

long, 24 mm. wide, entire, channeled toward base, covered beneath with white appressed scales, glabrous above; scape erect, 8 mm. in diameter, soon glabrous; scape-bracts lance-triangular, entire, all but the lowest remote; inflorescence (only one known) bipinnate with a single lateral branch, over 3 dm. long, appressed-stellate but soon glabrous; primary bract broadly ovate, apiculate, 6 mm. long; racemes elongate, laxly flowered with long sterile laxly bracteate bases; floral bracts broadly ovate, 5 mm. long; pedicels ascending at anthesis, 15 mm. long, sepals oblong-lanceolate, obtuse, 27 mm. long, ecarinate; petals obtuse, naked; ovary 4 mm. inferior. Pl. II, fig. 15: Lateral branch of inflorescence x 1/2; fig. 16: Flower x 1; fig. 17: Sepal x 1.

Type in the Gray Herbarium of Harvard University, collected in semi-shade on sandy limestone cliff, quebrada (ravine) in Cerros de Rio Ytau, 65 km. west of Manuel Pedraza, 12 km. west of San Pedrico, Department of Oran, Province of Salta, Argentina, 800 meters altitude, October 31, 1938, by W. J. Eyerdam and A. A. Beetle (No. 22795 in Goodspeed Expedition).

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MATERIALS TOWARD A MONOGRAPH OF THE GENUS VERBENA. IV

Harold N. Moldenke

VERBENA BIPINNATIFIDA Nutt.

A continuation follows of the listing of specimens cited by Miss Perry, but not as yet examined by me: TEXAS: Bexar Co.: Berlandier 429=71749 (G), 1449=189 (G); Eggert s.n. [San Antonio, 4 April 1901] (G); Groth 30 (F, G, W); Moore & Steyermark 3001 (E); Von Schrenk s.n. [vicinity of San Antonio, April 1919] (G); Wilkinson 9 (E). Brazoria Co.: Bush 205 (E, W). Comal Co.: Lindheimer 1072 (E, F, G, W), 1073 (E, F, G, W). Dallas Co.: Eggert s.n. [Dallas, 22 June 1899] (E), s.n. [near Garland, 24 June 1899] (E); Reverchon 739 (E, W), 1962 (E, F, G, W), s.n. [Dallas] (G, W). De Witt Co.: Howell 308 (W). Edwards Co.: M. E. Jones 26228 (E). Gillespie Co.: G. Jermy 183 (E). Goliad Co.: Berlandier 2428=998 (E, G). Hays Co.: Trelease s.n. [San Marcos, 11 June 1897] (E). Hemphill Co.: Eggert s.n. [Canadian, 10 Aug. 1900] (E); Howell 111 (W). Hood Co.: Eggert s.n. [near Granbury, 4 May 1900] (E); E. J. Palmer 6510 (E). Kaufman Co.: Tyler s.n. [vicinity of Terrell, 4 May 1904] (W). Kinney Co.: Mearns 1252 (W), 1274 (W), 1394 (W). Navarro Co.: E. J. Palmer 7821 (E). Parker Co.: S. M. Tracy 7999 (E, F, G, W). Tarrant Co.: Ruth 107 (E, F, G, W). Taylor Co.: Eggert s.n. [near Abilene, 7 June 1900] (E); S. M. Tracy 8000 (E, F). Travis Co.: E. J. Palmer 33389 (E, G). Victoria Co.: Eggert s.n. [near Victoria, 10 April 1900] (E); Maxon 3808 (W); E. J.



Palmer 9098 (E). Walker Co.: Dixon 561 (F). County undetermined: Lindheimer 232 (E), 289 (E, F, G, W), 307 (G). NEW MEXICO: Chaves Co.: Earle & Earle 526 (E). Santa Fe Co.: Earle 84 (E). County undetermined: W. Wright 1502 (G, W), 1504, in part (D). ARIZONA: Cochise Co.: Blumer 1345 (E, F, G); Goodding 251 (G), 495 (G); Goodman & Hitchcock 1211 (E). Coconino Co.: D. T. MacDougal 317 (D, F, G). Pima Co.: Pringle s.n. [April 13, 1881] (G). Santa Cruz Co.: Peebles, Harrison, & Kearney 4549 (W). MEXICO: Chihuahua: Nelson 6117 (G, W); Townsend & Barber 139 (E, F, G, W). It should be noted that the New York specimen of Visher 2132, which she cites here, is regarded by me as V. ambrosifolia Rydb., and those of Bush 4029, Blumer 1345, Earle & Earle 526, Goodding 251, and G. W. Stevens 14 are regarded by me as V. bipinnatifida var. latilobata Perry. She cites Hayden s.n. (E) from Montana with a question -- the label merely says "sandy soil along Yellowstone and Upper Missouri". She cites M. E. Jones 26228 and 26229 as "in part", the former as a mixture with V. pumila Rydb. and the latter with V. halei Small. She cites Berlandier 1449-189 in the Gray Herbarium as from "San Antonio de Bexar" [Bexar Co.], but I have cited no. 1449 in the Lund herbarium as from Travis Co., Texas.

Miss Perry annotated a specimen of Mearns 159 from Flagstaff, Arizona, collected on June 17, 1887, in the Columbia University Herbarium at the New York Botanical Garden as "V. bipinnatifida Nutt." in 1932, but does not cite it under that species in her monograph; it is probably the Mearns s.n. which she cites there under var. latilobata, and I am also so regarding the collection. She cites an Eggert s.n. from "along railroads, Miller Co. [Arkansas], 19 June 1908" as in the New York herbarium -- actually the date of this collection is "1898", not "1908".

Miss Perry, in her very excellent monograph of the North American species of Verbena, notes that "In the specimens from Arizona and Mexico.....the pubescence is hispidulous and the spikes at maturity are, for the most part, dense rather than elongated. The typical form of the species is very easily recognized by the hispid-hirsute pubescence, particularly of the inflorescence, the lack of glands, the long floral bracts, the elongating spike, the deeply cut leaves, and a rather coarse habit. Apparently it intergrades with V. ciliata in northern Mexico, with V. ambrosifolia in New Mexico, and at times with V. canadensis in the southwestern part of its range. Nevertheless, in spite of the many intermediate phases, it seems preferable to maintain each group as specific entities."

In all, 1138 herbarium specimens, including the types of most of the names involved, have been examined by me.

Citations: GEORGIA: Richmond Co.: Cuthbert s.n. [Augusta, May 1, 1903] (Fl--21063, Fl--21064). ALABAMA: Dallas Co.: R, M.



Harper 15 (N). Greene Co.: R. M. Harper 3183 (Ba, N); W. H. Rhoades s.n. [Clinton, July 1927] (Hs, N). Montgomery Co.: L. H. Bailey 45 (Ba); L. H. Pammel s.n. [May 30, 1921] (Io--102436); W. H. Rhoades s.n. [H. N. Moldenke 17089; Montgomery, July 1931] (Bt, N, St). Sumter Co.: W. H. Rhoades s.n. [near Gainesville, July 1927] (N). MISSISSIPPI: Lee Co.: R. D. Ray 5858 (N); B. Shelton 79 (St). Lowndes Co.: Diener 930 (Tl). Oktibbeha Co.: Weatherby & Weatherby 6313 (N, Up). Scott Co.: W. H. Rhoades s.n. [Morton, July 1927] (N). Sharkey Co.: J. D. Ray 4923 (N). SOUTH DAKOTA: Brookings Co.: Gunn s.n. [Brookings, 7-10-1895] (Io--15336). Brule Co.: E. N. Wilson s.n. [July 1893] (Ob--50770). Custer Co.: Hayward 2562 (Se--77056). Fall River Co.: Rydberg 935 (C, N). Hughes Co.: T. A. Williams s.n. [Pierre, Sept. 2, 1891] (N), s.n. [Blunt, Aug. 16, 1892] (Pl--22605); Williams & Wilcox s.n. [Pierre, 1891] (Ob--50769). Lyman Co.: Over s.n. [July 14, 1914] (Se--14956). Mellette Co.: Brenckle 51323 (Le); E. J. Wallace s.n. [White River, 7/16/1896] (N). Shannon Co.: Visher 2177 (N). Todd Co.: C. J. Elmore s.n. [Rosebud, Aug. 24, 1914] (Je--3154). County undetermined: J. B. H. s.n. [Bad Lands, June 1886] (Ca--25129). KANSAS: Barber Co.: W. H. Horr 3569 (Lw). Cloud Co.: Carleton s.n. [Warren, July 20, 1883] (Ur), s.n. [Aug. 20, 1884] (Ka), s.n. [June 14, 1886] (Ka, Ur, Ur, Ur); S. V. Fraser 442 (Ka--78951). Decatur Co.: A. S. Hitchcock s.n. [Jennings, June 25, 1892] (Ka). Ellis Co.: Bondy s.n. [June 7, 1935] (Se--54978); G. C. Deane s.n. [June 24, 1882] (Dt); F. C. Gates 16931 (Ka--76208); A. S. Hitchcock 393 (N), s.n. [Plains, July 16, 1895] (Ka); Imler s.n. [May 18, 1928] (Lw); Kellerman 9 (N); Rydberg & Imler 1166, in part (N), 1183 (Ka--75067), 1212 (N), 1253 (Lw, N); Sci. Exped. '85 s.n. [June 26, 1885] (Ka); H. Shepherd 83 (Cm, Dm, En, Ms, Ok, St--9211, Vt). Ellsworth Co.: M. Becker s.n. [Kanopolis, Summer 1896] (Ka); A. S. Hitchcock s.n. [Ellsworth Co., July 1895] (Ka). Geary Co.: F. C. Gates 17500 (Ka--79408). Gove Co.: A. S. Hitchcock s.n. [Gove Co., July 1895] (Ka). Graham Co.: Imler 21 (Ka--74707), 2021 (Bl--42247), s.n. [Bogue, Sept. 12] (Lw). Hodgeman Co.: A. S. Hitchcock s.n. [Hodgeman Co., August 1895] (Ka). Jewell Co.: W. H. Horr 4368 (N); B. Osborn 863r (Ka--88363). Kearny Co.: A. S. Hitchcock s.n. [Kearney Co., Aug. 29, 1897] (Ka). Lane Co.: F. C. Gates 16684 (Ka--75855). Lincoln Co.: F. C. Gates 16492 (Ka--75806); A. S. Hitchcock s.n. [Lincoln Co., July 1895] (Ka). Logan Co.: A. S. Hitchcock s.n. [Winona, May 1895] (Ka). Meade Co.: A. S. Hitchcock s.n. [Meade Co., Sept. 1, 1897] (Ka); W. H. Horr s.n. [5/7/42] (Lw). Mitchell Co.: Carleton s.n. [May 19, '88] (Ka). Morton Co.: A. S. Hitchcock s.n. [Morton Co., August 1895] (Ka). Ness Co.: A. S. Hitchcock s.n. [Ness Co., August 1895] (Ka). Norton Co.: F. C.



Gates 17456 (Ka--79334), 18081 (Ka--88035). Osborne Co.: A. S. Hitchcock s.n. [Osborne Co., June 20, 1897] (Ka); Shear 38 (C). Ottawa Co.: Godlove 319 (Ka--93071). Pawnee Co.: A. S. Hitchcock s.n. [Pawnee Co., August 1895] (Ka). Philipps Co.: A. S. Hitchcock s.n. [Philipps Co., June 29] (Ka). Republic Co.: A. S. Hitchcock s.n. [Courtland, June 24, 1892] (Ka). Riley Co.: Birch s.n. [5-22-1899] (Ka); Carleton s.n. [Manhattan, May 31, 1886] (Ur, Ur), s.n. [May 31, 1886] (Ur); J. W. Finley s.n. [se. of Manhattan, May 27] (Ka); A. Nelson 8245 (N); S. Stewart s.n. [May 11] (Ka). Rooks Co.: E. Bartholomew s.n. [Rockport, June 12, 1889] (Ka); Clothier s.n. [Aug.-Sept. 1898] (Ka); Imler s.n. [Sep. 12, 1929] (Lw). Rush Co.: A. S. Hitchcock s.n. [Rush Co., August 1895] (Ka). Russell Co.: Carleton s.n. [June 25, 1885] (Ur); Kellerman s.n. [June 25, 1885] (Ka). Saline Co.: Carleton s.n. [7/28/1892] (Ka); Hancin 251 (Ka--76788). Sheridan Co.: C. Weber 36 (Ka--78147). Smith Co.: W. H. Horr E.108 (B, Mv, Ok, S, St, Tl, Ur, We), W. 108 (Ca--44951); Kellerman s.n. [Smith Center, July 10, 1888] (Ka). Thomas Co.: A. S. Hitchcock s.n. [Thomas Co., June 27, 1897] (Ka). Trego Co.: F. C. Gates 16666 (Ka--75838); M. Reed s.n. [July 8, 1892] (Ka), s.n. [July 1892] (Ka). Wabaunsee Co.: Bartley 1240 (N); W. H. Horr s.n. [April 28, 1939] (Lw). Washington Co.: Dodd 35 (Ka--80595), 58 (Ka--80595). County undetermined: W. M. Canby s.n. [western Kansas, July 1871] (Pa); Oyster 4672 (N); W. S. Rusby s.n. [n. west Kansas, 1878] (Cm). MISSOURI: Jackson Co.: B. F. Bush 4029 (S). County undetermined: L. H. Pammel s.n. [5/20/00] (Io--46199). ARKANSAS: Clark Co.: Demaree 16114 (N), 17198 (Du--256564, Gg--267601, It, Ky, N, N, N, Ok, Ur). Hempstead Co.: E. J. Palmer 8045 (Gg--182153, Mg--59). Izard Co.: F. W. Pennell 10696 (N), 17004 (Gg--267608). Miller Co.: Eggert s.n. [19 June 1898] (N). County undetermined: Nuttall s.n. [Red River] (C--isotype); Wibbe s.n. [9-10-79] (Al). LOUISIANA: Caddo Par.: Cocks s.n. [June 1908] (Tl). East Feliciana Par.: Drummond 194 (Lu), 212 (Lu). Rapides Par.: Ball 401 (N). Saint Mary Par.: Langlois s.n. [17.VII.1893] (I, N). Vermilion Par.: Langlois s.n. [28.V.1883] (I). COLORADO: Baca Co.: W. A. Weber 4588 (Ca--945347). NEBRASKA: Boyd Co.: F. E. Clements 2055 (Gg--31292), 2776 (Gg--31292, Ka). Furnas Co.: J. W. Barnhart s.n. [Hendley, June 4, 1885; Herb. J. H. Barnhart 134] (N). Sherman Co.: J. M. Winter s.n. [June 11, 1931] (Ob--50773). Valley Co.: C. Emig s.n. [Ord] (We). Webster Co.: H. Hapeman s.n. [Red Cloud, May 31, 1926] (Up). County undetermined: Swezey 104 (C). OKLAHOMA: Beaver Co.: G. W. Stevens 346 (N, St--9219). Beckham Co.: Demaree 12451 (Ok--20375, Ok--22233); J. Engleman 1737 (Ok); J. R. McFarland 84 (Ok); Neill 27 (Ok); Stratton 4302 (Ml, N, St--26135, St--26136); Waterfall 1998 (Ok,



St). Blaine Co.: J. Engleman 1272 (Ok). Bryan Co.: W. S. Blain s.  
n. [Durant, April 10, 1934] (Bt--29693); Bragg 2 (St--15632); C.  
S. Sheldon 48 (Se--14957). Caddo Co.: Graumann 17 (St--17578);  
Edw. Palmer 47 (N). Carter Co.: Demaree 12296 (Ba, Ok--22206, St--  
12969); Demmer 31 (Ok), 46 (Ok); M. Hopkins 4691 (Ok), 4714 (Ok,  
Ok), 4837 (Ok), 6094 (Ok); Hopkins, Nelson, & Nelson 1131 (Ok);  
Marian 38 (Ok); A. G. Payne 18 (Ok); Rinehart 193 (Ok). Choctaw  
Co.: Estes 93 (St--17572); Hopkins, Nelson, & Nelson 328 (Ca--  
742335, Ok); McAfee 46 (St--21503); Nelson, Nelson, & Goodman  
5534 (Ok); Smith & Randall 73 (Ok); Spears 77 (Ca--882567, St--  
17566). Cimarron Co.: Rigney 129 (St--20028); Smith & Rinehart  
82, in part (Ok); Stratton 449 (St--26130), 5195 (N, St--26153,  
St--26154); Waterfall 3144 (Ok), 9049 (Ok). Cleveland Co.: Babb 3  
(Ok--10277); R. E. Chase 50 (Ok--10281), 97 (Ok--10280); Fielder  
s.n. [5/16/27] (Ok--10268); Hibbard 17 (Ok--10282); Louise Martin  
s.n. [6-22-28] (Ok--10271); Pitts s.n. [4/19/15] (Ok--20477, Ok,  
Or--18974). Comanche Co.: Buttram & Buttram 40 (Ok); M. K. Clemens  
11751 (Ba, Gg--37142), s.n. [Fort Sill, Apr. 27, 1916] (Ba); C.  
T. Eskew 1663 (Ok), 1675 (Ok), 1750 (Ok); Hopkins, Nelson, & Nel-  
son 801 (Au, Ca--742279, N, Ok, St--26115); M. L. Nelson 49 (Ok);  
C. S. Sheldon 48 (Al); Waterfall 13097 (St). Custer Co.: Mericle  
1571 (Ok); Waterfall 1165 (Ok). Davis Co.: M. Hawkins 37, in part  
(Ok). Ellis Co.: Clifton 3085 (Po--127527), s.n. [Stevens 3085]  
(Ur). Garfield Co.: Gephardt 1016 (Ok). Garvin Co.: Kennedy 318  
(Ok); E. J. Palmer 42063 (Ca--534758). Grady Co.: E. Morgan 566  
(Ok). Greer Co.: Bailey & Bailey 10157 (Ba); Herb. Univ. Okla.  
14899 (Ok). Harmon Co.: Sherrill 205 (Ok); G. W. Stevens 1108  
(Ok, St--9222); Stratton 317 (St--26126); Waterfall 8330 (Ok, St).  
Harper Co.: G. W. Stevens 305 (Du--65246, Ok, Ok, St--9218, Ur).  
Jackson Co.: Demaree 12134 (Ok--22204), 12138 (Ok--20380), 12216  
(Ok--20360); M. Hopkins 1024 (Ok), 3067 (Ok). Johnston Co.: Hop-  
kins, Nelson, & Nelson 994 (Ok). Kay Co.: Kelting 231 (Ok).  
Kingfisher Co.: J. Engleman 1271 (Ok); Grace s.n. [June 27, 1935]  
(Ok--19063). Kiowa Co.: G. J. Goodman 6272 (Ok). Lamar Co.: Dem-  
aree 12003 (N). Logan Co.: J. Engleman 1273 (Ok); C. C. Smith 431  
(Ok), 673 (Ok). Love Co.: McLennan 3 (Ok); Nelson, Nelson, Good-  
man, & Waterfall 5695 (Ok). Major Co.: J. R. McFarland 30 (Ok);  
Waterfall & Coryell 9921 (Ca--993896, St). Marshall Co.: G. J.  
Goodman 5817 (Ok), 5868 (Ca--81889, Ok); Waterfall 698 (N, Ok); A.  
Wilson s.n. [July 12, 1950] (Ok). McClain Co.: Demaree 12859 (Ok--  
22017, St--12968). McCurtain Co.: Keeling 84 (St--17570). Murray  
Co.: Beard 65 (St--9233); R. Bebb 4140 (Ok); Becker, Waterfall, &  
Kennedy 5299 (Ok), 5342 (Ok); Brenckle 48065 (N); Broadbent 48  
(Ok); Coleman 19 (We); E. E. Dale 50 (Ok), 111 (Ok), 118 (Ok), 295



(Ok); Demaree 12242 (Ok--22221), 12277 (Ok--22162); Emig 43 (Cm), 788 (Cm); Fielder 4 (Ok--10261); Flowers s.n. [May 3, 1939] (Ok, Ok); Goltry 10 (St--14230); G. J. Goodman 2078 (Mn--26180, Ok--17969); G. E. Hall 59 (Ok); M. J. Hall 13 (Ok); Harden 108 (St--25040); M. Hopkins 2765 (Ok, St--15021), 2780 (Ok), 3959 (Ok), 4736 (S), 4771 (Ok), 4823 (Ok), 5178 (Ok), 6075 (Ok); Hopkins & Cross 6421 (Ok); Hopkins, Nelson, & Nelson 667 (Ca--742280, Ok), 709 (Ca--742338, Ok, St--26116); Jeffs s.n. [May 15, 1918] (Ok--10270); Kinman 84 (Ok); Marian 25 (Ok); G. M. Merrill 283 (N); W. S. Myers 314 (Ok); P. M. Nelson 102 (Ok); Randal 44 (Ok); Rice 22 (Ok); K. Starks s.n. [16 July 1950] (Ok); G. W. Stevens 14 (Du--66651, Ok, Ok, St--9216, Ur); Stratton 10 (N, St--26118, St--26119); Van Valkenburgh 81 (Ok). Oklahoma Co.: Stedmen 79 (Ok); Waterfall 1982 (N, Ok, St--21491). Payne Co.: Ray 110 (Ok); Stiles s.n. [May 20, '97] (St--21930). Pontotoc Co.: B. E. Cole 94 (St--21678); D. McCoy 1149 (St); Prater 10 (Ok); Preston 90 (Gg--316093). Pushmataha Co.: Parker 21 (Ok). Smith Co.: G. W. Stevens 699, in part (Ok). Texas Co.: G. W. Stevens 427 (Du--65405, Ok, St--9212, Ur). Tillman Co.: Fleming 132, in part (Ok); C. C. Smith 1005 (Ok). Woods Co.: G. W. Stevens 699, in part (Du--66663, N, Ok--21373, Ok, St--9213, St--9214, Ur), 2850 (Ok), A.2850 (St--9215). Woodward Co.: G. J. Goodman 2388 (Ok). County undetermined: Carleton 177 (Ka, Ur); C. T. Eskew 1106 (Ok); G. W. Stevens 1202 (Ok), A.1063 (Ok), A.3085 (Ok); Van Vleet s.n. [Mt. Sheridan, 7/4/03] (Io--117045). TEXAS: Anderson Co.: Plank s.n. [Palestine, April 19, 1895] (N). Andrews Co.: Lundell & Lundell 11405 (Sm). Austin Co.: F. W. Pennell 10284 (N); Turner & Johnston 54345 (Au--121642); H. Wurzlów s.n. [Industry, 1891] (Ur). Bandera Co.: L. H. Bailey 7482 (Ba), 7501 (Ba), 7503 (Ba). Bastrop Co.: Duval s.n. [Bastrop, 1928] (W--1438667); Marrs s.n. [Smithville, 4-10-1930] (Ca--882571); Tharp 2817 (Du--206897). Baylor Co.: Bridge s.n. [near Seymour, 6/16] (Cn). Bee Co.: F. A. Barkley 16T423 (Au, N, Or--55386); F. W. Gould 6060 (Au--121653, Ca--985733); M. C. Johnston 541 (Au--121643, St); Lundell & Lundell 10055 (Id, N); York & York 54035 (Au--121637). Bell Co.: Lundell & Lundell 10135 (N); McDaniel 14 (Nt), s.n. [Salado, Aug. 8, 1938] (Nt); C. L. York 46389 (Au); York & York 54022 (Au--121646). Bexar Co.: Balcom s.n. [San Antonio, April 1917] (Up--75578); A. Ball 4 (Au--121651); Barkley & Parsons 1 (Au, N); R. Bebb 2272 (Ok), s.n. [San Antonio, May 1, 1905] (Ur); Bogusch 199 (Ur); Clemens & Clemens 976, in part (Ba, Gg--37136, Po--69883); Collector undesignated s.n. [San Antonio, 1926] (Wi), s.n. (Sr); Groth 30 (N); G. Jermy s.n. [1904] (N), s.n. [San Anton.] (N); I. S. Jones 2209 (Po--158869), s.n. [Laurel Heights, Mar. 12, 1926] (Wi); May s.n. [3-18-26] (Wi);



McCullough 6 (Ok); Metz 79 (Gg—310895, I, N, Ok, Se—57949); Pangel s.n. [San Antonio, Mar. 1, 1926] (Wi); L. Richter s.n. [San Antonio] (Au); E. D. Schulz s.n. [San Antonio, March 25, 1817] (Mi), s.n. [San Antonio, March 18, 1918] (Mi), s.n. [San Antonio, 3-15-1921] (Wi), s.n. [San Antonio, 4/13/1922] (Wi); C. Skottsberg s.n. [Sibolo Creek, Selma, 1/6/1935] (Go); Small & Wherry 11968 (N). Blanco Co.: Bogusch s.n. [April 8, 1924] (Ob—50774); Lundell & Lundell 10274 (Ld, N). Borden Co.: Whitehouse 16746 (Sm). Bowie Co.: Letterman s.n. [Texarkana, Aug. 1880] (N). Brazoria Co.: Bush 449 (N). Brazos Co.: O. M. Ball 1504 [Reeves 199] (Cs); L. H. Pammel s.n. [7-1888] (Io—15341); Römer s.n. [Herb. Prager 18634] (Gg—31291). Brewster Co.: Warnock W.284 (Au). Brown Co.: Brenckle 48078 (N); F. W. Pennell 10481 (N); K. Stanford s.n. [Brownwood, 5-5-1931] (Au, Mi). Burleson Co.: Reeves 185 (N). Burnet Co.: C. C. Albers 38003 (Au, Au); Barkley & Copeland 38a (Au, N); F. W. Pennell 10469 (N); Warnock W.1096 (Au). Caldwell Co.: McBryde s.n. [Spr.—Sum. 1931] (Au, Au); Mercer s.n. [Fentress, 3-29-1931] (Au); Straudtmann s.n. [Dec. 30, 1936] (Au). Cameron Co.: R. Runyon 2495 (N, N), 4340 (Br, Mi, N, Ug); G. H. Thurber s.n. [Fort Brown, Feb. '57] (N). Carson Co.: A. M. Ferguson s.n. [4/3/01] (Au). Castro Co.: Rachaner 102 (Au). Childress Co.: Beazley s.n. [Carey, May 16, 1929] (Au); Wild Flower Contest s.n. [Childress, May 1930] (Au). Coleman Co.: Pruitt 228 (Au—121661); Shinnars 26392 (Ur). Collier Co.: Lundell & Lundell 9295 (Ld, Mi, N), 9296\* (Mi); McCart 1541 (Nt); F. J. H. Merrill s.n. [May 1, 1886] (C). Collingsworth Co.: Bailey & Bailey 10143 (Ba). Comal Co.: W. H. Kellogg 8 (Au); Lindheimer 10 (Ka), 1072 (Au, Br, Ca—147488, Me, Me, Me, Me, N), 1073 (Au, Br, Ca—147487, Me, Me, Me, N, Ok—10348, Up—48540); F. W. Pennell 5444 (N, Up—48540); F. W. Pennell 5444 (N, Up—72853); Rauterberg 1593 (Sm). Comanche Co.: Wild Flower Contest s.n. [Apr. 30, 1930] (Au). Cooke Co.: Correll & Correll 12989 (Sm); Newton 10 (Nt). Coryell Co.: Warnock 46413 (Au, N); Wolff 3458 (Tr). Crockett Co.: Cory 35469 (N, N); Warnock & McBryde 15313 (Au—123235). Crosby Co.: C. O. Erlanson 1135 (Mi), 1160 (Mi). Culberson Co.: Hitchcock & Stanford 6782 (Po—265508). Dallas Co.: R. Bebb 2456 (Ok), 1310 (Ok), 1374 (Ok); Boll s.n. [1871] (Cb); E. Brainerd s.n. [Dallas, March 28, 1908] (Vt); Bunker s.n. [May '42] (Ob—50762); Collector undesignated s.n. [Highland Park, 3-29-19] (Wi); A. B. Couch 3 (Ur); I. E. Diehl 13 (Po—71128); L. Goodwin 12 (Au—168948); Hamric & Thompson 8 (Au—172518); Hendrix 16 (Nt); Hynes s.n. [5-18-26] (Au, Au), s.n. [Spr.—Summer 1926] (N); B. Jones 6 (Nt); Lundell & Lundell 7056 (Mi, N, N), 8333 (Ld, Mi), 8534 (Ld, Mi, N), 9181 (Ld, Mi, N, N), 9137 (Ld, Mi, N), 9771 (Mi), 10416 (Ld,



N), 10568 (Ld, N), 11315 [Plant. Exsic. Gray. 1275] (Al, Au, Ca—702524, Dp—31802, Gg—308962, H—106661, I, Ka—95212, Ld, Mi, Ms, N, Ok, Or—49887, Or—49888, Pl—131196, S, Sm, St—23302, Tl, Ur, Vi, Vi, We), 11704 (N), 12132 (N); Ness s.n. [Aug. 7, 1925] (Tr); R. L. Oliver 76 (Nb); F. W. Pennell 5399 (Up—72783); J. Reverchon 739 (Up—17084), 1962 (Up—17087), 1962\* (Bc, C, Ca—445518), s.n. [Curtiss 1962\*] (Cm, I, Pa, Vt), s.n. [Dallas, May 1876] (Bc); O. Sanders 113 (Ld, Mi); Shinners 8576 (Sm); R. Spencer 5 (Nt); Storm 1019 (Ur); R. Van Vleet 78 (Au—121656), 120 (St). Deaf Smith Co.: C. L. Lundell 11457 (N). Denton Co.: Dobbins 16 (Nt); B. B. Harris s.n. [Spring '26] (Nt); Lundell & Lundell 9535 (Ld, Mi, N); McBryde 811 (Nt); McCart 1593 (Nt); Whitehouse 15590 (N). DeWitt Co.: M. Riedel s.n. [7-18-41] (Au). Dickens Co.: Parks & Cory 13620 (Tr). Duval Co.: M. E. Croft 20 (C), s.n. [San Diego, 1885] (Mi). Eastland Co.: Hodge Oak School 18 (Au, Au); Mrs. G. Robinson 18 (N); Warnock 46376 (Au). Edwards Co.: Cory s.n. [11-3-1936] (Md); Cutler 778 (Ba); M. E. Jones 26228 (Du—235289, Gg—237865, La, Mn—22402); Parks & Cory 6633 (Tr), 9035 (Tr), 20843 (Tr); Shreve 9925 (Fs). Ellis Co.: Cory 39243 (Au); Lundell & Lundell 9364 (Ld, Mi, N); O. Sanders 21 (Mi); Shackelford 3 (Nt); Turrell s.n. [Waxahachie, 3/18/1898] (Tu). Erath Co.: Gough s.n. [3-12-21] (Au); Hoisington 9 (Ok), 108 (Ok), 140 (Ok), 242 (Ok); Lundell & Lundell 10167 (Ld, N); Whitehouse 20675 (St); G. Williamson 13 (Nt). Fannin Co.: McCart 2032 (Au—121638, Au). Fayette Co.: Parks & Cory 10074 (Tr); Ripple 51-580 (Au—121647). Garza Co.: Ruth 107, in part (N). Gillespie Co.: F. A. Barkley 14522 (Vi); G. Jermy 182 (Ka); Mainland & Barkley 14522 (Au). Glasscock Co.: Cory 42069 (We). Goliad Co.: Lundell & Lundell 10059 (Ld, N); C. B. Williams 13 (Au). Gonzales Co.: C. C. Albers 35006 (Au); Friesner 10376 (Bt—40558); Pladeck s.n. [near Gonzales, 3-30-1940] (Bt—51164). Grayson Co.: Anderson & Hood 312 (Ok); R. Bebb 1410 (Ok, Ur); Center 17 (Nt); Harold Gentry 51-183 (Au—121611, Au—121683), 51-1781 (Au—121615); C. S. Sheldon s.n. [Denison, June 13, 1891] (Al); Sowder 24 (Au); M. M. Taylor 11 (Nt); Woodall s.n. [Denison, Apr. 4, 1930] (N), s.n. [Denison, Apr. 4, 1931] (Gg—316095). Grimes Co.: Sixth Grade Navasota s.n. [April 1934] (Au, Au); Wild Flower Contest s.n. [Navasota, Apr. 1934] (Au, Au). Guadalupe Co.: Johnston & McCart 5023 (Au—121613). Hansford Co.: Cutter 33, in part (Ok), 38 (S), 228 (Ok); G. J. Goodman 5286 (Au—121652, N, Ok). Hardeman Co.: Whitehouse 10784 (Sm). Harris Co.: Eifrig s.n. [Houston, June 1926] (Ca—882581, Mi); E. Hall 435, in part (Pr); Parks & Cory 8221 (Tr). Hays Co.: G. L. Fisher 49047 (Go); R. M. King 2615 (Au—181196); Krodel & Warnock 46529



(Au, N); Stanfield s.n. [July 1896] (N); Warnock & Krodel 19 (Au, Ml, N, N). Hemphill Co.: Tharp s.n. [Red Deer Cr., 6.16.29] (Au). Hidalgo Co.: Clover 1450 (N). Hill Co.: K. E. Smith s.n. [Itasca, 12-14-33] (Au). Hockley Co.: Rachaner 131, in part (Au, N). Hood Co.: Blackwell 64 (Nt); E. J. Palmer 6510 (Po--217509). Irion Co.: Wild Flower Contest s.n. [Mertzon, April 1932] (Au). Jack Co.: Mc Cart 892 (Nt); Whitehouse 15291 (Sm). Jefferson Co.: Brenckle 48069 (N); Lundell & Lundell 11232 (N). Jim Wells Co.: Freeborn & Freeborn 347 (N). Jones Co.: Mahler 1367 (St). Karnes Co.: J. C. Johnson 805 (Au--121660, Hk). Kaufman Co.: Ashworth 4 (Nt). Kerr Co.: V. L. Cory 51759 (N); M. E. Jones s.n. [between Kerrville and San Antonio, April 23, 1931] (Po--188428); Kelting 17 (Ok); Whitehouse s.n. [June 8, 1929] (Au). Kimble Co.: Straudtmann s.n. [Aug. 19, 1941] (Au). Kinney Co.: Cory 28993 (N); Mearns 1274 (Du--24194), 1394 (Du--24192). Kleberg Co.: G. J. Harrison s.n. [Riviera, Feb. 24/30] (Gg--184907); Scholt 25 (Au, Au). Lamar Co.: Demaree 12003 (Ok--20373); McMullen s.n. [Paris, 5/11/27] (Au). La Salle Co.: Mauermann 12 (Au); Penfound s.n. [Cotulla, April 13, 1936] (Tl). La Vaca Co.: Johnston & McCart 5205 (Au--121607). Leon Co.: Tharp, Turner, & Johnston 54986 (Au--121644). Liberty Co.: Small & Wherry 11781 (N). Live Oak Co.: Tharp s.n. [March 22, 1931] (Au, Au, Au). Lubbock Co.: E. L. Reed 3943 (Au, Bl--42248). Lynn Co.: Rose-Innes & Moon 1052 (Au, N). Mason Co.: Dapprich 7770 (Sm). Maverick Co.: M. E. Jones 28300 (Ca--479297, Gg--237869, Po--188426), s.n. [Eagle Pass, April 27, 1931] (Du--239762); Schott s.n. [Eagle Pass] (N). McLennan Co.: Pudig & York 46382 (Au); L. D. Smith 21 (Au--121610, St), 197 (Au--121609), 410 (St), 730 (Au--121649), 905 (Au--121614); C. L. York 46087, in part (N), 46100, in part (Au). McMullen Co.: Thompson & Graham 65 (Au--123199). Menard Co.: Bottimer T.20 (Au--172720); Y. Jones s.n. [Fort McKavett, 4-1-1931] (Au); Mahoney s.n. [Menard, May 1, 1933] (Au, Au). Mills Co.: Egg s.n. [Jan. 7, 1931] (Au, N); Knowles s.n. [Goldthwaite, 4-10-1931] (Au). Montague Co.: McCart 1632 (Nt); Satterfield 21 (N, Nt). Navarro Co.: I. B. Bryant 12 (Nt); Gahwiler 14 (Au); Matlock s.n. [Frost, 5-10-1932] (Au); L. M. Mc Clure 5 (Nt); E. J. Palmer 7821 (Gg--182152). Nolan Co.: Mrs. V. E. Stanfield s.n. [Sweetwater, 4-5-1931] (Au). Nueces Co.: A. A. Heller 1385 (Es, Mm--15396, Tu); F. W. Pennell 10337 (N); Tharp s.n. [11-9-39] (Au). Ochiltree Co.: C. S. Wallis 4885 (St). Oldham Co.: Lambert & Lambert s.n. [August 19, 1939] (Up); Lundell & Lundell 11450 (N), 11462 (N). Orange Co.: Herb. Univ. Texas s.n. [Orange, Spring] (Au). Palo Pinto Co.: Anderson & Harty 10 (Nt); Harold Gentry 1282 (Au--121662); J. W. Gillespie 5223 (Du--210177). Parker Co.: S. M. Tracy 7999 (Au, Cm, Es, N, Vt); C. L.



York 22 (Au--121645). Randall Co.: Lundell & Lundell 11444 (Sm). Reagan Co.: Cory 53507 (N); Herb. Univ. Texas s.n. [Best, April 1931] (Au). Red River Co.: E. Adams 104 (Nt). Reeves Co.: Tracy & Earle 106, in part (Au). Roberts Co.: C. S. Wallis 4944-1, in part (St). Runnels Co.: F. W. Gould 7065 (Au--121626); J. C. Johnson 611 (Au--121608); Lundell & Lundell 10160 (Ld, N). San Patricio Co.: F. A. Barkley 16T409 (Au, N); Williges 336 (Au--179760). Sutton Co.: Cory 39625 (Au, N, N); Geib 4251 (Tr); Gould & Sperry 5733 (Au--121650, Ca--917764); M. E. Jones 28299 (Po--188406); Rohrbaugh 390 (Ok). Tarrant Co.: F. C. Gates 19134 (Ka--89646); H. Hapeman s.n. [Fort Worth, May '94] (Hp); H. N. Moldenke 6954 (N); E. Nash 13 (Nt); Ruth 83 (Au), 92 (L1), 107, in part (Cm, Io--113644, Ka--67107, Mi, Mi, N, N, Sm, Up, Ur), 107a (Up), 110, in part (N), s.n. [Fort Worth, June 19, 1909] (Po--267675); Steimert s.n. [May 5, 1946] (Ok); L. F. Ward s.n. [Fort Worth, Sept. 9, 1877] (Bc), s.n. [Fort Worth, Sept. 1877] (Pa). Taylor Co.: Lundell & Lundell 11364 (N); Mahler 1312 (St); Tolstead 5783 (Ca--48977), 6927 (Au, Ca--882576, N); S. M. Tracy 8000 (Cm, N); Warnock 46352 (Au, N). Terrell Co.: Warnock & McBryde 14866 (Au--123218); G. L. Webster 150 (Au--121648). Throckmorton Co.: Wild Flower Contest s.n. [April 1934] (Au). Tom Green Co.: Cory 50566 (N, Sm); F. W. Pennell 10493 (N); R. W. Pohl 4741 (Sm); C. Smith 7 (Ok), 173x (Ok); Wolff 4159 (Tr). Travis Co.: C. C. Albers 33021 (Au), 34011 (Au, Au, Au); Barkley & Copeland 5 (Au, N), 76 (Au, N); Barkley & Rowell 44 (Au, N, N), 103 (Au, N); Berlandier 1449 (Lu); Biltmore Herb. 3654b (S, S), s.n. [6.VI.1903] (S); Birge 2957 (Au); Bogusch 423 (Mg--27), s.n. [w. of Austin, 2-16-1926] (Mi); Bogusch & Molby 2927 (Ur); Bot. 23 Univ. Texas s.n. [Deep Eddy, 4-30-36] (Au); Brues 19248 (Sm), 19797 (Sm); Cintron, Buechner, & Barkley 16T249 (Au, N, Ok, S); Cohn & Barkley 13252 (Au, Ca--882568, N); A. M. Ferguson 489 (Au--121641), s.n. [Oct. 12, 1900] (Au); Herb. Hort. Bot. Gothenb. s.n. [Austin, June 6, 1903] (Go); Herb. Univ. Texas s.n. [Austin, 6/25/27] (Au, Au); F. W. Johnson s.n. [Austin, Oct. 6, 1913] (N); J. C. Johnson 6032 (Au, N); Lundell & Lundell 8826 (Ld, Mi, N, N), 9095 (Ld, Mi, N); Mahler 1256 (St); McWilliams 4632 (Au); R. H. Painter 6 (Ka--71736); R. B. Payton 41 (Au); Ripperton & Barkley 14542a (Au, N); Rose & Russell 24129 (W--1369462); Rowell 7058 (Au); Rowell & Mann 7 (Au, N); Rugel s.n. [Austin] (Mi); Mrs. Smith s.n. [Austin, 5/1/35] (Au, Bt--24727, St--9207); Straudtmann s.n. [July 17, 1940] (Au); L. C. Taylor 3034 (Ca--697809); Tharp 44090 (Au, N), s.n. [Austin, Spring 1920] (Ca--882579, Ur), s.n. [Austin, 10.20.28] (Go), s.n. [Austin, 4/12/35] (Bt--25427, N, Sm, St--9208), s.n. [Austin, 5/9/35] (Au, St. 9209), s.n. [Austin, 3-1-37] (Ca--882574), s.n. [Austin, 2-23-39] (Mi), s.n. [Austin, 4/10/41] (Ca--



882573, Mv); Tharp & Warnock 46084 (Au); Tharp & York 50-168 (Au-121639); Thompson & Hamilton 3451 (Se--28357); Warnock 107 (Au), 46033 (Au, N); Webster 5 (Au, N); Werkenthin s.n. [Austin, 2.26.15] (Io--102276); C. L. York 49004 (Au--121640); H. H. York s.n. [3-18-08] (Au); York & Wolf s.n. [Sept. 29, '08] (Au); M. S. Young 113, in part (Ur). Uvalde Co.: Cory 6133 (Tr); Lundell & Lundell 10263 (Ld, N), 10955 (N), 10958 (N), 10975 (N); Parks & Cory 18103 (Tr). Val Verde Co.: Farr s.n. [Del Rio, May 9, 1911] (Up--52679); M. E. Jones 26229 (Po--178358); Parks & Cory 20842 (Tr); Perry, Bigelow, Wright, & Schott 830 (C); Warnock & McBryde 15073 (Au--123265). Victoria Co.: E. J. Palmer 9098 (Du--205507, S); Shiller s.n. [Dacosta, May 2, 1928] (Au). Walker Co.: Dixon 561 (La, Po--159054, Po--159344, W--1521886); Warner s.n. [Huntsville, March] (Hu). Washington Co.: Brackett 253 (Au), s.n. [Apr. 1928] (Au, Au), s.n. [4-10-38] (Ca--882572); Reeves 186 (N). Webb Co.: Nickels s.n. [Laredo, April 1880] (Up--17085). Wichita Co.: Parks & Cory 13233 (Tr), 16234 (Tr); Whitehouse 9589 (N), 9609 (N). Williamson Co.: Bodin s.n. [Georgetown, Dec. 1889] (Ka); Lundell & Lundell 10369 (Ld, N); C. L. York 46207 (Au). Wilson Co.: Bogusch 764 (Mg--35); Edw. Palmer 1049 (Pa); Thompson & Graham 50 (Au--123190). Wise Co.: Newton 20 (Nt). Young Co.: S. Hayes 610 (Ms, N). County undetermined: Capt. Bolton s.n. [April 1895] (Ka); T. Drummond 194 (S), s.n. [Texas] (Sg--68315); Eifrig s.n. [Texas, 1924] (Ca--882582); L. Kern s.n. [May 17th] (Au); Lindheimer 232 (Ka), 289 (N, Pa, S), s.n. [Soutehrn Texas, 1849--51] (N), II.289 (Ca--248234); E. Meyer s.n. [1844] (M); Ruffner s.n. [N.W. Texas] (Pa); Schlottmann s.n. [1886] (Ah); Teas s.n. [So. Texas, June 1926] (Ba, Ba). NEW MEXICO: Dona Ana Co.: R. S. Ferris 1169 (Du--91550). Grant Co.: E. L. Greene s.n. [Near Silver City, Aug. 11, 1880] (Pa); O. B. Metcalfe 1231 (Bl--50341); Mulford 896 (Ur); W. Stewart s.n. [June 26, 1936] (Gg--267605, La); C. B. Wolf 2598 (Du--190979). Hidalgo Co.: L. Benson 7376 (Po--267660); Tucker 2441 (S, Z). Lincoln Co.: Wooton 363 (Ka, Po--267674). Luna Co.: Treakle s.n. [Deming, April 9, 1911] (Po--73867). Santa Fe Co.: F. S. Earle 84 (N); Heller & Heller 3536 [Herb. Barnhart 2904] (N); A. Nelson 11757 (S). Socorro Co.: R. S. Ferris 1187 (Du--91552); Ferris & Duncan 2292 (Du--126170); H. H. Rusby 337, in part (C, Pl--72002, Pr); Vasey s.n. [Socorro, May 1881] (S); Wooton s.n. [Devil's Park, Aug. 9, 1900] (We). Valencia Co.: Condit s.n. [Laguna, July 8, 1912] (Ca--195627); O. Degener 4853 (N); Nelson & Nelson 2187 (N). County undetermined: Lambert & Lambert s.n. [August 30, 1934] (Up); Mearns 108 (Du--24167); Parry, Bigelow, Wright, & Schott s.n. [below Donana] (C); H. H. Rusby 243 (Fc); C. Wright 1502 (T). ARIZONA: Apache Co.: L. Benson



9573, in part (Po--267652); R. S. Ferris 1218 (Du--91453). Co-chise Co.: L. Benson 9467 (Po--267662); Blumer 1345, in part (Ka-60177, Tu); Carlson s.n. [Bisbee, June 2, 1915] (Gg--31426); O. M. Clark 4880 (B); R. S. Ferris 9933, in part (Mi); Fowler s.n. [Barfoot Park, 25.VI.1933] (La, La, La); L. N. Goodding 415 (N); Goodman & Hitchcock 1211 (Ca--426361, Mn, N); Hilend 747 (La); Kearney & Peebles 14234 (To); Kruckeberg 3864 (N); Kusche s.n. [Cave Creek Canyon, July 1927] (Gg--147070); Thornber s.n. [June 1, 1903] (Ur); Wiegand, Maguire, Richards, & Moeller 11150 (N); C. B. Wolf 2490 (Du--190874). Coconino Co.: Collom 902 (N); D. T. MacDougal 317 (Ca--104868, Dp, Io--38763, N, N, Tu); H. H. Rusby 337, in part (Ca--104830); Solbrig 2803 (Ca--177948). Gila Co.: Molohon 52 (Fc); Peebles & Smith 14093 (N); Whitehead 1645 (Mi). Graham Co.: Darrow, Phillips, & Pultz 1122 (Tu--10327); Kearney & Peebles 14153 (To); Peebles 12989 (To); Shreve 4367 (Ca--195158, Fs). Greenlee Co.: L. D. Benson 9467 (Du--326794, N); D. R. Goddard 650 (Ca--717818). Navajo Co.: H. S. Gentry 3822 (Ak--25770); Livingston, Livingston, & Thornber s.n. [Apache Camp, 8/10/06] (Tu); Luck s.n. [Taylor, Aug. 1, 1897] (Cm). Pima Co.: L. Benson 3322 (Po--267615); H. W. Graham 8-30-46 (Cm); Nelson & Nelson 1543 (Ur); Peebles & Harrison 2235 (La, S); Pringle s.n. [April 13, 1881] (Ll). Santa Cruz Co.: H. W. Graham 7-14-2 (Cm); Loomis, Peebles, Harrison, & Kearney 1348 (To); Peebles & Fulton 11489 (To). Yavapai Co.: L. Benson 7460 (Po--267661). MEXICO: Chihuahua: Dobie 35 (Au); M. E. Jones s.n. [Sept. 17, 1903] (Po--71134); A. Lee 42 (Au, N); F. W. Pennell 19252 (Me, N); Townsend & Barber 139, in part (Ca--138818, Me, N, Po--71126, Ur, Vt); S. S. White 2393 (Fs), 2543 (Fs); E. Wilkinson s.n. [Sept. 26, 1885] (Al). Coahuila: F. A. Barkley 16057 (Au); E. G. Marsh 1121 (St), 2148 (St); Edw. Palmer 1050 (Pa); Stanford, Retherford, & Northcraft 241 (N, Ur); Wynd & Mueller 450 (Mi, S, Ur, Ur). Durango: Forrer s.n. [September and October, 1881] (I, N); H. S. Gentry 6870 (Ak--22789); J. H. Maysilles 7039 (N), 7057 (Lm, N), 7472 (Mi). Guanajuato: G. L. Fisher s.n. [July 28, 1926] (Mg--34). Jalisco: Barkley, Webster, & Rowell 7659 (Au--167038, N); L. I. Davis s.n. [Jaday, July 6, 1959] (Au--171900, Au--171909). México: G. L. Fisher s.n. [July 24, 1924] (Mv); Matuda 26384 (Cb). Michoacán: Hinton 13125, in part (Mi). Puebla: Barkley, Rowell, & Webster 2458 (Au--123245, N); L. I. Davis 226 (N), 233 (N). Tabasco: L. I. Davis 1 (N), 3 (N). Tamaulipas: Collector undesignated 312 (B). CULTIVATED: Belgium: Herb. Jard. Bot. Brux. s.n. (Br). France: Boucher s.n. [1819] (Du--166480). Italy: Herb. Harvey s.n. [h. R. P. 1819] (Du--166491), s.n. [h. R. P., julio 1843] (Du--166492). Massachusetts: R. E. Torrey s.n. [Amherst, Sept. 6,



1940] (Ms). New Jersey: G. H. M. Lawrence P.237 (Ba), P.353 (Ba). New York: H. N. Moldenke 11284 (N, N, N). South Dakota: Barr 101 (Ba). West Virginia: Davis & Davis 6259 (We). LOCALITY OF COLLECTION UNDETERMINED: F. V. Hayden s.n. [Yellowstone, etc., 1853--4] (Dt).

VERBENA BIPINNATIFIDA var. LATILOBATA Perry, Ann. Mo. Bot. Gard. 20: 325--326. 1933.

Synonymy: Verbena bipinnatifida var. latiloba Perry ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947. Verbena bipinnatifida latilobata Perry ex Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209. 1951.

Literature: Perry, Ann. Mo. Bot. Gard. 20: 311, 325--326, & 355. 1933; Sperry, Sul Ross State Teach. Coll. Bull. 22: 41. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 12, 14, 18, & 101. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 18 & 40. 1942; Moldenke, Phytologia 2: 127. 1944; Moldenke, Castanea 10: 39. 1945; Moldenke, Alph. List Cit. 1: 46, 143, 164, 169, 193, 209, 242, 244, 270, 274, & 290. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 22. 1947; Moldenke, Phytologia 2: 347. 1947; Moldenke, Wrightia 1: 232. 1948; Moldenke, Alph. List Cit. 2: 465, 470, 472, 477, 483, 497, 538, 542, 597, 604, & 629 (1948), 3: 656, 767, 807, 808, 828, 833, 952, & 954 (1949), and 4: 996, 1071, 1121, 1123, 1170, 1189, & 1290. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 23, 25, 26, 32, 163, & 197. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209 & 2210. 1951; Moldenke, Phytologia 3: 467. 1951; Moldenke, Résumé 21, 25, 28, 31, 38, 223, 358, & 470. 1959; Moldenke, Résumé Suppl. 2: 3. 1960.

This variety differs from the typical form of the species in its 3-cleft (trifid) leaves, with the segments remotely incised or lobed, the ultimate segments much broader than in the typical form. The plant is perennial, erect and to 30 cm. tall or else procumbent, the lateral branches procumbent, the leaf-blades strigillose above but hirtellous-hirsute (especially on the venation) beneath, the spikes compact or somewhat elongate in age, the bractlets variable in length, usually equaling or exceeding the calyx, the floral and fruit characters in general similar to those of the typical form, the corolla described as light-rose, pink, lavender, or purple, and the connective-glands (according to Kearney) considerably surpassing the anther-cells.

The type of the variety was collected by Carl Vilhelm Hartman (no. 906) between San Pedro and Fronteras, Sonora, Mexico, between September 20 and 24, 1890, and is deposited in the Gray Herbarium of Harvard University. Collectors have found the variety in canyons and river bottoms, on mountainsides and gravelly hillsides, burned-over pinelands, subalpine meadows, rocky slopes, steep gravelly slopes, and semi-timbered slopes, in oak woodlands and waste places, along roadsides, at the edge of cornfields, and in rocky terrain on canyon slopes, at altitudes of 4350 to 8400



feet. Brown found it to be "sparse in pasture" in Brewster County, Texas. Ferris reports that it forms a groundcover with Helenium hoopesii A. Gray, Delphinium, Artemisia, and Pteris in Cochise County, Arizona; in the same county Blumer found it in "rolling andesitic pineland recently lumbered". Tucker encountered it on steep southeast-facing slopes in shrubby growth of Quercus arizonica Sarg., Q. emoryi Torr., and Pinus cembroides Zucc. Mueller describes it as "sparse on grassy slopes" in Chihuahua.

The variety differs chiefly from the typical form of the species in its foliar characters. It has been collected in anthesis and in fruit in February, April, and June to October. Material in herbaria has been misidentified and distributed as V. aubletia Jacq., V. bipinnatifida Nutt., V. canescens H.B.K., V. ciliata Benth., V. elegans H.B.K., and V. wrightii A. Gray. Davis emphasizes that it has "perfectly upright growth", but Hinton says "generally procumbent". The Bush 4029 material from Missouri is from "introduced" plants, according to the collector, but I assume that he does not mean cultivated; Miss Perry cites this collection, as well as Earle & Earle 526, as typical V. bipinnatifida. The Whiting & Sanders 756/913 from Oak Creek Canyon, cited below as from Yavapai County, Arizona, may actually have come from Coconino County, and the M. E. Jones s.n. [Santa Rita Mts., Aug. 24, 1903], cited from Pima County, may possibly have been collected in Santa Cruz County. The C. Wright 1503 cited by Miss Perry "in part" apparently is a mixture with V. tumidula Perry and V. wrightii A. Gray. She cites the following 14 specimens not as yet seen by me: ARIZONA: Cochise Co.: L. N. Goodding 883 (G); Griffiths 4833 (W); T. E. Wilcox s.n. [Fort Huachuca, Sept. 1894] (W). Pima Co.: Griffiths & Thorner 159 (W); M. E. Jones s.n. [Santa Rita Mts., 24 Aug. 1903] (W). MEXICO: Chihuahua: Nelson 4856 (G, W); C. Wright 1503, in part (G, N). Durango: Forrer s.n. [Sierra Madre west of Durango, Sept.—Oct. 1881] (F); Garcia 331 (W). Sonora: Hartman 880 (G), 906 (G—type); Murdoch s.n. [Cananea, 20 Aug.—1 Sept. 1914] (F). Miss Perry cites a Mearns s.n. [Flagstaff, 17 June 1887] on the basis of a specimen in the New York Botanical Garden herbarium — the specimen there, however, is Mearns 159 and is certainly this variety, but was annotated by her in 1932 as "V. bipinnatifida Nutt."

In all, 94 herbarium specimens have been examined by me.

Citations: MISSOURI: Jackson Co.: Bush 4029 (N). OKLAHOMA: Greer Co.: Logan 124 (Ok). Murray Co.: G. W. Stevens 14 (N). TEXAS: Brewster Co.: G. W. Brown B.107 (Au); Sperry 1492 (Om). Dallas Co.: B. Jones 6 (Ok). Hidalgo Co.: L. I. Davis 199 (N). NEW MEXICO: Chaves Co.: Earle & Earle 526 (N). Grant Co.: Blumer 60 (N). Otero Co.: Spalding 28 (Tu). County undetermined: C. Wright 1503, in part (Ca--247679), 1602 (T). ARIZONA: Cochise Co.: F. A. Barkley 14A611 (Au, Ca--743022); Blumer 1345 (N); R. S. Ferris 9933,



in part (Rs--26916); Fowler s.n. [Barfoot Park, 26.VI.1939] (La); L. N. Goodding 37 (N, Tu), 251 (N), 883 (N, Tu); Goodman & Hitchcock 1211 (Gg--183908); L. Henderson 26 (Au, Au); Hilend 678 (La); M. E. Jones s.n. [Sept. 3, 1903] (Po--71156); Kearney & Peebles 15117 (To); Kusche s.n. [Cave Creek Canyon, June 26--29, 1927] (Gg--147069); W. W. Price s.n. [Aug. 25, 1893] (Du--97116); J. J. Thornber 7024 (Tu), s.n. [Fort Lowell, April 25, 1903] (Ca--882580), s.n. [Dragoon Summit, Aug. 19, 1905] (Tu); T. E. Wilcox s.n. [Ft. Huachuca, Aug. 1893] (C). Coconino Co.: Fulton 9672 (To); Mearns 159 (C, N). Gila Co.: Dunkle 5226 (H--491); H. W. Graham 7-28-3 (Cm); Peebles & Smith 14093 (To); E. Sanders 803/2339 (To); J. Whitehead 1645 (N). Graham Co.: Humphrey, Anderson, Rinehart, & O'Donnal 712 (Tu); Kearney & Peebles 9781 (To), 9802 (To); Pultz & Phillips 1849 (Tu--16175). Pima Co.: M. E. Jones s.n. [Santa Rita Mts., Aug. 24, 1903] (Po--71159, Po--71160); C. B. Maguire s.n. [March 24, 1935] (N); J. J. Thornber s.n. [Fort Lowell, June 1, 1903] (Tu), s.n. [Tanque Verde, June 8, 1913] (Tu). Pinal Co.: Porter, Peebles, & Harrison 1741 (To). Santa Cruz Co.: Epling & Stewart s.n. [Patagonia, Sept. 4, 1936] (La); H. S. Gentry 3295 (Ak--23134); Kearney & Peebles 10130 (Gg--267609, Po--208646), 10548 (Mi, To); Peebles, Harrison, & Kearney 4549 (To); Whiting 1047 [Cat. 4414] (To). Yavapai Co.: Whiting & Sanders 756/913 (Tu). County undetermined: Toumey s.n. [Galiuro Mts., July 29, 1894] (N). MEXICO: Chihuahua: M. E. Jones s.n. [Sept. 11, 1903] (Po--69327), s.n. [Sept. 16, 1903] (Po--69328); Le Sueur 305 (Au), 461 (Au); C. H. Mueller 3347 (Ca--720107); F. W. Pennell 18732 (D--733975, W--1641278); Townsend & Barber 139, in part (Me); S. S. White 2393 (Mi), 2456 (Mi), 2543 (Mi). Durango: F. W. Pennell 18264 (D--733977, W--1641017). Michoacán: Hinton 13125, in part (Au, N, N, N). Sonora: Donnelly 5 (Ca--146398), 6a (Po--4003); Hartman 906 (Ca--924053--isotype); Tucker 3478 (Du--399532, Gg--413693); S. S. White 3131 (Mi, Mi), 3261 (Mi), 3731 (Mi). State undetermined: Née 109 (Q). CULTIVATED: Belgium: M. Martens s.n. (Br). Mexico: Halbinger & Reko 313 (N). LOCALITY OF COLLECTION UNDESIGNATED: Fremont s.n. [Expedition to California, 1845--7] (T); Herb. Bonpland s.n. (S).

xVERBENA BLANCHARDI Moldenke, *Revist. Sudam. Bot.* 4: 18. 1937.

Synonymy: Verbena angustifolia x hastata Blanchard ex Moldenke, *Revist. Sudam. Bot.* 4: 18, in syn. 1937. Verbena angustifolia x hastata Hill ex Moldenke, *Suppl. List Invalid Names* 7, in syn. 1941. Verbena hastata x angustifolia Hill ex Moldenke, *Suppl. List Invalid Names* 8, in syn. 1941. Verbena blanchardii Moldenke in Chittenden, *Roy. Hort. Soc. Dict. Gard.* 6: 2209 &



2210, sphalm. 1951. Verbena hastato-angustifolia Bebb, in herb.

Literature: Kanda, Bot. Gaz. 69: 54--71, pl. 6, fig. 8 & 9. 1920; Moldenke, Revist. Sudam. Bot. 4: 18. 1937; Moldenke, Prelim. Alph. List Invalid Names 44 & 48. 1940; F. C. Gates, Fl. Kans. 190. 1940; Moldenke, Suppl. List Invalid Names 7 & 8. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 2, 3, 6, 8, 11, 74, & 101. 1942; Moldenke, Alph. List Invalid Names 45, 47 & 50. 1942; Moldenke, Phytologia 2: 68, 72, & 114. 1945; Moldenke, Alph. List Cit. 1: 30, 31, 35, & 43. 1946; Moldenke, Phytologia 2: 326. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 24 & 26. 1947; Hill & Salisb., Ind. Kew. Suppl. 10: 242. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 50. 1948; Moldenke, Alph. List Cit. 2: 359, 515, & 538 (1948), 3: 828 & 879 (1949), and 4: 1208. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 3, 6, 12, 14, 16, 21, 163, & 197. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209 & 2210. 1951; Moldenke in Gleason, New Britton & Br. Illustr. Fl., pr. 1, 3: 126, 129, & 130 (1952) and pr. 2, 3: 126, 129, & 130. 1958; Moldenke, Am. Midl. Nat. 59: 343. 1958; Moldenke, Résumé 5, 9, 15, 18, 20, 26, 223, 357, 365, 366, 374, & 470. 1959.

Illustrations: Kanda, Bot. Gaz. 69: pl. 6, fig. 8 & 9. 1920; Moldenke in Gleason, New Britton & Br. Illustr. Fl., pr. 1, 3: 130 (1952) and pr. 2, 3: 130. 1958.

The type of this hybrid was collected by Lieutenant Ruffner at Lexington, Rockbridge County, Virginia, and is deposited in the Torrey Herbarium at the New York Botanical Garden. It is named in honor of William Henry Blanchard (1850--1922), American botanist and educator, well-known for his work on Rubus and on New England plants. The name xV. blanchardi has been proposed for the natural hybrid which occurs between V. simplex Lehm. and V. hastata L. where the ranges of these two species overlap in the eastern United States, and for artificial hybrids produced experimentally between these two species. The hybrid sometimes resembles one "parent", sometimes the other, in general habit. The leaves are generally broader, more acute, and with coarser pubescence and larger teeth than in V. simplex, more narrowly lanceolate or oblong-lanceolate than in V. hastata and never incised nor hastate. The fruit is produced sparingly and irregularly, whereas in both "parents" fruit production is usually heavy. Kanda (1920) gives a cytological discussion of the hybrid. It was apparently introduced into (or originated in) cultivation in 1854, but the Herb. Hort. Bot. Berol. s.n. [1854] specimen was annotated as V. hastata L. by Miss Perry.

The type of V. hastato-angustifolia was collected by Michael Schuck Bebb at Fountaindale, Winnebago County, Illinois, and is deposited in the Jesup Herbarium at Dartmouth College. The "Verbena simplex x hastata" of Gates, Fl. Kans. 190 (1940), if one may judge from the herbarium specimens which he has so annotated, is a mixture of V. simplex Lehm. and V. simplex var. eggetti Moldenke. I have not as yet seen any specimens so annotated by



Gates that are the hybrid which he suggests. It may, therefore, be that the Kansas records which he gives -- and which I have copied, on his authority, in my "Résumé" (1959) -- from Butler, Cherokee, Douglas, Lyon, Montgomery, Neosho, and Osage Counties actually do not apply to this hybrid. Similarly, the "Verbena angustifolia x hastata" of Jacobs is typical V. simplex Lehm.

Collectors report finding xV. blanchardi in dry fields, grassy ground, and on roadside banks and railway rights-of-way, flowering from June to August and fruiting in June and August. They report the common names "blue vervain" and "false vervain" -- the former also applies to V. hastata L., and the latter to V. hastata and to V. litoralis H.B.K. In herbaria it has been variously misidentified and distributed as V. angustifolia Michx., V. engelmannii Moldenke, V. hastata L., V. paniculata Lam., V. rugosa Willd., and V. stricta Vent. The corollas are described as pale-blue or violet to lilac-blue. In all, 15 herbarium specimens, including the types of all the names involved, have been examined by me.

Citations: VERMONT: Bennington Co.: W. H. Blanchard 162 (N). VIRGINIA: Rockbridge Co.: Ruffner s.n. (T--type). ILLINOIS: Cook Co.: E. J. Hill 161.1898 (Ur), 162.1898 (Ur, Ur). Winnebago Co.: M. S. Bebb s.n. [Fountaindale] (Dt). Stony Island: H. H. Smith 5952 (Ca--882824), 5982 (Ca--882823). KENTUCKY: Warren Co.: S. N. Price s.n. [Bowling Green, July 29, 1899] (N). OKLAHOMA: Latimer Co.: F. A. Barkley 1219 (Ok--10312), s.n. [6/20/28] (Ok--10313). Marshall Co.: G. J. Goodman 5418 (St). Wagoner Co.: R. Bebb 4324 (Ok). CULTIVATED: Germany: Herb. Hort. Bot. Berol. s.n. [1854] (N). LOCALITY OF COLLECTION UNDESIGNATED: Collector undesignated 43 (Q).

VERBENA BONARIENSIS L., Sp. Pl., ed. 1, 20. 1753 [not V. bonariensis Rendle, 1904, nor Schau., 1960].

Synonymy: Verbena bonariensis altissima, lavandulae canariensis spica multiplici Dill., Hort. Eltham. 406. 1732. Verbena bonariensis. Lavandulae canar. spica multiplici Dill., Hort. Eltham. pl. 300, fig. 387. 1732. Verbena foliis lanceolatis, floribus congestis fastigiatis L., Hort. Cliff. 11. 1737. Verbena bonariensis altissima, lavandulae canariensis spica multiplici Dill. ex L., Hort. Cliff. 11, in syn. 1737. Verbena tetrandra, spicis fasciculatis, foliis lanceolatis amplexicaulibus L., Hort. Upsal. 8. 1748. Verbena bonariensis altissima, lavandulae canariensis folio, spica lavandulae Dill. apud L., Sp. Pl., ed. 1, 20, in syn. 1753. Verbena bonariensis altissima spica lavandulae Dill. ex Sabbat in Martelli, Hort. Roman. 3: 10. 1775. Verbena elongata Salisb., Prodr. 71. 1796. Verbena trichotoma Moench, Suppl. Meth. Plant. 131. 1802. Veronica bonariensis, altissima,



lavandulae canariensis folio, spicâ lavandulae Dill. apud Poir. in Lam., Encycl. Meth. Bot. 8: 549, in syn. 1808. Verbena spicis brevibus, subfasciculatis; foliis oblongo-lanceolatis, amplexicaulibus Lam. apud Poir. in Lam., Encycl. Meth. Bot. 8: 549, in syn. 1808. Verbena (bonariensis), tetrandra, spicis fasciculatis; foliis lanceolatis, amplexicaulibus L. apud Poir. in Lam., Encycl. Meth. Bot. 8: 549, in syn. 1808. Verbena quadrangularis Vell., Fl. Flum. 16 (1825) and Icon. 1: pl. 39. 1827. Verbena bonariensis altissima lavandulae canariensis folio et spica Dill. apud Walp., Repert. 4: 19, in syn. 1845. Verbena corymbosa Hort. ex Walp., Repert. 4: 19, in syn. 1845 [not V. corymbosa Cham., 1832, nor Relh., 1947, nor Ruiz & Pav., 1798]. Verbena bonariensis longibracteata Walp., Repert. 4: 20. 1845 [not V. bonariensis var. longibracteata Kuntze, 1893]. Verbena bonariensis Dill. ex Goncalves de Cunha & Goncalves Sobrinho, Rev. Fac. Ciencias 3: 10 & 43. 1938. Verbena fonariensis L. ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. Verbena bonariesis L. apud Stellfeld, Trib. Farm. [Vellozoa] 12: 45, sphalm. 1944. Verbena bonatiensis L. ex Moldenke, Alph. List Cit. 1: 284, sphalm. 1946. Verbena bonariensis L. ex Moldenke, Alph. List Invalid Names Suppl. 1: 2, in syn. 1947. Verbena bonariense L. ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947. Verbena hasta L. ex Moldenke, Alph. List Invalid Names Suppl. 1: 24, in syn. 1947. Cymaria idjenensis Koord. ex Moldenke, Résumé 276, in syn. 1959. Verbena bonaerensis Larrañ. ex Moldenke, Résumé 358, in syn. 1959. Verbena bonariensis Vell. ex Moldenke, Résumé 359, in syn. 1959. Verbena bonariensis f. umbrosa Osten ex Moldenke, Résumé 359, in syn. 1959. Verbena littoralis H. Betch. ex Moldenke, Résumé 368, in syn. 1959 [not V. littoralis Humb., 1959, nor H. & B., 1947, nor H.B.K., 1845, nor Kunth, 1847, nor L., 1946].

Literature: Dill., Hort. Eltham. 406, pl. 300, fig. 387. 1732; L., Hort. Cliff. 11. 1737; A. van Royen, Fl. Leyd. Prod. 326. 1740; L., Hort. Upsal. 8. 1748; L., Sp. Pl., ed. 1, 20. 1753; Kniphof, Bot. Orig. Herb. Viv. pl. [284]. 1757; L., Syst. Nat., ed. 10, 852. 1759; Kniphof, Herb. Viv. 2: no. 98, pl. 1155. 1764; Mill., Gard. Dict., ed. 8, no. 6. 1768; J. A. Murr. in L., Syst. Veg., ed. 13, 62. 1774; Dill., Hort. Eltham. Add. Denom. Linn. pl. 300. 1774; Sabbat in Martelli, Hort. Roman. 3: 10, pl. 54. 1775; Christm. & Panzer, Vollst. Pflanzensyst. Houttuyn 5: 125--126. 1779; Gaertn., Fruct. & Sem. 1: 315, pl. 66, fig. 1. 1788; Lam., Tabl. Encycl. Méth. Bot. [Illustr.] 1: 57, pl. 17, fig. 2. 1791; R. A. Salisb., Prodr. 71. 1796; Willd., Sp. Pl. 1: 117--118. 1797; Thunb., Prodr. Pl. Cap. 96. 1800; Moench, Suppl. Meth. Plant. 131. 1802; Poir. in Lam., Encycl. Méth. Bot. 8: 549--550. 1808; Mirbel, Ann. Mus. Hist. Nat. Paris 15: 260, pl. 14 (2), fig. 4. 1810; J. Sm. in Rees,



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Illustrations: Dill., *Hort. Eltham.* pl. 300, fig. 387. 1732; Kniphof, *Herb. Viv.* pl. [284] (in color) (1757) and 2: pl. 1155 (in color). 1764; Dill., *Hort. Eltham. Add. Denom. Linn.* pl. 300. 1774; Sabbat in Martelli, *Hort. Roman.* 3: pl. 54 (in color). 1775; Gaertn., *Fruct. & Sem.* 1: pl. 66, fig. 1. 1788; Lam., *Illustr.* 1: pl. 17, fig. 2. 1791; Mirbel, *Ann. Mus. Hist. Nat. Paris* 15: pl. 14 (2), fig. 4. 1810; Vell., *Fl. Flum. Icon.* 1: pl. 39. 1827; *Agric. Gaz. N. S. Wales* 17: 800. 1906; F. M. Bailey, *Weeds & Poison Pl. Queensl.* 143. 1906; Fyson, *Fl. Nilgiri & Pulney Hill-tops* 2: 214. 1915; Britton, *Fl. Bermuda* 311. 1918; Sansin, *Anal. Soc. Cient. Argent. Buenos Aires* 88: 115. 1919; Stearn, *Flora Batava* 27: pl. 2093. 1925--1930; St. John & Hosaka, *Univ. Hawaii Res. Publ.* 6: 132. 1932; Dermen, *Cytologia* 7: 163, fig. 19. 1936; Troncoso, *Darwiniana* 3: 481, fig. 3 a--d. 1939; Augusto, *Fl. Rio Grande do Sul* fig. 99. 1946; Moldenke in Chittenden, *Roy. Hort. Soc. Dict. Gard.* 6: 2210. 1951; Moldenke in Gleason, *New Britton & Br. Illustr. Fl.*, pr. 1, 3: 128 (1952) and pr. 2, 3: 128. 1958.

Coarse erect perennial or annual herb, 0.3--2 m. tall, usually robust, deep-green throughout, often suffrutescent, sometimes in clumps 1 m. wide, with a taproot; stems strict, sharply and conspicuously tetragonal, somewhat scabrous-pubescent, hispidulous, or subvillous, especially on the angles, often 3-branched at the base, often rather naked above; leaves decussate-opposite, sessile, lanceolate or oblong-lanceolate, 4.5--13 cm. long, 0.6--2 cm. wide, the lower ones usually 9--13 cm. long and 1--1.5 cm. wide, all acute at the apex, cordate and subauriculate and adnate-semiamplexicaul at the base, sharply and unequally serrate along the margins from below the middle or incised-serrate, entire toward the base, rugose and hirtellous above, spreading-pubescent beneath, particularly along the prominently reticulate veins, or hirsute and scabrous on both surfaces, penninerved, venose, the margins revolute; inflorescence paniculate, terminal, cymose, fastigiate; spikes many-flowered, compact and aggregated, mostly short, eventually cylindric, 4--10 in number, commonly sessile or subsessile and crowded in dense fasciculate long-pedunculate cymes; bractlets lanceolate, acuminate at the apex, barely equaling or slightly surpassing the calyx, pubescent or hirtellous and ciliate, not glanduliferous; flowers very small or minute; calyx about 3 mm. long, pubescent, hispidulous on the angles, not glanduliferous, its lobes acute with short subulate tips; corolla varying from blue, bright-blue, reddish-blue, or blue-violet to violet, dark violet-purple, purple, bright-purple, red-purple, rosy-violet, lavender, rose-lavender, lavender-pinkish, lilac, dark-lilac, mauve, or even red, its tube scarcely twice the length of the calyx, pubescent on the outer surface, the limb small and inconspicuous, nearly regular; stamens didynamous, included; fruit splitting into 4 cylindric brown cocci included in the persistent calyx-tube, trigonous, about 2 mm. long, chiefly striate, slightly raised-reticulate at the apex, the dorsal side



3-striate, slightly cross-striate at one end, the commissural faces scarcely reaching the tip of the cocci, muricate-scabrous by being thickly set with strongly bulbous acute strigulae; chromosome number:  $x = 7$ ,  $2n = 28$ .

The type of this common and widespread species was collected in fields at Buenos Aires, Argentina, and is sheet no. 11 under genus 35 in the Linnean Herbarium at London. The species is apparently originally native to the area from Brazil and Bolivia south through Paraguay and Uruguay to Argentina and west to Chile, but has been introduced into and is now wild in Colombia, Ecuador, and Peru, as well as in the United States [Massachusetts, New Jersey, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Arkansas, Louisiana, Oklahoma, Texas, Oregon, and California], Bermuda, Jamaica, St. Helena, the Azores and Canary Islands, England, Sweden, Portugal, Spain, Switzerland, Kenya, Congo Leopoldville, Southern Rhodesia, Republic of South Africa, Malgache Republic, Mauritius, Réunion, Pakistan, India, Ceylon, Malaya, Java, the Hawaiian and Fiji Islands, New Caledonia, Loyalty Islands, Australia, New Guinea, Bribie and Double Islands, New Zealand, and Pitcairn Island. It was apparently introduced into cultivation in 1737 in Sweden and is now known from gardens in Ontario, Massachusetts, New York, New Jersey, Maryland, Oklahoma, British Guiana, Peru, Sweden, England, Belgium, France, Germany, Romania, the Canary Islands, Congo Leopoldville, India, and Java. Degener reports that it is sparingly naturalized in pastures on Molokai, while MacMillan (1943) reports it as naturalized near up-country gardens in Ceylon. Meebold found it near Indian settlements on Viti Levu and was of the opinion that it was "probably brought from India". It is recorded from Terceira in the Azores by Gonçalves de Cunha & Gonçalves Sobrinho on the authority of Trelease (1897) and Tultén & Warburg (1932) in the works cited above (1938 and 1941). Ball (1891) quotes W. Andrews about its occurrence in Patagonia: "Plant with tall upright stem to a height of from 4 to 6 feet; very small deep-purple blossoms in clusters at point of long stems. Decoctions of this are much used to bathe bruises. Foliage of a dark green and rough to the touch. Grows in clayey soil, especially near streams, lakes, &c." Ball continues "This species appears to be a genuine cosmopolite, extending to the warm temperate regions of the earth, though doubtless in many stations (for instance, the Canary Islands) it has been introduced by human agency." In Queensland it is described by L. S. Smith as a "tall erect weed fairly common along roadsides."

Collector report that the species in its native habitats is found along roadsides, in dry fields, waste places and dry or sandy waste land, ditches, and moist flat land, on dumps, river flats, and canal banks, on or near river banks, along trails and railroad rights-of-way, along fences in rice fields, in swamps and open places in live oak forests, in wet sandy open ground or waste valley land, in pastures, deep woods, and the margins of old Taxodium swamps, in clearings in woods, irrigation ditches,



sandy woods, and vacant lots, in fertile fields and marshes, on ballast, and in clay loam, sand, or sandy loam soil, most often in rather dry soil of old fields. It is described from wet sandy open ground, waste land, and wet places, in Lufkin sandy loam, in moist ditches and sandy bottoms, on campos and hills, in moist loam at the edge of fields, in rocky soil of mountains, and open ground on mountaintops, on open mountain slopes, in moist ground, campo bogs, damp woods, campos between woods, and low places, along fencerows and the edge of woods, at the edge of water or even in 6 inches of water, and in the neighborhood of cultivated ground, on islands and shores, along creeks running through woods, in fertile soil on the banks of ditches, in open low velvet woodland, in the full sun in sandy soil on railroad embankments, hill pastures, and cultivated ground. It has been collected at altitudes from sea level to 2900 meters, blooming in every month of the year, fruiting from April to October and in February and December. Caldevilla says that the species is "common in swamps" in Uruguay, while Legrand found it there "en un baldio del balneario" and "cerca dubafiado del balneario". Gallinal and his associates report it from fertile fields and marshes and as "rare" in Uruguay. Herter reports that at Montevideo it grows in sandy dry soil along roadsides exposed to sunlight.

Henderson found it on ballast in Oregon. In Natal it is said by West to be a weed on old lands, while McClean describes it as a weed in cultivated lands, gradually penetrating into grasslands and scrub. In Bermuda it is "common" according to Collins, and in Jamaica it is described by Harris as a "common weed in open places and old vegetable gardens", Philippi (1870) reports it as common in the province of Valdivia, Chile, and Jørgensen affirms that it is very common at Villa Rica in Paraguay; Kuntze says "introduced like wild in Australia". Repton reports it as "common" in the Transvaal. Mann, in the reference cited above, says that it has been introduced and has become a very troublesome weed in the Hawaiian Islands, but surely he refers here to V. litoralis H.B.K. We found the latter to be extremely common in most parts of the larger Hawaiian Islands on our travels there in 1961, but did not encounter V. bonariensis at all.

V. bonariensis is said by Heller to be "plentiful along the Yuba river 5 miles east of Marysville", California, where, he says, it is a "striking species". Wolf also refers to it as "abundant here". It is not listed in Jepson's "A Manual of the Flowering Plants of California" (1923--1925). Carter & Bowerman describe it from the same area as a perennial up to 4 feet tall, with lavender corollas, on moist or flooded ground along drainage ditches, "common but occurring intermittently". Jepson in 1943 records it from Merced and Solano Counties, California. Eastwood (1932) says "This verbena from Argentina has appeared in several localities in California. It was first noted by Mr. J. W. Stacey between Alto and Mill Valley, in Marin County, where the clustered spikes overtop the high, dense vegetation along the railroad track. It has been collected also at Collinsville, Solano County, by Miss C. E.



Smith, and along the Merced River between Snelling and the bridge, Merced County, by J. T. Howell." Carter found it "in loam along ditch with Lotus americanus, Rumex crispus, Melilotus alba, Helianthus annuus, and Cuscuta sp." in Fresno County.

Murrill (1945) reports it as rare in Alachua County, Florida. The Stacey s.n. [Oct. 27, 1924] specimen in the herbarium of the California Academy of Sciences bears a notation "first record from California", but this is not true, since Hainey collected the species at Marysville as far back as 1920, although he called it "Verbena hastata perhaps hybrid". Mason & Smith found it to have a taproot in 6 inches of water of fresh stream in Merced County, while Nabs & Smith found it by a runoff ditch, probably dry part of the year, in Stanislaus County, and Crampton encountered it in sandy soil along ditchbanks with Holcus halepensis and Setaria geniculata in Merced County.

Verbena bonariensis is cited by Raimondi (1943) from Arequipa, Peru, on the basis of his no. 9112, not as yet seen by me. Schallert calls it a "weed" in sandy soil along roadsides, "introduced around Charleston, especially common on Sullivan's Island", South Carolina. Wolf & Stark found it "abundant in sun in moist loam at edge of fields" in Yuba County, California, while Cory says it is "infrequent in sandy woods" in Jasper County, Texas. Cabrera & Dawson describe it as a hemicryptophyte.

Sabbat (1775) regarded the pre-linnean Verbena americana, spica multiplici, foliis urticae angustissimis, floribus caeruleis Herm. and Verbena altissima, americana Herm. as belonging in the synonymy of V. bonariensis. Actually, they belong with V. hastata L. The "Hook., Bot. Misc. 2: 166" reference sometimes cited for V. bonariensis seems to be an error, since I am unable to find any such reference.

Chamisso (1832) says "Ad fretum Stae. Catharinae legimus ipsi, misitque Sellowius in Brasilia meridionali 'Salto' aliisque locis nec non in Brasilia aequinoctiali copiose lectam. Occurrit et memoratu digna varietas villosior, bracteis longioribus apice recurvis." Reiche (1910) comments "A esta especie en el Herb. Mus. Nac. i en el Catalog. plant. vasc. chil. se refieren algunas mu- estras con las hojas del medio de 4--6 cm. de largo. Mui afin a V. hispida. En las provincias centrales i australes (Valdivia, Corral i Osorno)."

The Herb. W. H. Harvey s.n. [h. P. 1820] in the Dudley Herbarium is said to have been grown from seeds received from Buenos Aires, while O. R. Holmberg s.n. [22/9/1911] in the University of Lund herbarium was grown from seeds sent by Dusén from Paraná, Brazil. Bojer (1837) says that on Mauritius it "croit dans les plaines fertiles des quartiers des Plaines" and blooms all through the year. Baker (1877) says "naturalised plentifully in Mauritius in fields and by roadsides", while Vaughan calls it "a common weed" there. Burkill describes it from Pahang as "semiwoody erect herb to 2 ft.; rough square stems; coarse leaves; compact terminal



inflorescences; flowers purple; opensward, alt. 6600 ft.; only one previous collection for Malaya, from Tanah Rata at 4750 ft. alt." MacMillan (1943) speaks of the leaves as "deeply cut". Harper writes that the species is found on railroad rights-of-way in Tuscaloosa County, Alabama, "apparently a recent introduction here; commoner around seaports, such as Mobile, Pensacola, and Charleston; but also seen since near Birmingham." Palmer reports it from alluvial ground along roadsides, "probably introduced" in Saint Francis County, Arkansas. Pedersen says that it is "not rare on moist land" in Corrientes, Argentina. Rojas describes it as a shrubby herb 1--1.5 m. tall with blue-violet flowers, in fields and thickets at Puerto Casado, Paraguay, and Hassler comments that this material (T. Rojas 1892) is intermediate between V. bonariensis and V. inamoena Briq.

V. bonariensis is said to be adventive in England, according to Douglas H. Kent in a letter to me dated November 28, 1949. The J. Cryder specimen collected at Bradford, Yorkshire, in 1920 is also "probably this" according to Rep. Bot. Exch. Club Brit. Isles 1922: 617 (1923). Augusto cites Augusto, Bornmüller, Edésio, Emrich, Lindman, and Teodoro specimens from Rio Grande do Sul, Brazil; Hayek (1908) cites Wettstein & Schiffner s.n. and Campos Novaes s.n. from São Paulo. Schauer (1847 and 1851) cites Lhotsky s.n. from the Organ Mountains, Rio de Janeiro, as well as Bacle s.n., Ecklon & Zeyher s.n., and Lambert s.n. from the Cape of Good Hope; Pearson (1910) cites Drège s.n. [near Rondebosch], Rehmann 1704, and Woolley Dod 481 from the Cape. Guillaumin (1949) cites Buchholz 1491 and 1636 from New Caledonia. I have not as yet seen any of these specimens.

The specific name of this plant is sometimes upper-cased for no valid reason. The label on Franc 1018 says "Plants of New Caledonia", but "Loyalty Islands" has been added later.

The specimen on which the name Cymaria idjensis is based is apparently Koorders 43245 in the Buitenzorg herbarium; that on which V. bonariensis f. umbrosa is based is Parodi 8890 from San Nicolás, Buenos Aires, collected in January, 1929, and deposited in the Osten Herbarium at Montevideo; and that on which V. littoralis H. Betch. is based is McCann s.n. [9-15-36] in the University of Maryland herbarium, the material on one sheet said to have been raised from seed obtained from Brussels and the other from seed received from Bucharest.

The "Index Kewensis", volume 2, page 1178, says for Verbena capensis Thunb., Prodr. Fl. Cap. 96. 1800 "bonariensis, Lippia asperifolia." On the basis of this statement, the name V. capensis is often given in the synonymy of V. bonariensis. Thunberg's description, however, is "capensis. V. diandra spicis oblongis solitariis axillaribus hirsutis, foliis ovatis rugosis crenatis." I think that this refers very plainly to Lippia javanica (Burm. f.) Spreng. and nothing else. It should not be in the synonymy



of Verbena bonariensis! as done by Walpers, Schauer, and Jackson.

The Verbena bonariensis Rendle is Junellia patagonica (Speg.) Moldenke, while V. bonariensis Schau. is V. intermedia Gill. & Hook.; V. bonariensis & littoralis Hook. of Walpers and var. littoralis Hook. of Gay are both V. littoralis H.B.K.

It should be noted here that the two very ancient specimens in the Stockholm herbarium, cited below, are inscribed with interesting annotations. The Nietzel s.n. has in pencil on the obverse side "cfr. Verb. 9 bonariensis L. sp. pl. 20", while on the reverse side, in pencil "linné herb." and in ink (in Montin's handwriting) "Verbena (bonariensis) tetrandra, spicis fasciculatis, foliis lanceolatis amplexicaulibus. Syst. nat. ed. 13. n. 10. Habitat in agro Bonariensi. 4 Specimen ex horto Upsal. communicavit hortul Nietzel." The other, cited below as Herb. Linnaeus s.n., has on its obverse side, in pencil "cfr. Verbena 9 bonariensis L. sp. pl. 20 (Diandr. Monog.) K", and on the reverse side, in pencil "Linné herb." and in ink (in what is probably Linnaeus' handwriting) "Hort."; then in ink in an unknown hand "Verbena", then in ink in Linnaeus' hand "bonariensis", followed, in ink, in an unknown hand "Linn."

The original place of publication of the binomial is inaccurately given as page "28" in Lilloa 6: 322 (1941), as well as by Schauer (1847 and 1851) and other writers, while Moench (1802) gives the page as "117", also erroneously.

The physico-chemical properties of the sap in relation to phytogeography are discussed by Harris in the 1934 reference cited above, on the basis of a Jamaican specimen. The plant is used in popular medicine in Argentina according to Schwindt. Rosengurt B.783 in the Britton Herbarium has galled spikes. The Torrey, Golub, & Moseley s.n. specimen in the University of Massachusetts herbarium, and Hatschbach 4215 in the University of Oklahoma herbarium, greatly resemble var. conglomerata Briq. and may possibly be better referred to that variety, while the Mrs. A. F. Nelson s.n. [5-5-42] at the University of Texas looks somewhat like V. brasiliensis Vell., but there are no good leaves left on the specimen to verify this suspicion. Worth & Morrison 16498 at the University of California is a mixture of V. bonariensis and V. brasiliensis.

The surname of Pedro Boffa, collector in Argentina, is misspelled "Boffo" in some herbaria.

Common names for V. bonariensis include "Bonar's verbena" [in North Carolina, according to Schallert], "camaradinha", "cambará do capuêra" [in Brazil, according to Stellfeld], "clustered-flowered vervain", "cluster-flowered vervain", "formosa sem dote", "hana-hrass" [in Hawaii, according to St. John & Hosaka], "hoi" [in Hawaii, according to William Brigham], "jurupeba", "margarita azul", "oi" [in Hawaii, according to St. John & Hosaka], "purple top" [in Queensland, according to Bailey], "sekara" [in Fiji, according to Parham], "South American vervain", "sudamerikanisches



Eisenkraut", "tall verbena", "verbena", "verveine", "verveine de Buénos-Ayres", "verveine de Buenosaires", "verveine sauvage", "vunikutu" [in Fiji, according to Parham], and "yerba de fierro". It should be noted, however, that the name "verbena" is also applied to the genus Verbena as a whole, as well as to V. bracteata Lag. & Rodr., V. corymbosa Ruiz & Pav., V. hastata L., xV. hybrida Voss, V. litoralis H.B.K., V. officinalis L., V. peruviana (L.) Britton, V. platensis Spreng., V. stricta Vent., and V. urticifolia L., and even to Bouchea prismatica (L.) Kuntze, B. prismatica var. longirostra Grenz., Clerodendrum fragrans var. pleniflorum Schau., Priva lappulacea (L.) Pers., Stachytarpheta calderonii Moldenke, S. cayennensis (L. C. Rich.) Vahl, S. frantzii Polak., S. guatemalensis Moldenke, and S. jamaicensis (L.) Vahl. "Verveine" is applied also to Stachytarpheta cayennensis and S. jamaicensis, and "verveine sauvage" to Phyla nodiflora (L.) Greene.

Herbarium material of V. bonariensis has been misidentified and distributed as V. bonariensis f. longibracteata Kuntze, var. brevibracteata Kuntze, var. longibracteata Kuntze, V. brasiliensis Vell., V. braziliensis Vell., V. capensis Thunb., V. hanseni Greene, V. hastata L., V. hispida Ruiz & Pav., V. intercedens Briq., V. litoralis H.B.K., V. littoralis H.B.K., V. paniculata Lam., V. polystachya H.B.K., V. stricta Vent., V. urticifolia L., V. venosa Gill. & Hook., Lavandula burmannii Benth., Stachytarpheta sp., and "Labiatae". On the other hand, the Woolston 785 distributed as V. bonariensis is actually xV. intercedens Briq.; Kaspiew s.n. [Moss Vale, 4.6.51] and J. M. Wood 12122 are V. litoralis H.B.K.; Barkley 231 is V. sphaerocarpa Perry; Duss 3470 and 4697 are V. rigida Spreng.; and Fox & Godfrey 2823 is V. brasiliensis Vell.

Dr. Bailey's manuscript Catalogue of Florists Handling Verbenaceae (1935) lists Reuthe as offering V. bonariensis to the horticultural trade.

In California the species has been collected at altitudes of 50 to 200 feet, in Arkansas from 145 to 250 feet, in Assam from 1000 to 3000 feet, in Jamaica from 3200 to 4000 feet, in Transvaal at 4350 feet, in Ceylon at 5000 feet, in Brazil at sea-level, in Argentina from 50 to 2900 meters, in Chile at 200 meters, and in Bolivia at 2200 meters.

Pellett (1923) reports that V. bonariensis "appears to be most important in many places as a source of honey. He says that "apparently it was first noticed in this country [the U.S.A.] in Mobile County, Alabama, in July 1893 and since that time has become common along roadsides and in waste places near the Gulf Coast much to the advantage of the beekeepers. The honey is dark in color with pronounced though pleasing flavor. In a letter to the author George W. Bohne of Luling, Louisiana, wrote as follows:



'This is a honey which often gives trouble to inexperienced operators as it is often gassy -- not actually fermented -- when freshly gathered we find large patches blown loose from the comb which form "white blisters" and show frothy bubbles within the cells. When put into storage tanks such honey granulates very quickly. Moderate heating before storage overcomes this condition. I figure that vervain honey amounts to about forty percent of our total yield.'"

The name, Verbena quadrangularis, was published on page 16 of the original Velloso work cited above, but appears on page 17 of the 1881 reprint published by the Arquivos Mus. Nac. at Rio de Janeiro. Sampaio & Peckolt (1943) and Irmão Augusto (1946) correctly reduced V. quadrangularis to synonymy under V. bonariensis, as Schauer (1847 and 1851) does also.

Hauman-Merck (1913) cites his no. 351 and Spegazzini 449 from Rio Negro, Argentina, but I have not as yet seen these collections. Miss Perry cites 30 additional specimens not as yet examined by me: SOUTH CAROLINA: Charleston Co.: Curtiss 1963, in part (E, F, G); Gibbes s.n. [Charleston Neck, 28 Sept. 1853] (W); H. N. Moldenke 148 (E); Robinson 127 (G). ARKANSAS: Saint Francis Co.: E. J. Palmer 29303 (E, G). LOUISIANA: Saint Tammany Par.: Arsène 11859 (F, W), 12534 (F, W). TEXAS: Angelina Co.: Tharp 2558 (W); BERMUDA: Brown & Britton 98 (D, G); F. S. Collins 53 (G), 266 (G); Harshberger s.n. [Pembroke Swamp, 6/21/05] (D, E, G); Marble 737 (D); A. H. Moore 2946 (G); Robinson 94 (G). JAMAICA: A. S. Hitchcock s.n. [Blue Mountains, 14 Jan. 1890] (E); Maxon & Killip 569 (G); Nichols 163 (E, G); Orcutt 2736 (E, G); Perkins 102 (G).

In all, 749 herbarium specimens, including the types of most of the names involved, and 12 mounted photographs have been examined by me.

Citations: MASSACHUSETTS: Middlesex Co.: Pease 11837 (Ur). NEW JERSEY: County undetermined: I. Burk s.n. [Raign's Point, Oct. 1886] (Up--17109). NORTH CAROLINA: Bladen Co.: Fox & Boyce 3783 (N). Carteret Co.: M. Hill 165 (H--72611). Currituck Co.: W. B. Fox 4161 (N); W. H. Rhoades s.n. [Pemberton, August 1932] (Bt--30405, Bt--71466). New Hanover Co.: Fox & Boyce 3771 (N); Wells & Shunk s.n. [4/29/1938] (No--8595). SOUTH CAROLINA: Abbeville Co.: Radford 22769 (St). Charleston Co.: Curtiss 1963\*\* (Bc, Cm, I, Pa, Vt); W. H. Duncan 6051 (Gu); Gibbes s.n. [Sept. 28, 1853] (N); Herb. Leroy s.n. [Charleston] (N); Mellichamp s.n. [1879] (Pa); H. N. Moldenke 148 (Go, H--5460, N, S, Up, Ur); F. H. Sargent s.n. [Charleston, June 26, 1950] (Ok, We); P. O. Schallert 1634 (H--5458). Georgetown Co.: Godfrey & Tryon 268 (Ca--956862, N). Sullivan Island: Biltmore Herb. 9386a (S). County undetermined: Herb. Leroy s.n. [S. C.] (C). GEORGIA: Calhoun Co.: R. F. Thorne 3659 (Vi), 4152 (N). Chatham Co.: W. H. Rhoades s.n. [Savannah,



August 1929; Moldenke 17082] (Br, Bt--71467, Bt, N, St). Grady Co.: Cronquist 5472 (Gu--29318). Richmond Co.: Cuthbert 267 (N), 358 (N), s.n. [June 22, 1900] (Fl--21071), s.n. [June 25, 1900] (Fl--21069). FLORIDA: Bradford Co.: Arnold & West s.n. [Starke, 6-15-30] (Fl--21073, Hp, Tl). Dade Co.: Esselbaugh s.n. [Princeton, March 16, 1946] (Ur). Gadsden Co.: Buswell s.n. [West Florida, May 1928] (Bu); E. West s.n. [Chattahoochee, 8 Sept. 1931] (Fl--21082). Polk Co.: McFarlin 5732 (Gg--237855, I, Mi). Walton Co.: E. G. Hume s.n. [Northwest Walton Co., 4/13/38] (Fl--29765). ALABAMA: Crenshaw Co.: C. T. Reed 2073 (Au). Tuscaloosa Co.: R. M. Harper 3672 (Ba, Mi, N). MISSISSIPPI: Harrison Co.: Bomhard s.n. [Gulfport, May 15, 1927] (Cm); H. P. Riley s.n. [May 8, 1937] (Rs--30539). Rankin Co.: W. H. Rhoades s.n. [Pelahatchie, July 1926] (Bt--71464, Bt--71465), s.n. [Pelahatchie, July 1927; H. N. Moldenke 17083] (Br, Bt--71465, Bt, Ml, N, Nd, Se, St). TENNESSEE: Haywood Co.: Herb. Butler Univ. 71468 (Bt); W. H. Rhoades s.n. [Brownsville] (Hs). ARKANSAS: Ashley Co.: Demaree 17637 (Du--256561, N, Ok), 23692 (Sm), 24516 (Bm, Sm). Bradley Co.: Demaree 19552 (Ca--882585, N). Drew Co.: Demaree 18555 (N, Ok), 19287 (Ky, N, Pl--131511, Ur), 23251 (Sm). Logan Co.: Mrs. H. S. Young s.n. [June 20, 1925] (Cm, Cm). Saint Francis Co.: E. J. Palmer 29303 (N). Sevier Co.: Brinkley 267 (Au); V. L. Cory 57455 (St). LOUISIANA: East Baton Rouge Par.: L. H. Bailey s.n. [Baton Rouge, July 16, 1918] (Ba); I. T. Forbes s.n. [Baton Rouge, Aug. 1927] (Io--128004). Jefferson Par.: L. E. Fox 2107 (Nc). La Fourche Par.: L. E. Fox 2030 (Nc). Plaquemines Par.: Ewan 17474 (Tl). Saint Martin Par.: S. W. Hutchinson 7878, in part (En). Saint Tammany Par.: George & Shepard 5 (Au). Tangipahoa Par.: Correll & Correll 9259 (H--78633, N). Terrebonne Par.: Arceneaux 35 (It); Small & Alexander s.n. [along Bayou Blue, near Houma, Apr. 1931] (H--82340, N, N, N). OKLAHOMA: McCurtain Co.: Estes 94 (St--17574); E. J. Palmer 10486 (Bi, Du--205611, S, W--1569482); Waterfall 7599 (Ok, St), 11160 (St). TEXAS: Angelina Co.: Tharp s.n. [Huntington, 9-15-1923] (Au). Galveston Co.: Mrs. A. F. Nelson s.n. [5-5-42] (Au). Hardin Co.: Tharp 50-108 (Au--121750). Harris Co.: Boon 60 (Au); G. L. Fisher 34094 (Au), s.n. [June 1, 1934] (St). Jasper Co.: Cory 49850 (Sm). Jefferson Co.: Brenckle 48071 (N); Warner s.n. [near Beaumont] (Hu). Liberty Co.: Stougaard s.n. [White Oak Bayou, August 20th, 1923] (Hu). Orange Co.: G. L. Fisher 48132 (No--24729). Red River Co.: E. Adams 27 (Nt, Nt). Tyler Co.: C. C. Albers 39011 (Au); Tharp s.n. [7/24/39] (Au, Au, Au, Ca--882584, Mi, N). Wood Co.: McMullen s.n. [Golden, 7/9/27] (Au). County undetermined: McMullen s.n. [9-10-27] (Nt). OREGON: Multnomah Co.: L. F. Henderson 1525 (Or--8851). CALIFORNIA: Butte



Co.: J. T. Howell 34674 (Gg). Fresno Co.: Ella Carter 91 (Ca--709369, N). Marin Co.: J. T. Howell 19323 (Au, Ca--710620, Gg--322695, N, Pl--152029, S); Stacey s.n. [Oct. 27, 1924] (Gg--34493). Merced Co.: Crampton 2262 (Gg--389574, Gg--389575); J. T. Howell 1081 (Gg--172420); Mason & Smith 8242 (Ca--192056, Du--415523). Solano Co.: C. E. Smith 2 (Gg--31465). Stanislaus Co.: Nobs & Smith 206 (Ca--192058, Du--415587). Yuba Co.: Carter & Bowerman 3721 (Ca--623487, Du--269449, Gg--310896); Hainey s.n. [Marysville, 7/2/1920] (Gg--186167); A. A. Heller 15162 (Ca--726652, Du--256716, N, Po--252838, S, Se--86612, Ur, Ur); B. R. Jackson s.n. [Marysville, June 1932] (Gg--195408, Mn--20597); Jepson 16759 (Ca); L. S. Rose 39200 (N, We); C. B. Wolf 1965 [5503] (Mn--23987); Wolf & Stark 5503 [seed 1965] (Ca--527328, Du--231446, Gg--218383, Po--213074, Rs--7608). BERMUDA ISLANDS: Main: Bailey, Bailey, Whetzel, Degener, & McCallan s.n. [July 25, 1921] (I); Brown & Britton 98 (N, Po--63881, Up--45675); F. S. Collins 266 (Cm, N); O. Degener 1302 (N), s.n. [Hungry Bay, July 25, 1921] (Ba, Ms); Harshberger s.n. [Pembroke Swamp, 6/21/05] (N, Up--39539); Marble 737 (N); McCallan s.n. [Experiment Station, July 4, 1921] (Ba); A. H. Moore 2946 (Gg--155396, Mi). Saint George's: W. R. Taylor 49-1151 (Mi). JAMAICA: Barkley & Rishbeth 1121 (Le); N. L. Britton 1700 (N), 3313 (N); Chrysler 1419 (Ru); B. M. Davis s.n. [Abbey Green] (Mi), s.n. [Rodvor] (Mi); W. Harris 9132 (N); Harris & Lawrence C.15120 (Ca--987505); Maxon 2615 (N); Maxon & Killip 569 (N, Ur); Nichols 163 (N); C. R. Orcutt 2736 (Ca--430611, Po--179460, S), 3338 (Ca--430596); Proctor & Barkley 22J282 (Cb); Rothrock 340 (Up--33297); N. Taylor 4244 (N). COLOMBIA: Magdalena: Barkley & Gutiérrez Villegas 1927 (N). ECUADOR: Pichincha: Paredes s.n. [Sept. 1943] (N). PERU: Department undetermined: Née 12, in part (Q). BRAZIL: Federal District: Azambuja 38 (N); Freire & Vidal s.n. [Quinta da Boa Vista, Jan. 1923] (Ja--46523); Occhioni 532 [Herb. Jard. Bot. Rio Jan. 55229] (N). Minas Gerais: Bello 176 (Ja--46592); F. C. Hoehne s.n. [Poco de Caldas, Jan. 26, 1919] (Sp--2912); Lindberg 135 (Br, S); Mello Barreto 3179 [Herb. Jard. Bot. Belo Horiz. 2278] (Ja--46554); Mosén 640 (N, S); Regnell II.205 [12/1864] (S), II.205 [1/1865] (S), II.205b (S), II.210 [8/1/1857] (S, Ug); Widgren 1208 (Br), s.n. [1845] (Ja--46589, Lu, S). Paraná: Dusén 17044 (S), s.n. (Ja--46572); Hatschbach 4215 (Ok), 4307 (Sm), 5418 (Mm). Rio de Janeiro: N. J. Andersson s.n. [Rio de Janeiro, 1851] (N, S, S); Bailey & Bailey 297 (Ba); Bello 175 (Ja--46591); Emygdio de Mello Filho s.n. (Ja--46553); Herb. Sal-danha 6089 (Ja--46539), 6939 (Ja--46540); Rocha & Silva 13 (Ja), 53 (Ja); Sampaio 7687 (Ja--46516), 8505 (Ja--34734); J. Vidal II.



5045 (Ca--170005), s.n. [Maricá, April 20--25, 1943] (Ja--38972); Vidal & Valle I.69 (Ja--46779); Vieillard s.n. [Rio Janeiro, 1861] (La). Rio Grande do Sul: Costa Sacco 410 [Herb. Hort. Bot. 1316] (N); Henz s.n. [Rambo 35458] (N); Jürgens 27 (B), 290 (B); Rambo 51144 (N), 57305 (S); Vianna 123 [Herb. Jard. Bot. Rio Jan. 46114] (N). Santa Catarina: Hatschbach 526 (N, Ug); Reitz 3321 (N, S, S); Smith & Klein 11183 (W--2249375), 11394 (N, Ok); Smith, Reitz, & Sufridini 9426 (Ok), 9430 (W--2249360), 9545 (Ok). São Paulo: Bailey & Bailey 860 (Ba); Freire & Azevedo 131 (Ja--31561); F. C. Hoehne s.n. (N, Sp--1361, Ug); W. Hoehne 887 (N); Moldenke & Moldenke 19669 (Es, Lg, N); Usteri s.n. [Santos, Jan. 20, 1907; Herb. Polytech. São Paulo 254b] (Sp--15724); J. Vidal s.n. [Ribeirão Pires, April 1937] (Ja--35198). State undetermined: Lisboa s.n. [Herb. Jard. Bot. Rio Jan. 2688] (N); Mikan s.n. [Tocaja, Martio] (V); Widgren s.n. [Brasilia] (Lu). URUGUAY: "A. C." s.n. [Herb. Osten 21879] (Ug, Ug); Arechavaleta 36 (N, Ug); H. H. Bartlett 20710 (Mi), 21292 (Mi, W--1907582), 21306 (Ca--775172, Mi, W--1907583); Berro 2922 (N), 6717 (N), 8408 (N); Cabrera 3223 [Herb. Osten 23346] (N, Ug); Caldevilla 85 (Ug--5990); Castellanos s.n. [Herb. Inst. Miguel Lillo 11758] (N); Collector undesignated 50 (Ug); Gallinal, Aragone, Bergalli, Campal, & Rosengurt PE.4733e (N); Gardia s.n. [Lab. Biol. Animal, Jan. 12, 1943] (Ug); Herter 268 [Herb. Herter 81709] (B, B, Ca--314285, N, S, Sp--26635), s.n. [Herb. Osten 18496] (Ug), s.n. [Herb. Osten 19030] (Ug); Legrand 100 (Ug), 398 (Ug); Osten 4666 (Ug); Rosa-Mato 1916 (Ug--9815); Rosengurt B.783 (N), B.864 (N); Seijo s.n. [16 Nov. de 1884] (Ug); Teissene 4480 (Ug). PARAGUAY: Hassler 2130 (Cb, V--1406), 6692 (Ca--944358, N, S), 9643 (Cb, N, V); Jørgensen 3768 (Du--197904); Lindman A.3645 (N, S); T. Meyer 16033 (N); Montes 3334 (N); Morong 173 (C), 1540 (C); Pedersen 4341 (N); T. Rojas 172 (S), 1892 [Herb. Hort. Parag. 10077; Herb. Osten 13559] (Ug), 13559 (Go). BOLIVIA: Cochabamba: Steinbach 5020 [Herb. Osten 16232] (Cb, N, Ug), 9681 (E--974664, N, Po--219681, S). CHILE: Concepcion: Barros Valenzuela 8044 (N); Capt. King s.n. [Concepcion] (S). Coquimbo: Worth & Morrison 16498, in part (Ca--631730). O'Higgins: Sparre 2297 (S). Santiago: Guzmán 23 [Herb. Mus. Nac. Hist. Nat. Chile 59935] (N); Pahlman s.n. [Las Nogales, Jan. 28, 1913] (S). Valdivia: Buchtien s.n. [7/11/1902] (S), s.n. [Valdivia, 17.I.1904] (Gg--353140); Hollermayer 64 (Ca--704783), s.n. [Werdermann 1362] (Ca--323093, S); Lechler 185 (S); R. A. Philippi 115 (S). Province undetermined: Cuming 352 (Br); Herb. Esc. Agric. El Vergel 178 [Angol] (Ca--664808); Kunkel s.n. (Cb). ARGENTINA: Buenos



Aires: R. Alvarez 221 (S), 350 (S), 759 (Ca); N. J. Andersson s.n. [Buenos Ayres, 1852] (S); Boffa s.n. [Berisso, 20-II-1945] (Gg--406036, S), s.n. [Berisso, XII.1944] (S); Brizuela 1459 (Vi), 1589 (Vi); Cabrera 1367 (N), 1689 (N, S), 4288 (N), 4784 (N), 5148 (N), 5233 (N), 5660 (N), 10696 (Vi); G. Dawson 912 (Ca--882587, N); Eyerdam & Beetle 23173 (Ca--636607); Gillies s.n. [Pampas of Buenos Ayres] (N--photo, Z--photo); Herb. Linnaeus G. 37, S.11 (Ls--type, N--photo of type, Z--photo of type); Hicken s.n. [Herb. Inst. Bot. Darwinion 8760] (N); Krapovickas 3412 (N); Lefebvre s.n. [1885] (Br); Malecky s.n. [Enero 1940] (Ca--882586); Moldenke & Moldenke 19709 (N); Née 12, in part (Q), 86 (Q); Osten 2604 (Ug); Parodi 8890 [Herb. Osten 20943] (Ug); Remiro s.n. [15.X.1945] (Vi); Ruiz Huidobro 1666 (S), 1695 (N, S), 1771 (S); Scala 372 (N, N, Ug), s.n. [Canal Guazú, XI/1925] (N); A. G. Schulz 5678 (Sz); Venturi 54 [Herb. Inst. Miguel Lillo 31447] (N, N, S), 149 [Herb. Inst. Miguel Lillo 31446] (N). Catamarca: Jørgensen 1295 (W--1121004). Chaco: R. M. Aguilar 467 (N), 803, in part (N); Buratovich 732 (N); Jørgensen 2468 [Herb. Osten 11875] (Ug); T. Meyer 3444 [Herb. Inst. Miguel Lillo 17333] (Ca--882873, N); A. G. Schulz 1483 (N); C. L. Schulz 807 (Gg--353258, N), 1131 (N). Córdoba: Balegno 937 (N); Birabén 31 (N); A. T. Hunziker 8116 (N); Rodrigo 309 (N); F. A. Roig 1071 [Herb. Ruiz Leal 17829] (Sm). Corrientes: Collector undesignated 3971 (N); Ibarrola 1241 (S), 2131 (W--1931874); Pedersen 1333 (N); Rodrigo 708 (N, N); Ruiz Huidobro 3733 (N), 3798 (N), 3873 (N), 3987 (N), 4066 (N), 4125 (N), 4175 (Es, N); Rosengurt B.3707 (N); G. J. Schwarz 325 (S), 360 (S). Entre Ríos: Job 90 (W--1987981); T. Meyer 10758 (N); Ruiz Huidobro 3592 (Es, N), 3657 (Es, N); Scala s.n. [Canal Guazú] (N); Sota 63 (N). Formosa: I. Morel 41 (N), 159 (N), 323 (N), 372 (Gg--352697, N), 609 (N), 627 (N), 757 (N), 1221 (N). Mendoza: Araque Molina & Barkley 20M2217 (N); Carette & Ruiz Leal 3891 (N); Paci 794 (N); Ruiz Leal 1046 (N), 3055 (N). Misiones: Bertoni 2436 (N); Ekman 1972 (N, S), 2025 (S), 2026 (N, S), 2027 (N), 2028 (N); G. J. Schwarz 1427 (N), 1723 (N), 3490 (N), 3582 (N); Schwindt 37 (N). Río Negro: W. Fischer 236 (Cm, N, Ur). Salta: Bruch s.n. [Las Juntas, XII/1896] (N, N); Burkart 13205 (N); Ruiz Leal 12626 (Ss). San Juan: Cuezco 1077 (N, Ok). San Luis: Vignati s.n. [Estancia Grande, II-1940] (N). Santa Fé: R. Alvarez 346 (N); Barrionuevo s.n. [4-II-47] (N); Greco s.n. [4-II-1947] (N); Hayward 1425 (N); Job 634 (N), 796 (N, S), 797 (N), 1063 (N); Maldonado Bruzzone 1723 (W--1988281); Terribile 464 (N), 512 (N); Venturi 84 [Herb. Inst. Miguel Lillo 31449] (N). Tucumán: Bruch 2723 (N, N, S, Sp--36994, Sp, Ug);



Castillón s.n. [Herb. Inst. Miguel Lillo 31444] (Au, N); Descole & Schreiter 10752 (Ca); Lillo 11326 [Herb. Osten 8462] (Ug), s.n. [Herb. Inst. Miguel Lillo 31451] (N, N); Lorentz & Hieronymus 853 (N), s.n. [30.I.1874] (Br); Monetti 239 [Herb. Osten 10873] (Ug); Olea 134 (Ca--165477); C. C. Olrog s.n. [P. Olrog 90] (Og), s.n. [P. Olrog 92] (Og); D. Rodriguez 471 [Herb. Inst. Miguel Lillo 31450] (Au, N, Vi); Schreiter s.n. [Gualinchay, Dec. 1, 1917; Herb. Osten 12194] (Ug); Venturi 2937 [Herb. Osten 17240] (Ug). Province undetermined: Hicken 889 (Gg--31286); Hunziker 911 (N); Sparre 388 [Rosario] (S). ST. HELENA: N. J. Andersson s.n. [St. Helena] (S). MADEIRA: G. Gonçalves da Costa s.n. [Maio 1938] (Go). CANARY ISLANDS: Tenerife: Asplund 693 (S); Bourgeau s.n. [Teneriffa; Herb. Saldanha 2772; Herb. Mus. Nac. Rio Jan. ref. II] (Du--166456, Ja); Cyrén s.n. [9 Juin 1929] (Ca--17491, Go, Go); Eliasson s.n. [Realejo Alto, 2/8/1957] (Go); Tullgren 192 (S). Island undesignated: Burchard 124 (S). SWEDEN: Blöm s.n. [in rudertis, 4/9/1939] (S), s.n. [Göteborg, 4/9/1939] (Go), s.n. [Göteborg, 6/10/1940] (Go). PORTUGAL: Gomes Pedro s.n. [Pragal, Almada] (N). SPAIN: Herb. Mus. Bot. Stockh. 51 (S). GERMANY: Fiedler 26633 (Go). SWITZERLAND: Probst s.n. [8.9.27] (Go), s.n. [23.8.32] (Pb), s.n. [27.8.32] (Pb), s.n. [17.8.1936] (Ew, Gg--267611), s.n. [Solothurn, 11.11.1936] (N). CONGO LEOPOLDVILLE: Bredo 1072 (Br); Quarré 74 (Br, Br, Br), 3224 (Br, Br, Br), 3468 (Br, Br, Br), 4759 (Br, Br, Br). KENYA: Lindblom s.n. [5.1920] (S). SOUTHERN RHODESIA: J. C. F. Hopkins s.n. [Govt. Herb. Salisbury 6744] (N), s.n. [Govt. Herb. Salisbury 7911] (N), s.n. [Govt. Herb. Salisbury 9405] (Rh); G. M. McGregor M.82/37 (S); Pardy s.n. [Govt. Herb. Salisbury 8488] (N); Rattray 1007 (Rh). REPUBLIC OF SOUTH AFRICA: Cape Province: N. J. Andersson s.n. [Cap] (S, S); Drège s.n. [Tygerberg] (S); Gründahl s.n. [Prom. b. spei] (S); Haptröm s.n. [3 Jan. 1935] (S); Herb. Mus. Bot. Stockholm s.n. [Rondebosch] (S); Rehmann 1709 (Br); Sidey 3053 (S); Sollier s.n. (S); Stender s.n. [Cap] (S); Thunberg s.n. (S); Wahlberg s.n. [Africa occidentalis] (S), s.n. [Kaapsche Flahte] (S); E. Wall 5, in part [Heidelberg, 8/36] (Ew), 5, in part [Swellendam, 10/12/37] (Ew). Natal: A. P. D. McClean 851 (Gg--310862); Sidey 2058 (S), 3443 (N, S); O. West 975 (Ss); Wylie 27993 (N). Transvaal: Bodley s.n. [Jan. 1923] (S); L. E. Codd 5689 (Ss); T. J. Jenkins s.n. [Herb. Transvaal Mus. 10275] (Z); A. Peter 50921 [S.40] (B), 50947 [S.41] (B); Repton 304a (Ba, Se--95334); F. A. Rogers 18871 (S); Schlieben 7176 (B, N); R. G. N. Young s.n. (Cb). State undetermined: Acock 4326 [Hels Hoogte] (S); Penther 1795 [Swellendam, Heidelberg] (S); F. R. R.



Schlechter 2334 [George] (S). MALGACHE REPUBLIC: d'Alleizette 74m (P); Baron 1715 (P), 2363 (K), 2715 (K), 6104 (P); Geneaud 7 (P). MASCARENE ISLANDS: Mauritius: N. J. Andersson s.n. [Mauritius] (N, S); Bijoux s.n. (Bz--23741); Sieber, Fl. Maurit. II.214 (Br, M, P); d'Urville s.n. [Ile de France, 1825] (P); Vaughan 118 (S). REUNION: Boivan 1236 (Du--166455); Potier s.n. [St. Denis, Sept. 25, 1872] (P); Richard 95 (P). INDIA: Assam: W. Griffith s.n. [1843] (Br). East Punjab: Koelz 4571 (Mi, N); Ram 312 (N); R. R. Stewart 1866 (N). Khasi States: Hooker f. & Thomson s.n. [Mont. Khasia] (Br, M, S). Uttar Pradesh: R. R. Stewart 16007 (N). State undetermined: Herb. Roxburgh s.n. (Br). CEYLON: Silva 48 (N). MALAYA: Pahang: Burkill 808 (Ng--16860). INDONESIA: GREATER SUNDA ISLANDS: Java: C. A. Backer 25103 (Bz--23726, Bz--23727, Bz--25645, Ut--52561); Bergman s.n. [VII.1939] (Bz--23730); Clason-Laarman 636 (Bz--23732); Docters van Leeuwen-Reijnvaan 4595 (Bz--23728); C. W. Franck 545 (S); Groenhart s.n. [5/3/1939] (Bz--23729); Koorders 43221 (Bz--23737, Bz--23738), 43245 $\beta$  (Bz--23736, Bz--25646); Ultée s.n. [IX.1925] (Bz--23724, Bz--23725, Ut--81991); Van der Gijl 139 (Bz--23733); Van Steenis 7194 (Bz--23731). MELANESIA: New Guinea: Northeastern New Guinea: M. S. Clemens 8255a (B), 8610 (B), 8668a (B). LOYALTY ISLANDS: Franc 1018 (Ca--390583, N). NEW CALEDONIAN ISLANDS: New Caledonia: Franc 1693a (N, N); Germain s.n. [1874--76] (B); MacDaniels 2044 (Ca--54060). YASAWA FIJI ISLANDS: Viti Levu: Meebold s.n. [Suva, Aug. 1932] (Bi). AUSTRALIAN REGION: AUSTRALIA: New South Wales: Collector undesignated 770 (B); Kaspiew 1470 (B); Rodway 332 (Gg--226488); Valentin s.n. [29 Jan. 1948] (S). Queensland: M. S. Clemens s.n. [Double Island Point, October 1946] (Mi); Mauritson s.n. [near Cairns, December 1936] (Go); L. S. Smith 3076 (N); C. T. White 7222 (Ba). South Australia: Kaspiew 99 (Ew), 1469 (B). State undetermined: Kuntze 20183 [Stanthorpe] (N). GREAT BARRIER REEF: Bribie Island: M. K. Clemens s.n. [Apr. 20--30, 1944] (Or--49589). Double Island: M. K. Clemens s.n. [Feb. 16, '43] (Or--46677), s.n. [Oct. 1947] (Or--56195). NEW ZEALAND: Philson 234 (H--56451). POLYNESIA: HAWAIIAN ISLANDS: Lanai: G. C. Munro 326 (Bi), 352 (Bi), 444 (Bi), s.n. [Kamoku, 6/29/18] (Bi). Molokai: O. Degener 11260 (N, N). PITCAIRN ISLAND: Chapin 947 (Bi, N), 948 (N); Quayle X (Bi, Bi); H. Saint John 14993 (Bi). CULTIVATED: Belgium: Herb. Du Mortier s.n. [Hort. Bot. Bon. 1825] (Br); M. Martens s.n. [hort. insul. 1820] (Br), s.n. (Br); Nyst s.n. (Br). British Guiana: L. H. Bailey s.n. [Botanic Garden, Georgetown] (Ba). Canada: G. H. M. Lawrence 753 (Ba). Canary Islands: E. Wall 5, in part [28/423] (Ew). Congo Leopoldville: RR. PP. Salésiens



263 (Br), 638 (Br). England: L. H. Bailey s.n. [Royal Botanic Gardens, Kew, Aug. 8, 1919] (Ba); Herb. Roy. Hort. Soc. Garden Wisley s.n. [August 1937] (Ba); Nelmes 1044 (Ba). France: Bouchon 3889 (La), s.n. [Duffour 3889] (Vi); Collector undesignated 12 (Q), s.n. [h. P.] (Br); Herb. W. H. Harvey s.n. [h. R. P. 1819] (Du--166453), s.n. [h. P. 1820] (Du--166454), s.n. (Du--166452); Herb. Saldanha 2776 (Ja--46560). Germany: Herb. Calif. Acad. Sci. 31283 (Gg), 31284 (Gg). India: Herb. Hort. Bot. Calcutt. s.n. (Bz--23739, T); Wallich s.n. (S). Java: Herb. Hort. Bot. Bogor. XV. K.A.XLV.12 (Bz--26439), XV.K.A.XLVI.5 (Bz--26454). Maryland: Mc Cann s.n. [9-15-36] (Md, Md, Md). Massachusetts: L. H. Bailey s.n. [Harvard Univ. Bot. Gard.] (Ba); Torrey, Golub, & Moseley s.n. [Amherst, Sept. 18, 1939] (Ms). New Jersey: G. H. M. Lawrence P. 520 (Ba). New York: H. N. Moldenke 8551 (N). Oklahoma: Stratton 6124 (St). Peru: Soukup 2911 (N). Sweden: Herb. Linnaeus s.n. (F--photo, N--photo, S, Sg--photo, Z--photo); O. R. Holmberg s.n. [22/9/1911] (Lu); Nietzel s.n. (S); E. Wall 5, in part [1/941] (Ew). LOCALITY OF COLLECTION UNDESIGNATED: Collector undesignated 520 [Herb. Mus. Nac. Rio Jan. prov. IV] (Ja), s.n. (N); Gandoger s.n. [Con. Gomera, 4.1905] (N); Herb. Jard. Bot. Brux. s.n. (Br); Herb. Jewett s.n. (Mi, Mi); Herb. Linnaeus s.n. (F--photo, N--photo, S, Sg--photo, Z--photo); Herb. Martius s.n. (Br); Herb. Mus. Bot. Stockholm s.n. (S, S, S), s.n. [Feb. 22--24] (S); Herb. Mus. Nac. Rio Jan. ref. VIII (Ja), X (Ja); Herb. Petit-Thouars s.n. (P); V. May s.n. [French's Forest, 26/1/35] (Go); Osbeck s.n. (S); T. Shepherd 19 (S); Swartz s.n. (S).

VERBENA BONARIENSIS f. ALBIFLORA Moldenke, Phytologia 3: 117. 1949.

Literature: Moldenke, Phytologia 3: 117 & 135. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 105 & 197. 1949; Moldenke, Résumé 126 & 471. 1959.

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

The type of the form was collected by A. V. de la Sota (no. 82) on Isla "El Cavadito", dept. Gualaguay, Entre Ríos, Argentina, on January 13, 1947, and is deposited in the Britton Herbarium at the New York Botanical Garden. Thus far it is known only from the original collection. In all, 1 herbarium specimen and 4 mounted photographs have been examined.

Citations: ARGENTINA: Entre Ríos: Sota 82 (F--photo of type, N--type, N--photo of type, Sg--photo of type, Z--photo of type).

VERBENA BONARIENSIS var. CONGLOMERATA Briq., Arkiv Bot. Stockh. 2 (10): 11, pl. 3b. 1904.

Literature: Briq., Ann. Conserv. & Jard. Bot. Genève. 3: 164.



1899; Briq., Arkiv Bot. Stockh. 2 (10): 11, pl. 3b. 1904; Stapf, Ind. Lond. 6: 429. 1931; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 38 & 101. 1942; Moldenke, Castanea 13: 117 & 118. 1948; Moldenke, Alph. List Cit. 2: 458 & 599 (1948), 3: 665, 703, 704, 848, 858, & 869 (1949), and 4: 1124 & 1249. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 99, 100, 105, & 197. 1949; Moldenke, Phytologia 3: 135 (1949), 3: 305 (1950), and 3: 467. 1951; Stellfeld, Trib. Farmac. [Vellozoa] 19 (10): 166. 1951; Moldenke, Résumé 109, 118, 119, 126, 223, & 471. 1959; Moldenke, Résumé Suppl. 2: 2. 1960; Angely, Fl. Paran. 16: 78 (1960) and 17: 46. 1961; Moldenke, Résumé Suppl. 3: 8 & 29. 1962.

Illustrations: Briq., Arkiv Bot. Stockh. 2 (10): pl. 3b. 1904.

This variety differs from the typical form of the species in its very harshly rough bullate-rugose leaves, much reduced and more or less capitate or subcapitate spikes, and elongated well-developed corollas, twice as long as in the typical form, whose tube surpasses the calyx by 2--3 mm. and whose limb is to 3 mm. wide. The plant is described by collectors as an annual suffrutescent herb, 1--2 m. tall; the stems very rigid; leaves mostly 3--5 cm. long and 0.8--1.5 cm. wide; spikes very short, densely glomerate in quasi-heads at the apex of the peduncles; bractlets rather broadly lanceolate or ovate-lanceolate, acuminate at the apex, equaling or slightly surpassing the calyx; calyx red; corolla varying from blue or intensely violet-blue to lilac, lavender-purple, violet, blue-violet, or purple, or the limb Amethyst Violet No. 35/2 and the tube Rhodamine Purple No. 29/1, according to the Royal Horticultural Society Colour Chart, 1938--1942.

The type of this distinctive variety was collected by Carl Axel Magnus Lindman (no. A.473) in dry sandy pastures at Porto Alegre, Rio Grande do Sul, Brazil, on October 12, 1892, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva. The variety is said by collectors to inhabit marshes and swampy places, wet fields and wet fertile meadows, shrubby fields and campos, river banks, high grassy rather wet soil along railroad embankments, and dry sandy pastures, blooming from September to April and in July. Jørgensen describes it as ruderal and common at Villa Rica, Paraguay; Osorio found it to be "rare in the interior of a swamp" at La Barra, San José, Uruguay. Ritter reports that where he found it in Rio Grande do Sul there is a 1.5 m. rainfall and 10--35° annual temperature. Goodspeed says that it is a "rather good garden prospect if grown in masses, cuts and keeps well." It was introduced into cultivation in 1841.

This plant has recently been found as a garden weed at Sebastopol, Sonoma County, California. Seeds from this material have been scattered near the museum buildings of the California Academy of Sciences in Golden Gate Park, San Francisco, and have produced tall stiffly erect plants which J. T. Howell, in a letter to me dated June 26, 1961, says were blooming in June, producing "a real show....delicately and pleasantly fragrant." My wife, son, and I saw these plants still in full bloom there in August, 1961, on our visit to the locality.

The variety is found native from southern Brazil through Uru-



guay and Paraguay into northern Argentina, at altitudes of 6 to 20 meters. Berro 1626 in the Britton Herbarium is apparently virus infected. Briquet, in his original description, points out that this variety has exerted well-developed corollas like those seen in V. rigida Spreng., but very unique capitate inflorescences. He says that the Reineck & Czermak 151 which he cited as V. bonariensis in his 1899 publication is really this variety, but I have not as yet seen this collection.

Specimens of the variety have been misidentified and distributed in herbaria as V. bonariensis L., V. bonariensis var. brevibracteata Kuntze, f. brevibracteata Kuntze,  $\alpha$  brevibracteata Kuntze, var. longibracteata Kuntze, V. inamoena Briq., V. montevidensis Spreng., and V. rigida Spreng. The Hoss 18323 from Tennessee has a label reading "in the back yard of J. M. Brown, 1601 Lombard Place, probably a hybrid, June 29, 1954".

In all, 65 herbarium specimens, including the type collection, and 4 mounted photographs have been examined by me.

Citations: TENNESSEE: Knox Co.: Hoss 18323 (O). CALIFORNIA: Sonoma Co.: Noldeke s.n. [Sebastopol, May 14, 1961] (Z). BRAZIL: Paraná: Dusén 7166 (S). Rio Grande do Sul: Lindman A.473 (F—photo of isotype, N—photo of isotype, S—istotype, S—istotype, Si—photo of isotype, Z—photo of isotype); Malme 701 (S), 701a (S), 915 (S); Rambo 38407 (N), 41219 (N), 51444 (N, S); Reineck & Czermak 69 [Herb. Osten 4159] (S, Ug); Ritter 35458 (N, S). State undetermined: Widgren s.n. [Brasilia] (S). URUGUAY: Arechavaleta 463 (Ug, Ug, Ug); Banquero & Bronsini 3137 (Ug); H. H. Bartlett 21292 (Ca—772088); Berro 1626 (N), 1966 (N); Caldevilla 636 (Ug—9804); Gallinal, Aragone, Bergalli, Campal, & Rosengurtt PE.5461 (N); Herter 1059a [Herb. Herter 82626] (B), s.n. [Herb. Osten 18496] (Ug); Osorio 348 (Ug—13054); Osten 3662 (N, Ug), 4724 (Ug, Ug), 5391 (N, Ug, Ug); Rosengurtt & Gallinal 5804 (S, Ug—14300). PARAGUAY: Hassler 8934 (N, N, S); Jørgensen 3768 [Herb. Osten 22250] (N, N, S, Ug), 3774 [Herb. Osten 22240] (Ug); T. Rojas 1880 [Herb. Hort. Parag. 10067; Herb. Osten 13528] (N, Ug), s.n. [Herb. Osten 13528] (N, N, S). ARGENTINA: Buenos Aires: Dusén 6293 (S); Goodspeed 23225 (Ca—636601), Corrientes: Ibarrola 1784 (S), 1963 (S). Entre Ríos: T. Meyer 10313 (N). Misiones: Bertoni 1915 (N). CULTIVATED: Belgium: M. Martens s.n. [ex horto 1841] (Br), s.n. [ex horto 1843] (Br). California: Bracelin 1512 (Gg—339909, Go), 2827 (Gg—347738, Go). New York: New York Bot. Gard. Cult. Pl. 387-38 (N). North Dakota: Waldron s.n. [Stevens 756] (Ca—882807).

VERBENA BRACTEATA Lag. & Rodr., Anal. Cienc. Nat. 4: 260. 1801.

Synonymy: Verbena prostrata G. Savi, Soc. Ital. Mem. Mat. & Fis. 9: 349, pl. 7. 1802 [not V. prostrata Ait., 1947, nor Benth., 1959,



nor R. Br., 1812]. Verbena bracteosa Michx., Fl. Bor.-Am. 2: 13. 1803 [not V. bracteosa Pursh, 1940]. Verbena squarrosa Roth, Catal. Bot. 3: 3. 1806. Zapania bracteosa (Michx.) Poir. in Lam., Encycl. Méth. Bot. 8: 843. 1808. Verbena repens Spreng. ex Steud., Nom. Bot., ed. 2, 2: 750. 1841 [not V. repens Bertol., 1806, nor Larrañ., 1959, nor Savi, 1825, nor Ten., 1947]. Zapania bracteosa Poir. apud Walp., Repert. 4: 24, in syn. 1845. Verbena canescens Chapm., Fl. South. U. S., ed. 1, 307. 1860 [not V. canescens H.B. K., 1818]. Verbena bracteosa var. brevibracteata A. Gray, Syn. Fl. N. Am. 2 (1): 336. 1878. Verbena rudis Greene, Pittonia 4: 152. 1900. Verbena confinis Greene, Pittonia 4: 152. 1900. Verbena brevibracteata (A. Gray) Eggert, Torreya 2: 124. 1902. Verbena imbricata Woot. & Standl., Contrib. U. S. Nat. Herb. 16: 166. 1913. Verbena bracteata Cav. ex Seymour, Host Ind. Fungi N. Am. 587. 1929. Verbena bracteata var. confinis (Greene) Farwell ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. Verbena bracteata var. rudis (Greene) Farwell ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. Verbena braceosa Michx. ex G. L. Fisher, Am. Bot. Exchange List, sphalm. 1946. Verbena bracteata Michx. ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947. Verbena bracteata Timmons ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947. Verbena repens Thouin ex Moldenke, Résumé 373, in syn. 1959. Verbena stricta x bracteosa Engberg ex Moldenke, Résumé 375, in syn. 1959 [not V. stricta x bracteosa Bebb, 1940, nor Eggert, 1940, nor A. S. Hitchc., 1940, nor Mackenzie, 1940, nor Rydb., 1940, nor Sandberg, 1947]. Verbena bracteosa Michx. ex Moldenke, Résumé Suppl. 2: 8, in syn. 1960. Verbena bracteata (Lag.) Rodr. ex Moldenke, Résumé Suppl. 2: 10, in syn. 1960. Verbena bracteosa Gray ex Moldenke, Résumé Suppl. 2: 10, in syn. 1960. Verbena bracteosa stricta Thompson ex Moldenke, Résumé Suppl. 2: 10, in syn. 1960. Verbena bracteosa Michx. ex Moldenke, Résumé Suppl. 2: 10, in syn. 1960. Verbena canescens Kunth sensu Chapm. ex Moldenke, Résumé Suppl. 2: 11, in syn. 1960. Verbena imbricaria Woot. & Standl. ex Moldenke, Résumé Suppl. 2: 11, in syn. 1960. Verbena bractiata Lag. & Rodr. ex Moldenke, Résumé Suppl. 3: 36, in syn. 1962. Verbena bracteata Lag. ex Moldenke, Résumé Suppl. 3: 36, in syn. 1962. Verbena bracteosa Benth. ex Moldenke, Résumé Suppl. 3: 36, in syn. 1962. Verbena bracteosa L. ex Moldenke, Résumé Suppl. 3: 36, in syn. 1962.

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- 790--794, 796--798, 800, 802--804, 806, 809, 811, 812, 816, 822, 824, 825, 827, 828, 831--833, 835, 839, 840, 843, 844, 849--852, 854, 856--858, 866, 869--871, 873, 876, 878, 880, 883--887, 892, 895, 899, 904, 917, 926, 927, 931, 932, 936, 942, 945--947, 949--952, 954, 955, 958, 966, 970, 973, 976, & 977 (1949), and 4: 979-981, 986, 990--998, 1002--1004, 1014--1017, 1068, 1080, 1084--1086, 1095, 1098--1100, 1105, 1107, 1109--1112, 1114, 1115, 1118-1123, 1125, 1128, 1132--1136, 1138, 1139, 1141--1144, 1149, 1150, 1152, 1154, 1155, 1162--1164, 1166--1168, 1173--1177, 1181--1183, 1187, 1191, 1192, 1198, 1200, 1204, 1205, 1207, 1210--1214, 1216-1222, 1224--1231, 1233, 1235--1246, 1252, 1253, 1260, 1261, 1288-1292, 1294, 1298, & 1299. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 12. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 2--8, 10--14, 16--21, 23, 25--27, 32, 107, 108, 163, & 197. 1949; Moldenke, Phytologia 3: 71--73, 131, 132, & 141 (1949) and 3: 283, 291, & 374. 1950; M. L. Grant, Proc. Iowa Acad. Sci. 57: 118. 1950; Fern. in A. Gray, Man. Bot., ed. 8, 1209, 1211, & 1612, fig. 1468. 1950; Deam, Yunker, & Friesner, Proc. Ind. Acad. Sci. 59: 51. 1950; Clokey, Univ. Calif. Publ. Bot. 24: 198 & 274. 1951; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209 & 2210. 1951; Moldenke, Phytologia 3: 449 & 450 (1951) and 4: 67 & 119. 1952; Moldenke in Gleason, New Britton & Br. Illustr. Fl., pr. 1, 3: 127, 131, & 134. 1952; Moldenke, Phytologia 4: 185, 186, 266, & 450 (1953) and 5: 94. 1954; Thorne, Am. Midl. Nat. 52: 313. 1954; Thorne, Proc. Iowa Acad. Sci. 62: 181. 1955; St. John, Fl. Southeast. Wash. & Adj. Ida., rev. ed., 352. 1956; Strausbaugh & Core, Fl. W. Va. 3: 774, 776, & 777. 1958; Moldenke in Gleason, New Britton & Br. Illustr. Fl., pr. 2, 3: 127, 131, & 134. 1958; Moldenke, Am. Midl. Nat. 59: 342--345, 349, 355, 357--359, & 361. 1958; Moldenke, Résumé 5--11, 13--26, 28, 31--33, 38, 129, 130, 223, 359, 360, 362, 365, 367, 372--375, 393, 415, 424, & 471. 1959; Moldenke, Résumé Suppl. 1: 2 & 3 (1959) and 2: 1--3, 8, & 10--14. 1960; Monachino, Bull. Torrey Bot. Club 87: 422. 1960; Moldenke, Résumé Suppl. 3: 1, 2, 4--8, & 36. 1962.
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- Annual or perennial, hairy, commonly prostrate or trailing, sometimes forming large spreading mats or clumps to 1 m. in diameter from a single caudex, occasionally erect; root large, woody;



stems usually several from a common base, diffusely branched and wide-spreading, decumbent or ascending, rarely erect, hirsute or coarsely hirsute; branches usually decumbent or prostrate, 1--5 dm. long, hirsute; leaves 1--6.5 cm. long, wedge-lanceolate, pinately incised or usually 3-lobed, narrowed at the base into the short margined petiole, hirsute on both surfaces, the midrib and larger veins slightly prominent beneath, the lateral lobes narrow and divaricate, the middle lobe large, cuneate-obovate, incised-dentate or cleft; spikes terminal, sessile, continuous with the branches or nearly so, comparatively thick (usually 10--15 mm. wide), conspicuously bracteose, harshly hispid-hirsute throughout; bractlets large, conspicuous, much longer than the calyx, foliaceous, usually surpassing the entire flower, mostly 8--15 mm. long, acute to acuminate or short-attenuate at the apex, spreading-ascending or sometimes appressed, recurved in age, coarsely hirsute, the lowermost often incised and quite leaf-like, the upper linear-lanceolate, entire; flowers small, 4--10 mm. long; calyx 3--4 mm. long, hirsute particularly along the veins, its lobes very short, connivent over the schizocarp; corolla varying from blue, bluish, light-blue, light lavender-blue, bluish-purple, or deep-blue to purplish, purple, lilac, lavender, gray-lavender, violet, pale-violet, purplish-pink, or pink, sometimes pink with a white center or lavender with a white throat, its tube protruding slightly beyond the calyx, very finely pubescent outside the throat, hairy inside, its limb 5-parted, 2--3 mm. wide; nutlets trigonous, linear, 2--2.5 mm. long, the dorsal surface sharply raised-reticulate above, striate below, the ventral surface with the commissural faces reaching to the distal end of the cocci, muricately scabrous, densely set with unequal strongly bulbous acute strigulae; chromosome number:  $2n = 14$  or  $n = 14$  [Solbrig].

The type of this extremely common and variable species was collected from cultivated material growing in the Botanical Garden at Madrid, Spain, in 1801, and is deposited in the herbarium there. The type of V. confinis was collected by Elmer Otis Wootton (no. 409) in the Organ Mountains, Dona Ana County, New Mexico, on August 30, 1897; that of V. imbricata is Wootton 2831, collected at Farmington, San Juan County, New Mexico, on August 8, 1904, deposited in the United States National Herbarium at Washington. The type of V. rudis was collected by Charles Fuller Baker (no. 564) at Arboles, Archuleta County, Colorado, on June 18, 1899.

It is worthy of note here that V. repens Bertol., V. repens Larrañ., and V. repens Savi are synonyms of Phyla nodiflora (L.) Greene; V. repens Ten. is a synonym of Phyla nodiflora var. rosea (D. Don) Moldenke; V. prostrata R. Br. is V. lasiostachys Link; V. stricta x bracteosa A. S. Hitchc. is xV. perriana Moldenke; and the V. stricta x bracteosa of Bebb, of Eggert, of Mackenzie, of Rydberg, and of Sandberg are all xV. deamii Moldenke.

Texan collectors describe V. bracteata as an annual with gray-lavender or violet corollas.





Moldenke, Harold N. 1962. "Materials toward a monograph of the genus *Verbena*. IV." *Phytologia* 8, 230–272. <https://doi.org/10.5962/bhl.part.27502>.

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