

The North Texas Species of *Plantago* (Plantaginaceae)¹

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The *Plantaginaceae* of Texas have been partly or wholly revised by five authors successively: Decaisne in 1852, Gray in 1878, Morris in 1900, 1901, and 1903, Poe in 1928, and Pilger in 1937. None of these revisions is very satisfactory, partly because of reliance on quite unreliable characteristics such as color of plant after drying or number of seeds, partly because of lack of knowledge of distribution patterns of Texas plants, and partly because of limited collections or because different collections were distributed under the same number.

In the following synopsis, though written only for the counties of north central Texas from Waco to the Red River and from Mineola west to Palo Pinto, all but two of the species said to occur in the state are accounted for. I have seen no collections of *P. Rugelii* Dcne. (which might be found in the extreme northeastern part of the state), or of *P. Rosei* Pilger (described from El Paso, the type collection a mixture of this species and *P. spinulosa*, and the two perhaps not specifically distinct). Localized varieties of *P. Hookeriana* and probably *P. rhodosperma* occur in South Texas and the Trans-Pecos; they are not included in the following key.

ARTIFICIAL KEY TO NORTH TEXAS SPECIES OF PLANTAGO

- 1a. Bracts scarious-margined or wholly herbaceous, without slender scarious tips
- 2a. Sepals and bracts glabrous; spikes 2-4 mm. thick in flower
 - 3a. Leaf blades elliptic or ovate, more than 1.5 cm. wide.....1. *P. major*
 - 3b. Leaf blades linear or oblanceolate, less than 1.5 cm. wide.....2. *P. elongata*
- 2b. Sepals and bracts pubescent or villous; spikes 3.5-12 mm. thick in flower
 - 4a. Hairs on upper part of scape spreading at right angles
 - 5a. Bracts at base of spike keeled and clasping; corolla lobes erect and folded together after as well as before flowering
 - 6a. Bracts 1-2.5 mm. long; corolla lobes 0.8-2.3 mm. long; mature seeds oblong, 1.25-1.75 mm. long by 0.7-0.8 mm.

¹Grateful acknowledgment is made to the Library of the Missouri Botanical Garden for the loan of Das Pflanzenreich Heft 102, missing from the SMU set. This synopsis is based on the 160 Texas and 42 out-of-state specimens in the Herbarium of Southern Methodist University, and all cited specimens are deposited there if not otherwise indicated.

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- wide, yellow-brown to black, deeply grooved ventrally, not transparent-margined.....3. *P. virginica*
- 6b. Bracts 3-4.5 mm. long; corolla lobes 2-3 mm. long; mature seeds oval or oblong-oval, 2.4-2.8 mm. long by 1.3-1.8 mm. wide, bright red to reddish black, shallowly concave ventrally, with pronounced transparent margin.....4. *P. rhodosperma*
- 5b. Bracts at base of spike not keeled nor clasping; corolla lobes spreading or reflexed after flowering
- 7a. Corolla lobes 1-2 mm. long; spike (excluding bracts) 4-8 mm. thick8b. *P. Purshii* var. *spinulosa*
- 7b. Corolla lobes 3-4 mm. long; spike 8-12 mm. thick.....9. *P. Hellerei*
- 4b. Hairs on upper part of scape closely ascending or appressed
- 8a. Bracts triangular-ovate, broadly scarious-margined except at apex (each margin $\frac{1}{4}$ - $\frac{1}{3}$ entire width of bract)
- 9a. Leaves woolly-pubescent on both surfaces; corolla lobes suborbicular, isodiametric or nearly so (2 by 2 mm. or 2.2 by 2 mm., measuring length in center of lobe).....5. *P. Hookeriana*
- 9b. Leaves glabrous on the upper surface, thinly pubescent on the lower; corolla lobes cordate-ovate, about 0.5 mm. longer than wide (2 by 2.5 mm. to 2.5 by 3 mm.).....6. *P. Wrightiana*
- 8b. Bracts narrowly triangular-lanceolate to lance-linear, narrowly scarious-margined near base, otherwise herbaceous
- 10a. Leaves glabrous on the upper surface; bracts in middle of spike 3-6 times as long as the calyxes.....7. *P. aristata*
- 10b. Leaves rather densely pubescent on the upper surface; bracts in middle of spike shorter than or up to 4 times as long as the calyxes
- 11a. Scapes 6-26 cm. long, spikes 2-11 cm. long when half or more of the flowers have opened; most of the scapes longer than their spikes (a few may be as long or slightly shorter)
- 12a. Bracts in lower part of spike shorter or slightly longer than the calyxes.....8a. *P. Purshii*
- 12b. Bracts in lower part of spike 2-4 times as long as the calyxes.....8b. *P. Purshii* var. *spinulosa*
- 11b. Scapes 1.3-6.5 cm. long, spikes 2-10 cm. long when half or more of the flowers have opened; most of the scapes shorter than their spikes (a few may be as long or slightly longer).....8c. *P. Purshii* var. *breviscapa*
- 1b. Bracts scarious except at base and in center, ovate and abruptly narrowed into a long scarious tip.....10. *P. lanceolata*

1. *P. MAJOR* L. Stream bottom thickets, not common; specimens from Dallas and Grayson counties. Also found along streams in the mountains of Trans-Pecos Texas.

2. *P. ELONGATA* Pursh. Ditches, stream banks, or disturbed ground, both sandy and clayey, usually in damp soil. Common where found, but rather local in occurrence. Specimens at hand (from Burnet, Denton, Galveston, Jasper, Newton, Nueces, Travis, and Wichita counties) vary in

scapes and petioles from rather densely to sparsely puberulent, in leaf blades from entire to dentate or pinnately lobed, and in number of seed from 4 to 15. They do not appear to be specifically separable from South Dakota plants of *P. elongata*, to which species Texas records of the later-described *P. pusilla* Nutt. and *P. heterophylla* Nutt. are accordingly referred.

3. *P. VIRGINICA* L. Very common in sandy soil along roads, ditches or in disturbed ground throughout eastern Texas, west to the East Cross Timbers. The plant is variable, but generally smaller and less densely pubescent than *P. rhodosperma* (which it greatly resembles), and usually has entire leaves.

4. *P. RHODOSPERMA* Dcne. Very common in clayey or sandy soils in disturbed habitats from the Blackland Prairies westward. Near the coast this species extends eastward to Jefferson County. Generally more robust than *P. virginica*, densely gray-pubescent with somewhat hispid hairs, the leaves varying from entire to dentate or pinnately lobed. It is possible that geographic varieties are to be recognized in South Texas. The names *P. virginica* var. *longifolia* Gray (cf. Fernald, 1938), *P. occidentalis* Dcne. (in the sense of Morris, 1903), *P. echioides* Dcne., *P. rhodosperma* var. *echioides* (Dcne.) Pilger, and *P. rhodosperma* var. *macrocalyx* Pilger have been applied to plants in this complex in recent treatments.

5. *P. HOOKERIANA* Fisch. & Mey. *P. patagonica* var. *lanatifolia* Coulter & Fisher, Bot. Gaz. 18: 301. 1893. (At least in part.) *P. lanatifolia* (Coulter & Fisher) Small ex Morris, Bull. Torr. Bot. Club 27: 114. 1900. *P. inflexa* Morris, Bull. Torr. Bot. Club 27: 113. 1900. (In part; see discussion below.) In sand, along roads, in vacant lots, or other disturbed places; primarily a species of the central Gulf Coast, extending northward to Smith and Henderson counties.

Plantago patagonica var. *lanatifolia* was based on two specimens: Hockley, Harris Co., F. W. Thurow in 1890, and Industry, Waller Co., H. Wurzlow in 1891. The authors state that their description "includes two forms, one of which is very densely white-floccose, with narrower and more numerous spikes and very acute leaves; the other more robust and spreading, with broader and scarcely acute

leaves." I believe that these are merely minor variations of the same species. The leaves of well-developed plants vary from 6 to 20 mm. wide, and occasionally have a few teeth or small lobes; the apex may be either broadly or narrowly acute. Leaves of the related *P. Wrightiana* are from 4 to 11 mm. wide, and entire on all plants examined (26 sheets, with 1 to 8 plants on each).

There is some uncertainty regarding the identity of *P. inflexa* Morris, arising from the fact that Engelmann & Gray distributed several of Lindheimer's collections under the same number. Morris designated *Lindheimer exs. 163* (two sheets in Herb. Missouri Botanical Garden) as type, stating that it came from Cat Spring (in Austin Co.). In Engelmann & Gray's published account (Boston Journ. Nat. Hist. 5, repr. p. 22, 1845), number 163 (as *P. gnaphaloides*) is said to have come from Galveston Island. There are two pertinent Lindheimer collections in the Herbarium of Southern Methodist University. One (from the Dapprich Herbarium) bears Lindheimer's own label, reading "auf sandigem Boden bei Catspring April 1844." The other (from the Missouri Botanical Garden) has the printed *Flora Texana exsiccata* label, Fasc. I, 1843, numbered 163, but without locality. The former has bracts shorter than the sepals, and is typical *P. Hookeriana* as described by Pilger; from the locality, it would seem to be an isotype of *P. inflexa*. The other specimen has a printed annotation label reading "*P. inflexa* Morris n. sp.," and bears a penciled note in an unidentified hand "Type of *P. inflexa* Morris"—an evident error, since no locality is given. This plant has bracts about twice as long as the sepals in the lower part of the spike, and represents *P. Hookeriana* var. *inflexa* (Morris) Pilger, Pflanzenreich 102. Heft Fam. IV. 269: 377, 1937, with emended description. Morris's description included both forms. Inasmuch as Lindheimer's field labels were very carelessly handled when exsiccatae sets were made up (usually discarded, sometimes interchanged), it seems desirable to disregard the type locality given by Morris, and to accept those specimens of *Lindheimer exs. 163* with long bracts as true type material. This will permit the retention of the name in the more restricted sense of

Pilger, and avoid coining a new name for this component of the broadly defined *P. inflexa*.

No author discussing *P. Hookeriana* has seen a type. If one exists, it presumably was in the herbarium of the Leningrad (St. Petersburg) Botanical Garden. The type locality was merely "provincia Texas." From the specific name, it evidently was received from Hooker, whose Texas collector, Thomas Drummond, traveled extensively in South Central and Coastal Texas (see Geiser, 1948), where this species is rather common. According to Pilger, Fischer and Meyer's description applies well to specimens from the Berlin Botanical Garden in 1840 and later. In addition, he cites a Drummond collection as representative of the species proper. There seems no doubt then that Pilger's identification of this species is correct.

6. *P. WRIGHTIANA* Dcne. *P. Hookeriana* var. *nuda* (Gray) Poe, Bull. Torr. Bot. Club 55: 416. 1928. Along railroads, on rocky limestone hills, or in sandy soil, from the Blackland Prairies westward; primarily a species of the Edwards Plateau. In general appearance this species resembles *P. aristata* more than *P. Hookeriana*.

7. *P. ARISTATA* Michx. Highway margins or disturbed sandy soil, Dallas and Grayson counties eastward. Often abundant, and therefore usually not collected; undoubtedly more common and widespread than herbarium specimens indicate.

8a. *P. PURSHII* R. & S. *P. Purshii* var. *typica* Poe, Bull. Torr. Bot. Club 55: 412. 1928. Sandy soil, widely distributed from Dallas and McLennan counties westward. The most pronounced extreme has silvery gray pubescence and bracts shorter than the calyxes. Transitional forms to var. *spinulosa* have yellowish gray pubescence and bracts slightly longer than the calyxes.

8b. *P. PURSHII* var. *spinulosa* (Dcne.) Shinnery, comb. nov.³ *P. spinulosa* Dcne. in DC., Prodr. 13: 713. 1852. *P. patagonica* var. *spinulosa* (Dcne.) Gray, Man. ed. 2 p. 269. 1856. In sandy or thin rocky soil, less common than the typical variety, and not extending as far east; collections

³*P. PURSHII* var. *oblonga* (Morris) Shinnery, comb. nov. *P. oblonga* Morris, Bull. Torr. Bot. Club 28: 119. 1901. *P. spinulosa* var. *oblonga* (Morris) Poe, l. c. 55: 411. 1928. Occurring from New Mexico to southern California; spikes prevailingly short and rather thick.

from Medina, Taylor, and Wilbarger counties. Morris (1901) gives a photograph of the type specimens, collected by Charles Wright in "Texas oriental" in 1848-49. The location is perhaps a reminiscence of Berlandier's "Comancherries orientales," referring to the southeastern border of the Edwards Plateau. The specimens are well matched by a collection from 3 miles west of Castroville, Medina Co., *Shinners 7291*, April 19, 1945. "East Texas" in this case undoubtedly refers to the Austin-San Antonio area, where Wright collected in 1849; not to the vicinity of the Louisiana boundary, where he was located earlier (see Geiser, 1948). The most extreme form of *var. spinulosa* has yellowish gray pubescence, that on the upper part of the scape widely spreading (as in the Medina Co. plants; this conceivably due to crossing with *P. Helleri*), and bracts markedly longer than the calyxes. More commonly the pubescence is appressed, as in typical *P. Purshii*.

8c. *P. PURSHII* var. *breviscapa* Shinners, var. nov. A specie differt scapis brevibus 1.3-6.5 cm. longis quam spicis plerumque brevioribus (spicis 2-10 cm. longis), bracteis quam calycibus usque quadries longioribus. TYPE: 2½ miles northeast of Jacksboro, Jack Co., Texas, *Lloyd H. Shinners 11350*, June 5, 1949 (in Herb. Southern Methodist University). "Sandy and rocky soil, road margin." Bracts slightly to much longer than the calyxes, as in *var. spinulosa*. The plant is strikingly different from *P. Purshii* (typical) in its dwarf habit, short scapes, long bracts, yellowish gray pubescence, and often slightly falcate leaf blades. Were it not for the intermediate *var. spinulosa*, it would be treated as a distinct species. The following additional collections may be cited, all from Texas. BREWSTER Co.: 12 miles west of Alpine on Highway 90, *Eula Whitehouse 18682*, May 10, 1947. JEFF DAVIS Co.: Highway 118, 3½ miles southeast of Fort Davis, *V. L. Cory 53103*, May 16, 1946. MITCHELL Co.: N.E. ¼ sec. 3 Lavaca Nav. Co. Block 19, *Richard W. Pohl 4499*, April 27, 1944; shores of Lake Hollywood, S.E. ¼ sec. 25 S.P.R.R. Block 16, *Pohl 4725*, March 27, 1945. MOORE Co.: Cactus Ordnance Works, Dumas, *Beryl & Holger Jespersen 2673*, May 18, 1945. PARKER Co.: 1½ miles southeast of Springtown, *Shinners 11400*, June 5, 1949.

9. *P. HELLERI* Small. Very common on limestone hills, Grand Prairie, Edwards Plateau, and Trans-Pecos, from Tarrant, McLennan, Travis, and Comal counties westward to Pecos and Reagan counties. The widely spreading stem pubescence, short thick spikes or heads, and large corollas make this a distinctive and easily recognized species.

10. *P. LANCEOLATA* L. As yet an infrequent introduction in cities. DALLAS Co.: s.e. corner of McKinney and St. Paul, Dallas, *Shinners* 9224, May 3, 1947. An additional collection extending the range of this plant to the Trans-Pecos may be cited. BREWSTER Co.: Alpine, *Cory* 53172, May 15, 1946.

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Mexican Species of *Desmanthus* (Leguminosae)

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Of the world's recognized species of *Desmanthus*, nearly half are found in Mexico. Sixteen species and three varieties are recognized in the present paper. Ten are restricted to Mexico, seven extend a relatively short distance from or inside its border, and two are weedy species widely distributed in tropical areas of North, South, and Central America.

Britton & Rose (1928) described nine new species in their treatment of *Desmanthus* (as *Acuan*). In the present paper two of these are reduced to synonymy (*A. latum* and *A. Arsenei*); in addition, 2 species and one variety are described as new. From the sparsity of herbarium material

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