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The North American Species of *Fuirena*

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## THE NORTH AMERICAN SPECIES OF *FUIRENA*.

BY B. F. BUSH.

There has not been a clear presentation of the species of this genus since Mr. Coville published his "Revision of the United States species of *Fuirena*" in 1890,\* in which he recognized three species and two varieties, one of which he later on raised to specific rank. However, Mr. Coville's conception of the species was but little better than that of Torrey, Gray, Chapman and various other writers, and it is the purpose of the present paper to present the species in a much better light than has heretofore been done. It has been my good fortune to have been able to examine a much greater amount of herbarium material than was available heretofore, through the kindness of Mr. C. D. Beadle of the Biltmore Herbarium, of Professor Wm. Trelease of the Missouri Botanical Garden, and of Mr. Richard Rathbun of the United States National Museum,† (who have enabled me to complete this paper by placing in my hands for study all the specimens in their care.

The distinctive characters of the species of *Fuirena* are to be found in the flowers alone, although certain other characters are of specific value in the first two mentioned. The size of the plants, hairiness of the stems and leaves, and size of the inflorescence, vary so much in all the rest of the species, as to be unworthy of much consideration in separating the species. Given a certain amount of variation, however, the perianth scales, bristles and achenes ex-

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\* Bull. Torr. Bot. Club. **17**:6. (1890).

† For the sake of convenience I have used the letters B, M and N to signify specimens from the Biltmore Herbarium, the herbarium of the Missouri Botanical Garden, and that of the United States National Museum, respectively.

hibit quite constant characters that may be relied on for specific distinctions.

The species herein treated have been variously regarded by authors as varieties or forms of *Fuirena squarrosa*, but in my opinion it is better to regard them as species, as they are clearly distinct from one another by characters that seem to be very constant.

Torrey, in 1824, rightly understood *F. scirpoidea*, *F. squarrosa* and *F. hispida*, but curiously enough interchanged the identity of the two latter. Gray, in various editions of the Manual, completely ignored Michaux's *F. squarrosa*, rightly recognized Elliott's *F. hispida*, and relegated *F. squarrosa* to Torrey's var. *pumila*. Chapman, in 1860, rightly understood Elliott's *F. hispida*, which thirty-five years afterward he asserted was a good species, but he applied Michaux's name *F. squarrosa* to the species which thirty years later was described by Coville as *F. squarrosa breviseta*, although he had collected and distributed the real *F. squarrosa* which he did not recognize. Mr. Coville in his revision gives Louisiana as the western limit of *Fuirena squarrosa*, as does also Britton in the Illustrated Flora and in the Manual of the Northern States and Canada, and the same range is assigned to this species by Dr. Small in his Flora of the Southern United States; but I have not seen any specimens from west of Florida, all those examined from west of that State belonging either to *F. breviseta* or *F. hispida*.

Dr. Britton, in the works above-mentioned, gives Nebraska as part of the range of *F. squarrosa*, as does Dr. Small in his Flora, but I think this rests on an error of determination, for I do not think that *F. squarrosa*, which is a strictly maritime species, could be found in Nebraska where only plants of sandy plains or saline soil are found. It is very probable that specimens of *F. simplex*, a species of sandy plains, have been mistaken for *F. squarrosa*.

## ANALYSIS OF THE SPECIES OF FUIRENA.

Leaves, at least the lower ones, reduced to bladeless sheaths.

Sheaths all bladeless.

1. *F. SCIRPOIDEA*.

Upper sheaths with short leaf-blades.

2. *F. LONGA*.

Leaves with well-developed blades.

Awn, when present, borne on the apex of the sepal, which tapers into it.

Bristles longer than the perianth-scales and achene.

Spikelets large, 12 to 20 mm. long.

3. *F. CYLINDRICA*.

Spikelets small, 5 to 12 mm. long.

4. *F. SQUARROSA*.

Bristles reaching the middle of the achene, or shorter.

Bristles smooth, not exceeding the stipe of the achene.

5. *F. BREVISETA*.

Bristles smooth, or downwardly barbed, reaching the middle of the achene.

Smooth; stems, leaves and sheaths densely white-villous; leaves strongly ciliate.

6. *F. CILIATA*.

Barbed; stems, leaves and sheaths somewhat hispid; leaves but little ciliate.

7. *F. HISPIDA*.

Awn arising from the back of the sepal, just below its apex.

8. *F. SIMPLEX*.

## 1. *FUIRENA SCIRPOIDEA* Michx.

*Fuirena scirpoidea* Michx. Fl. Bor. Am. 1:38. (1803).

Rootstocks slender, elongated; stems 2 to 6 dm. tall, widely tufted, very slender, resembling an *Eleocharis* in appearance; leaves all reduced to bladeless sheaths; bracts of the involucre 2 to 6 mm. long, appressed to the spikelets, acute or cuspidate; spikelets sessile, solitary, or 2 to 3 together in the clusters, oblong-ovate, 6 to 12 mm. long, dark brown at maturity; scales oblong or obovate, finely pubescent, mucronate or aristate, the points appressed; sepals 3; blades obovate-orbicular, obtuse or apiculate at the apices, with a long tapering base about as long as the stalks, scabrous on the upper part of the margins; perianth-bristles retrorsely hispid, as long as the stalks of the sepals; achenes triquetrous, constricted at each end, with concave sides, black at maturity, fully 1 mm. long, tipped by the antrorsely hispid style which is one-half as long as

the achene. — Low sandy ground, near the coast, Georgia and Florida, west to Mississippi. Spring to autumn.

*Specimens examined.* — GEORGIA: Camp Cornelia, *Harper* 1490, August 9, 1902 (M N). FLORIDA: Apalachicola, *Chapman*, September, 1896 (B M N); no locality given, *Chapman*, without date of collection, many collections (B M N); Miami, *Garber*, June, 1877 (M); Indian River, *Palmer*, 591, 1874 (M); Tampa, *Ferguson*, August, 1898 (M); Palma Sola, *Tracy* 6980, May 14, 1900 (B M N); Polk County, *Ohlinger* 564, May 15, 1894 (M); Suwanee County, *Hitchcock*, June–July, 1898 (M); Jacksonville, *Curtiss* 4863, June 16, 1894 (B N), 4097, June 17, 1893 (N), June, 1877 (N); Eustis, *Nash* 12, March 12–31, 1894 (M N), 2081, June 16–30, 1895 (B N), *Hitchcock*, June and July, 1894 (M); Lake Monroe, *Garber*, March, 1876 (M); St. John's County, *J. D. Smith*, March 4, 1882 (N); St. Augustine, *Canby*, April, 1869 (M N); East Florida, *Leavenworth*, without date of collection (M); no locality given, *Chapman*, without date of collection, in part, the single slender plant (M); no locality given, *Hart Wright*, without date of collection (M). ALABAMA: Mobile, *Mohr*, July, year not given (N), August, 1893 (M); Perdido, collector not given, June 26, year not given (M). MISSISSIPPI: Biloxi, *Tracy* 1526, July 12, 1891 (N), 1526, July 12, 1891, in part, the slender plants with single spikelets (N), 1633, July 15, 1891 (N), 1649, July 10, 1891 (N); Ocean Springs, *Tracy* 1649, July 10, 1891 (N.), *Skehan*, September 14, 1895 (M); Horn Island, *Tracy* 4813, June 1, 1891 (M N); Bay St. Louis, *Langlois* 138, September, 1883 (N).

## 2. *Fuirena LONGA* Chapm.

*Fuirena longa* Chapm. Fl. S. U. S. 3 ed. 541. (1897).

Rootstocks slender, elongated; stems 8 to 12 dm. tall, erect, robust, resembling *Dulichium* in appearance; leaves

towards the base of the stem reduced to acuminate sheaths, on the upper part of the stem with narrow, acuminate blades 2 to 5 cm. long; bracts of the involucre linear, 8 to 25 mm. long, acuminate-cuspidate; spikelets sessile, oblong-ovoid, 2 to 6 together in the clusters, 10 to 15 mm. long, light brown at maturity; scales obovate or oblong, several-ribbed, roughish-pubescent, with awns about as long as the bodies; sepals 3; blades deltoid-ovate, obtuse or apiculate at the apices, truncate at base, minutely scabrous nearly all around, longer-stalked than in the last species; perianth-bristles one-half as long as the stalks of the sepals, reaching to the middle of the achene, or shorter, retrorsely-hispid; achenes oblong, acutely triquetrous, with concave sides, yellow-brown at maturity, tipped by the long antrorsely hispid style, which is as long as the achene. — Low pine barrens, Florida to Mississippi. Summer and autumn.

*Specimens examined.* — FLORIDA: Apalachicola, *Chapman*, without date of collection, type (M), *Chapman*, September, 1890 (B); no locality given, *Chapman*, without date of collection (B); no locality given, *Chapman*, without date of collection, in part, the stouter plants. (M). MISSISSIPPI: Biloxi, *Tracy* 1526, September 1, 1894, in part, the stouter plants with several spikelets in the clusters (N).

### 3. FUIRENA CYLINDRICA Bush, sp. nova.

Rootstocks short, thick; stems tall, slender, not very leafy, 3 to 4 dm. tall; leaf-blades short, flat, thin, smooth above, closely pubescent beneath, 2 to 4 cm. long, 2 to 3 mm. wide; sheaths very short, smooth; spikelets sessile, 2 to 5 together in the capitate clusters, oblong or mostly cylindrical, 11 to 20 mm. long, 3 to 5 mm. in diameter; scales obovate, deep reddish-brown, more or less hispid-pubescent, 3-nerved, each tipped with a stout erect hispid awn

nearly as long as the body; sepals 3; blades spatulate or fiddle-shaped, tapering at the base, nearly sessile, obtuse and rounded at the apex, the lower half semi-translucent, the upper half thick and granular-incrusted, awnless, or with a short, slightly downwardly-barbed awn from the apex; perianth-bristles longer than the achene and sepals, nearly or quite smooth; achenes oblong, triquetous, tapering at the base, light yellow at maturity, tipped by the antrorsely-hispid style, which is as long as the achene. — Sandy soil, southern Texas. Summer and autumn.

*Specimens examined.* — The only specimen seen is that of the type, collected in the Valley of the Rio Grande, below Dona Ana, Donna Ana County, New Mexico, by *Mexican Boundary Survey* 1523, 1848, in part, the other two plants on this sheet being, one, an *Eleocharis*, the other *F. simplex* (N).

It has been referred to *F. simplex macrostachya* (Britton) Coville, but differs conspicuously in the cylindrical spikelets, slender stems, small leaves, and especially in the shape of the sepals and position of the awn.

#### 4. FUIRENA SQUARROSA Michx.

*Fuirena squarrosa* Michx. Fl. Bor. Am. 1:37. (1803).

*Fuirena squarrosa pumila* Torr. Fl. U. S. 1:68. (1824).

Rootstocks scarcely any, rarely tuber-bearing, more commonly with fibrous roots, the plants being annual; stems tufted, glabrous, sometimes slightly ciliate on the margins; sheaths pubescent, the lower sometimes densely so; spikelets sessile, solitary, or 2 to 8 together in the capitate clusters, ovoid or ovoid-oblong, 6 to 12 mm. long, 3 to 5 mm. in diameter; scales ovate or oblong, brown, pubescent, mostly obtuse and rounded at the apex, 3-nerved, each tipped with a short, spreading or recurved awn nearly as long as the body; sepals 3: blades oblong, long-stalked, semi-translucent, usually narrowed at both ends, acuminate

into a rough, downwardly barbed or rarely smooth, awn; perianth-bristles mostly much longer than the sepals and achene, retrorsely rough-barbed; achenes triquetrous, fully .8 mm. long, tipped by the hispid style, which is as long as the achene, yellow-brown at maturity.—Sandy shores, eastern and southern Massachusetts, Rhode Island and southern New York to the coasts of Virginia, North Carolina, and Florida, being therefore a maritime species: also in the interior about the Great Lakes. Summer and autumn.

*Specimens examined.* — MASSACHUSETTS: Plymouth, Oakes, 1842 (M N); Springfield, *Maria L. Owen*, 1890 (N). RHODE ISLAND: Providence, *Olney*, without date of collection (N); no locality given, *Thurber*, 1846 (M). NEW JERSEY: Cape May, *Parker* 8598, August 20, 1869 (M); no locality given, *Eaton*, 1860 (M); *Bernhardi Herbarium* (M). NEW YORK: Wading River, Long Island, *E. S. Miller*, September 26, 1875 (M); Long Island, *Hart Wright*, without date of collection (M). VIRGINIA: Virginia Beach, *Heller* 1232, August 22, 1893 (M N), *Kearney* 2039, August 4, 1898 (N), 2067, October 1, 1898 (N). INDIANA: Dune Park, *Agnes Chase* 902, August 4, 1898 (M N). NORTH CAROLINA: Wilmington, *Coville* 141, June 27, 1890, approaching *F. hispida* in the thicker reddish sepals (N); no locality given, *Curtis*, without date of collection, approaching *F. hispida* in the thicker reddish sepals (M). SOUTH CAROLINA: No locality given, *Ravenel*, 1872 (M), *Elliott*, without date of collection (M). FLORIDA: Lake City, *Rolfs* 916, October 13, 1893, approaching *F. hispida* in the thicker reddish sepals (M), *Hitchcock*, June-July, 1898, approaching *F. hispida* in the thicker reddish sepals (M); Eustis, *Hitchcock*, June and July, 1894, in part, the smaller plant, approaching *F. hispida* in the thicker reddish sepals (M), *Nash* 910, June 1–15, 1894 (M N); Aspalaga, *Chapman*, October, 1897, in part, the smaller



plant (M), no locality given, Curtiss, 1875, a very large form with abnormally opposite leaves, approaching *F. hispida* in the hispid sheaths and leaves.

##### 5. *FUIRENA BREVISETA* Coville.

*Fuirena breviseta* Coville, Bull. Torr. Bot. Club. **28** : 466. (1901).

*Fuirena squarrosa breviseta* Coville, Bull. Torr. Bot. Club. **17** : 6. (1890).

*Fuirena squarrosa* Chapman, Fl. S. U. S. 514, (1860); not *Fuirena squarrosa* Michx. l. c. (1803).

Rootstocks stout, elongated; stems tall, robust, leafy, 3 to 8 dm. tall; leaf-blades flat, thickish, densely pilose beneath, minutely pubescent above or sometimes smooth, nervose, acuminate at apex; sheaths on the upper part of the stem smooth, on the lower part often densely finely pilose; spikelets sessile, 2 to 8 together in the capitate clusters, ovoid or ovoid-oblong, 6 to 12 mm. long, 4 to 6 mm. in diameter; scales obovate or oblong, brown, more or less hispid-pubescent, 3-nerved, each tipped with a stout spreading or recurved awn nearly as long as the body; sepals 3; blades oval, obovate or suborbicular, acutish at the base, rounded or truncate at the apex, and with a minute apiculation; perianth-bristles short, not longer than the stipe of the achene, smooth; achenes oblong, triquetrous, light yellow at maturity, tipped with the antrorsely hispid style, which is as long as the achene. — Sandy soil along the coast, from eastern North Carolina to Florida, west along the Gulf coast to southern Texas. Summer and autumn.

*Specimens\* examined.* — NORTH CAROLINA: No locality given, *Kearney* 1963, August 1, 1898 (N), *McCarthy*, July, 1885 (N); Washington, *Biltmore Herbarium*, July 17, 1897 (B). SOUTH CAROLINA: No locality given, *Gibbes*, without date of collection (N). GEORGIA: *Leslie*, *Harper* 403, August 17, 1900 (M N); *Empress*, *Harper* 1628, September 13, 1902 (M N); no locality given, *Beyrich*, 1833 (M). FLORIDA: *Miami*, *Garber*, July, 1877, type

(M N); Eustis, *Nash* 1038, June 16–30, 1894 (B M N), *Hitchcock*, June and July, 1894, in part, the larger plant (M); Jacksonville, *Curtiss* 4098, July 13, 1893 (N), 5064, September 17, 1894 (M N), 5582, October 30, 1895 (B M N); Rosewood, *Garber*, June, 1876 (N); Duval County, *Curtiss* 3068, July, year not given (N); Jefferson County, *Hitchcock*, June and July, 1898 (M); Myers, *Hitchcock* 412, July and August, 1900 (M N); no locality given, *Chapman*, 1897 (M), *Chapman*, without date of collection (M), *Simpson*, 1889 (N). ALABAMA: Mobile, *Mohr*, 1897 (B). MISSISSIPPI: Tchouteco Bouffe River, *Tracy* 4814, October 9, 1898 (M); Biloxi, *Tracy* 6321, June 22, 1899 (B N); Ocean Springs, *Tracy* 54, July 19, 1899 (N), *Skehan*, 1895 (M), *Seymour* 14, August 21, and September 11, 1891 (M). LOUISIANA: Lake Charles, *Mackenzie* 437, August 25 to September 10, 1898 (M); Hammond, *Biltmore Herbarium*, September 17, 1900 (B). TEXAS: Hockley, *Thurow*, without date of collection (N); Eastern Texas, *Nealley*, 1888 (N); Orange, *Letterman* 547, August 11, 1886 (M).

## 6. *FUIRENA HISPIDA* Elliott.

*Fuirena hispida* Elliott, Sk. 1: 579. (1821).

*Fuirena squarrosa hispida* (Ell.) Chapman, Fl. S. U. S. 514. (1860).

Rootstocks slender, usually tuber-bearing; stems smooth or rarely a little pubescent, few-leaved, 3 to 8 dm. tall; leaf-blades linear, 5 to 12 dm. long, short-pubescent above, long-pubescent beneath, sheaths densely hispid with long spreading hairs; spikelets sessile, 3 to 8 together in the capitate clusters, ovoid or ovoid-oblong, 6 to 12 mm. long, 4 to 6 mm. in diameter; scales obovate or oblong, brown, more or less hispid-pubescent, 3-nerved, nearly as long as the body; sepals 3; blades deltoid-ovate, acuminate at apex, truncate or cordate at base, thick, reddish, opaque or nearly so, tapering into a

thick unbarbed point or tip; perianth-bristles reaching to the middle of the achene or rarely to its tip, retrorsely barbed; achenes fully 1 mm. long, triquetrous, light yellow at maturity, tipped by the antrorsely hispid style, which is one-half as long as the achene. — Sandy fields and woods, New Jersey to Florida, west to Texas, north to Kentucky and Indian Territory. Summer and autumn.

*Specimens examined.*—NEW JERSEY: Forked River, *Britton*, August, 1889 (N); no locality given, *Knieskern*, without date of collection (M N), *Dr. B.*, without date of collection (N). DISTRICT OF COLUMBIA: Washington, *Ward*, 1879 (N), *Coville*, September 29, 1889 (N). MARYLAND: Salisbury, *Holmes* 185, August 1, 1890 (N); Beltsville, *Olds*, September, 1898 (N). NORTH CAROLINA: Salisbury, *Heller* 188, August 21, 1890 (M). SOUTH CAROLINA: Aiken, *Ravenel*, September, 1869 (N); Blue Ridge, *Redfield* 8600, September 3, 1876 (M); Graniteville, *Eggert*, August 6, 1898 (M). GEORGIA: Clarke County, *Harper* 89, June 29, 1900 (M N); Tifton, *Harper* 665, September 19, 1900 (N); Oconee and Gwinnett Counties, *Small*, July 14, 1893 (M N); Cordele, *Tracy* 1511, July 20, 1890 (N); Washington, *Chapman*, without date of collection (B). FLORIDA: Aspalaga, *Chapman*, October, 1897 (B M); *Chapman*, October, 1897, in part, the larger plant (N); Pablo Beach, *Combs* 47, July 21, 1898 (N); Indian River, *Palmer*, 1874 (M); Lake City, *Rolfs* 885, September 6, 1893 (M); no locality given, *Buckley*, without date of collection (M N). ALABAMA: Auburn, *Earle & Baker*, August 11, 1897 (B M), September 8, 1897 (M); Spring Hill, *Bush* 74, August 22, 1897 (M); Montgomery, *McCarthy*, August, 1888 (M); Greensboro, *Biltmore Herbarium*, August 4, 1899 (B); no locality given, *McCarthy*, August, 1888 (N), *Bigelow*, without date of collection (M). MISSISSIPPI: Waynesboro, *Pollard* 1230, August 8 and 9, 1896 (M N). TEXAS: Rusk County, *Vinzent* 28, July, August, year not

given (M); Hempstead, *Hall* 693, June 1, 1872 (M), 693, June 1, 1872, in part, the three larger plants (MN); Millcreek, *Lindheimer* 107, August, 1843 (M); Tyler, *Reverchon* 2302, September 20, 1900 (M); Eastern Texas, *Nealley*, 1884, 1888 (N); Southwestern Texas, *Lindheimer* 187, 1843 (M). INDIAN TERRITORY: Atoka, *Sheldon* 63, June 23, 1891 (N).

#### 7. FUIRENA CILIATA Bush, sp. nova.

Rootstocks stout, elongated, tuber-bearing; stems stout, leafy, 4.5 to 6 dm. tall, densely and softly pilose with long white hairs; leaf-blades numerous, 3 to 8 on the stems, broad and long, 5 to 15 cm. long, 4 to 6 mm. wide, densely pilose on both sides, and ciliate on the margins with long white hairs; sheaths densely pilose with long spreading white hairs; spikelets sessile, 3 to 8 together in the capitate clusters, ovoid or ovoid-oblong, 6 to 12 mm. long, 4 to 6 mm. in diameter; scales obovate or oblong, 3-nerved, densely hispid and ciliate with long white hairs, tipped with a long slender ciliate awn, much longer than the body; sepals 3; blades deltoid-ovate, truncate at base, tapering into a blunt tip, thick, reddish, opaque; perianth-bristles reaching to the middle of the achene, smooth, unbarbed; achenes oblong, sharply triquetrous, with concave sides, rather more than 1 mm. long, tipped with the style, which is about one-half as long as the achene, white at maturity. — Swamps, eastern Texas. Summer and autumn.

*Specimens examined.* — The only specimens seen are those of the type, collected at Swan, Smith County, Texas, by *J. Reverchon* 2911, June 10, 1902 (M), and those collected at Palestine, Texas, by *H. Eggert*, June 10, 1899 (M).

#### 8. FUIRENA SIMPLEX Vahl.

*Fuirena simplex* Vahl, Enum. 2: 384. (1806).

*Fuirena squarrosa aristulata* Torr. Ann. Lyc. Nat. Hist. N.Y. 3: 291. (1836).

Rootstocks slender, usually fibrous, not tuber-bearing;

stems commonly robust, 1 to 8 dm. tall, smooth, leafy; leaf-blades flat, linear, 3 to 25 cm. long, 3 to 10 mm. wide, smooth above, sometimes sparsely pubescent beneath, sometimes slightly ciliate on the margins, acuminate at the apex; sheaths smooth on the upper part of the stem, sometimes pubescent on the lower part; spikelets sessile, 2 to 8 together in the capitate clusters, ovoid or ovoid-oblong, 6 to 12 mm. long, 5 to 8 mm. in diameter; scales obovate or oblong, brown, pubescent, 3-nerved, each tipped with a short, slender, spreading awn; sepals 3; blades ovate-oblong, obtuse or retuse at the apex, the retrorsely-barbed awn arising from just below the apex, sometimes wanting; perianth-bristles retrorsely-hispid, equaling or exceeding the short-stalked achene; achenes triquetrous, fully 1 mm. long, bright white at maturity. — Sandy plains and saline soil, Nebraska (?), Missouri and Kansas, to western Arkansas, Texas, New Mexico and Mexico. Summer and autumn.

*Specimens examined.* — MISSOURI: Courtney, *Bush* 223, October 24, 1897 (M); Irondale, *Glatfelter*, August 21, 1895 (M); Annapolis, *Russell*, September 25, 1899 (M); Piedmont, *Russell*, date of collection not given (M). ARKANSAS: Fulton County, *Blankinship*, August, 1888 (N). INDIAN TERRITORY: Sapulpa, *Bush* 1400, September 29, 1895 (M); Sand banks of the Canadian River, *Bigelow*, 1853–54 (N). KANSAS: Comanche County, *Hitchcock* 861, 1896 (M N). TEXAS: Dallas, *Reverchon* 2301, August 10, 1900 (M), 3602, 1880 (M), 1000, 1880 (M), *Letterman*, 1881 (N); Squaw Creek, Gillespie County, *Jermy* 538, 1389 (N); Moore County, *Carleton* 426, August, 1891 (N); San Antonio, *Bush* 1224, October 2, 1900 (M N), *Eggert*, September 8, 1900 (M); Kerrville, *Heller* 1937, June 26–30, 1894 (B M N); Columbia, *Bush* 1312, October 5, 1900 (M); Orange, *Letterman* 547, August 11, 1886 (M); New Braunfels, *Lindheimer* 184,

May, 1846 (M N), 185, 186, May, 1846 (M); Hempstead, *Hall* 693, June 1, 1872, in part, the two smaller plants (M N); Southwestern Texas, *Palmer* 1335, September, 1879, to October, 1880 (M); Western Texas, *Wright* 718, May-October, 1849 (N); Devil's River, *Eggert*, September 10, 1900 (M); Valley of Rio Grande, below Dona Ana, Donna Ana County, New Mexico, *Mexican Boundary Survey* 1523, 1848, in part, the stouter broken stem (M N). NEW MEXICO: On Arkansas River, *Fendler* 125, without date of collection (M). MEXICO: States of Coahuila and Nuevo Leon, *Palmer* 1336, February to October, 1880 (N); Hacienda de Angostura, *Pringle* 3690, July 26, 1891 (M).