Bm, S); R. Alvarez 427 (S); Cabrera 861 (N), 1710 (N), 2108 (N, W--1574454), 2336 (N, N, N); Cannelle s.n. [Rio Parana Mini] (Mv); H. M. Curran s.n. [Oct. 19, 1913] (N); Krapovickas 2678 (Gg--353253, N), 2742 (N); Nicora 377 (W--2196464); Pastore 137 (N); Remiro s.n. [Mercedes, 20.IV.1943] (Mv); Scala 10001 (N); A. G. Schulz 5690 (Z); Sparre 268 (S). Corrientes: Pedersen 774 (W--2122544), 5074 (S); Ruiz Huidobro 2087 (S). Entre Ríos: Cabrera 10756 (W--2370638). Misiones: Ber-toni 3196 (N); Ekman 2018 (N, S), 2030 (N, S); Grüner 418 [Herb. Osten 23180] (Ug); Martinez Crovetto 3443 (N); Medina 128 (Gg--353260, N); T. Meyer 11297 (N); Montes 91 (Ca, Ca), 1237 (Es, Gg--352674, N), 9553 (Vi, Vi); G. J. Schwarz 624 (Ca), 821 (Ca), 1127 (Ca), 1128 (S), 1430 (N), 1472 (N), 1733 (N), 1976 (N), 3779 (N). Santiago Island: Cabrera 2159 (N, W--1574495).

VERBENA MORICOLOR Moldenke, Phytologia 2: 424--425. 1948.

Bibliography: Moldenke, Phytologia 2: 424--425 & 482. 1948; Moldenke, Castanea 13: 119. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 106 & 198. 1949; Moldenke, Alph. List Cit. 4: 1090. 1949; Moldenke, Phytologia 3: 290. 1950; Howell, Wasmann Journ. Biol. 10: 377. 1952; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 127 & 472. 1959.

Herb, to 1 m. tall; stems and branches slender, more or less tetragonal, sparsely and irregularly pilose with whitish hairs of various lengths, the youngest parts rather densely hirsutulous with sharp-pointed hairs about 1 mm. long borne at right angles to the branch; nodes annulate; principal internodes elongated, 7.5--13 cm. long; leaves decussate-opposite; petioles slender, 1.5--2 cm. long, irregularly pilose with very short hairs and sparsely hirsutulous with long sharp-pointed hairs like on the younger branches; leaf-blades thin-chartaceous, somewhat lighter beneath, lanceolate, 4--8 cm. long, 1--2.3 cm. wide, attenuate-acute at the apex, obtuse or abruptly acute at the base, irregularly dentate from the base to the apex with rather broad sub-acute teeth, the larger irregularly interspersed with smaller ones

toward the base of the blade and often doubly dentate, rather densely strigose-pubescent above, densely pubescent beneath with hairs of various lengths; midrib slender, plane or slightly subimpressed above, slightly prominulous beneath; secondaries about 7 pairs, very slender, ascending, hardly arcuate, indiscernible above, rather obscure beneath; veinlet reticulation indiscernible; inflorescence terminal, spicate, the flowering portion apparently elongating to about 7 cm.; peduncles similar to the upper branches or stems in texture, shape, and pubescence, 1--7.5 cm. long; rachis densely pilose-pubescent with hairs of various lengths; bractlets lanceolate, about 4 mm. long, attenuate to the apex, sparsely puberulent on the back, the margins regularly ciliate; calyx cylindric, 6--7 mm. long, about 1 mm. in diameter, rather sparsely puberulent-pilosulous, the teeth 0.5 and 0.9 mm. long, subulate; corolla hypocrateriform, varying from blue-violet or violet to purple, rose, or mulberry-colored, its narrow-cylindric tube 13--14 mm. long, densely pilose-puberulent above the calyx, its limb 6--7 mm. wide, much darker in the throat, glabrous within, subglabrate on the outer surface.

The type of this handsome species was collected by Santiago Venturi (no. 5397) among spiny plants on a hillside at Sierra de Calilegua, at an altitude of 800 meters, in the department of Ladesma, Jujuy, Argentina, on October 11, 1927, and is deposited in the herbarium of the California Academy of Sciences at San Francisco. The species is obviously related to *V. phlogiflora* Cham. and *V. incisa* Hook., but differs conspicuously in its much smaller calyx and corolla. One collector describes the plant as a "shrub", but probably in error. It has been found at altitudes of 360 to 1600 meters, flowering in January, February, September, and October. Herbarium material has been misidentified and distributed as *V. megapotamica* Spreng. and *V. scrobiculata* Griseb. In all, 15 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: ARGENTINA: Catamarca: Wall & Sparre s.n. [La Estancia, 27/11/46] (Ew, N), s.n. [Alsaverade, 27/11/46] (Ew, Ew, N). Jujuy: Venturi 5397 [Herb. Osten 20800] (Em--isotype, F--photo of type, Gg--157893--type, N--isotype, N--photo of type, S--isotype, Si--photo of type, Ug--isotype, W--1440837--isotype, W--1591472--isotype, Z--photo of type). Salta: Lillo 18111 [Herb. Osten 3469] (Ug); Parodi 9179 [Herb. Osten 22534] (Ug); Schreiter 5037 [Herb. Osten 20774] (Ug).

VERBENA MULTICAULIS Raf., Herb. Raf. 65, nom. nud. 1833.

Bibliography: Raf., Herb. Raf. 65. 1833; E. D. Merr., Ind. Raf. 205 & 295. 1949; Moldenke, Résumé Suppl. 7: 3. 1963.

Nothing is known about this plant except that, according to Merrill, the name was proposed by Rafinesque and published by him in 1833, without description, based on a type from the "Appalachian Mountains". It is very probably a synonym of *V. simplex* var. eggerti Moldenke, but of this I cannot be sure without seeing the type material.

VERBENA NANA Moldenke, Phytologia 3: 119. 1949.

Bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 105 & 198. 1949; Moldenke, Phytologia 3: 119 & 136 (1949) and 3: 289 & 290. 1950; Stellfeld, Trib. Farmac. 19 (10): 167. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Angely, Fl. Paran. 7: 13. 1957; Moldenke, Résumé 110, 118, 127, & 472. 1959; Angely, Fl. Paran. 16: 79 (1960) and 17: 46. 1961; Moldenke, Phytologia 9: 388. 1964.

Dwarf annual herb, 1 dm. or less in height, or sometimes suffrutescent and to 6 cm. tall; stems semi-prostrate or erect, usually with 2 ascending or erect branches at the base, obtusely tetragonal, deeply 4-sulcate in drying, densely hirsutulous with whitish mostly glanduliferous hairs of various lengths standing at right angles to the stem; principal internodes 0.5--2 cm. long; leaves decussate-opposite; petioles slender, 3--11 mm. long, densely hirsutulous like the stem and branches; leaf-blades chartaceous, rather uniformly green on both surfaces, ovate, 1.3--2.5 cm. long, 8--12 mm. wide, obtuse or subacute at the apex, acute at the base, appressed-serrulate with rather wide, flat, rounded teeth from the widest part to the apex, rather densely pubescent on both surfaces with whitish, stiff, straight, more or less glanduliferous hairs; midrib slender, plane above, subprominulous beneath; secondaries slender, 2--5 per side, ascending, subprominulous beneath; veinlet reticulation rather obscure on both surfaces; inflorescence terminal, dense, rather few-flowered, sessile or subsessile; bractlets lanceolate, 4--5 mm. long, glandular-pubescent; calyx tubular, about 11 mm. long, densely hirsutulous with short, whitish, often glanduliferous hairs standing at right angles to the surface, the rim irregularly 5-apiculate, the teeth about 1 mm. long; corolla hypocrateriform, varying from intensely red or rose to pink, rose-lilac, or lilac-tinged, its tube about 15 mm. long, glabrous on the outer surface, the limb 5--6 mm. wide, glabrous.

The type of this very distinct species was collected by Ishmael Morel (no. 117) at Pirané, in the department of Pirané, Formosa, Argentina, on October 23, 1945, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species has been found on campos, in low wet soil, in Copernicia palm woods, and in Vachellia farinosa thorn-thickets, in flower in February, June, and October to December, and in fruit in October. It is said to be common in open ground in Paraguay, and rather abundant in the Argentine Chaco. A common name is "verbena de los palmares".

Herbarium material has been misidentified and distributed under the names "V. chamaedryfolia var. vel hybr." [by Osten], "V. aff. kuntzeana Moldenke" [by Troncoso], V. phlogiflora Cham., and V. scrobiculata Griseb. In all, 29 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: BRAZIL: Paraná: Stellfeld s.n. [Herb. Mus. Paran. 3140] (N). São Paulo: Brade 7002 [Herb. Inst. Bot. S. Paulo 6724]

(N); Edwall s.n. [Herb. Comm. Geogr. & Geol. 2958] (N, Sp--15729, Sp--15732). PARAGUAY: Fiebrig 1218 (S), 4371 (Bm, Cb, Cb); Pedersen 4069 (N, S, Ut--90219b, W--2283663); T. Rojas 254 (Bm, S), 256 (S), 1895 [Herb. Hort. Parag. 10055; Herb. Osten 13558] (N, N, Ug). ARGENTINA: Chaco: T. Meyer 680 [Herb. Osten 22944] (N, N, Ug), 2943 (N); A. G. Schulz 286 [Herb. Osten 23147] (N, Ug), 1466 (N). Formosa: I. Morel 117 (B--isotype, F--photo of type, N--type, N--photo of type, Sg--photo of type, Z--photo of type), 496 (Bm).

VERBENA NEOMEXICANA (A. Gray) Small, Fl. Southeast. U. S., ed. 1, 1010 & 1337 [as "neo-mexicana"]. 1903.

Synonymy: Verbena officinalis var. hirsuta Torr. in Emory, Rep. U. S. & Mex. Bound. Surv. 2: 128. 1859. Verbena canescens var. neo-mexicana A. Gray, Syn. Fl. N. Am. 2 (1): 337. 1878. Verbena neo-mexicana Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148, hyponym. 1894. Verbena canescens x officinalis Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148, in syn. 1894. Verbena neomexicana Small ex Prain, Ind. Kew. Suppl. 3: 187. 1908. Verbena canescens neomexicana A. Gray ex Standl., Contrib. U. S. Nat. Herb. 13: 171 & 211. 1910. Verbena officinalis hirsuta Torr. ex Standl., Contrib. U. S. Nat. Herb. 13: 171 & 211, in syn. 1910. Verbena canescens var. neomexicana A. Gray apud Perry, Ann. Mo. Bot. Gard. 20: 296. 1933. Verbena neomecicana (Gray) Small ex Moldenke, Suppl. List Invalid Names 9, in syn. 1941. Verbena neo-mexicana Small ex Moldenke, Suppl. List Invalid Names 9, in syn. 1941. Verbena neomexicana (A. Gray) Small ex Moldenke, Alph. List Cit. 1: 200, sphalm. 1946. Verbena neomexicana (Gray) Small ex Moldenke, Résumé 237, in syn. 1959. Verbena canescens neo-mexicana Gray ex Moldenke, Résumé 360, in syn. 1959. Verbena neo-mexicana Gray ex Moldenke, Résumé 370, in syn. 1959.

Bibliography: Torr. in Emory, Rep. U. S. & Mex. Bound. Surv. 2: 128. 1859; A. Gray, Syn. Fl. N. Am. 2 (1): 337. 1878; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148. 1894; J. K. Small, Fl. Southeast. U. S., ed. 1, 1010 & 1337. 1903; Prain, Ind. Kew. Suppl. 3: 187. 1908; Standl., Contrib. U. S. Nat. Herb. 13: 171 & 211. 1910; J. K. Small, Fl. Southeast. U. S., ed. 2, 1010. 1913; Perry, Ann. Mo. Bot. Gard. 20: 246, 248, 261, 296--298, 301, 302, 340, & 355. 1933; Dermen, Cytologia 7: 161 & 162. 1936; Cory, Texas Agr. Exp. Sta. Bull. 550: 88. 1937; Moldenke, Prelim. Alph. List Invalid Names 45 & 47. 1940; Moldenke, Suppl. List Invalid Names 8 & 9. 1941; Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4: 18. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 17 & 29--30. 1942; Moldenke, Alph. List Invalid Names 46 & 49. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 13, 14, 19, & 101. 1942; Schnack & Covas, Darwiniana 6: 470. 1944; Moldenke, Phytologia 2: 128. 1945; Darlington & Janaki Ammal, Chromosome Atlas 270. 1945;



Moldenke, Alph. List Cit. 1: 34, 116, 182, 199, & 200. 1946; W. C. Leavenworth, Am. Midl. Nat. 36: 187. 1946; L. C. Hinckley, Am. Midl. Nat. 37: 170. 1947; Moldenke, Phytologia 2: 331 (1947) and 2: 163--164. 1948; Moldenke, Wrightia 1: 225--227. 1948; Moldenke, Alph. List Cit. 2: 471, 538, & 539 (1948), 3: 708, 723, 729, 752, 789, 939, 953, & 954 (1949), and 4: 990, 1142, 1150, 1224, 1230, & 1290. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 24--26, 33, & 198. 1949; McDougall & Sperry, Pl. Big Bend 146. 1951; Moldenke, Phytologia 3: 467 & 468 (1951) and 5: 133. 1955; Moldenke, Biol. Abstr. 30: 1093. 1956; Moldenke, Am. Midl. Nat. 59: 356 & 362. 1958; Moldenke, Résumé 29, 31, 32, 39, 224, 237, 360, 361, 370, 371, & 472. 1959; Moldenke, Phytologia 8: 121 & 124 (1961) and 8: 279. 1962; Moldenke, Résumé Suppl. 3: 10 (1962), 4: 4, 14, & 17 (1962), 5: 4 (1962), and 6: 4. 1963; Gleason & Cronquist, Man. Vasc. Pl. 580. 1963; Moldenke, Phytologia 8: 471-473 & 477 (1963) and 9: 34, 36, 156, 165, & 166. 1963.

Short-hairy herb, to 1 m. tall, slender; stems upright, branched from the base, hirsute; branches 10--35 cm. long; leaves decussate-opposite, the blades 1--5 (usually less than 5) cm. long, rather narrow, entire or coarsely toothed, pinnately cleft, or almost parted, with the segments again incised or coarsely toothed, rugose, somewhat scabrous and finely pustulate above, the veins more or less prominent beneath, hirsute on both surfaces; inflorescence spicate, the spikes solitary or tending to be paniced, usually short-pedunculate, slender, open, hirsute; bractlets lanceolate-acuminate, commonly not longer than the calyx; flowers small or very small; calyx about 3 mm. long, hirsute-pubescent and very slightly glandular, its teeth short and subulate; corolla hypocrateriform, varying from blue, dark-blue, or blue-lavender to blue-purple, purple, or pink, its tube scarcely longer than the calyx, the limb approximately 4 mm. wide; cocci trigonous with a convex back, about 2 mm. long, very shallowly reticulate-scribulate on the upper half, longitudinally striate below, the commissural faces extending to the tip of the coccus; chromosome number:  $n(x) = 7$ ;  $2n = 14$ .

The type of this rather puzzling species was collected by Charles Wright (no. 1497) in the borders of thickets near Coppermines, at 1900 meters altitude, Grant County, New Mexico, in 1851, and is deposited in the Gray Herbarium of Harvard University. Gray's original discussion says "Borders of thickets near the Coppermines, New Mexico, Wright, Bigelow. Appears as if a hybrid between V. canescens and V. officinalis. S. Arizona, similar in foliage but with long bracts, Rothrock." Torrey's V. officinalis var. hirsuta was also described as from "near the copper mines" and was probably based on the same collection.

The species in its typical form has been found in wet ground, piñon pine-oak forests, grasslands and mesquite grasslands, along streams, at the base of hills, on hills along creeks, rocky slopes, gravel and sandbars of creeks, in granitic soil on foothills, and amongst rubble along the beds of small streams, at altitudes from 180 to 2665 meters, blooming in February and from April to Novem-

ber, in fruit in February and from July to November. Hinckley describes it as frequent at middle and upper elevations in canyons. Warnock found it "sparse in deep igneous soil". Smith, Peterson, & Tejada encountered it in gray to whitish soils with occasional calcareous outcrops and thorn-scrub-cactus cover in Puebla. It is reported as cultivated in Massachusetts.

Briquet (1894) mentions, without description, a "V. neomexicana" which he says is a hybrid between V. canescens H.B.K. and V. officinalis L. I have no doubt that he was referring to the plant here under discussion, found rather abundantly in western Texas, New Mexico, and adjacent Arizona and Mexico. I do not believe that it is of hybrid origin; certainly one of the putative parents, V. officinalis, occurs only very sparingly in this region. Wooton says of his unnumbered collection from Ruidosa Creek, July 3, 1895, "larger and of different habit from V. canescens. Probably a good sp." and with this statement I concur. Two rather ill-defined varieties are described hereinafter, but V. neomexicana var. grandiflora Moldenke is a synonym of V. cloverae Moldenke.

Verbena neomexicana has been crossed with V. halei Small, producing xV. notha Moldenke, and with V. urticifolia L., producing xV. torpa Moldenke. Herbarium specimens have been misidentified and distributed under the names V. canescens H.B.K., V. halei Small, V. neomexicana var. hirtella Perry, V. neomexicana var. xylopoda Perry, and V. xutha Lehm.

On the other hand, the G. L. Fisher 32238, H. C. Hanson 645, Herrick 715, LeSueur 53, E. G. Marsh 278, C. H. Mueller 2375 & 8139, Parks & Cory 7396, Sperry 478 & T.321, B. H. Warnock 46615 & W.168, and Wooton 3852, distributed as V. neomexicana, are all var. hirtella Perry; Blumer 1804, 2170, & N.159, Gooding 334 & 2246, Gould & Pultz 3164, E. H. Graham 3231, Griffiths 4122, G. J. Harrison 4778, Harrison & Kearney 5796 & 6689, Knobloch 1304, Mearns 1013 & 1887 [and maybe 1918], E. W. Nelson 6161 & 6271, Nelson & Nelson 2018, Peebles, Harrison, & Kearney 3790, W. W. Price s.n. [May 1, 1894], Thornber & Thornber s.n. [Total Wreck Mts., May 7, 1902], Toumey s.n. [Copper Basin, Aug. 24, 1894], Townsend & Barber 192, and Wooton s.n. [Santa Rita Range Reserve, May 12, 1912] are all var. xylopoda Perry; Kenoyer & Crum 2879 & 2951 and E. G. Marsh 278 are V. canescens H.B.K.; E. J. Palmer 10002, Tharp 352, 1361, s.n. [Austin, 5/27/20], s.n. [Langtry-Dryden, 6-14-1931], and s.n. [10/9/36], B. H. Warnock 11238, and Warnock & McBryde 14908 are V. canescens var. roemeriana (Scheele) Perry; E. W. Lathrop 2046 is V. halei Small; H. S. Gentry 1923 is V. pinetorum Moldenke; and Cory 53.475, V. L. Hams 1752, E. J. Palmer 12382, Tharp 43-804, and Warnock & Mullins 14405 are V. plicata Greene; Kammerer 33 is V. wrightii A. Gray;

O. B. Metcalfe 612 is a mixture with something not verbenaceous, while Warnock 21715 is definitely not verbenaceous. The Sixth Grade Brownsville 34 and s.n. [Nov. 1934] and Tharp 1201, cited by me in Lundell's Flora of Texas as V. neomexicana, are actually V. runyoni Moldenke. Sperry 583, distributed as "V. neomexicana var.?" is V. halei Small.

Perry cites Ferris & Duncan 2607 (E) and E. J. Palmer 30791 (E) as var. hirtella, but I think that they are better placed in the typical form of the species. Similarly, E. A. Phillips 753 and S. S. White 2202 and 3836 have been annotated by me as var. xylopoda, but the University of Michigan sheets of these collections show definitely very small flowers, and, I believe, represent the typical form. Likewise, S. S. White 1678 and Whitehead 1288 were annotated by me as var. hirtella in some herbaria, but the University of Michigan specimens show lobed or even very deeply lobed leaves and I feel that they had better be referred to the typical form of the species.

Perry (1933) cites the following 7 additional specimens not as yet seen by me: NEW MEXICO: Grant Co.: E. L. Greene s.n. [Pinos Altos Mts., 1880] (E, F); C. Wright 1497 (E--isotype, G--type, W-isotype). Socorro Co.: O. B. Metcalfe 612 (E, G). She comments that "The collections of Young 1703, Wooton 646, and Wooton (collection of July 3, 1895) are by no means typical of the species, but perhaps are better placed here than elsewhere. This species appears to be very closely related to V. canescens and V. gracilis. It differs from both, however, in the upright habit and the nutlets. In both V. canescens and V. gracilis the commissural face does not extend to the tip of the nutlet and the striae on the dorsal surface are less conspicuous." In all, 81 herbarium specimens, including the type collections of most of the names involved, have been examined by me.

Citations: TEXAS: Brewster Co.: C. H. Muller 8138 (Au, Ca--882854, Mi, N, N); Sperry 477 (Om); B. H. Warnock 9677 (Rf). Jeff Davis Co.: Ferris & Duncan 2606 (Du--124293), 2607 (Du--125418, Gg--31385, N); Hinckley 170 [9/15/34] (N), 170 [8/13/35] (N), s.n. [Mt. Livermore, 9/15/34] (Au, Au), s.n. [July 5, 1936] (N); E. J. Palmer 30791 (Au), 31867 (Au); Sperry T.811 (Om), T.812 (Om); Tharp 1493 (Au); M. S. Young 1703 (Au, W--1114647). Travis Co.: A. M. Ferguson s.n. [April 1901] (Au). Val Verde Co.: Collector undesignated s.n. [Del Rio, Aug. 19, 1932] (Dp); Parry, Bigelow, Wright, & Schott s.n. [valley of the Rio Grande below Doffana] (W--56197). NEW MEXICO: Catron Co.: Eggles-ton 20292 (W--1522846). Grant Co.: Chapline 609 [Herb. U. S. Forest Serv. 25064] (N); E. L. Greene s.n. [Pinos Altos Mts., Aug. 23, 1880] (Vt); Holzinger s.n. [G. O. S. Ranch, 27 Aug.--12 Sept. 1911] (W--660558), s.n. [East Canton] (W--660559); C. Wright 1497 (Ca--248344--isotype). Lincoln Co.: Goodman & Water-

fall 4967 (Ok); Wooton 646 (N, Ur), s.n. [Ruidosa Creek, July 3, 1895] (C, N, W—563952, W—736886). Sierra Co.: Beals s.n. [Lake Valley, July 1904] (Mi); O. B. Metcalfe 955 (W—497854). Socorro Co.: O. B. Metcalfe 612, in part (Ca—882628, N, Po—70886, W—495596). ARIZONA: Cochise Co.: Gould & Pultz 3164 (W—1893186); A. R. Moldenke 616 (B, S). Gila Co.: Collom 355 (W—1683306). Maricopa Co.: Whitehead 1288 (Mi, N). Pima Co.: S. B. Parish s.n. [Herb. Osten 13011] (Ug); Skjót-Pedersen 946 (Cp). Yavapai Co.: Gould & Darrow 4180 (W—2008734). MEXICO: Baja California: Meling 3 (Du—225545, N, Po—209970, W—1635283). Chihuahua: S. S. White 2202 (Mi, Oa). Coahuila: S. S. White 1678 (Mi, Tu—35529). Guanajuato: Waterfall 16553 (Ca). México: Waterfall 16476 (Z). Nuevo León: Mueller & Mueller 157 (Au, Me); S. S. White 1577 (Mi, W—1822814). Sonora: E. A. Phillips 753 (Mi, Rf, Sm); S. S. White 2787 (Mi), 3099 (Mi), 3836 (Mi, N, W—2132273), 3836a (Mi), 3882 (Mi, W—2132284). LOCALITY OF COLLECTION UNDETERMINED: Herb. Torrey s.n. (T).

VERBENA NEOMEXICANA var. HIRTELLA Perry, Ann. Mo. Bot. Gard. 20: 298—299. 1933.

Synonymy: Verbena neomexicana var. hirstella Perry ex Moldenke, Alph. List Invalid Names Suppl. 1: 25, in syn. 1947. Verbena mexicana Sperry ex Moldenke, Résumé Suppl. 4: 17, in syn. 1962 [not V. mexicana L., 1753, nor Pers., 1960].

Bibliography: Perry, Ann. Mo. Bot. Gard. 20: 260, 261, 298—299, & 355. 1933; Cory, Texas Agr. Exp. Sta. Bull. 550: 88. 1937; Sperry, Sul Ross State Teach. Coll. Bull. 19: 68. 1938; Moldenke, Annot. & Classif. List 108. 1939; Sperry, Sul Ross State Teach. Coll. Bull. 22: 41. 1941; Moldenke in Lundell, Fl. Texas 3 (1): 16, 17, & 30—31. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 3, 13, 14, 19, & 101. 1942; Moldenke, Phytologia 2: 128. 1945; Moldenke, Alph. List Cit. 1: 104, 176, & 224. 1946; Moldenke, Phytologia 2: 331. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 25. 1947; Moldenke, Wrightia 1: 227—228. 1948; Moldenke, Alph. List Cit. 2: 467, 475, 476, 498, 517, 522, 527, 538, 539, 596, & 640 (1948), 3: 656, 666, 679, 684, 698, 707, 748, 752, 753, 756, 790, 795, 797, 798, 807, 833, 873, 905, 953, 954, 963, & 966 (1949), and 4: 989—993, 1071, 1107—1110, 1121, 1122, 1126, 1142, 1149, 1150, 1240, 1241, 1244, & 1247. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 6, 24—26, 33, & 198. 1949; McDougall & Sperry, Pl. Big Bend 146, fig. 145. 1951; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 1, 3: 126, 131, & 132 (1952) and print. 2, 3: 126, 131, & 132. 1958; Moldenke, Résumé 8, 29, 31, 32, 39, 370, 424, & 472. 1959; Moldenke, Résumé Suppl. 1: 3. 1959; Lewis & Oliv., Am. Journ. Bot. 48: 639—641. 1961; Moldenke, Phytologia 8: 124. 1961; Moldenke, Résumé Suppl. 3: 10 & 40 (1962), 4: 4 & 17 (1962), and 5: 4. 1962; Moldenke, Phytologia 8: 472, 477, & 478 (1963) and 9: 156, 165, & 199. 1963.



Illustrations: McDougall & Sperry, Pl. Big Bend fig. 145. 1951; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 1, 3: 132 (1952) and print. 2, 3: 132. 1958; Lewis & Oliv., Am. Journ. Bot. 48: 640. 1961.

This variety differs from the typical form of the species in being densely canescent-hirtellous, the leaves more or less shallowly incised, the bractlets usually broadly ovate-acuminate, and the corolla-limb about 8 mm. wide.

It is described as an erect, slender, perennial herb; stems upright, branched, densely canescent-hirtellous; leaves 1--5 cm. long, more or less shallowly incised or lobed, sometimes entire, canescent-hirtellous on both surfaces, the veins more or less prominent beneath; spikes solitary or sometimes tending to be paniced, usually short-pedunculate, canescent-hirtellous and glandular throughout; bractlets usually broadly ovate-acuminate, commonly not longer than the calyx; flowers large; calyx about 3 mm. long, canescent-hirtellous and very slightly glandular, its teeth short and subulate; corolla varying from blue, bluish, or bluish-purple to blue-lavender, light bluish-lavender, lavender, purplish, purple, or deep-purple, its tube scarcely longer than the calyx, its limb about 8 mm. wide; nutlets trigonous, about 2 mm. long, with a convex back, very shallowly reticulate-scrobiculate on the upper half, longitudinally striate below; chromosome number:  $n = 7$ .

The type of this rather poorly defined variety was collected by Ernest Jesse Palmer (no. 34065) among dry arroyos, plains, and foothills of the Chisos Mountains, Brewster County, Texas, on May 22, 1928, and is deposited in the herbarium of the Missouri Botanical Garden at St. Louis. The variety has been collected in sandy, rocky, limestone, or granitic soil, in dry arroyos, desert scrub and washes, crevices of rocks above waterways, foothills, old lakebeds, on gravel knolls, in rocky fields, grasslands, and rolling grasslands, on low mountainsides, flats, rocky hillsides, rocky open hilltops, plains, gravelly mesas, limestone hillsides, and sandstone mountainsides, along small sandy draws, and along the banks of dry streams, at altitudes of 1260 to 8000 feet, flowering from January to November, fruiting from February to October. Warnock found it "scattered" or "infrequent" in Brewster County and "infrequent" or "frequent along highways" in Presidio County, Texas, and "frequent on limestone soil" in Presidio County; Young found it "common in open valley" in Brewster County; Hinckley & Warnock describe it as "infrequent and widespread along creek" in Presidio County; while Hanson reports it "common on mountainside". In Webb County it was encountered by Iltis, Koeppen, & Iltis "in fine sandy red clay soil on microphyll desert" with various species of Acacia and Opuntia, Prosopis, many spiny shrubs and weeds, Aristida, and Bouteloua. In Nuevo León it is said by Mueller to be "abundant in shaded situations" and "common in scrub oak and pinyon"; Mueller & Mueller describe it as "sparse"; while Stanford, Retherford, & Northcraft encountered it "in scrubby woodland association of pine, juniper, and oaks, heavily grazed by goats".

The name Verbena mexicana Sperry is based on Sperry 478, collected on flats in Brewster County, Texas, and deposited in the herbarium of Omer E. Sperry at Alpine, Texas. Verbena mexicana L. and V. mexicana Pers. are synonyms of Priva mexicana (L.) Pers.

The variety is recorded from Gila and Maricopa Counties, Arizona, in my 1949 and 1959 publications, apparently in error, unless the two collections cited hereinafter from that state prove to have originated in those counties. The Herb. Univ. Texas s.n. [Devine-Dilley, 3/1/30] and Tharp s.n. [Devine-Dilley, March 1, 1930] may have been collected in either Medina or Frio Counties, Texas, while Tharp 8744 may have come from either Duval or Jim Wells County. As to the LeRoy s.n. specimen cited below from Baltimore County, Maryland -- it bears a label inscribed "near Baltimore, Md., 1866", but Miss Perry says "surely not collected at Baltimore unless cultivated". There is also the possibility of it having been introduced accidentally as a weed there and the station now destroyed in the growth of the city. I am inclined to the latter theory.

Herbarium specimens of this variety have been misidentified and distributed under the names V. canescens H.B.K., V. gracilis Desf., V. halei Small, V. menthaefolia Benth., V. neomexicana (Gray) Small, V. neomexicana (A. Gray) Small, V. neomexicana var. xylopoda Perry, V. officinalis L., V. orcuttiana Perry, V. plicata Greene, V. polystachya H.B.K., V. urticaefolia L., and V. xutha Lehm.

On the other hand, the Meling 3 and S. S. White 3836a, distributed as V. neomexicana var. hirtella, at least in some herbaria, are typical V. neomexicana (A. Gray) Small (with the corollas only 4, not 8, mm. wide); Mexican Biol. Exped. Univ. Ill. 992 and R. A. Schneider 992 are var. xylopoda Perry; and Tharp s.n. [Austin, 11-17-39] and E. W. Lathrop 2075 are V. canescens var. roemeriana (Scheele) Perry. M. E. Jones 26224 is a mixture with V. canescens var. roemeriana, while B. H. Warnock and Wiggins 4360 are mixtures with V. plicata. S. S. White 2168 is annotated by me in some herbaria as var. xylopoda Perry, but the University of Michigan specimen shows leaves not at all lobed, so I think the collection had better be placed in var. hirtella. S. S. White 1678 and Whitehead 1288 were annotated as var. hirtella or var. xylopoda by me in some herbaria, but the University of Michigan specimens show lobed or even deeply lobed leaves and I now feel that these collections are better placed in typical V. neomexicana. The Tharp s.n. [6/19/31], R. H. Painter 249, and Ecology Class Univ. Texas s.n. [2.28.30] cited by me as var. hirtella in Lundell's "Flora of Texas" (1942) are now regarded by me as representing V. canescens var. roemeriana instead. H. C. Hanson 645 bears a label reading "Flora of Texas", but was collected 17 miles north of Ruidosa, New Mexico. Perry (1933) cites the following 10 additional specimens not as

yet seen by me: TEXAS: Brewster Co.: Moore & Steyermark 3277 (E); E. J. Palmer 34065 (E--type); M. S. Young 112 (E). Culberson Co.: Parry, Bigelow, Wright, & Schott s.n. [between Van Horn Wells and Muerte, 2 July 1852] (N, W). Presidio Co.: H. C. Hanson 645 (G); McKelvey 2046 (G). MEXICO: Coahuila: Purpus 1094 (E, F, G). The Ferris & Duncan 2607 and E. J. Palmer 30791, however, which she cites, I regard as typical V. neomexicana. She says "The pubescence of this variety is much finer and shorter than in the above [var. xylopoda]. The leaves are not so deeply incised and often tend to be elongated. The leaves of Purpus 1094 are so narrow and shallowly incised that it appears superficially like V. perennis; nevertheless the character of the pubescence allies it with this variety." I may add that Mueller & Mueller 506 also has the leaves so very narrow, only the basal ones with a pair of narrow lateral lobes, that it also greatly resembles V. perennis. The E. Wilkinson s.n. [Sta. Eulalia hills, 30 July 1885] cited below, is cited by her as var. xylopoda.

In all, 162 herbarium specimens, including type material of all the names involved, have been examined by me.

Citations: MARYLAND: Baltimore Co.: LeRoy s.n. [near Baltimore, Md., 1866] (C). TEXAS: Bexar Co.: O. M. Clark 7441 (Ok--18719). Brewster Co.: Lewis & Oliver 5457 (Nb); Moore & Steyermark 3277 (Ca--471230, Du--224476, Gg--194778, Mi, N); C. H. Mueller 8139 (Au, N, W--1651901); L. T. Murray s.n. [May 22, 1928] (It); E. J. Palmer 34065 (N--isotype); Parks & Cory 7034 (Tr), 7396 (Tr); Rose-Innes & Moon 1200 (Au); Rose-Innes & Warnock 537 (Au); O. E. Sperry 73 (W--1684173), 94 (Om, W--1684183), 477 (W--1684423), 478 (Om, W--1684424), 1536 (Om), 1704 (Om), T.761 (Om, W--1848966), T.821 (Om); Steiger 1373 (N); Tharp s.n. [Wilson Ranch, 6/19/31] (Au, Au, Au), s.n. [6-19-31] (Sm), s.n. [Wilson Ranch, June 1931] (Au, Au), s.n. [Wilson Ranch] (Au); B. H. Warnock 537 (N), 20436, in part (Au), C.801 (N), W.168 (N), s.n. [May 3, 1937] (Au, Mv); M. S. Young 101 (Ur), s.n. [8/12/15] (Au). Dimmit Co.: M. E. Jones 28993 (Po--187972). Frio Co.: C. H. Mueller 2612 (Ar--171042); Tharp s.n. [Devine-Dilley, March 1, 1930] (Au). Hudspeth Co.: Tharp 43-804 (N); Waterfall 5143 (N, Ok). Jeff Davis Co.: Hinckley s.n. [Limpia Canyon, July 1936] (Fs); D. C. Ingram 2522 [U. S. Dept. Agr. Forest Serv. 96187] (W--2344747); M. E. Jones 26224, in part (Po--178345); A. R. Moldenke 646 (S). Jim Hogg Co.: Parks & Cory 16905 (Tr); Tharp s.n. [June 15, 1928] (Au). Jim Wells Co.: Tharp 8744 (Au). La Salle Co.: C. Skottsberg s.n. [Millet, 4/6/1935] (Go). Live Oak Co.: Tharp s.n. [March 21, 1932] (Au). Medina Co.: Herb. Univ. Texas s.n. [Devine-Dilley, 3/1/30] (Au, Au). Presidio Co.: Correll & Rollins 23652 (Ld); Garner 50 (Au); H. C. Hanson 645 (N); Hinckley 1089 (Au, Au, N),

1971 (Au, N), 2428 (N), 3246 (N), s.n. [Marfa, April 1938] (Fs); Hinckley & Warnock 46942 (Au, N, S); D. C. Ingram 2607 [Herb. Forest. Serv. 96392] (S); J. R. Lundell 5 (Id); Lundell & Lundell 14340 (N, Rf, W--1927012); McKelvey 2046 (Ca--480042, W--1581386); Parks & Cory 26401 (Tr); B. H. Warnock 8908 (Rf), 14337 (Rf), 46615 (Au, Ca--731949, N, Ok, S); Warnock & McBryde 14555 (Rf). Travis Co.: C. L. York 46035 (Au, N). Val Verde Co.: G. L. Fisher 32238 (W--1624201); M. E. Jones 28296, in part (Du--239763); Parry, Bigelow, Wright, & Schott 827, in part (W--56198); Whitehouse 11479 (Sm). Webb Co.: H. J. Hamby 343 (Ar--206601), 792 (Ar--206289); Iltis, Koeppen, & Iltis 19 (Ws); Tharp 3687 (Au, W-1289911). County undetermined: Havard s.n. [Texas] (W--225359). NEW MEXICO: Dona Ana Co.: Parry, Bigelow, Wright, & Schott 827, in part (N, N). Lincoln Co.: H. C. Hanson 645 (W--982971). Socorro Co.: C. L. Herrick 715 (W--737262); Wootton 3852 (Ur, W--736224). ARIZONA: County undetermined: D. T. MacDougal 634 (Au, N); Purpus 8233 [Besner Creek] (Ca--139759). MEXICO: Baja California: T. S. Brandegee s.n. [San Enrique, May 2, 1889] (Ca--104853); G. Lindsay s.n. [July 11, 1937] (Du--259288); Raven, Mathias, & Turner 12587 (Ca--171728, Du--418149). Chihuahua: Correll & Johnston 21737 (Id); Knobloch 252 (Z), 935 (Sm); A. Lee 46 (Au, N); LeSueur 53 (Au, Ca--712702, Gg--319703, W--1887827), 231 (Au); F. W. Pennell 18691 (W--1641250); Shreve 9089 (W--1790741); S. S. White 2168 (Mi, Tu--35536), 2316 (Mi); E. Wilkinson 37 (W--1323066), s.n. [Sta. Eulalia hills, July 30, 1885] (Ob--50870, W--219413). Coahuila: E. G. Marsh 147 (Au, Au), 278 (Au--212149), 684 (Au--122335, Ok); Edw. Palmer 25 (Ca--104849); Purpus 1094 (Ca--139758, N, Po--63882), 1134 (Ca--139721); Stanford, Retherford, & Northcraft 234 (Ca--713322, Du--289331, N, Se--69590); Waterfall 16623 (Ca). Durango: Reko 5201 (W--1318979); Waterfall & Wallis 13342 (Ok). Nuevo León: C. H. Mueller 2375 (Au, Mi), 2391 (Au); Mueller & Lueller 465 (Au), 506 (Au, Mi); R. A. Schneider 992 (Mi, N). Oaxaca: Purpus 3408 (Ca--138826). Puebla: Purpus 3927 (Ca--138825).

VERBENA NEOMEXICANA var. XYLOPODA Perry, Ann. Mo. Bot. Gard. 20: 297--298. 1933.

Synonymy: Verbena canescens var. arizonica Gray ex Moldenke, Alph. List Invalid Names Suppl. 1: 23, in syn. 1947. Verbena neomexicana xylopoda Perry ex Moldenke, Résumé 370, in syn. 1959. Verbenaceae neomexicana (Gray) Small ex Moldenke, Résumé Suppl. 4: 21, in syn. 1962.

Bibliography: Perry, Ann. Mo. Bot. Gard. 20: 261, 285, 297--298, & 355. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 13--15, 19, & 101. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 17 & 30. 1942; Moldenke, Phytologia 2: 128. 1945; Moldenke, Bot.



Gaz. 106: 161. 1945; Moldenke, Am. Journ. Bot. 32: 610. 1945; Moldenke, Alph. List Cit. 1: 46, 77, 182, 235, 242, 244, 260, & 274. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 23. 1947; Moldenke, Phytologia 2: 164. 1948; Moldenke, Wrightia 1: 228. 1948; Moldenke, Castanea 13: 113. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 44. 1948; Moldenke, Alph. List Cit. 2: 370, 403, 409, 472, 473, 475, 476, 478--480, 494, 497, 498, 519, 523, 527, 597, & 598 (1948), 3: 656, 700, 723, 724, 731, 752, 755, 769, 771, 783, 803, 807, 809, 813, 828, 831, 881, 905, 933, 952, & 963 (1949), and 4: 996, 1003, 1068, 1071, 1121, 1125, 1126, 1129, 1148, 1166, 1171, 1174, 1192, 1199, 1210, 1217, 1224, 1225, 1229, 1231, 1240, 1242, 1243, & 1252. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 10, 24, 26, 27, 33, & 198. 1949; Moldenke, Phytologia 3: 375. 1950; Moldenke, Résumé 13, 29, 32, 33, 39, 361, 370, & 472. 1959; Moldenke, Résumé Suppl. 4: 21. 1962; Moldenke, Phytologia 8: 472 & 477 (1963) and 9: 36, 156, & 215. 1963.

This variety differs from the typical form of the species in having its stems somewhat coarser, the pubescence shorter, denser, and more glandular, the calyx about 4 mm. long and glandular-hirsute, with acuminate teeth, and the corolla-limb 6--10 mm. wide.

It is described as an herb to 30.5 cm. tall, the leaves deeply lobed, the bractlets 3--3.5 mm. long, the flowers large, the calyx 3.5--4 mm. long (including the teeth) and glandular or densely glandular, the corolla large or very large, varying from blue, blue-violet, or blue-lavender to dark-blue, lavender, lavender-pink, or purple, more or less 2-lipped, the tube 4--6 mm. long (including the throat), the limb 9--10 mm. wide, and the nutlets scabrellous on the commissure.

The type of this rather ill-defined variety was collected by Herbert Christian Hanson (no. A.1130) on rocky slopes in Sabino Canyon, Santa Catalina Mountains, Pima County, Arizona, on April 21, 1922, and is deposited in the herbarium of the Missouri Botanical Garden at St. Louis. Verbena canescens var. arizonica is apparently based on an unnumbered collection made by Cyrus Guernsey Pringle in the foothills of the Santa Rita Mountains, Pima or Santa Cruz County, Arizona, on May 11, 1884, and is deposited in the Gray Herbarium at Harvard University.

The variety has been collected among rocks, in granitic soil on foothills, in sandy or limestone soil, on gravelly slopes, rocky hills, open dry rocky slopes in chaparral, dry plains and gentle slopes, gravelly brush-covered plains, rocky limestone slopes, decomposed limestone, and stony slopes, along moist stream-sides, bordering streambeds, in pine woodlands, scrubland on limestone mountainsides, canyons, pinelands or pine woodlands, grasslands and oak-grasslands, dry rocky canyons, and calcareous deserts, at altitudes of 100 to 8000 feet, flowering and fruiting from February to October.

Maguire found the plant on "gravelly west slopes in mesquite and Opuntia cholla association", while Tucker found it in "pine-oak woodlands of Pinus chihuahuana, P. engelmannii, Quercus arizonica, Q. viminea, some shrubby Q. hypoleucoides, and Arbutus"; Wiegand,

Maguire, Richards, & Moeller encountered it on "gravelly slopes, west exposure, under Quercus and Rhus"; Stanford, Retherford, & Northcraft found it in a "mountain valley with much bare limestone present, partially covered with Agave and Yucca". Mueller says that it is "common in meadows" and "common on rocky slopes in open pine-oak forests"; Wiegand, Maguire, Richards, & Moeller describe it as "uncommon on gravelly slopes under Quercus and Arctostaphylos"; while Runyon avers that it is "widespread on hills in Starr Co. [Texas]". Benson collected it in the Lower Sonoran Zone of Arizona. Blumer, in a note on his collection no. 1804, says "may be introduced".

The Mearns 1918 collection from the Niggerhead Mountains, near Monument 82, is hereinafter cited from Sonora, Mexico, on the authority of Perry (1933).

T. H. Kearney comments in regard to Eastwood 1847 "approaches V. menthaefolia (nutlets scaberulous on the commissure)"; in regard to Harrison & Kearney 5796 he says "calyx glandular, 3.5 mm. long, nearly as long or slightly surpassing the calyx [sic]"; and in regard to Kearney & Peebles 10355 says "V. menthaefolia Benth. is very similar in appearance to V. neomexicana but has more slender spikes and more reduced bracts. It is questionable whether the two forms are specifically distinct."

Wynd & Mueller 525 was originally distributed as "Verbena xutha Lehm. vel aff.", while Edw. Palmer 1041 was annotated by Perry as "Aff. V. Halei or V. xutha".

Material of V. neomexicana var. xylopoda has been misidentified and distributed in herbaria under the names V. brevibracteata (A. Gray) Eggert, V. canescens H.B.K., V. canescens var. neo-mexicana A. Gray, V. canescens neo-mexicana Gray, V. halei Small, V. hastata L., V. neomexicana (A. Gray) Small, V. neo-mexicana (A. Gray) Small, V. neo-mexicana Gray, V. neomexicana var. hirtella Perry, V. officinalis L., V. prostrata A. Br., V. remota Benth., V. sororia D. Don, and V. xutha Lehm.

On the other hand, the Mueller & Mueller 506, distributed as var. xylopoda, is actually var. hirtella. E. A. Phillips 753 and S. S. White 2202 and 3826 were annotated by me as var. xylopoda in several herbaria, but the University of Michigan sheets show definitely very small flowers (less than 6 mm. wide), so I now regard these three collections as representing typical V. neomexicana, as I also do Collom 355 and Gould & Darrow 4180. The corolla also seems very small on Peebles, Harrison, & Kearney 1753, Tidestrom 872, and Peebles & Harrison 1649, but the pubescence on the stems in not that of typical V. neomexicana, so I think that in these cases the corollas were large when fresh and have merely shriveled up in the drying process.

Nelson & Nelson 5138, cited hereinafter as from Terrell County, Texas, was actually collected between Terrell and Webb Counties

("between Sanderson and Laredo") and is very anomalous in appearance, the fruiting-calyx and fruit being much larger than is normal for this taxon. It may represent an undescribed species. Griffiths 3431 is a mixture with something non-verbeneaceous.

Annette Carter, Principal Herbarium Botanist at the University of California, in a letter to me dated February 18, 1955, states that she has checked through the University of California herbarium and the Jepson herbarium and finds no California specimens of this variety. Miss Perry (1933) cites the following 33 additional specimens not as yet seen by me: ARIZONA: Cochise Co.: Blumer 1804 (E, F, G), 2170 (F); Goodding 334 (G); Lemmon 2857 (G). Maricopa Co.: Coues & Palmer 571 (E). Pima Co.: H. C. Hanson A.1130 (E--type). Santa Cruz Co.: Pringle s.n. [Santa Rita Mts., May 11, 1884] (D, F, G). Yavapai Co.: M. E. Jones s.n. [Skull Valley, April 28, 1903] (E); W. W. Jones 344 (G), 346 (G). CALIFORNIA: County undetermined: Edw. Palmer s.n. [1876] (G). MEXICO: Baja California: Edw. Palmer 312 (E, F), s.n. [Big Canyon of Tantillas Mts., 10 Sept. 1875] (G). Chihuahua: Hartman 608 (G); Nelson 6161 (G), 6271 (G); Edw. Palmer 52 (E, F, G); Pringle 270 (D, F, G); Townsend & Barber 192 (E, F, G); Wislizenus 150 (E). Sonora: Thurber 446 (G, N). It is probable that the Thurber "446" which she cites from the New York Botanical Garden herbarium is the Thurber 336 cited by me hereinafter from the Torrey Herbarium. She comments that "This variety differs from the species in the denser and more glandular pubescence and the larger corolla. The nutlets also are slightly longer, with the reticulations somewhat deeper than in the species, and the commissural faces hardly extend to the tip of the nutlets. The specimens Nelson 6161, 6271, and Townsend & Barber 192 closely resemble the above variety [var. xylopoda] in inflorescence, but are more like V. neomexicana in the long and somewhat sparsely hirsute indument on the lower part of the stem; Pringle 270 and Wilkinson approach variety hirtella."

In all, 181 herbarium specimens, including the type of one of the names involved, have been examined by me.

Citations: FLORIDA: County undetermined: Collector undesignated s.n. [Florida] (Vt). TEXAS: Hidalgo Co.: R. Runyon 55 (Rr). Terrell Co.: Nelson & Nelson 5138 (Au). Victoria Co.: Owens 3125 (Au). Webb Co.: Perkins & Hall 2627 (Po--256897). ARIZONA: Catron Co.: Eggleston 20292 (N). Cochise Co.: Barneby 5151 (N); Benson 10299 (Po--267654); Blumer 1804 (Du--24179, Ka--60416, N, Tu, W--561956), 2170 (W--563573), N.157 (Tu), N.159 (Tu); J. I. Carlson s.n. [Warren, May 20, 1915] (Gg--31469, W--873378); Darrow s.n. [July 26, 1943] (Tu--14767); Goodding 334 (Fg--8032, N, Tu, Tu), 2246 (Ca--466879, Ca--130030, S); Gould & Pultz 3164 (Ca--705195, N); Harrison & Kearney 5796 (To, W--1435178); M. E. Jones s.n. [Sept. 3, 1903] (Po--248003); Kearney & Peebles 13847 (To); Mearns

1013 (Du--9555, N, W--229031); W. W. Price s.n. [May 1, 1894] (Du--97119, Po--88556); Wiegand, Maguire, Richards, & Moeller 11065 (Gg--295125, N, N, Pl--130554, Ua--47404); T. E. Wilcox s. n. [Ft. Huachuca, Aug. 1892] (C). Gila Co.: Nelson & Nelson 2018 (N); Wiegand, Maguire, Richards, & Moeller 11336 (Gg--295126, N, N, Pl--130553, Ua--47403). Mohave Co.: Eastwood 18447 (Gg--188947). Pima Co.: Benson 10224 (Po--267653); Burnham 479 (I); N. C. Cooper C.725 (Ak--12632); Eastwood 17921 (Gg--174989); Gilman 1120 (Po--172237); E. H. Graham 3231 (Cm, Du--246092); Griffiths 3431 (W--497009), 4122 (W--660150); G. J. Harrison 4778 (To, W--1367707); M. E. Jones s.n. [Aug. 31, 1903] (Du--151801, Po--183132); Kearney & Peebles 10355 (To), 10846 (To); King & Beckett 11402 (S); Munz 1149 (Po--98043); Peebles 6860, in part (Gg--192656); Peebles, Harrison, & Kearney 3790 (To, W--1367484); Spalding s.n. [March 21, 1906] (Tu, Tu); J. J. Thornber 8111 (Tu); Wooton s.n. [Santa Rita Range Reserve, May 12, 1912] (W--663954). Pinal Co.: J. Arnold s.n. [April 16, 1937] (N); G. J. Harrison 6689 (Po--173002); Harrison & Kearney 1488 (To), 6689 (N); C. B. Maguire 10884 (N, N, Ua--47402); Nichol s.n. [May 6, 1925] (Tu); Peebles 6860, in part (Gg--184987); Peebles & Harrison 1649 (To); Peebles, Harrison, & Kearney 1753 (To); Thornber & Thornber s.n. [Total Wreck Mts., May 7, 1902] (Ca--882627, Tu). Santa Cruz Co.: Kearney & Peebles 13863 (To); Pringle s.n. [Santa Rita Mts., May 11, 1884] (Bc, Br, Cm, Ll, Pa, Up--17121, Vt, W--56199); Tidestrom 872 (W--507749). Yavapai Co.: Crosswhite 718 (Hi--194682); M. E. Jones s.n. [Skull Valley, April 28, 1903] (Po--248001, W--856988), s.n. [Skull Valley, May 1, 1903] (Po--248002); Toumey s.n. [Copper Basin, Aug. 24, 1894] (W--619181). County undetermined: Herb. LeRoy s.n. [Ariz. '84] (C). CALIFORNIA: County undetermined: Edw. Palmer 339 1/2 [Cent. Cal. 1876] (W--56181). MEXICO: Baja California: D. R. Harvey 539 (W--1685982). Chihuahua: Correll & Johnston 21528 (Ld); M. E. Jones s.n. [Colonia Juarez] (Po--248004); Knobloch 1304 (Mi); LeSueur 875 (Au); C. H. Mueller 3427 (Ca--720115, Mi, Rf); E. W. Nelson 6161 (W--359874), 6271 (W--359988); Edw. Palmer 52 (N, W--57352); Pringle 270 [Herb. Osten 13018] (Br, Ll, Me, Me, Mi, N, Pa, Ug, Up--17097, Vt, W--56159); Shreve 9097 (Ca--731845, Fs); Townsend & Barber 192 (Ca--138834, Me, Me, N, Po--71148, Ur, Vt, W--38324); J. M. Tucker 2508 (Ca--2791, Gg--415500, Z); Waterfall 16100 (Ca). Coahuila: Barkley, Webster, & Rowell 7189 (Mi, N); Herb. Inst. Biol. Univ. Nac. Mex. 7138, in part (Me); Stanford, Retherford, & Northcraft 426 (N, Se--70445); Wynd & Mueller 525 (Fs, I, N, Ok, S, Ur, W--1639936). Nuevo León: Barkley, Webster, & Rowell 7150 (Au--123253, N); Mexican Biol. Exped. Univ. Ill. 992 (Fs, N); C. H. Mueller 2305 (Fs, Mi), 2391 (Mi); Edw. Palmer 1041 (Pa, W--



56200); F. W. Pennell 16880 (Me); Schery 32 (Mi); R. A. Schneider 992 (Ur). San Luis Potosí: F. W. Pennell 17535 (D-733971, Me, W--1640627). Sonora: Mearns 1887 (W--232428), 1918 (Du--9549, W--232676); Merton 2042 (W--232685); Thurber 336 (T); S. S. White 3310 (Mi), 3985 (Mi), 4176 (Mi, W--2132336); Wiggins 6164 (Du--253441). Tamaulipas: Stanford, Lauber, & Taylor 2381 (N, N). State undetermined: E. Wilkinson s.n. [1885] (Mi).

xVERBENA NEQUAM Moldenke, Phytologia 5: 133. 1955.

Synonymy: Glandularia laciniata x dissecta Schnack & Covas, Darwiniana 7: 73, in textu. 1945. Verbena laciniata x dissecta Dermen ex Moldenke, Phytologia 3: 467. 1951. Verbena dissecta Spreng. x V. tenuisecta Briq. ex Moldenke, Résumé 363, in syn. 1959. Verbena tenuisecta Briq. x V. dissecta Spreng. ex Moldenke, Résumé 376, in syn. 1959. Verbena dissecta Willd. x V. tenuisecta Briq. ex Moldenke, Résumé Suppl. 2: 11, in syn. 1960.

Bibliography: Schnack & Covas, Darwiniana 7: 73. 1945; Schnack & Covas, Revist. Argent. Agronom. 12: 224. 1945; Moldenke, Phytologia 3: 467 (1951) and 5: 133. 1955; Moldenke, Biol. Abstr. 30: 1093. 1956; Moldenke, Am. Midl. Nat. 59: 356. 1958; Moldenke, Résumé 224, 296, 363, 376, & 473. 1959; Moldenke, Résumé Suppl. 2: 11 & 12. 1960; Moldenke, Phytologia 8: 121. 1961; Moldenke, Résumé Suppl. 4: 19. 1962; Moldenke, Phytologia 9: 69. 1963.

The name, xV. nequam, was proposed by me in 1955 for the hybrid between V. dissecta Willd. and V. tenuisecta Briq., produced artificially by Schnack & Covas from cultivated material in Argentina and described by them in 1945 under the designation "Glandularia laciniata x G. dissecta". Evidence seems to indicate that what they consistently identify as Glandularia laciniata is actually Verbena tenuisecta.

Verbena dissecta and V. tenuisecta grow together in at least two states of Brazil, in Uruguay, and in at least six provinces of Argentina. It is possible that they also occur together in parts of Bolivia and Chile. One might expect to find this hybrid in the wild where the ranges of the parent species overlap. It is very possible that some of the almost innumerable "forms", "races", "mutants", "ecotypes", "lusi", or "variants" now generally regarded as V. laciniata (L.) Briq., V. dissecta Willd., V. tenuisecta Briq., V. santiaguensis (Covas & Schnack) Moldenke, V. mendocina R. A. Phil., or other species in this complex may actually represent this hybrid. Much more intensive work is urgently needed in this group of the genus. xV. nequam should certainly have considerable horticultural merit.

xVERBENA NISA Moldenke, Résumé Suppl. 4: 10, 11, 18, & 19 (1962), nom. nov.

Synonymy: Glandularia perakii x laciniata Schnack & Covas, Darwiniana 7: 73, in textu. 1945. Verbena perakii (Covas &

Schnack) Moldenke x V. tenuisecta Briq. ex Moldenke, *Résumé Suppl.* 4: 18, in syn. 1962. Verbena tenuisecta Briq. x V. perakii (Covas & Schnack) Moldenke, *Résumé Suppl.* 4: 19, in syn. 1962.

Bibliography: Schnack & Covas, *Darwiniana* 7: 73. 1945; Moldenke, *Résumé Suppl.* 4: 10, 11, 18, & 19. 1962.

The name, xV. nisa, was first proposed by me in 1962 for the hybrid, artificial or natural, between Verbena perakii (Covas & Schnack) Moldenke and V. tenuisecta Briq. This hybrid was apparently first produced in 1944 by Schnack and Covas from cultivated material in Argentina and was referred to by them in their 1945 publication cited above under the designation "Glandularia perakii x G. laciniata". Evidence seems to indicate, however, that the plant which they consistently identify as Glandularia laciniata was actually Verbena tenuisecta. As far as known now, the two parental species do not occur together in the wild anywhere, so it is not probable that this hybrid will be found in the wild, unless the ranges of the parental species are much extended in the future either by natural distributional expansion or by more collecting on our part producing a more complete picture of the natural ranges of the species. The hybrid should have considerable horticultural merit.

VERBENA NIVEA Moldenke, *Phytologia* 1: 459. 1940.

Bibliography: Moldenke, *Phytologia* 1: 459. 1940; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 44 & 101. 1942; Hill & Salisb., *Ind. Kew. Suppl.* 10: 242. 1947; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 98, 106, & 198. 1949; Moldenke, *Résumé* 115, 127, & 473. 1959; Moldenke, *Résumé Suppl.* 4: 5. 1962.

Low procumbent or trailing herb, branched from the base; branches spreading in radial fashion, very slender, sometimes almost filiform, obtusely subtetragonal, rather densely puberulent with very short spreading cinereous hairs, more sparsely so or glabrescent in age, the youngest branchlets very densely short-pubescent with spreading cinereous hairs; nodes faintly annulate; principal internodes 0.5--2.5 cm. long, mostly greatly abbreviated; leaves decussate-opposite, numerous, usually with several much reduced ones in their axils; petioles slender, 1--4 mm. long, flattened, deeply canaliculate above, narrowly winged-margined, rather densely or sparsely strigose with appressed whitish hairs; leaf-blades chartaceous, uniformly gray-green on both surfaces, ovate in outline, 4--8 mm. long and wide, densel strigose with appressed whitish antrorse hairs on both surfaces, 3-lobed or -parted almost to the base, each division often again 2- or 3-lobed, the lobes all obtuse at the apex and revolute-margined; the very slender midrib and secondaries impressed above, slightly prominulous beneath; veinlet reticulation indiscernible on both surfaces; inflorescence terminal, capitate; heads small, many-flowered, dense, subsessile or very short-pedunculate; calyx tubular, 3--4 mm. long, often purplish, densely short-pubescent with whitish rather spreading hairs; corolla

white, bluish-white, or slightly purplish, its tube about 5 mm. long, the limb 2.5--3 mm. in diameter.

The type of this species was collected by Santiago Venturi (no. 10014) along the highway to San Antonio, Rosario de Lerma, at an altitude of 3000 meters, Salta, Argentina, in December, 1929, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species has been found at altitudes of 3000 to 4200 meters (according to labels, but see Dr. Asplund's letter quoted hereinafter), flowering from December to March and in May, fruiting in March. Herbarium material has been misidentified and distributed as V. microphylla Kunth and it is actually possible that these two taxa are not distinct. More intensive study is required here.

In regard to the Asplund 5871 collection cited below, whose label reads "General Campero, 4200, 1921/6/III. 12366", Dr. Asplund, in a letter to me dated November 19, 1961, says "The railway station General Campero (that is the spelling on the station house) is in the province of Pacajes in the Department of La Paz, Bolivia. According to my annotations I collected there on March 6, 1921, only one number of Verbena, viz. Nr. 2800, which you determined in July 1954 as Verbena microphylla H.B.K. From where the number 12366 comes I do not know at all, but the change of 2800 to 5871 was most probably done by Dr. Otto Buchtien. He helped me in drying my plants in the rainy season during the first months of 1921, and as a compensation for his help I allowed him to take fragments for his own herbarium. When he inserted these fragments (which were sometimes rather large) into his herbarium he seems to have regarded them as a continuation of his 'Herbarium Bolivianum' and gave them new numbers, continuing his own number series. In copying my field labels he seems to have been sometimes not very careful. For Nr. 2800 I have annotated an altitude of 3900 m (= the altitude of the railway station house in the bottom of the valley), not 4200 m (= approximate altitude of the plateau above the station)."

In all, 10 herbarium specimens, including the type, have been examined by me.

Citations: BOLIVIA: La Paz: Asplund 5871 [12366] (W--1134873). Potosí: Fiebrig 2613 (S, S). ARGENTINA: Jujuy: T. Meyer 3167 (N), s.n. [Herb. Inst. Miguel Lillo 34401] (N); Venturi 8777 (Du--372486, E--962052, N, W--1591414). Salta: Venturi 10014 (N--type).

VERBENA NIVEA f. ROSEA Moldenke, Phytologia 8: 60. 1961.

Bibliography: Moldenke, Phytologia 8: 60. 1961; Moldenke, Résumé Suppl. 3: 15. 1962.

This form differs from the typical form of the species in having rose-colored corollas.

The type of the form was collected by Santiago Venturi (no. 10111) in waste land between pastures at an altitude of 3800 meters, Cumbre del Cajon, dept. Tafí, Tucumán, Argentina, on April 20, 1926, and is deposited in the United States National Herbarium at

Washington. At the time of its publication, I was under the impression that the corollas of V. nivea are always white. However, some collectors describe them as "bluish-white" or "o ligeramente morada", possibly due to fading with age. The present form seems to have the flowers always pink in color. It is known thus far, however, only from the type specimen.

Citations: ARGENTINA: Tucumán: Venturi 10111 (W--1591428--type).

xVERBENA NOACKI Moldenke, *Phytologia* 2: 149. 1946.

Synonymy: Verbena hispida x hastata Dermen, *Cytologia* 7: 170, in textu. 1936. Verbena noackii Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 221. 1951. Verbena hastata L. x V. hispida Ruiz & Pav. ex Moldenke, *Résumé* 366, in syn. 1959. Verbena hispida Ruiz & Pav. x V. hastata L. ex Moldenke, *Résumé* 366, in syn. 1959.

Bibliography: Dermen, *Cytologia* 7: 170. 1936; Moldenke, *Phytologia* 2: 149. 1946; Moldenke, *Alph. List Invalid Names Suppl.* 1: 24. 1947; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 164 & 198. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 221. 1951; Moldenke, *Am. Midl. Nat.* 59: 356--357. 1958; Moldenke, *Résumé* 224, 366, & 473. 1959; Moldenke, *Phytologia* 8: 121 (1961) and 9: 219 & 296. 1963.

The name, xV. noacki, was proposed by me in 1946 for the hybrid produced artificially by Dermen from cultivated material in Massachusetts between V. hastata L. and V. hispida Ruiz & Pav. and discussed by him in 1936. The two parental species do not normally grow together anywhere in the wild -- one being temperate North American and the other being temperate South American. It is not expected, therefore, that this hybrid will ever be found in the wild unless one or the other of the parents is introduced into the region of the other and becomes acclimated there. The hybrid might, however, have horticultural possibilities. Its characters are intermediate between those of the two parental species.

Adding a second "i" to the termination of the second part of this binomial name, and of various other similar binomials in my article on Verbena in the Royal Horticultural Society's *Dictionary of Gardening* (1951), seems to have been a policy of its editor. It was definitely not due to any intentional act on my part, since I do not approve of such so-called and wholly unnecessary and undesirable "corrections" of original spellings!

xVERBENA NOTHA Moldenke, *Phytologia* 5: 133. 1955.

Synonymy: Verbena halei x neomexicana Dermen, *Cytologia* 7: 170. 1936. Verbena halei Small x V. neomexicana (A. Gray) Small ex Moldenke, *Résumé* 365, in syn. 1959. Verbena neomexicana (A. Gray) Small x V. halei Small ex Moldenke, *Résumé* 370, in syn. 1959.

Bibliography: Dermen, *Cytologia* 7: 170. 1936; Moldenke, *Phytologia* 3: 467 (1951) and 5: 133. 1955; Moldenke, *Biol. Abstr.* 30: 1093. 1956; Moldenke, *Résumé* 224, 365, 370, & 473. 1959; Moldenke,



Phytologia 8: 121 (1961) and 9: 166. 1963.

The name, xV. notha, was proposed by me in 1955 for the hybrid between V. halei Small and V. neomexicana (A. Gray) Small produced artificially by Dermen from cultivated material in Massachusetts in 1936 and discussed by him in that year. The two parental species grow together in the wild in at least four counties of Texas and one county of Arizona, as well as in at least four states of Mexico, so it is very possible that this hybrid occurs in the wild. It may account for some of the many puzzling "intermediate" specimens hereinbefore cited under V. neomexicana and its two varieties.

VERBENA OCCULTA Moldenke, Phytologia 3: 280--281. 1950.

Bibliography: Moldenke, Phytologia 3: 280--281 & 286 (1950) and 3: 485. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 85 & 473. 1959; Moldenke, Phytologia 9: 395. 1963.

Herb; stems and branches erect or ascending, brunnescent, obtusely tetragonal, appressed-pilosulous on the older parts, short-pubescent with spreading hairs on the younger parts; nodes annulate; principal internodes 0.5--3 cm. long; leaves decussate-opposite, sessile, more or less clasping-based; petioles obsolete; leaf-blades deeply 3-parted to about the middle, uniformly dark-green on both surfaces, brunnescent in drying, thin-chartaceous, very fragile in drying, densely pubescent on both surfaces with subappressed hairs of irregular length, the divisions often few-toothed or short-lobed, the lobes subacute, somewhat revolute-margined, the single vein in each segment flat or obscure above, prominulous beneath; inflorescence terminal, spicate, abbreviated, 1.5--4 cm. long, densely many-flowered; peduncles obsolete or to 2 cm. long, spreading-pubescent; bracts few, foliaceous, oblong, to 12 mm. long and 2 mm. wide; bractlets large and conspicuous, surpassing and mostly hiding the calyx, 8--10 mm. long, lanceolate, attenuate at the apex, rather densely appressed-pubescent; calyx about 5 mm. long, irregular, densely pubescent, its rim 5-lobed; corolla varying from blue or violet to clear-lilac, purple, or rose, hypocrateriform, its tube 8--10 mm. long, the limb 4--5 mm. wide.

The type of this curious species was collected by Ramón Ferreyra (no. 1298) in a stony habitat, at an altitude of 3200 to 3500 meters, near Nevado Cajamarquilla, in the province of Bolívar, La Libertad, Peru, on September 12, 1946, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species has been found in rocky places at altitudes of 2625 to 4000 meters, blooming in May, June, August, and November. The only common name recorded for it is "verbena".

In all, 10 herbarium specimens, including the type, have been examined by me.

Citations: PERU: Cajamarca: R. Ferreyra 8522 (Z); Scolnik 867 (S), 1304 (Er, N). La Libertad: Angulo 1675 (Z); R. Ferreyra 1298 (N--type); López Miranda 1108 (W--2173745); López Miranda & Sag-

ástegui 2718 (S); Ochoa 1443 (N), 1468 (N).

VERBENA OCCULTA f. ALBA Moldenke, Bull. Torrey Bot. Club 77: 405. 1950.

Bibliography: Moldenke, Bull. Torrey Bot. Club 77: 405. 1950; Moldenke, Revist. Sudam. Bot. 8: 167. 1950; Moldenke, Phytologia 3: 376 (1950) and 4: 451. 1953; Moldenke, Résumé 85 & 473. 1959; Moldenke, Phytologia 9: 395. 1963.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Ramón Ferreyra (no. 6586) in a grassy steppe, at an altitude of 3800 to 3900 meters, between San Rafael and Cerro de Pasco, in the department of Pasco, Peru, on January 31, 1950, and is deposited in the Britton Herbarium at the New York Botanical Garden. The plant has been collected at 3400 to 4000 meters altitude, flowering in April and June. Sandeman describes it as a "low-growing herb, the leaves very viscous, growing in full exposure on the mountain-side". His specimen is a perfect match for the illustration given by Ruiz & Pavon for their V. multifida, which, however, they state came from Concepcion, Chile. Their name, furthermore, seems to be only a new name for Erinus laciniatus of Linnaeus and so must go into the synonymy of V. laciniata (L.) Briq. regardless of the identity of the plant which they illustrated.

In all, 7 herbarium specimens of this form, including the type, have been examined by me.

Citations: PERU: Ancash: Cerrate 302 (N), 316 (N). Junin: Asplund 12009 (S, S); Sandeman 103 (K). Pasco: R. Ferreyra 6586 (N--type); Ochoa 333 (N).

VERBENA OFFICINALIS L., Sp. Pl., ed. 1, 20--21. 1753 [ V. officinalis Auct., 1957, nor Wats., 1943].

Synonymy: Verbena Dorst., Botanicon 292. 1540. Cymbina Dorst., Botanicon 292, in syn. 1540. Crista gallina Dorst., Botanicon 292, in syn. 1540. Peristereon Dorst., Botanicon 292, in syn. 1540. Verbenaca Dorst., Botanicon 292, in syn. 1540. Verbenaca recta Ruell., Ped. Dioscorid. Anazarb., vol. 1, 317. 1549. Verbenaca Matth., Comment. 466--467. 1554. Sacra herba Matth., Comment. 466--467. 1554. Communis Verbena sive sacra procerior recta L'Obel, Plant. Obs. 231. 1576. Verbena vulgò appellata Caesalp., De Plantis 450. 1583. Alterum genus, quod Mas apud Plinium intelligitur Caesalp., De Plantis 451. 1583. Verbena recta Dodon., Stirp. Hist. Pemptad. 150. 1583. Communis verbena & sacra recta L'Obel, Icon. Stirp. 534. 1591. Verbena communis Gerarde, Herbal 580. 1597. Verbena sacra Gerarde, Herbal 580. 1597. Verbena vulgaris Clus., Rar. Plant. Hist. 4: xlv. 1601. Verbena communis caeruleo flore C. Bauh., Pinax Theatr. Bot. 269. 1623. Verbena communis & sacra recta L'Obel ex C.

Bauh., Pinax Theatr. Bot., ed. 1, 269, in syn. 1623. Columbaris Herm. ex C. Bauh., Pinax Theatr. Bot., ed. 1, 269, in syn. 1623. Herba sacra Ang. Tur. ex C. Bauh., Pinax Theatr. Bot., ed. 1, 269, in syn. 1623. Verbena sive verbenaca Guil. ex C. Bauh., Pinax Theatr. Bot., ed. 1, 269, in syn. 1623. Hierobotane mas Brunf. ex C. Bauh., Pinax Theatr. Bot., ed. 1, 269, in syn. 1623. Verbena Gesn. ex C. Bauh., Pinax Theatr. Bot., ed. 1, 269, in syn. 1623. Verbena mascula Brunfels ex C. Bauh., Pinax Theatr. Bot., ed. 1, 269, in syn. 1623. Verbenaca vulgaris Lug. ex Matth., Opera Omnia Comment. 742, in syn. 1624. Sacra herba Tourn. ex Matth., Opera Omnia Comment. 742, in syn. 1624. Verbena recta Trag. ex Matth., Opera Omnia Comment. 742, in syn. 1624. Verbenaca recta Dodon. ex Matth., Opera Omnia Comment. 742, in syn. 1624. Verbena communis C. Bauh. ex Matth., Opera Omnia Comment. 742, in syn. 1624. Verbena vulgaris J. Bauh., Hist. Plant. Univ. 3: 443-444. 1650. Verbena Matth., Apolog. 214. 1674. Verbena communis, flore coeruleo C. Bauh. apud P. Herm., Hort. Acad. Lugd.-Bat. Cat. 619. 1687. Verbena communis flore caeruleo C. Bauh. apud P. Herm., Fl. Lugd.-Bat. 55. 1690. Verbena latifolia lusitanica procerior Tourn. apud P. Herm., Fl. Lugd.-Bat. 55. 1690. Verbena off. Eysenkraut Rivin., Introd. Gen. Remherb. [24] Icon. [56]. 1690. Verbena communis, caeruleo flore C. Bauh. apud Tourn., Hist. Pl. Paris 309. 1698. ?Verbena chalepensis major vulgaris facie R. Morison, Plant. Hist. Univ. Oxon. 3: "408" [=418]. 1699. Herba sacra R. Morison, Pl. Hist. Univ. Oxon. 3: "408" [=418], in syn. 1699. Hierobotana Brunfels ex R. Morison, Plant. Hist. Univ. Oxon. 3: "408" [=418], in syn. 1699. Verbena communis sive vulgaris Clus. ex R. Morison, Plant. Hist. Univ. Oxon. 3: "408" [=418] & 419, sec. 11, pl. 25, fig. 1. 1699. ?Verbena chalepensis major, vulgaris facie Moris. apud Ray, Hist. Plant. 3: Suppl. 287. 1704. Verbena lusitanica latifolia procerior Tourn. ex Ray, Hist. Plant. 3: Suppl. 285. 1704. Verbena latifolia, lusitanica, procerior Tourn. apud Boerh., Ind. Plant. Hort. Acad. Lugd., ed. 1, 75. 1710. Verbena; lusitanica; latifolia; procerior Tourn. apud Boerh., Ind. Alt. Plant. Hort. Acad. Lugd., ed. 2, 1: 187. 1720. Verbena; communis; flore caeruleo C. Bauh. apud Boerh., Ind. Alt. Plant. Hort. Acad. Lugd., ed. 2, 1: 187. 1720. Verbena foliis multifido-laciniatis, spicis filiformibus L., Hort. Cliff. 11. 1737. Verbena communis, flore caeruleo C. Bauh. ex L., Hort. Cliff. 11, in syn. 1737. Verbena officinarum Dal. ex L., Hort. Cliff. 11, in syn. 1737. Verbena Rivin. ex L., Hort. Cliff. 11, in syn. 1737. Verbena humilior foliis incisis Clayt. ex J. F. Gronov., Fl. Virg., ed. 1, 8. 1739. Verbena folio variegata Breyn ex Haller, Enum. Meth. Stirp. Helvet. 1: 661. 1742. Verbena communis coeruleo flore C. Bauh. ex Haller, Enum. Meth. Stirp.

Helvet. 1: 661, in syn. 1742. Verbena foliis laciniatis superi-  
oribus, tripartitis, spicis angustis longissimis Haller, Enum.  
 Meth. Stirp. Helvet. 1: 661. 1742. Verbena Ruell. ex Haller, E-  
num. Meth. Stirp. Helvet. 1: 661, in syn. 1742. Verbena Caesalp.  
ex Haller, Enum. Meth. Stirp. Helvet. 1: 661, in syn. 1742. Ver-  
vena Rivin. t. 56 (sola summa planta) Blackw. t. 41 Haller, Enum.  
 Meth. Stirp. Helvet. 1: 661, in syn. 1742. Verbena communis  
caeruleo flore (Foliis dissectis) Tourn. apud Michel, Cat. Plant.  
 Hort. Caes. Florent. 98. 1748. Verbena communis caeruleo flore  
(foliis non, vel parum dissectis) Michel, Cat. Plant. Hort. Caes.  
 Florent. 98. 1748. Verbena vrticaefolia canadensis, foliis in-  
cisis, flore maiore Tourn. ex Michel, Cat. Plant. Hort. Caes.  
 Florent. 98. 1748. Verbena spuria L., Hort. Upsal. 8. 1748; Sp.  
 Pl., ed. 1, 20. 1753. Verbena (tetrandra), spicis filiformibus,  
foliis multifido-laciniatis L., Mat. Med. 6. 1749. Verbena su-  
pina Blackwell, Cur. Herbal 1: pl. 41. 1751. Verbena foliis  
multifido laciniatis, spicis filiformibus L. apud Sauvages, Meth.  
 Fol. Pl. Fl. Monspel. 279, sphalm. 1751. Verbena foliis lacini-  
atis, summis tripartitis, spicis angustis longissimis Haller ex  
 Sauvages, Meth. Fol. Pl. Fl. Monspel. 279, in syn. 1751. Verveine  
 Sauvages, Meth. Fol. Pl. Fl. Monspel. 279, in syn. 1751. Verbena  
tetrandra, spicis filiformibus paniculatis, foliis multifido-  
laciniatis, caule solitario L., Sp. Pl., ed. 1, 20. 1753. Verbena  
tetrandra, spicis filiformibus, foliis multifido-laciniatis caul-  
ibus numerosis L., Sp. Pl., ed. 1, 1: 20. 1753. Veronica humili-  
or, foliis incisis Clayt. ex L., Sp. Pl., ed. 1, 1: 20, in syn.  
 1753. Verbena (officinalis) tetrandra spicis filiformibus panic-  
ulatis, foliis multifido-laciniatis, caule solitario L., Fl.  
 Svec., ed. 2, 10. 1755. Verbena tetrandra, spicis filiformibus,  
foliis multifido laciniatis, caulibus numerosis L. apud J. F.  
 Gronov., Fl. Virg., ed. 2, 4. 1762. Verbena urticae folio cana-  
densis, foliis incisis, flore majore Tourn. apud J. F. Gronov.,  
 Fl. Virg., ed. 2, 4, in syn. 1762. Verbena humilior foliis in-  
cisis J. F. Gronov., Fl. Virg., ed. 2, 4. 1762. Verbena foliis  
tripartitis, rugosis, spicis nudis gracillimis Haller, Hist.  
 Stirp. Indig. Helvet. 1: [96]. 1768. Verbena tetrandra spiciis  
filiformibus paniculatis, foliis multifido laciniatis, caule  
solitario L. apud Haller, Hist. Stirp. Indig. Helvet. 1: [96],  
 in syn. 1768. Verbena foliis vix dissectis Haller, Hist. Stirp.  
 Indig. Helvet. 1: [96]. 1768. Verbena Rivin. t. 56. summa, ut  
fere solet, planta Blakwell t. 41 Haller, Hist. Stirp. Indig.  
 Helvet. 1: [96], in syn. 1768. Verbena officinalis tetrandra,  
spicis filiformibus paniculatis, foliis multifido-laciniatis,  
caule solitario L. apud Pollich, Hist. Plant. Palat. 1: 22. 1776.



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Annual or perennial herb, 0.1-2 m. tall, varying from erect to spreading or even low and sprawling, scented, often weedy, sometimes semi-woody, diffusely much-branched; stems 1 or several, ascending or spreading to erect, slender, mostly herbaceous, somewhat tetragonal and margined, branched above, striate, glabrous or almost so except on the muriculate or scabrid angles; leaves decussate-opposite, sessile or subsessile or sometimes narrowed into a short winged petiole, sheathing at the base; leaf-blades 1.5-10 cm. long, 0.7-2 cm. wide, the basal and lower ones more or less ovate, ovate-oblong, oblong, or oblong-lanceolate to lanceolate or oblanceolate or even rhomboid-ovate in general outline, varying from tripartite-laciniate or deeply incised to more or less deeply trifid, 5-cleft, or even 1- or 2-pinnatifid, narrowed toward the base or cuneate into a petiole, the upper ones similar but smaller and less divided, the uppermost entire, the various segments, lobes, or lacinations acute or obtuse at the apex, often again incised or crenate-serrate, strigose-scabrous or roughly pubescent to appressed puberulent or even subglabrous or glabrescent on both surfaces, sometimes sparsely strigillose on the larger venation only beneath; larger veins impressed above, prominent beneath; inflorescence composed of long, slender, axillary and terminal spikes ("racemes" according to Verdoorn), 15-50 cm. long, forming a terminal much-branched panicle, wide and more or less leafy below; spikes few, very lax, slender or filiform, 15-23 cm. long, strict, open and remotely flowered or compact only during anthesis, greatly elongating after anthesis, paniculate or subpaniculate, bracteate; peduncles glabrous, smooth on the flat surfaces, roughened on the margins for their whole length; rachis hirtellous and glandular, the branches slender; bractlets ovate or lanceolate, not over 2 mm. long, shorter than (or the lower as long as) the calyx, acute or acuminate at the apex, pubescent or hirtellous beneath, glabrous above, glandular, with the midrib very prominent beneath

(i.e., on the back); flowers numerous, fragrant, small, loosely arranged on the narrow spikes, distant below, crowded above, usually only 4 or 5 blooming simultaneously on one spike, about 12 mm. long; calyx cylindric, about 2 mm. long, glabrous within, hirtellous or hispid on the ribs outside, glandular, the rim subtruncate, minutely toothed; corolla hypocrateriform, varying from red, peach-red, red-violet, rose, rose-purple, rose-lavender, lavender-rose, pale rose-purple, or pink to purple, pale-purple, bluish-purple, mauve, lilac, violet, lavender, deep-lavender, lavender-blue, light-blue, bluish, or blue ("albo-rufescentes" according to J. A. Murray, 1774), its tube delicate, cylindric, a little longer to about twice as long as the calyx, usually less than 3 mm. long, the limb 1--1.5 mm. wide, the lobes more or less rounded; stamens inserted at about the middle of the corolla-tube; anthers not appendaged; pollen-grains oblate-spheroidal, 26--30  $\mu$  x 29--35  $\mu$ , usually 29  $\mu$  x 32  $\mu$ , the endocolpium lalongate, 3.5  $\mu$  x 12  $\mu$ ; ovary and style about 2 mm. long, glabrous; fruiting-calyx persistent, short-hairy, enclosing the fruit; fruit slightly larger than in V. gracilescens, composed of 4 nutlets, easily separating, the cocci broadly ellipsoid or shortly oblong, 1.5--2 mm. long, strongly striate, areolate-reticulate between the veins or striations toward the apex on the back; chromosome number:  $n = 7$ ;  $2n = 14$ .

Cufodontis (1962) states that this species, the type of the genus, is based on "syntypes: ex Europae mediterraneae ruderatis"

It should be noted here that V. officinalis Auct., referred to in the synonymy above, is a synonym of V. gracilescens (Cham.) Herter; V. officinalis Cuevas is Stachytarpheta jamaicensis (L.) Vahl; V. officinalis Wats. is V. menthaefolia Benth.; V. officinalis var. gracibras Lehm. is V. litoralis H.B.K.; V. officinalis var. gracilescens Cham., var. gracilescens Griseb., and var. gracilescens Haumann-Merck are all V. gracilescens (Cham.) Herter; V. officinalis var. hirsuta Torr. is V. neomexicana (A. Gray) Small; V. officinalis var. major Osten is V. gracilescens (Cham.) Herter; V. officinalis var. mediterranea Née is V. menthaefolia Benth.; V. officinalis var. tenuis Cham. is V. gracilescens (Cham.) Herter; V. officinalis f. roseiflora Benke is V. halei f. roseiflora (Benke) Moldenke, as is also V. officinalis f. rosa Blackwell.

The following hybrids are known: with V. halei Small (=xV. conata Moldenke); with V. hastata L. (=xV. baileyana Moldenke); with V. hispida Ruiz & Pav. (=xV. meretrix Moldenke); with V. lasiostachys var. septentrionalis Moldenke (=xV. suksdorfi Moldenke); with V. robusta Greene (=xV. clemensorum Moldenke); with V. supina L. (=xV. adulterina Hausskn.); and with Veronica maritima L. (=xVeronicena haartmani Moldenke). The supposed "Verbena officinalis x bracteosa Barnes" is xV. perriana Moldenke (actually V. bracteata Lag. & Rodr. x V. urticifolia L.), "Verbena offic-

inalis x prostrata Derment" is xV. suksdorfi Moldenke (actually V. officinalis L. x V. lasiostachys var. septentrionalis Moldenke), and "Verbena officinalis x xutha Engelm." is V. halei Small.

The "V. officinalis L." of C. Berg, Anal. Soc. Cientif. Argent. 3: 199 (1877), which he found around Buenos Aires and describes as "Los ejemplares eran muy tiernos y ténues", is V. gracilescens (Cham.) Herter. The "Sacra herba Ruell." is a mint.

Hooker (1829) describes a var.  $\alpha$  "caule erecto subhispidio, foliis lanceolatis, inciso-serratis trifidisque segmentis incisus scabris, spicis filiformibus subpaniculatis, floribus remotiusculis.....In Pampas ab urbe Bonaria usque ad Mendozam." He mentions also a var.  $\beta$  "foliis grosse serratis vix profunde incisus....Apud Rio Saladillo ad limites occidentalis planitiei Pampas dictae, et ad margines aquarum in Provinciae Mendozae.....Var.  $\beta$  differs from the  $\alpha$  and the common European state of the plant, solely in the less deeply cut leaves." His second variety is certainly V. gracilescens (Cham.) Herter.

Linnaeus (1753) distinguishes his V. spuria by its "caulibus numerosis" from V. officinalis with its "caule solitario". He also uses the term "paniculatis" for the spikes of the latter and does not use it for those of the former. Poiret (1808) affirms that Michaux's "V. spuria, caule decumbente, ramisissimo, divaricato; foliis ovalibus, incisus; spicis filiformibus, bracteis calices superantibus" and Clayton's "V. humilior, foliis incisus" are the V. spuria form of the species, too. Hooker (1836) says "The V. spuria, Willd., which I possess from Pennsylvania and New Jersey, I agree with Mr. Nuttall in considering a mere var. of officinalis."

The type of Verbena humilior foliis incisus Gronov. (and variants of this pre-linnean name) is sometimes cited as "Clayton 8", but the figure here is the page number of Gronovius' work where the name appears. The "Verbena spuria inedito" of Ruiz & Pavon is V. menthaefolia Benth.

Verbena recta Caesalp. is given under the genus Lycopus by Haller in his Enum. Meth. Stirp. Helvet. 1: 660 (1742). This same author places Verbenaca supina s. femina Fuchs and Verbenaca supina Cord. under what is now known as Verbena officinalis on page 661 of the same work, but these names actually belong in the synonymy of V. supina L. On page 551 he places Verbena mas Fuchs and Verbena recta & mas Gesn. under what he calls Sisymbrium foliis pinnatis, extremo lobo triangulo, siliquis erectis, cauli adpressis, and which is what we now know as Erysimum officinale L. On page 624 he places Verbenaca recta Cord. in the synonymy of a species of Lycopus which he calls Alectorolophus calycibus glabris, foliis inter floris latioribus,

Michel (1748) regarded the Verbena of Caesalpinus as a "species" with dissected leaves, while the Verbenaca of Matthiolum he

regarded as a "species" with not at all or only slightly dissected leaves. Under the former he says "Haec, & sequens promiscue usurpantur pro Verbena, Herba Sacra, Hierobotane, Herba S. Ioannis, & Berbena". C. Bauhin (1623) includes Verbenaca foemina Caesalp. and Verbenaca supina (& foemina) Fuchs in the synonymy of Verbena communis caeruleo flore (which is now V. officinalis), but these two names belong more properly in the synonymy of V. supina L.

Stearn (1961) notes that "although Linnaeus placed his genus Verbena in the class Diandria, having two stamens, he deliberately included within it species with two stamens and species with four, among the latter being V. officinalis, the historic type of the genus."

Of Verbena urticae folio canadensis, foliis incis, flore majore Tourn. Ray, in his Hist. Plant. 3: Suppl. 285 (1704), says "Hujus speciei folia pinguntur à Jacobo Zannoni in eadem tabula cum Verbena con foglie d'ortica di Canada pag. 203. ubi plena habetur omnium partium descriptio." This appears to be V. urticifolia L.

Matthiolum (1624) regarded Verbenaca supina Fuchs and Verbena foemina Caesalp. as synonyms of V. officinalis, but these names actually belong in the synonymy of V. supina L.

Schauer (1847) included V. setosa Mart. & Gal. in the synonymy of V. officinalis, but it really belongs with V. menthaefolia Benth. In my Prelim. Alph. List Invalid Names 46 (1940) I regarded V. domingensis Urb. as a synonym of V. officinalis, but I now maintain it as distinct. Similarly, in my Alph. List Invalid Names Suppl. 1: 22 (1947) I reduced xV. adulterina Hausskn. to synonymy under V. officinalis, but now regard it as probably distinct.

Lam (1919) places V. macrostachya F. Muell. and V. menthaefolia Benth. in the synonymy of V. officinalis, but I regard the former as a valid variety and the latter as a valid species.

Verbena communis caeruleo flore C. Bauh. is accredited to "G. Bauh." by J. Bauhin (1689) and is given as a synonym of V. supina L. Actually, Caspar Bauhin's given name was sometimes written "Kaspar" or "Gaspard".

Dorsten (1540) says "Verbenae duo sunt genera, Altera floribus est albis, altera verò coeruleis". Haller (1742) recognized a variety "β" with white flowers (now known as f. albiflora Strobl) and a variety "γ" with variegated leaves ("Folio variegata Breyn Prodr. ll. p. 100"). I have not as yet seen any specimens with variegated leaves, but the form may well exist and may be worthy of nomenclatural recognition. On page [96] of his 1768 work, Haller regards the Hort. Florent. p. 98 plant as a variety "β Foliis vix dissectis". Ray (1704) and Linnaeus (1737) regarded Tournefort's "Verbena lusitana latifolia procerior" as a variety -- designated as "α" by Linnaeus -- of V. officinalis.



No description is given of V. officinalis var. natalensis in the original place of publication, but the name is based on F. Krauss 151 "ad fluv. Umlaas, Natal, Dec."

"Koch & Almquist, Svenska Flora 1", "Hochst., Pl. Schimp. Abyss. I. 145", and "Poeppig, Coll. Pl. Chile 158" are sometimes cited as though they were literature references, but appear to be exsiccatae. L'Ecluse, Rar. Plant. Hist. XLV (1601) is sometimes cited as "2: 45, fig. 1", as "xiv", or as "Rar. Aliq. Stirp. Pannon. p. XLV.1.B.III.p.443. 1583" -- the last-mentioned may be a reference to Bejthe, Stirp. Nomencl. [14]. 1583. The Haartman (1756) reference is sometimes given as "pl. 11" [=II]. The date on the volume title-page is "1756", on the second title-page is "August 20, 1756", and at the head of the article itself is "November 23, 1751". On page 35 it is stated that "Floruit quidem haec planta omni anno felicissime, in annum que haec edimus 1755 & vivi." This is sometimes misquoted as "1775".

It is perhaps worth mentioning here that J. F. Gronovius, Fl. Virg., ed. 1, 8 (1739) is sometimes cited as "Clayt., Fl. Virg. 8. 1743". O. F. Müller, Icon. Plant. Fl. Dan. 4: pl. 628 (1775) is also cited as "1777"; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 147 (1894) is often cited as "1895"; and Fiori & Paoletti, Icon. Fl. Ital. fig. 3218 (1902) is also cited as "1895". The L., Fl. Suec., ed. 1, 9 (1745) reference is sometimes referred to as page "26", which figure actually is the species number on page 9; L., Mat. Med. 6 (1749) is sometimes erroneously cited as page "38"; J. Bauh., Hist. Plant. Univ. 3: 443--444 (1650) is sometimes cited as "1651" or "1750"; Gerarde, Herbal 580 (1597) is sometimes erroneously cited as page "781"; Zetterstedt, Pl. Vasc. Pyren. 220 (1857) is sometimes incorrectly cited as page "1050", that figure being the species number on page 220. Roig y Mesa, in his Pl. Medic. Cuba 671 (1945), cites Robledo, Lecc. Bot. 2: 526 (1940), but the correct page is 497. Sabbat in Martelli, Hort. Roman. 3: 11, pl. 55 (1775) is sometimes cited as an illustration of V. officinalis, but it is pl. 56 which has the illustration of this plant. Zannich., Istor. Piante Venez. pl. 269 (1735) is sometimes cited as "pl. 289", but the latter is an illustration of a composite, there designated as Cyanus minor. Hofmeister, Jahrb. Wiss. Bot. 1: 82--190 (1858) is sometimes cited in the bibliography of V. officinalis, but the species is mentioned only on page 140, while the "M. Treub, Ann. Jard. Bot. Buitenz. 3: 77--87 (1883) reference is entirely incorrect, since the species is not mentioned anywhere on those pages. Hara (1948) cites fig. 1319 (1933) and fig. 563 (1940) in two books with Japanese titles not decipherable to me.

Eig, Zohary, & Feinbrunn (1931) state that the leaves of V. officinalis are "pinnate", but actually they are always simple! These authors probably meant to say "pinnately parted". They note that in Palestine the species is "found almost all year round" (i.e., in anthesis?). Zohary (1962) says that it comprises part of the Rubion sancti Alliance in the Inuletum viscosae Alliance among the ecologic formations there.

Common and vernacular names for this plant are numerous, including "akkoraragg", "Altarblume", "aristereon", "Aschlepius alceas", "ashthroat", "berbena", "berbina", "berbine", "bernena", "blue vervain", "camaradinha", "candelabra verbena", "chamarlycus", "chamaelygos", "chamelicos", "chamticos", "columbina", "columbine", "common veruaine", "common vervain", "cố roi ngua", "creisetta", "crista gallinacea", "crocetta", "curetis fersefomon", "cyparissos", "demetrius", "diöse lacete", "Druidenkraut", "Druivenkruid", "echtes Eisenkraut", "Eisen-bart", "Eisen-bart kraut", "eisenkraut", "Eisen-dek", "Eisenhart", "Eisen-hart", "Eisen-hart kraut", "eisenhendrik", "Eisenherz", "Eisen-herz", "Eisen-herz kraut", "eisenhindrik", "Eisenkraut", "Eisen-kraut", "eisen krokt", "Eisenreich", "Eisen-reich", "Eisenweich", "Eisen-weich", "eisener Heinrich", "eiserich", "eiserich kraut", "eisern", "eisernhart", "eisern-hart", "eisewich", "eisewig", "eisick", "enchanter's plant", "enchanter's-plant", "erba dé berména", "erba de San Giovanni", "erba trona", "erba turca", "erbo à touti li man", "European-verbena", "European vervain", "European vervein", "exupera", "eysencrut", "eysenhardt", "eysenkruyd", "eyssenchrawtt", "eyssen-kraut", "Feldcypresse", "ferraria", "gebräuchliches Eisenkraut", "gemeine Eisenkraut", "gemeines Eisenkraut", "geweiht kraut", "geweiht-kraut", "geweiht kraut", "gtvercinotu", "Hahnenkampf", "Hahnen-kampf", "frog's-foot", "frossis-foot", "Hahnenkopf", "Hahnen-kopf", "hardijzer", "heiliges Kraut", "Heiligkraut", "Heilig-kraut", "herba columbariae", "herba santa", "herba S. Ionnis", "herba veneris", "herba verbenae", "herba verbenae officinalis", "herba verbenae sanguinalis", "herbe à tous les maux", "herbe a tous maux", "herbe aux enchantements", "herbe aux sorciers", "herbe aux sorcières", "herbe de foie", "herbe de sang", "herbe de vervaine", "herbe di San Giovanni", "herbe du foie", "herbe sacrée", "herbe-sacrée", "herb-grace", "herb of the cross", "herb-of-the-cross", "herb o' grace", "herb of grace", "herculania", "herva de ferro", "hierobotane", "hierobotane", "holie herbe", "holy herb", "holy-herb", "holy veruane", "holy vervain", "holy wort", "iezerkroet", "iherobotane", "iisercruyt", "ijsenkruyd", "ijserhard", "ijserhart", "ijserkruyd", "ijzerhard", "ijzerkruid", "irenhard", "ifren Hendrek", "isarna", "isarna chrút", "isarnina", "isecruyt", "isekrut", "isena", "isearre", "isen-bart", "isen-brut", "isen-hard", "isenharde", "isen-kraut", "isenkrút", "iserebart", "isercruit", "isercruyt", "isere", "iseren-bart", "iserene Hendrek", "iseren-hard", "iserenkrut", "iserhark", "iserhart", "iserhert", "iserich", "iser-kraut", "isern", "isernehart", "isern Hendreck", "isern krut", "isinchlete", "isin-ina", "isin-un", "isirn", "isirn wurz", "isni", "issenkraut", "issernhar", "issinkraut", "Junos teares", "jagged-leaved vervain", "jernurt", "Juno's herb", "Juno's tears", "Juno's tears", "Junothränen", "Juno-tränen", "jururuba", "karáita", "Katzenblut", "Katzenblutkraut", "kau kau yeuk", "kau nga ts'o", "kerckkruyd", "kerkkruid", "Krauskraut", "kuma-tsuzura", "la verveine", "la verveine officinale", "lecheri", "licinia", "lightning plant", "lung nga ts'o", "lustam", "lustrago", "mà pién tsão", "ma pin tso", "ma pin t'so", "ma tien tháo", "matricalis",

"Mercurie's moist blood", "Mercuries moist bloude", "Mercury's moist blood", "Merkurblut", "militarem", "mine çiç", "mine çiç o!", "native vervain", "ngoh sat na", "official vervain", "Opferbraut", "Opferblut", "pámúkh", "panchromos", "pancremon", "pempentar", "peristerian wort", "peristerion", "perstereona", "philtrodotes", "pigeon's grass", "pigeon's-grass", "pigeon's grasse", "pigeon weed", "pitagosas", "planta de sorte", "pushtu", "reichhard", "reich-hard", "reich-hart", "Richard-kraut", "rigi el khamâm", "rigl el khamâm", "ri'f el khamâm", "sacra herba", "Sagenkraut", "Segen-kraut", "seruftit", "serruffit", "shamuki", "shop vervain", "sideritis", "simpler's joy", "simpler's-joy", "sirpina", "sister vervain", "ssirugtiät", "Stahlkraut", "Stahlkraut", "standing berbana", "Tauben-kraut", "Taubenlieb", "tialu", "tigrodion", "trygonium", "trygonum", "urgebäo", "varveino", "varveyn", "Venusader", "Venusblut", "verain", "verbena", "verbenaca", "verbena colombaria", "verbenam", "verbene colombaria", "verbene officinale", "verminacola", "verminacula", "vertiperdum", "veruaine", "veruayne", "veruana", "vervain", "vervaine masse", "vervayne", "vervein", "verveine", "verveine batard", "verveine bâtarde", "verveine commune", "verveine d'Europe", "verveine officinale", "verveino", "verven!", "vervena", "vervene", "verveyn", "vervin", "vrgebacm", "Weihsprossen", "Wieselblut", "wilder eisewig", "wild hyssop", "worogobá", "yik mo tso", "ysen-hard", "ysen-krüte", "ysercruit", "ysere", "yseren", "yseren-hard", "yseren-hart", "yser-hard", "yser-hart", "yserkruid", "ysern", "ysernhard", "ysinina", and "yzerkruid".

Verbena officinalis has been collected in anthesis and in fruit in every month of the year, growing at altitudes from sea level to 11,000 feet. It is found along roadsides and ditches, in fields, wheatfields, pastures, roadside meadows, waste places, grassy ground, damp or moist places, vacant lots, railroad grounds, and very dry pastures, on dry gentle slopes, grassy hillsides, village commons, and mountainsides, along village streets, rocky paths, sandy roadsides, and canal-banks, at the borders of rice fields and the edges of barnyards, in moist or sandy soil, in damp, grassy, or cultivated ground, on old ballast in shipyards, in dry land under trees, lowlands, cleared areas, and the lawns of old houses.

Stewart & Corry (1888) report that it is casual in northeastern Ireland, adding the comment that "Templeton notes this species as about gardens.....not indigenous, and not naturalized", but MacKay (1836) says "roadsides and waste ground in a limestone soil. Plentiful near Cork, and Killarney, and at Kilmacannick, County of Wicklow." Mrs. Clemens says that it is "gay in paddocks when nothing else showed color except chenopods" and "pretty weed along road" in Queensland. Keogh found it "in densely timbered country" in New Guinea. Suvarnakoses found it scattered in mixed deciduous forests in Thailand, while Kasapligil (1956) reports it growing along ditches and in moist places in Jordan.

Domin (1928) gives its distribution as "temperierte und subtropische Gebiete der ganzen Erde. In Australien mit Ausschluss

von Nord-Australien und West Australia, dafür aber auf Tasmanien." He states that in Queensland it inhabits savanna woods, growing in sandy soil, and occurs as a weed on rainforest soil cleared for cultivation. Verdoorn (1938) says "Widely distributed from the Cape Peninsula through the south-eastern and eastern districts [of the Republic of South Africa] to Natal; also recorded from the Orange Free State and the Transvaal; appears to be rare in the dry central and north-western districts as there is only one record from Prieska....A native of Europe and naturalized at the Cape over 100 years ago. In some areas it is a troublesome weed in lands but plants may be destroyed by the usual methods of clean cultivation before the seeds ripen. In some parts of Griqualand East it is said to be a good winter feed for large and small stock."

Franchet (1882) records it from French Somaliland, while Loureiro (1790) records it as both wild and cultivated in China and Cochinchina. Hausman (1948) describes the flowers as purple and states that the species is found in the United States from "Maine south to Florida; west to Tennessee, Texas." All the Texan material so determined, however, has proved to be V. halei Small. Berg (1877) records it from Buenos Aires, saying "Encontré esta especie en muy pocas partes cerca de Buenos Aires. Los ejemplares eran muy tiernos & ténues". The material to which he refers here is actually V. gracilescens (Cham.) Herter. Bojer (1837) gives the temperate zones of Europe and Asia as the home of V. officinalis, and "Perou" as the original home of V. spuria (L).

Connor & Adams (1951) aver that V. officinalis is "occasional and sometimes locally abundant in waste places on both islands" of New Zealand; Bose calls it a weed of waste places in India; Fahrenholtz found it abundant at the edge of ditches in Germany; Bailey encountered it as a weed in parks in China; Sampson found it to be a "common weed of waste places, abundant on the city walls [of Canton]; flowers all the summer"; Rodin reports it from among cultivated valleys and hills with sparse vegetation in Pakistan; Clemens calls it a weed near houses in Luzon; Ching calls it "common" in Anhwei, China, but Lei found it "rare, among scattered shrubs in dry level land"; Collins reports it as common in Bermuda. Puchtler encountered it growing with Carduus nutans, Lappa officinalis, Persicaria hydropiper, P. lapathifolia, and Thymus serpyllum in Germany; Thedenius refers to it as "subspontaneous" in Sweden; Yuncker calls it a "roadside weed" on Okinawa and describes it as a "weed in waste areas and occasional along roadsides" and also as a "roadside weed" on Niue. Black (1926) describes it as rare or localized in temperate Australia; Watt (1893) reports it "common in the Himálaya from Kashmir to Bhután, at altitudes of 1,000 to 6,000 feet, and in the Bengal plain to the Sunderabands." Radford & Stewart found it growing along a wagon road at the edge of a saltmarsh in North Carolina, while Mackenzie reports it as uncommon along the streets of Cape May, New Jersey. Murrill (1945) calls it "rare in Alachua County, Florida", but the plant to which he refers



here is V. halei Small.

Gonçalves da Cunha & Gonçalves Sobrinho (1938) record V. officinalis from the island of Faial, in the Azores, where they say that it grows in association with Selaginella denticulata, Rubus rusticanus, Polygonum aviculare, Hypericum boeticum, Blechnum spicant, Asplenium hemionitis, and Scolopendrium vulgare. In their 1940 publication they aver that it is not very frequent and has about the same frequency as Ranunculus megaphyllus, Euphorbia stygiana, Rubus hochstetterorum, Ammi seubertianum, Vaccinium cylindraceum, Cymbalaria muralis, and Mentha piperita. Buchli (1936) calls it a field weed in northeastern Switzerland; W. Young (1936) records it from Scotland; Soest (1931) gives us a distribution map of its occurrence in the Netherlands and Lid (1952) does the same for Norway; Bojer (1837) records it as cultivated on the island of Mauritius, where he says that it rarely flowers. Koch & Almquist record it from Finland, while Fernald records it from Dinwiddie, Henrico, and Princess Anne Counties, Maryland. Hara (1956) gives its distribution as "Europe....Asia Minor, Caucasus, s.w. Asia, c. Asia, n. India, Siam, Indo-China, China, Korea, Honshu, south to Formosa, Australia, Polynesia. The plant is weedy, and the Japanese specimens agree well with the European." Deam (1940), on the other hand, excludes it from the flora of Indiana. C. & E. Reid (1907) report it in the fossil form from the Pliocene of England and Belgium.

The G. V. Nash s.n. [7 S. 1898], cited below, was cultivated in New York from seeds secured from Geneva, Switzerland, in 1898. The Herb. Calif. Acad. Sci. 31390, also cited below, does not bear any indication on its label that it originated from cultivated material, but I assume that this was the case. The species has been in cultivation as early as 1799 in England, according to Murray (1799).

Herbarium material of V. officinalis has been misidentified and distributed under the names V. littoralis H. & B., V. littoralis H.B.K., V. riparia Raf., V. supina L., V. supina Spreng., V. urticifolia riparia (Raf.) Britton, V. xanthi Gray, V. xutha Lehm., Bouchea sp., Buchnera sp., Stachytarpheta sp., and Veronica officinalis L. The Bornmüller s.n. [Gebirge Juda, Juli 1897] collection was originally distributed as V. tenuispicata Stapf, and no. 5516 as V. officinalis var. grandiflora Hausskn. Schimper 145, at least insofar as the United States National Herbarium specimen is concerned, seems to be var. prostrata Gren. & Godr. Paez 112 is V. bipinnatifida Nutt.

The E. F. Constable 11633, Pedley 377, and L. S. Smith 3045, distributed as V. officinalis, are actually var. gaudichaudii Briq.; Schlieben 7691 is V. brasiliensis Vell.; Chardon 34, J. T. Curtis Jr. s.n. [July 27, 1944], Eggers 1828, E. L. Leonard 3939, Questel 1686, and C. Wright 3658 are V. domingensis Urb.; Jameson 125/26 and Shepard 254 are V. gracilescens (Cham.) Herter; Beamer

s.n. [April 30, 1933], W. H. Duncan 20214, G. Een s.n. [29.3. 1951], R. K. Godfrey 53168, E. Hall 432, R. L. McGregor 15558, E. J. Palmer 33604, J. Skehan s.n. [Seymour & Earle 109], and B. L. Wagenknecht 2599, as well as almost all the Texan specimens so identified, are V. halei Small; Rodin 3917 and Türckheim 904 are V. litoralis H.B.K.; Abrams 3406, Lyonnet 334, C. T. Mohr s.n. [Huatusca, 1857], E. W. Nelson 1943 & 4577, C. R. Orcutt s.n. [Apr. 1889], J. G. Ortega 4215, Edw. Palmer 141, 153, 268, & 1042, Pringle 8534, and Salazar s.n. [Nopala, Aug. 1, 1913] are V. menthaefolia Benth.; Havard s.n. [Texas], Parry, Bigelow, Wright, & Schott 827, and Tharp s.n. [Wilson Ranch] & s.n. [Wilson Ranch, [June 1931]] are V. neomexicana var. hirtella Perry; Mearns 1013, Edw. Palmer 339 1/2 & 1041, and F. W. Pennell 16880 are V. neomexicana var. xylopoda Perry; Gallegos 2342 is V. orcuttiana Perry; T. J. Hale s.n. [Baraboo, 1861] and T. A. Williams 119 are xv. perriana Moldenke; E. W. Nelson 6096 and Edw. Palmer 356 are V. pinetorum Moldenke; Sidey 1196 is V. rigida Spreng.; M. E. Jones s.n. [Grinnell, Aug. 1877] is V. stricta Vent.; C. C. Albers 34008 is V. tenuisecta Briq.; Gauba 1698 is V. tenuispicata Stapf; Parry & Palmer 718 is the type collection of V. teucrifolia var. corollulata Perry; Ripley s.n. [Sep. 10, 1902] is V. urticifolia L.; Clover 1695, Eggert s.n. [along railroads, 10 June 1898], Harding 399, and W. H. Rhoades s.n. [Jackson, 1927] are V. xutha Lehm.; and Gorman 4005 is Cochranea anchusaefolia (Poir.) Gürke in the Heliotropiaceae, while Lapham s.n., distributed as "V. spura L.", is actually V. hastata L.

The Behn s.n. [7 Decbr. 1920] collection has extra large leaves. The Small & Heller s.n. [July 16--17, 1891] collection appears to be exactly like some specimens of V. riparia Raf., and may prove to be that species. Tanaka & Shimada 11032 and H. Smith 1536 exhibit pubescent foliage like that seen in V. menthaefolia Benth. Meissner 572 possibly represents var. prostrata Gren. & Godr. Baldacci 152 has spikes that are rather long and stiff, while T. Tanaka 11032 has them rather dense and long. Phares 1733 is described by the collector as "a form with deeply incised leaves". C. P. En 2022, from "a garden" in Fukien, may be from cultivated material, but the label does not plainly indicate this. Cowgill 1730 was cultivated in Maryland from seeds secured on Mt. Kaakerpu, at an altitude of 3000 meters. The McCann s.n. [9-15-36], cited below, was cultivated in Maryland from seeds secured from Brussels, Belgium. Liu L.831 was cultivated in Peking from seeds secured from Copenhagen, Denmark, while L. H. Bailey s.n. [Sept. 21, 1923] was cultivated at Ithaca, New York, from seeds secured from Vilmorin-Andrieux & Cie. (no. 49659), sown on April 27th. Bailey (1935) reports that the seeds of this species are

offered to the horticultural trade also by Floraire, Haage & Schmidt, Kew, and Taihoku. The species is known definitely to have been cultivated in Spain in 1814 and in France in 1819. Cultural directions given by Vilmorin-Andrieux are "Semer de mars en juillet, en pépinière; repiquer en pépinière; mettre en place en automne, de préférence, ou au printemps, en terrain sain. -- Fl. de juin en août."

The Haussknecht s.n. specimens from Greece, cited below, may actually represent the type collection of xV. adulterina Hausskn., but I see no differences between them and small specimens of typical V. officinalis. They are not at all hairy. Perhaps they represent one of the F<sub>2</sub> segregates reverting to ancestral type.

The "Verbena officinalis" of I. C. Verdoorn, Union of S. Afr. Dept. Agr. & Forest. Bull. 185: 171, fig. 90 (1938) is actually V. litoralis H.B.K. The Kausch s.n. [Rottstock, 1869] is a mixture with V. hastata L., while M. K. Clemens s.n. [Forest Hill, Jan. 1944] is a mixture with two species of Fabaceae and A. H. Kahn s.n. [8.7.25] is also a mixture with something non-verbena-ceous.

Urban, in his discussion of V. domingensis, cites Eggers 2175 as V. officinalis. He maintains that it differs from V. domingensis in having subsimple stems, many times larger leaves, which are pinnatifid or the lower ones pinnately parted, and larger flowers. The length of pistil in relation to size of pollen grains is discussed by Covas & Schnack in Darwiniana 7: 86 (1945). According to Seymour (1929), V. officinalis is attacked by the fungus Erysiphe cichoracearum DC.

The two specimens of V. officinalis from Czechoslovakia preserved in the Stockholm herbarium from Linnaeus' herbarium are inscribed as follows: The first has on the obverse side in ink "4" and "Verbena officinalis Linn. 13", the first and third words in a later hand, the second word in an early hand, the number probably in Linnaeus' hand; on the reverse side in pencil "Linné herb." and in ink (in Linnaeus' handwriting) "Verbena communis Gerb. tanay 312" and in the same hand "Habitat in incultis Verania circa Lubnam", followed (in an unknown hand) by "von Linné sen. scripsit", and then "Herb. Alstroemerii", and finally (in Dahl's handwriting) "a Linné P." The second specimen has on its obverse side in pencil "Verb. 13 offic. L. sp. pl. 20" and in ink (perhaps in Linnaeus' hand) "13 officinalis"; on the reverse side in pencil "Linné herb." and in ink "Herb. Osbeckii" and "Verbena officinalis" and "Linn." (in a different hand), and finally "a Linné f." (in Dahl's handwriting).

Gerarde (1597) calls this plant "Common veruaine" and "Holy veruane". He says "Vervain is called....in Latin Verbena, & Verbenaca, Herculania, Ferraria, & Exupera, or some Matricalis, & Hierobotane, of others Veruena, & Sacra herba. Verbenae are herbs that were taken from the altar, or from some holie place, which because the Consul or Praetor did cut up, they were like-

wise called Sagmina, which oftentimes are mentioned in Liwie to be grassie herbs cut up in the capitol. Plinie also witnesseth in his 22. book, II. chap. that Verbenae & Sagmina be all one, & this is manifest by that which we read in Andria in Terence: Ex ara verbenas hinc sume; Take herbs here from the altar, in which place Terence did not meane Veruaine to be taken from the altar, but some certain herbe: for in Menander, out of whom this Comedie was translated, is read  $\mu\upsilon\sigma\phi\upsilon\eta$ , or Myrtle, as Donatus saith. In Spanish it is called Vrgebaum; in Italian Verminacula: in Dutch Isercruit; in French Veruayne: in English Iunos teares, Mercuries moist bloude, Holie herbe, and of some Pigeons grasse, or Columbine, because Pigeons are delighted to be amongst it, as also to eate thereof, as Apuleius writeth."

Mrs. William Starr Dana, in her "How to Know the Wild Flowers", says of the vervena: "It was believed to be the herba sacra of the ancients, until it was understood that the generic title Verbena was a word which was applied to branches of any description which were used in religious rites. It certainly seems however, to have been applied to some special plant in the time of Pliny, for he writes that no plant was more honored among the Romans than the sacred Verbena. In more modern times it has been regarded as an 'herb of grace' and has been gathered with various ceremonies and with the invocation of a blessing, which began as follows; 'Hallowed be thou, Vervain, As thou growest on the ground, For in the Mount of Calvary There thou wast first found!' Mrs. Alice Earle Hyde writes in a letter dated October 29, 1940, that it is said to have grown at the foot of the cross on Calvary." In the book entitled "Poety of the Flowers" the rhyme quoted above is said to be an "old Cornish superstition".

Friend (1883) records that the plant is called "Holy Herb", and according to Pliny was one of the sacred plants of the Druids and was gathered by them with all manner of mystic ceremonies. An old rhyme is

"Hail to thee, Holy Herb!  
Growing on the ground  
On the Mount of Olivet  
First wert thou found.

Thou art good for many an ill,  
And healest many a wound;  
In the name of sweet Jesus,  
I lift thee from the ground."

William Coles, in his "Adam in Eden", says "It is known to such as have skill of nature, what wonderful care she hath of the smallest creatures, giving to them a knowledge of medicine to help themselves, if haply diseases are among them. The Swallow cureth her dim eyes with Celandine; the Wesell knoweth well the virtue of Herb Grace; the Dove the Verven; the Dogge dischargeth his mame with a kind of grass; and too long it were to reckon up all the medicines which the beasts are known to use by nature's direction only."



Friend states also that "vervain is said to have the power to open locks and unshoe horses"...."vervain leaf is called 'Frog's-foot' from fancied resemblance to the foot of a frog. A cuplet reads 'Frossis-foot men call it, For his levys are like the frossys fet.'.....Witches are said to be fond of vervain and to use its juice with that of hemlock, nightshade, & St. Johnswort, to mix into their baleful draughts prepared for their enemies. But this is contradicted in St. Colne's charm, as sung by Meg Merrilies at the birth of Harry Bertram: 'Trefoil, Vervain, John's Wort, Dill, Hinder witches of their will'. It is also contradicted in the old rhyme given in the notes to the 'Demon Lover' in the 'Minstrelsy of the Scottish Border': 'Gin ye wud be leman mine, Lay aside St. John's Wort and Verveine'....Conway remarks that in France the Mandrake superstition seems occasionally to invest some other root. Thus the author of 'Secrets du Petit Albert' (Lyon, 1718) says that a peasant had a Bryonia root of human shape, which he received from a gipsy. He buried it 'at a lucky conjunction of the moon with Venus' in spring, and on a Monday, in a grave, and then sprinkled it with milk in which three field mice had been drowned. In a month it became more human-like than ever. Then he placed it in an oven with Vervain, wrapped it afterwards in a dead man's shroud, and so long as he kept it, he never failed in luck at games or work'.....Conway says 'In reading accounts of the witch trials, especially those of the south of England, one can hardly help remarking that in the antics by which so-called witches imposed upon their neighbours the plants used by them are almost always Rue and Vervain'....Brand quotes from Scot's 'Discover of Witchcraft', pp. 151--152, that 'To be delivered from witches (in England), they hang in their entries.....verven' and 8 or 10 other plants....Valerian and Vervain are famous plants, and are scarcely ever mentioned, especially the latter, without reference being made to their mystic character.....I have named the Vervain already on more than one occasion, and shall therefore say as little about it here as possible. Several suggestions have been made respecting the origin of the word, Professor Max Müller being of the opinion that it is connected with brahman, a word intimately associated with India. Although a favorite with witches, it was at the same time one of the plants which hindered them from carrying out their evil designs. Among other plants 'Vervain and Dill Hinder witches from their will'.....Among the ancients Vervain was sacred to the god of war, and was borne by ambassadors when they went to defy or challenge the enemy. It became associated with the god of war and thunder in Germany also, and was thus supposed to be capable of protecting houses from lightning and storm. Mr. Conway remarks that even yet, in some districts of England, children may be seen with Vervain twined about their necks, little knowing how nearly it has been related in times of witchcraft to a halter. Pliny tells us that the Druids made use of it in casting lots, in drawing omens, and in other pretended magical arts....But although it was once so famous, the plant has lost its glory. Among ourselves it has fallen into disuse, in spite of the fact that a

pamphlet was some years ago written expressly to recommend it, directing the root to be tied with a yard of white satin ribbon round the neck, and to be allowed to remain there till the patient recovered.....The poet Drayton in his 'Muses' Elysium' says

A wreath of Vervain heralds wear,  
Amongst our garlands named;  
Being sent that dreadful news to bear,  
Offensive war proclaim'd.

.....The heads of Roman priests were sometimes garlanded with Vervain, the sacred and magic herb.....Wreaths of flowers have sometimes been worn around the neck as an amulet or charm....Vervain was one of the flowers so employed. By the Greeks and the French it was known as a sacred herb, and was used not only as an amulet, but also to cure venomous bites and various diseases. Its reputation was sufficient in the time of Ben Johnson for him to write: 'Bring your garlands, and with reverence place The Vervain on the altar'. An English writer has also recommended that the root be tied with a yard of white satin-riband around the neck, there to remain till the patient recovers; and Mr. Conway says children may still be seen in some places with the plant twined about their neck. The ancient Persian magi made great use of this plant in their worship of the sun, always carrying branches of it in their hands as they approached the altar. It was one of the plants dedicated to the goddess of beauty, while Venus wore a crown of Myrtle interwoven with Vervain. Roman ambassadors or heralds-at-arms also wore crowns of Vervain when they went out to proclaim war, or bid their enemies defiance; a custom to which Drayton refers in the lines already quoted. Vervain 'was sacred to the god of war', says Mr. Conway; but we fail to see the force of this. The Germans are said to have until quite recent times presented a wreath of Vervain to the newly-married bride, as if to put her under the protection of Venus the Victorious. The history of the plant, and of its name as well (if it be from the same root as brahman, as Professor Max Muller suggests), is full of interest.. Besides being indebted to Brand's 'Popular Antiquities' for sundry notes, quotations, and references, I ought to refer to the use I have made of 'Flora Historica' for Vervain and Mandrake."

Ingram (1887) says that this plant is symbolic of magic and inspiration in the "language of flowers". Ranson (1940) says "The name 'verbena' has come to us from the latin, and means sacred branch. Crowns of berbena, or vervain, the family name, were used in Roman public rites. Both the Greeks and Romans regarded the verbena as a peacemaker, and diplomats wore it often in their efforts to make peace with others. It was used also in marriage ceremonies, just as the orange blossom is now....In the Far East the verbena was considered a symbol of enchantment, and was thought to be strong enough to open a locked door.

"Verbena

These dainty round bouquets were made by fairies:

Their tiny fingers, deft and very strong,  
Arranged the lovely fragrant purple blossoms  
In beautiful rosettes the whole day long.

I think the busy, sprightly little fairies  
 Must know a thousand happy things to do --  
 Perhaps if we were diligent and patient  
 Our minds and fingers would be skillful, too.

"Vervain

This is a wayside altar --  
 This quiet country place --  
 The vervain candelabra  
 Lends dignity and grace.

To services of gratitude:  
 Their blue-tipped candles flame,  
 And all the flowers genuflect  
 And praise their Maker's name.

"The vervain was a sacred plant to the Druids, and of Thor, Scandinavian god of thunder. It was used by witches in their brews, and also was employed to hinder their spells. During the time of Shakespeare vervain was hung, with dill and a horseshoe, over the door to keep our evil spirits. It was considered by the ancient herb doctors, or 'simplers', as a cure for almost every disease known. Anxious mothers hung bits of it about their children's necks as a charm against sickness and evil. Christians attributed its miraculous healing qualities to the fact that it was found growing on Mount Calvary, when Jesus was crucified. For hundreds of years it was woven into bridal wreathes and was thought to bring luck to the bride and to help in regaining lost affections.

"With so many powers ascribed to it, it is no wonder that through the centuries it has merited such names as herb of the cross, holy herb, enchanter's plant, lightning plant, simpler's joy and many others. Even today this plant is gathered by French peasants, 'when the moon is right', for important cures. Bees delight in the dainty little lavender refreshment stands the vervain keeps in the sun for their entertainment, and feast on the nectar and pollen." Skinner (1911) says that boiling gun-flints with rue and vervain was supposed to ensure that the shot would reach the intended victim, no matter how poor the aim.

Hegi (1927) says: "Verbena officinalis ist ein alter Kulturbegleiter, dessen ursprüngliche Heimat unsicher ist, aber mit grosser Wahrscheinlichkeit im Mittelmeergebiete liegt. Die pflanze genoss vermutlich bei den antiker Völker eine grosse Verehrung. Nach Plinius war kein Kraut im Altertum wertvoller. Im alten Aegypten hiess die Pflanze die 'Träne der Isis'. Sie wurde bei feierlichen Gelegenheiten verbrannt (Herba sancta) und galt als das beste Wundkraut bei Verwundungen durch eiserne Waffen. Die Hippokratiker empfahlen sie gegen Unfruchtbarkeit. Auch wurde sie gegen Blasensteine, sowie auch als allgemeines Volksmittel benutzt. In Griechenland gilt sie noch gegenwärtig als Glückspflanze. Wann sie nach Mitteleuropa gelangt ist, ist unbekannt. Sie soll aber schon bei den Kelten und Germanen in hohem Rufe gestanden haben. Der heiligen Hildegard war sie als Heilpflanze

bekannt. Von Thal wird sie in der Harzflora (1577) aufgeführt, von Jungermann für Franken (1615). In dem in Lund aufbewahrten Herbar von Rostius (1610) liegt sie unter dem Namen Sideritis. Früher wurde sie viel in Gärten zu medizinischen Zwecken gebaut und die *Hérba Verbénæ s. H. Columbáriæ s. H. sanguinalis* als schleimhaltiges, zusammenziehendes, bitteres Mittel, ferner bei Wechselfieber, Steinleiden und Augentzündungen angewendet. Ferner dienen sie mit Zimmt, Nelken, Vanille und bitteren Mandeln gemischt als Ersatz für chinesischen Tee, ferner als Aufgruss (3 g. auf 1/4 Liter Wasser) gegen Kopfschmerzen, Migräne, allgemeine Schwäche usw. Kneipp empfiehlt diesen Tee auch gegen Keuchhusten, Nieren- und Leberleiden, Wasser- und Gelbsucht. Ein früher viel benutzter Haustee wurde aus 100 g Eisenkraut, 10 g Pfefferminze, 2 g Thymian, 2 g Majoran, 5 g Zimmt und 1 g Muskatblüte gemischt. Die Homöopathie bereitet aus der blühenden Pflanze eine Essenz. Gurken sollen beim Einmachen durch Zusatz von Eisenkrautwurzel schmackhafter werden. Chemisch wurde neben Gerbstoffen, Bitterstoff, Invertin, Emulsin usw. das nicht giftige Gykosid Verbenalin nachgewiesen, das sich in der frischen Pflanze in Form von Kristallnadeln findet, beim Trocknen aber zum Teil verschwindet. — Die Verbena (*verbenaca*, hierobotane) spielte im antiken Aberglauben eine grosse Rolle. Nach Plinius (Nat. hist. 25, 105 ff.) behaupteten die Magier, dass man, wenn man sich mit der Pflanze salbe, alles erlange, was man wolle, dass sie das Fieber vertreibe, Freundschaft erwerbe und alle möglichen Krankheiten heile, dass man sie beim Aufgang des Sirius sammeln müsse und zwar so, dass es weder der Mond noch die Sonne sehe usw. Ob allerdings unter der antiken *verbena* unsere *Verbena officinalis* zu verstehen ist, bleibt recht zweifelhaft. Unter '*verbenæ*' verstanden die Römer ganz allgemein die Kräuter und Baumzweige, deren man sich bei Opfern und anderen Kulthandlungen bediente. Fussend auf den antiken Berichten Quellen erscheint die *verbena* auch im Aberglauben des deutschen Mittelalters. So sagt der Regensburger Domheer Konrad von Meigenberg in seinem 'Buch der Natur' (Mitte des 14. Jahrhunderts), dass das Eisenkraut 'den zaubraeren gar nützz' sein. Auch Bock bemerkt in seinem Kräuterbuch (1551): 'Das Kraut Verbena würt noch heuttigs tags mehr zu der Zauberei dann zu der Artzney gesammelt.' In mittelalterlichen Handschriften sind uns verschiedene Beschwörungen der *Verbena* erhalten. Im heutigen Aberglauben ist das Eisenkraut so gut wie vergessen. Im Anhaltischen gehört es noch vor einigen Jahrzehnten zu den Pflanzen, die das Gewitter abwehren sollten. Man warf es zusammen mit Hartenau (*Hypericum perforatum*) bei einem aufziehenden Gewitter in das Feuer und sprach: 'Eisenhart und Hartenau -- Brennt an, dass sich das Wetter stau.' Im deutschen Volksaberglauben war das Eisenkraut wohl nie wirklich volkstümlich. Durch die Kleriker und Aerzte des Mittelalters war zwar Zeitweise manches über die geheimnisvollen Eigenschaften des Eisenkrauts ins Volk gedrungen, aber es blieb dort nicht haften. "*Verbena officinalis* ist ziemlich wärmebedürftig und fehlt infolgedessen im Norden von Deutschland und in den subalpinen Tälern der Alpen fast ganz. Hingegen ist sie gegen Beschädig-



ungen, vor allem gegen den Tritt von Weidevieh und Menschen sehr unempfindlich und findet sich meist gruppenweise in den Beständen von Lolium perenne und Polygonum aviculare, auf mageren, schwach gedüngten Weiden vom Festuca rubra -- oder Brachypodium pinnatum -- Sieglingia decumbens -- Typus. Nicht selten erscheint sie auch an Wegrändern mit Hordeum murinum und Sisymbrium officinale und S. sophia. Auch auf stärker gedüngten Böden pflegt sie nicht auszubleiben und ist dann mit Chenopodium-Arten, Lepidium draba, Potentilla supina, Ballota nigra, Aethusa cynapium, Dipsacus silvestris, Chrysanthemum parthenium usw. anzutreffen. In Rotkleeäckern ist diese Pflanze in Mitteleuropa selten zu finden, obgleich ihre Samen mit französischen Rotkleeasamen häufig eingeführt werden. -- Die kleinen von Apiden, Tagfaltern, Fliegen usw. besuchten Blüten bergen im Grunde den von der Unterlage des Fruchtknotens abgeschiedenen Nektar und besitzen einen Ring von nach vorn zusammenneigender Haare. Steckt das besuchende Insekt den Rüssel in die Kronenröhre, so streift dieser zunächst zwischen den Staubbeuteln vorbei und trifft erst dann auf die papillöse Fläche der tiefer stehenden Narbe. Da aber die Risse der Staubbeutel nach abwärts gerichtet sind, so wird er sich zunächst nicht mit Pollen behaften. Dies tritt vielmehr in der Regel erst beim zurückziehen des Rüssels ein, weil dann eine Drehung der Staubbeutel bewirkt wird. In der Regel erfolgt also Fremdbestäubung. Doch stehen die beiden unteren Staubbeutel der Narbe so nahe, dass auch mit einer selbsttätigen Selbstbestäubung zu rechnen ist, die anscheinend von vollem Erfolge begleitet ist. Gegendlich treten Blüten auf, in denen nur 2 Staubblätter vorhanden sind. Zur Fruchtzeit ist der Kelch schräg aufwärts gerichtet und gestattet dadurch ein Ausschütteln durch den Wind. Auch vorbeistreichende Tiere können dadurch, das sich die etwas einwärts gekrümmten Kelchblattspitzen an ihrem Felle reiben, zur Ausstreuerung beitragen. Als Schmarotzer treten Didymella effusa Niessl und D. rehmi (Kze.), Erysibe cichoriacearum DC., Mollisia verbenae (Opiz), Ophiobolus cesatianus (Mont.) usw. auf.

"Der Name Eisenkraut (althochdeutsch *isarna* [ergänze chrüt] mittelhochdeutsch *isenkrüt*) ist zunächst eine Uebersetzung des griechischen *sideritis* (Pflanzenname bei Dioskuridis; griech. *sideros* = Eisen). Er ist in vielen Gegenden dem Volk wohlbekannt und dürfte hauptsächlich durch Fachkundige (Aerzte, Apotheker) bzw. durch Bücher dahin gelangt sein. Iserhark [Eisenhark] (Mecklenburg), Eisenhindrik, iserene Hendrek, iren Hendrek [=eiserner Heinrich, vgl. Pflanzennamen wie guter Heinrich, stolzer Heinrich usw.] (Göttingen), Eisick (Nahagebiet)."

Pulteney (1790) says: "In the meantime, in tracing the origin and progress of botanical science in Britain, a survey of its state in the druidical times, ought to claim first attention; but in fact, the little information transmitted to us from the antients relating to this extraordinary sect, being almost wholly confined to Caesar and Pliny, precludes any enlarged view respecting my particular object. It is from Pliny we learn that the

mistletoe, the vervain, the selago and the samolus, these antient fathers of druidism attributed efficacies almost divine; and ordained the collection, and administration of them, with rites and ceremonies, not short of religious strictness, and such as countenanced the grossest superstition....The vervain, after previous libations of honey, was to be gathered at the rising of the dog-star; when neither sun nor moon shone; with the left hand only; after describing a circle around the plant &c; and thus prepared, it banished fevers, and other distempers; was an antidote to the bite of serpents, and a charm to conciliate friendship (from Pliny, Lib. xxv. c. 9)....With respect to this herb, the hierobotane, the sacra herba of Dioscorides, although the modern botanists have not agreed to confine the term to verbena, which Pliny has described, as having narrower and smaller leaves than the oak, it may be remarked, that there has been a diversity of opinions among the commentators, relating to the plant and it is acknowledged that verbena or verbenacea, was also applied, as a general term for all plants used about the altar in sacrifices. To this day the Tuscans apply the word vervena to slips, shoots, suckers or bundles of plants of any kind."

Webster (1942) says "Why this pale-flowered weedy herb ever became so imbued with magical virtues is a mystery. The Druids revered it. Perhaps the styptic tannic principle found in its stems and leaves bears out the legend, cited by Mrs. Grieves in her Herbal, that the herb was found on the Mount of Calvary and used to staunch the wounds of the Saviour. At any rate, as a very sacred and old-world herb, tuck it away in some corner of your mediaeval garden, the only place where it belongs."

As to its supposed medicinal properties, Haller (1768) has this to say: "Inodora planta, & fere insipida: destillantem.... dat ad agnem spiritum acidum, oleum amyreumaticum, & salem aliquem colatilem: in cinere fixus & salsus sal est, non alcalinus. Febres intermittentes succi spissati drachmam bie de die sumtam sanare....., aut certe peruviani corticis potestatem eo remedio adjuvari lego. Balsamum, cum oleo paratum, arcanum est antarthriticum Fulvii Testi....Decoctum cum spititu vini mistum glutem oculos connectens....dissipare dicitur. Ad narium haemorrhagiam veteres....adhibebant. In cataplasmate, cum rhodia radice tritam....dolores capitis sanare, & solam, amuleti modo....., eos dolores sedure, inque pleuritide fotum prodesse....Mihi non videtur ferio in medicinam recipi....Ad Verbenam n. 219. in convulsionibus infantum saepe appensum nihil praestitisse Rosen. Kinder Krankh. p. 79."

Vilmorin-Andrieux report that "Les feuilles entrent dans certaines préparations." Watt (1893) states that "In the Panjab the fresh leaves are considered febrifuge and tonic, and is said to be used as a rubefacient in rheumatism and diseases of the joints. The root is believed to be a remedy for scrofula and snake-bite. At one time it was worn in Europe as a charm against evil, and for good luck. In Tuscany it is said to be still employed as a poultice for liver complaints, and taken internally for the same

disease, and for dropsy."

MacKay (1836) speaks of the name, Verbena, with an origin in "ferfaen in Celtis, derived from fer to drive away and faen, a stone, from having been supposed to cure the complaint so called Theis." He continues: "The genus Verbena is placed by Sir James Edward Smith in the first order of the class Didynamia, but as Doctor Hooker remarks, it does not naturally rank there, being considerably different in the structure of its germen and fruit. This herb has scarcely any aromatic or other sensible quality. The root worn about the neck with a string, is an old superstitious remedy, or charm for the King's Evil [=scrofula]."

Ichekama tells us that the species is regarded as medicinal in Japan, too, while McClure says that on Hainan Island it is used in the treatment of dog bites. Roig y Mesa (1945) avers that it is the leaves and floriferous tips of the stems that are used medicinally in Cuba. According to Pamo "La Verbena oficinal fué considerada como astringente, resolutive, diaforética, antiespasmódica, vulneraria, etc. En la actualidad no se usa." In Eritrea "Las hojas se usan contra la inflamación de los glándulas del cuello." Paris (1963) states that it contains "verbenalin". Robledo is quoted as stating that the plant contains "verbenalina", which "tiene sabor amargo y se emplea como vulnerario." Caffas reports that in Cuba "Las hojas y sumidades de sabor amargo y astringente, se aplican sobre la piel, machacadas y en cataplasmas como vulnerarias. La infusión de las flores (45 gramos por litro de agua), se emplea para los dolores de cabeza."

Pliny, who died in Pompeii in 79 A.D., tells us that no plant was as highly esteemed by the Romans as this one; it was used to decorate Jupiter's altars, to cleanse houses, to guard against bad luck, and (according to Marzell [1930]) "mit der unsere Gesandten nach den Feinden gehen." P'ei (1947) says that in China it is "used by natives as a remedy for inflammation of the intestines." He records it from Sikang. Jyh Ho Chen, in a letter to me dated August 16, 1948, reports that Chinese doctors use V. officinalis in the treatment of malaria, and that the very bitter juice proves "very effective and successful." Perez Arbelaez (1937) states that the dosage is 10--20 grams in 200 grams of water in the treatment of fevers associated with amoebic dysentery and typhoid, administered as a decoction in enemas and tea, and that it is used with efficiency in this way at Bogotá, Colombia.

Loureiro (1790) says: "Virtus. Nervina, Deobstruens. Decoctum prodest in hydrope, cataplasma in tumore scroti." Connor & Adams (1951) report that "Vervain has been suspected of poisoning cattle in Australia on one occasion, but no poisonings have been reported in New Zealand....Vervain contains a glycoside, verbenalin, which appears to be very mildly toxic." Kuwajima (1939) describes a new glycoside, verbenin, but, according to Winde, Echaust, & Hansel (1961) "Das von Kuwajima.....als ein neue Glykosid der Verbena officinalis beschriebene Verbenin konnte in der Droge nicht nachgewiesen werden. Die Vermutung Breitwiesers (1942) wurde nunmehr experimentell belegt, dass Verbenin eine Kristallmodifikation des Verbenalins

darstellt." Hocking (1955) states that it contains a bitter glucoside called verbenalin, a neutral bitter principle tannin, and is used medicinally as a bitter tonic, astringent, and vulnerary in asthma and kidney disturbances; the root being extremely useful for liver and gallbladder disturbances, and the leaves used as a tea substitute.

Coon (1963) says "The constituent which brings Verbena into the medical field is a bitter glucoside and tannin, a simple infusion (2 teaspoons to 1 pint) being employed as a diaphoretic, tonic, and expectorant. There are, in herbal literature, no strong claims made for its efficacy....An exploration of the story of vervain leads us down some ancient avenues and provides an explanation for belief in the efficacy of the plant in herbal medicine. This plant was first used by the Romans. They gave us the name 'verbena', which to them meant any one of a number of plants used in sacrifices, purgation and supplications. Finally the name was attached to one particular plant and the virtues ascribed to Verbena by the Romans were passed along through the centuries until, in the Middle Ages, it was said to have been a plant which, growing on the Mount of Calvary, staunched the wounds of the Savior. The transferral of virtues from pagan to Christian (it has happened in our Christmas celebrations) was not unusual and verbena early became one of the holy herbs associated with St. John. Pliny said 'if the dining chamber be sprinkled in water in which the herb Verbena has been steeped, the guests will be merrier.' Such a story led to the belief in its efficacy as a cure against the plague, and as a remedy for almost anything. It even had supernatural powers. Several Welsh names have meanings such as 'devils' hate' and 'enchantment herb.'"

Jaeger (1961) reports that it produces pollen abundantly from 7 to 11:30 a.m. and in small quantities to 2 p.m. only.

Of very great interest in any discussion of Verbena officinalis is the problem of a possible hybrid between it and the scrophulariaceous Veronica maritima L. This hybrid is now known as xVeronica haartmani Moldenke. Roberts (1929) sums up the situation as follows: "On November 23, 1751, appeared a discussion, included in the Amoenitates Academicæ (vol. 3, pp. 28--52, 1764) by another of Linnaeus' pupils, Johannes Haartman, entitled Plantae Hybridæ. This discussion upon hybrid plants is to be noted, insofar as it reflects the views of Linnaeus and his school on the subject.... Veronica maritima (♀) x Verbena officinalis (♂) is described in the greatest detail (p. 35), and is illustrated. (8b, pl. 11). This natural hybrid is reported as having been produced in the Botanical garden at Upsala in 1750. The statement is made 'neque longe ab his lecta est haec nostra planta [♂], quae antea nulli Botanica visa est' (p. 35). The vegetative and flower characters are described in some detail. The hybrid was perennial, bloomed annually, and was multiplied easily by the roots, but had no fruit ('nullos vero fructus maturat') (p. 36).....The description of the plant is as follows: In height, hoary color of the stem and leaves, smoothness of the stem, structure of the spike, and color



of the corolla, the plant is stated to resemble the Veronica female parent. If the flowers and their color and the roundness of the stem were omitted, 'the most vacuate botanist would have considered it to be Verbena itself' (p. 35); the leaves of the hybrid are said to have had 'exactly the same singular division, with deeply furrowed lobes' (p. 35). The flowers are stated to have been smaller than those of the female parent, and not larger than the flowers of Verbena; the leaves 'sometimes in threes, as in the ♀ but more often opposite, as in the ♂'. Although the plant flowered annually, it was sterile, and bore no fruit, but was perennial and multiplied by the roots. 'Floruit quidem haec planta omni anno felicissime, in annum quo haec edimus, 1755, et vivis radicibus facillime immutata multiplicatur, nullos vero fructus maturavit' (p. 35). It thus appears that Linnaeus' hybrid Veronica, originating in 1750, was still alive in 1755."

Hooker (1836) cites T. Drummond 252 from New Orleans, Orleans Parish, Louisiana, for the typical form of V. officinalis and T. Drummond s.n. [New Orleans, 1833] as his var. spuria, deposited in the herbarium of the Royal Botanic Gardens at Kew.

Schauer (1847) cites Wallich 1825 and Edgeworth s.n. from Nepal; R. Brown s.n. and Lhotsky s.n. from eastern Australia; Bové s.n. from "Africae ora septentr."; Herb. De Candolle s.n. from the Canary Islands; Bergius s.n. from the Cape of Good Hope; Rafinesque s.n. from "America septentr."; Beyrich s.n. from Georgia; Humboldt & Bonpland s.n., Schiede 1167, and Berlandier 159 from Mexico; Sagra s.n. from Havana, Cuba; Sellow s.n. from "Brasilia merid."; and Sellow s.n. from Buenos Aires, Argentina. He notes that Schimper 145 differs in being "demissa, ramis procumbentibus, spica subglandulosa". I suspect that the last-mentioned is var. prostrata Gren. & Godr.

Richard (1851) cites Quartin-Dillon s.n. [Chiré, Aug.] and Schimper s.n. [Adoua, Mai] from Abyssinia. Ascherson (1867) cites Cienkowsky s.n. [Roseres, Senaar, 9 Mai 1848] and Schimper s.n. [Dehli-Dikeno, 23 Oct. 1854], while Engler (1892) cites Hildebrandt 445, Schimper I. 145, 7, & 284, and Rohlf & Stecker s.n. from Abyssinia. Bentham (1870) records the species from Victoria, Australia.

Baker & Stapf (1900) cite the following: ERITREA: Hildebrandt 445; Schweinfurth & Riva 1116; Stuedner 1304. ABYSSINIA: Schimper 7, 145, & 284; Quartin-Dillon s.n. [Shire]; Rohlf & Stecker s.n. [Godofelassi]. SUDAN: Senner: Cienkowsky s.n. KENYA: Scott-Elliott 7800. BRITISH SOMALILAND: Revoil s.n. Pearson (1901) cites the following: REPUBLIC OF SOUTH AFRICA: Cape Province: Burchell 503; Pappe s.n. [near Rondebosch]; Wolley Dod 492. Natal: Drège s.n. [Bashee River]; Gerrard 1249; Haygarth 473 [Herb. Wood 1964]; Krauss 151; Sanderson 92; Tyson 2105. Transvaal: Burke 59 Holub s.n. [Linokana]; Wilms 1175 & 1175a. Province undetermined:

Harvey 405; Miller s.n.; Zeyher 1364.

Domin (1928) cites A. Dietrich 1500 and Domin s.n. [II.1910] & s.n. [III.1910] from Queensland. Dop (1935) cites the following: INDO-CHINA: Annam: Chevalier s.n. [Lang-bian]; Couderc s.n. [Hué]; Evrard s.n. [Dalat]. Laos: Spire s.n.; Thorel s.n. Tonkin: Balansa s.n. [Haiphong]; Bois s.n. [Dong-dang]; Chevalier s.n. [Nam-dinh], s.n. [Phu-tho]; Clemens s.n. [Haiphong]; Couderc s.n. [Hanoi]; Demange s.n. [Hanoi]; Duport s.n. [Cho-ganh]; Eberhardt s.n. [Thuyen-quang]; Hautefeuille s.n. [Chapal]; Mouret s.n. [Nam-dinh]; Pételot s.n. [Cho-ganh]; Simond s.n. [vers Long-tcheou].

Rozeira (1944) cites the following: PORTUGAL: Coul. s.n. [Bragança]; Ferreira s.n. [Murça]; Henriq. s.n. [Sedeilos]; M. Lopes s.n. [Vimioso]; Mariz s.n. [Santulhão]; Rozeira s.n. [Amedo], s. n. [Covas-do-Douro].

The pollen-grain description given by Nair & Rehman (1962) is on the basis of a specimen collected at Hastanapur, India -- "N[ational] B[otanic] G[arden] 44559; Sl[ide] 2725."

Perry (1933) reduces V. domingensis Urb. to synonymy under V. officinalis, noting that "On the whole, the specimens from Santo Domingo and Cuba differ from the typical V. officinalis in their slender and more elongate habit; the inflorescence is scarcely as glandular, the flowers are smaller, and the nutlets often do not exceed 1.5 mm. in length. Nevertheless, the Cuban specimens vary greatly in size, and Curtiss 677 is hardly separable from typical V. officinalis. Since many of the specimens are rather poor, it appears probable that they may very well represent an impoverished condition. Urban himself was somewhat uncertain of the status of his species as he appended the following note in a later publication: 'An re vera a forma V. officinalis L. separanda?' " She cites, in addition to 15 specimens of Cuban and Hispaniolan collections cited hereinbefore by me under V. domingensis, the following 42 specimens not as yet seen by me: MASSACHUSETTS: Essex Co.: Oakes s.n. [Rowley] (G). RHODE ISLAND: Kent Co.: Thurber s. n. [Warwick Neck, 1848] (G). NEW YORK: Kings Co.: Schrenk s.n. [Brooklyn, 13 Sept. 1879] (E). NEW JERSEY: Camden Co.: Parker s. n. [ballast, Camden, 30 Aug. 1874] (G), s.n. [Longacoming, 23 July 1867] (G). Cape May Co.: Gershoy 583 (G). PENNSYLVANIA: Dauphin Co.: Porter s.n. [banks of the Susquehanna, Harrisburg, Oct. 1852] (G). Lancaster Co.: Porter s.n. [Lancaster, 21 Aug. 1861] (G). Philadelphia Co.: Lea s.n. [Philadelphia, 1844] (E). York Co.: MacElwee 873 (E). DELAWARE: New Castle Co.: Tatnall s. n. [Wilmington, 1845] (G). DISTRICT OF COLUMBIA: Ward s.n. [vicinity of Washington, 23 June 1878] (E). VIRGINIA: Accomac Co.: Norton s.n. [Parksley, 11 Sept. 1902] (E). Bedford Co.: Curtiss s.n. [30 June 1870] (E). Smyth Co.: J. K. Small s.n. [Marion, 1892] (E). NORTH CAROLINA: Avery Co.: Wislizenus 1214 (E). Bladen Co.: Biltmore Herb. 4762 (G, N). Currituck Co.: Randolph 587 (G).

Washington Co.: Randolph 645 (G). County undetermined: Curtis s. n. (E). SOUTH CAROLINA: Aiken Co.: Eggert s. n. [streets of Graniteville, 23 May 1899] (E). GEORGIA: Floyd Co.: Chapman s. n. [Rome] (E). FLORIDA: County undetermined: Rugel 121 (E, F). ALABAMA: DeKalb Co.: Eggert s. n. [Collinsville, 29 July 1897] (E). Etowah Co.: Eggert s. n. [Attala, 9 July 1898] (E). TENNESSEE: Carroll Co.: Eggert s. n. [Hollow Rock, 5 Aug. 1897] (E, F). Carter Co.: Small & Heller 484 (E, G). Knox Co.: Ruth s. n. [Knoxville, July 1893] (E). LOUISIANA: Plaquemines Par.: Tracy & Lloyd s. n. [Port Eads, 22 Aug. 1900] (E, G, N). BERLUDA ISLANDS: Main: S. Brown 492 (D, G); Brown & Britton 28 (D, G); F. S. Collins 267 (G); A. H. Moore 2939a (G). St. Georges: Robinson 113 (G).

In all, 1142 herbarium specimens, including the types of several of the names involved, and 27 mounted photographs and illustrations have been examined by me.

Citations: MASSACHUSETTS: Martha's Vineyard: E. P. Bicknell 7353 (N). CONNECTICUT: Fairfield Co.: H. C. Beardslee s. n. [Huntington] (Ob--50814). Hartford Co.: M. Brandegees s. n. [Berlin] (Ca--468123). Middlesex Co.: M. Brandegees s. n. [Middletown] (Ca--468123). New Haven Co.: W. W. Denslow s. n. [Sept. 1863] (Ms). NEW YORK: Bronx Co.: A. Brown s. n. [Hunter's Point, Aug. 10, 1879] (Tc); H. N. Moldenke 20562 (B, F, Fy, Hw, Le, Lm, N, Rs, S, Ss, Ug); J. Schrenk s. n. [Hunter's Point, Aug. 2, 1879] (C). Herkimer Co.: Collector undesignated s. n. [July 2, 1852] (N). Schenectady Co.: Tuckerman 748 (Al). Suffolk Co.: Leggett s. n. [Miller Place, Aug. 1861] (Tc, Tc); E. S. Miller s. n. [Mt. Sinai, Aug. 29, 1873] (N). Ulster Co.: Halsey s. n. [Kingston, 1820] (C). County undetermined: Miller s. n. [Long Island] (Ka); C. H. Peck s. n. (Al); J. Torrey s. n. (C, Pa). NEW JERSEY: Atlantic Co.: Rau 3 (In--10425). Camden Co.: Beringer s. n. [Camden, Aug. 1889] (Mi); Martindale s. n. [Camden, Sep. 1876] (Pu); M. W. Twaddell s. n. [August 8, 1878] (Up). Cape May Co.: K. K. Mackenzie s. n. [Cape May, Sept. 25, 1920] (H--51908, N); W. Stone 15810 (Up), 16317 (Up). Gloucester Co.: Brinton s. n. [Williamstown, June 25, 1889] (Ca--25186). Hudson Co.: Billberg s. n. [Hoboken, 1826] (S); J. Schrenk s. n. [Jersey City, July 9, 1879] (Tc). County undetermined: E. Durand s. n. [New Jersey] (Ky); R. E. Griffith s. n. [New Jersey, Julio] (Ky); Herb. Torrey s. n. (T); J. Torrey s. n. [1835] (Br). PENNSYLVANIA: Delaware Co.: Fogg 5695 (Up). Philadelphia Co.: R. C. Alexander s. n. [Philadelphia] (Ca--379997); I. Burk s. n. [Raighs Point] (Up--17111); Meredith s. n. [Oct. 9, 1920] (N); A. H. Smith s. n. [Navy Yard, July 1866] (Up--17112). York Co.: MacElwee 753 (Um--24), s. n. [York Furnace, June 1896] (Ka--71184); W. Stone 2166 (Up). County undetermined: A. P. Garber s. n. [August 1868] (S). DELAWARE: New Castle Co.: W. M. Can-

by 1960 (Dt); Morong s.n. [Wilmington, Sept. 2, 1873] (Bc). Sussex Co.: Commons 7 (N). MARYLAND: Baltimore Co.: Boldo 92 (Q); LeRoy s.n. [Baltimore, 1866] (C, Du—123488, Gg—31403, Ms, N); K. A. Taylor s.n. [July 9, '91] (Ur). Cecil Co.: Brinton s.n. [North East, July 20, 1890] (Up—17114). Dorchester Co.: C. P. Smith 2935 (I, I). Saint Mary's Co.: O'Neill s.n. [June 13, 1930] (I). Somerset Co.: J. H. Holmes 76 (W). Worcester Co.: C. E. Moldenke s.n. [H. N. Moldenke 6648] (N); H. H. Rusby s.n. [Stockton, Aug. 1889] (C, R); True 13 (Gu—10452, Up). County undetermined: Collector undetermined s.n. [W. D., Maryland] (Lu). DISTRICT OF COLUMBIA: M. S. Bebb s.n. [1862] (N); J. W. Chickering s.n. [6-24-1873] (N); Kearney s.n. [June 20, 1897] (N, Z—drawing); B. H. Patterson s.n. [July 9, '76] (Cm); Peck s.n. (Mi); E. S. Steele s.n. [July 21, 1896] (Ka—82507, Ob—50818, Um—12). VIRGINIA: Accomac Co.: Wilkins 5372 (Up). Montgomery Co.: Murrill s.n. [Blacksburg, 24 June 1895] (N). Norfolk Co.: Meredith s.n. [Norfolk, June 25, 1924] (H—26197), s.n. [Ghent, June 28, 1924; Herb. Dreisbach 3503] (Mi, Mi). Princess Anne Co.: Fernald & Long 4152 (Up); K. K. Mackenzie 1679 (Po—267668). Smyth Co.: J. K. Small s.n. [Marion, June 29, 1892] (Ca—104825), s.n. [Middle Fork, Holston River, Marion, July 6, 1892] (Ca—25185, Fc, Ob—50816, Up—17116, W). Southampton Co.: A. A. Heller 964 (C, Up—17117, W). County undetermined: Collector undesignated s.n. [In Canada, Virginia] (Lu, S); Herb. U. S. Dept. Agr. s.n. (Fc). Chincoteague Island: H. A. Gleason 8548 (N). WEST VIRGINIA: Jefferson Co.: Guttenberg s.n. [Harper's Ferry, Aug. 24, 1878] (N), s.n. [Harper's Ferry, Aug. 28, 1878] (Vt), s.n. [Harper's Ferry, July 22nd] (Cm). NORTH CAROLINA: Bladen Co.: Biltmore Herb. 4762 (N, W—332105). Buncombe Co.: R. H. Ward s.n. [Asheville, Aug. 21, '77] (Ur). Carteret Co.: Blomquist 10360 (H—49850). Currituck Co.: Randolph & Randolph 587 (Ba). Hyde Co.: D. S. Correll 1771 (H—40242); Radford & Stewart 786 (Hi—21562). Iredell Co.: M. E. Hyams s.n. [Statesville, July 1878] (W—147583). Jones Co.: A. E. Radford 37228 (Hi—104887). Madison Co.: G. B. Grant 2926 (Po—267635); J. D. Smith s.n. [Warm Springs, July 27, 1880] (W—1323114). Mitchell Co.: Collector undesignated s.n. [Aug. 9] (Hi—59469). Polk Co.: E. C. Townsend 92 (Pl—87180), s.n. [Columbus, May 31, 1897] (W—341769). Stokes Co.: Small & Heller 484, in part (Ca—25187, Up—17115, W), s.n. [near Hall's Store, Piedmont Springs, July 2, 1891] (Fc). County undetermined: Ashe s.n. [Roan Mtn., July '93] (Hi—59478); McCarthy s.n. [No. Carolina, Aug. 1885] (Ba), s.n. [E. N. Carolina, Aug. 1887] (W—218877). SOUTH CAROLINA: Anderson Co.: J. Davis 8493 (W—1204694). Darlington Co.: Collector undesignated s.n. [June 14, '11] (Hi—59464). County undetermin-



ed: G. McCarthy s.n. [Sept. 1888] (Ka); Short s.n. (Pr). GEORGIA: Rabun Co.: Cuthbert s.n. [Tallulah Falls, Aug. 5, 1899] (Fl—21115). County undetermined: Beyrich s.n. (Br). FLORIDA: Escambia Co.: Curtiss s.n. [Pensacola, summer 1885] (N). County undetermined: Rugel 121 (N, W—511942). ALABAMA: DeKalb Co.: Eggert s.n. [Collinsville, 29 July 1897] (Cm, N, W—754256). Mobile Co.: C. T. Mohr s.n. [waste & cult. lands, Mobile, May 10, 1876] (W—771863), s.n. [Mobile, July 1883] (Mi), s.n. [July—Sept. 1884] (C), s.n. [ballast ground, Mobile, 5/30/1887] (W—771862). County undetermined: Buckley s.n. [Aug. 1840] (Br, T). MISSISSIPPI: Wilkinson Co.: Phares 1733 (W). TENNESSEE: Carroll Co.: Eggert s.n. [Hollow Rock, 5 August 1897] (N). Carter Co.: Small & Heller 106 (Ob—50817), 484, in part (Ka), s.n. [along banks of the Doe River, July 16—17, 1891] (Ba, Dt, Io—20754, Ok, W—298655). Knox Co.: Ruth s.n. [June 1893] (Se—95716), s.n. [Knoxville, July 1893] (Dt, Ob—50815). LOUISIANA: Livingston Par.: Herb. Torrey s.n. [Albany] (T). Orleans Par.: Gates s.n. [near New Orleans, 1829] (T). Plaquemines Par.: Tracy & Lloyd 17 (Cm, N, Tr, Up—50898, W—383530). NEW MEXICO: Taos Co.: D. A. Johansen 600 (Gg—194251). OREGON: Multnomah Co.: J. C. Nelson 835 (Du—77653), 4841 (Or—17459); Suksdorf 1894 (Pl—138402). CALIFORNIA: Amador Co.: Belshaw 2454 (Ca—124400); G. Hansen 477 (Du—24213). San Diego Co.: H. P. Chandler 5122 (N); F. W. Johnson 1665 (N); Orcutt & Bowne s.n. [San Diego, 1884] (C). MEXICO: Nuevo León: F. W. Pennell 16880 (D—733979, Me, W—1640298). BERMUDA ISLANDS: Main: S. Brown 492 (N, W—848354); Brown & Britton 28 (N, Up—45621, W—524781); F. S. Collins 267 (Cm, N, W—717561); O. Degener s.n. [Hungry Bay, July 26, 1921] (Ba); A. H. Moore 2939a (Gg—155395, Mi, N). Island undetermined: Bailey, Bailey, Whetzel, Degener, & McCallan s.n. [July 26, 1921] (I); O. Degener 1306 (N); Marble 791 (N). BRAZIL: Rio de Janeiro: O. M. Barth 16 [Herb. Inst. O. Cruz 233] (W—2342992). BOLIVIA: Cochabamba: Buchtien 2414 (N). CHILE: Arica: Buchtien 4380 (W—1159367). Valdivia: Claude-Joseph 5408 (W—1470520); Hollermayer s.n. [Werdermann 1916] (W—1541196); Kunkel 397 (Sm); Sparre 2262 (S). Valparaíso: Behn s.n. [7 Decbr. 1920] (Ca—498614). Teja Island: Hollermayer s.n. [Werdermann 1916] (E—999029, N, N, S). TRISTAN DA CUNHA: Mejland 341 (Bm, Go). AZORES ISLANDS: Faial: C. S. Brown 213 (W—262279). MADEIRA: N. J. Andersson s.n. [Madeira, 1851] (S); Gonçalves da Costa s.n. [Alegria, Maio 1928] (Go); Hornbeck s.n. [Madeira] (Cp). CANARY ISLANDS: Gran Canaria: A. C. Cook 35 (N, W—536157), 569 (Ca—202072, Cm, Du—81264, Gg—31407, Go, Mi, N, Ob—14870, Or—14239, Po—220439, Ur, W—536746); Kuntze s.n. [31/XII/87] (N). Gomera: W. M. A. Brooke 427 (Bm). Lanzarote: R. T. Lowe s.n. (Bm). Tenerife: Asplund 1148 (S);

C. B. Clarke 2018 (Br); Tullgren 194 (S). GREAT BRITAIN: England J. Ball s.n. [South-West part of Herefordshire, Aug. 1848] (W--682455); Beeby s.n. [29.7.1888] (Go, S); A. J. Berggren s.n. [11.7.1920] (S); Britton & Britton s.n. [Brighton, July 22, 1888] (C), s.n. [Canterbury, Aug. 5, 1888] (C); R. Campbell s.n. [Hampton Courts, July 10, 1890] (Mm--20479); Collector undesignated s.n. [Freshwater Church, Sept. 1866] (Mi); M. Dehn 1 (N, N); Doubleday s.n. [Eppius] (C); Gentil s.n. [Teddington] (Br); P. J. Greenway 340 (N); R. A. Harper s.n. [Chisham, 9/21/1889] (Cm); Haworth s.n. (T); Herb. Lemmon s.n. [Clifton, August 8th, 1831] (Ca--329283, Ca--329284); Herb. Lond. Univ. s.n. (W--71960); Herb. Marie-Victorin s.n. [Croyden, 13 Oct. 1831] (Vi); Hooker s.n. [Aug. 1823] (Vi); Horwood s.n. [23/8/36] (Go); J. H. Lewis s.n. [22. VIII.1877] (LL); O. Lindblom s.n. [Aug. 1929] (S); Linton s.n. [18.VII.1885] (S); Lomax s.n. [16 Augusti 1891] (Du--90897, Ob--14871); R. M. Middleton Jr. s.n. [Oct. 1859] (Mm--15386); W. H. Painter s.n. [July 1883] (S); Pease 8280 (Gg--31501); Roekentz 1217 (Br); C. Skottsberg s.n. [11 Juli 1920] (Go); Tracke s.n. [Cornwall, 1832] (Vi), s.n. [near Helston, 1836] (M); Turrill s.n. [Keston, July 2, 1921] (Ba), s.n. [Oxford, 15.VIII.1933] (S); T. Twining s.n. [near Kingston, 1842] (Ca--330213); L. F. Ward s.n. [Corfe Castle, Aug. 18, 1894] (W--229639); H. C. Watson s.n. (La); B. Welch 5217 (Go); J. W. White s.n. [Bank of Avon, July 30, 1883] (Bl--42349), s.n. [July 20, 1883] (Go); J. W. Wood s.n. [July 1841] (Ms). Scotland: B. James s.n. [1852] (Mm--15387). Wales: A. E. Wade s.n. [July 1935] (Ms), s.n. [Aug. 1950] (Vi). EIRE: S. A. Stewart 5843 (Pr). SCILLY ISLANDS: Buller s.n. [Scilly Is.] (Wp). CHANNEL ISLANDS: Guernsey: R. Harvey s.n. [11th July 1863] (Bl--42351). Jersey: L. Arsène 454 (Vi). SWEDEN: Agardh s.n. [Klågerup] (S); N. J. Andersson s.n. [Skane, 1846] (S); Björding s.n. [Lund, Augusti 1880] (N); C. Blom s.n. [14/8/1936] (Go, S), s.n. [7/7/1948] (S), s.n. [12/10/1952] (S); Cöster s.n. [18/8/74] (S), s.n. [Aug. 1874] (Go, S), s.n. [1875] (S); Falck s.n. [Råflunda, 7 Sept. 1861] (Go); Hallberg s.n. [Göteborg] (Go); Herb. Hort. Bot. Gothenburg s.n. [1840-talet] (Go); Herb. Linnaeus s.n. (F--photo, F--photo, N--photo, N--photo, S, Sg--photo, Sg--photo, Z--photo, Z--photo); Herb. Mus. Bot. Stockholm s.n. [1841] (S); Hjorth s.n. [August 1862] (Go); Kohler s.n. [1.IX.1921] (Go), s.n. [IX.1921] (Ew); Leche s.n. (S); Lilja s.n. [1855] (Go); Lindeberg s.n. [Aug. 1862] (Go); Mortensen s.n. [11 Aug. 1883] (Bl--42350); Nordquist s.n. [Skane, 1850] (S); Rasch s.n. [13/7/87] (Go); Ringirg s.n. (S); Ringstrand s.n. [Raflunda] (Go), s.n. (S); Sjöberg s.n. [1/7/1928] (S); Sjövall s.n. [September 1884] (Go); Sondén s.n. [Tyckland, 1908] (S); C. G. H. Thedenius s.n. [Sept. 1898] (Ca--206308, Go);

K. F. Thedenius s.n. [29/7/1874] (S); Visbig s.n. (Go); Westerberg s.n. [17/8/1872] (S); Winslow s.n. [Göteborg, 1872] (Go).  
 BORNHOLM ISLAND: M. Engstedt s.n. [4/8/1908] (S); Klörker s.n. [25 Juli '83] (S); Krok s.n. [Juli 1865] (S, S); E. O. F. Nyman s.n. [3/9/86] (S). POLAND: Anderberg s.n. [14/7/1929] (Go); Dybowski 64 (S); Jungner s.n. [14/10/1906] (S); Nilsson & Degelius s.n. [14/7/1929] (S); Stendfinski s.n. [6.8.1872] (W-2156791).  
 DENMARK: Andersen s.n. [19/8/1895] (S, S); Christensen s.n. [2/7/96] (S), s.n. [28.VIII.1896] (Go); Cöster s.n. [Juli 1868] (S); M. Engstedt s.n. [4/8/1908] (Go, S); Ernstsen s.n. [1/7/68] (S, S); A. Hansen s.n. [31/8/98] (Go), s.n. (S); O. Hansen s.n. [10/8/96] (S), s.n. [10/10/97] (S); T. Holm s.n. [7/1881] (S); Johanson s.n. [4 Juli 1883] (S); Lorenzen s.n. [27/VII/1911] (S); Mortensen s.n. [21/7/1880] (S), s.n. [11 Aug. 1883] (S); H. F. Poulsen s.n. [8.1919] (S); Rosenberg s.n. [Kjörup, 9/8/1849] (S); A. E. Thomsen s.n. [5/8/1873] (S), s.n. [Aug. 1873] (S), s.n. [27/7/1908] (Hi--188874); Troiel s.n. [Haverup ved sorø, 2/8/1862] (S); Virliz s.n. (N); Visby s.n. [6/1853] (S); Vogel & Jørgensen s.n. [Fredensborg, 3/9/1876] (S). NETHERLANDS: Collector undesignated s.n. (I); De Mol s.n. (Bz--23784); Goester s.n. [Schalkwijk] (Ba); Henrard & Tap s.n. [20 Juni 1917] (La); Jonker & Kramer 210 (We); Oudemans 5014 (Br); Reclaire s.n. [Rotterdam, Juli 1898] (W-1750319); Tap s.n. [Aug. 1913] (La). LUXEMBURG: Lundberg s.n. [23/9/1925] (Go). BELGIUM: Bamps s.n. [Hasselt, Aout 1874] (Br); Bommer s.n. (Br); Busschodts s.n. [7 Juin 1886] (Br); Coemans s.n. (Br); Collector undesignated 3787 (Ca--95544); Coemans & Coemans s.n. [31 Juillet 1863] (Br), s.n. [14-7-79] (Br), s.n. [Août 1896] (Br); Crépin 165 (Br), s.n. [22/7/66] (Br); De Wilde-man s.n. [Laeken, 1881] (Br); De Witte s.n. [26 Juillet 1923] (Br); Evrard s.n. [25 juillet 1884] (Br); Guns s.n. [Juillet 1903] (Br), s.n. [16 juillet 1924] (Br); Hector 103 (Br); Henry s.n. [Namur, août 1882] (Br); Herb. Hort. Brux. s.n. [16 juillet 1924] (Ca--314048), s.n. [2 août 1927] (Ca--406664); Herb. Jard. Bot. Brux. s.n. [Blegny, 3 Juillet 1913] (Br), s.n. (Br, Br, Br); Lamabréé 3787 (W-2091277, W--2319331); Laurent 109 (Br); Lejeune s.n. (Br, Br); Lejeune & Coart 165 (Br); Libertae s.n. (Br); Lom-rabréé 3787 (Vi); Lundberg s.n. [8/IX/1927] (Go); Martinis s.n. [Juillet 1855] (Br); Mathieu s.n. [18-8-1907] (Br, Br); Michiels s.n. [11/8/1938] (Vi); Nyst s.n. [Env. de Brux.] (Br), s.n. (Br); Piré s.n. [Août 1873] (Br); Serclaes 9 (Br); Theux s.n. [Août 1908] (Br); Troch s.n. [Août 1883] (Br), s.n. [Juillet '90] (Br); Vandenbroeck s.n. [31 Juillet 1878] (Br); Van Haesendonck s.n. (Br); Van Heurck 4 (Br); Vermoesen s.n. [Curango-Hasselt, 7-8-1920] (Br, Br), s.n. [27 Juillet 1922] (Br); Wathelet s.n. [15

Août 1909] (Br). FRANCE: J. Ball s.n. [Paris, Oct. '39] (W--682442); Beger s.n. [12.VII.1916] (B); Billiet 1907 (Um--15); Bonne s.n. [fin juillet 1932] (It); Chamberet 2514 (Vi); S. L. Clarke s.n. [Mt. Revard, Aug. 8, 1898] (Lh); Coomans & Coomans s.n. [Nancy] (Br); Copineau s.n. [Douellens, 7 Jul. '90] (W--202597); Corbière s.n. [Cherbourg, 17/8/1886] (W--71990); Deize s.n. [Août 1896] (Du); L. Dempster 2402 (Ca--179923); Dongé s.n. [Juillet 1927] (Br, Br); G. Een s.n. [Clermont, 2.7.1955] (S); L. Engstedt s.n. [12/7/1937] (S); Erdmann s.n. [14/7/10] (S, S), s.n. [15/7/10] (S); Francaville s.n. [Alnalit, Pyrenees] (S); Gautier s.n. [12 Juin 1880] (Du); Gombault s.n. [Pouan, 18 juillet 1917] (S); Grapengiesser s.n. [12/8/1926] (S); Hård av Seyerstad s.n. [10/9/1947] (Go); Herb. W. H. Harvey s.n. [Liancourt] (Du--166463); Herb. Saldanha 2773 (Ja); Lassimonne 529 (W--274236); Lemée s.n. [Auch, 1922] (Bt--33828); S. Lindman s.n. [23 Juli 1925] (S); Mougeau s.n. [Août 1860] (Du); Nyman s.n. [7 Aug. 1860] (S); Östrand s.n. [25.6.1899] (S); Peyron s.n. [Juli 1891] (S, S); Puget s.n. [Annuy, Juillet 1853] (Vt); Segerström s.n. [17/6/1924] (S); Tidestrom 12985 (N, W--1554891), 13037 (I, W--1554904), 13282 (I, N), 13786 (N); E. Wall 5, in part [29/725] (Ew); Zetterstedt s.n. [16/7/1856] (Go), s.n. [6/10/1856] (S). PORTUGAL: J. J. Barros s.n. [V.26] (B), s.n. [VI.26] (B); Lemos 157 (Hi--202055); Linderoth s.n. [1858] (S), s.n. [Buzaco] (S); Rainha 2079 (W--2189943); Sjögren 453 (S). SPAIN: Albo s.n. [Alrededores de Santa Elena, 26.V.1933] (W--2213384); H. Delessert s.n. [Valence, 1850] (Du--166448); Knoche C.39 (Du); Kretzhmer 568 (S); Roivainen s.n. [17/6/1950] (S), s.n. [1950] (S), s.n. [11/4/1952] (Ca--97085); Zetterstedt s.n. [Barcugnas, 16/7/1856] (N, S). BALEARIC ISLANDS: Majorca: Knoche 2496 (Du--398343); Sjöberg s.n. [Mallorca, 27/10/1930] (S), s.n. [Mallorca, 7.XI.1930] (S). GERMANY: Benedicks s.n. [Gernrode] (S); C. Billot 67 (S); Bornmüller s.n. [Leipzig, 1878] (B), s.n. [Berka, IX.1897] (B), s.n. [12.VIII.1911] (B), s.n. [Ettersberg] (B); Chalmot s.n. [Göttingen] (W--368144); Collector undesignated 167 (Go), 172 (Ms), 226 (Du), s.n. (B); Degener & Degener 23405 (Ur); Dietrich 740 (Br); Döll s.n. [1843] (Br); Emmert s.n. (Vi); Erdmann s.n. [14 Juni 1914] (S, S), s.n. [14 Juli 1914] (Go); Erichsen s.n. [4/7/86] (Go); Fahrenholtz s.n. [Anfang Septbr. 1900] (Po--63918, Vt, W--980946); Felsmann s.n. [2/8/86] (Go); Grapengiesser s.n. [16/8/1929] (S, S); Gross s.n. [Brandenburg, 24/6/1920] (Sp--25790); Grossman s.n. [Leipzig, 1896] (M1); Guyot s.n. [Berlin, 7/33] (Pr); Hafström & Hafström s.n. [Wiesbaden, 1888] (S); Hase s.n. [Thüringen, 1906] (B); Harle 252 (Bt--46379); Heiland 6 (La); Helledaj s.n. [2 Juli 1886] (S, S); Herb. Calif. Acad. Sci. 31391 (Gg); Herb. Coll. Pharmacy s.n. (Pa); Herb. Landwirt. Hochsch. Berlin s.n. (B, B).