

VASCULAR PLANTS OF THE TEXAS
PANHANDLE AND SOUTH PLAINS

By

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PREFACE

After completion of a floristic study of the Gene Howe Wildlife Management Area in Hemphill County in 1956 (Rowell, 1957), the author realized the need for a similar study of the entire Texas Panhandle and South Plains. Since 1957 he has collected intensively throughout the area and has authenticated the study with approximately 15,000 sheets in a series of approximately 4,500 collections. The specimens have been processed according to standard herbarium procedures. For the most part the collections have been distributed with the first set going to the Herbarium of Oklahoma State University, the second to Texas Technological College at Lubbock, Texas, and additional sets to other herbaria.

The author has supplemented his own collections with specimens from research area in the herbaria of Oklahoma State University and Texas Technological College.

Monographs, revisions and other taxonomic literature in the Oklahoma State University Library and the personal libraries of Dr. U. T. Waterfall and the author were used in the identification of the specimens.

In the list of taxa in Chapter VI the order of the listing of the families conventionally follows the Engler-Prantl system as utilized in the Keys to the Flora of Oklahoma

(Waterfall, 1966). The genera and sub-generic taxa are arranged alphabetically under the families. Each species or subspecific taxon is followed with general habitat information, normal dates of flowerings and an alphabetical listing of the counties from which one or more collections were examined. Those taxa found to represent significant distributional records are enumerated in Chapter V.

The author wishes to express his appreciation to each of the members of his committee for his interest and guidance. He is especially grateful to Dr. U. T. Waterfall for acting as chairman of his committee, for his continued stimulating interest and for the use of his personal card index of research literature.

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CHAPTER I

PHYSICAL FEATURES

Location and Area

The name "Panhandle" is derived from the general shape of the northwest portion of the state of Texas. The term "South Plains" is a topographic designation of the area encompassing the northern portion of the expanded portion of the state adjacent to the Panhandle. The Panhandle and South Plains regions of Texas are bounded on the west by New Mexico and on the north and east by Oklahoma. The southern boundary is generally limited by the southern boundary of Gaines, Dawson, Borden, Garza, Kent, King, Foard, and Hardeman counties.

There are approximately 45,800 square miles of land, in forty-eight counties, in the area described above.

Geology

The portion of the Great Plains included in the study area is essentially a remnant of the Rocky Mountain piedmont plain deposited during the early Cenozoic Era by streams flowing eastward from the Rocky Mountains. The region consists primarily of undivided Cenozoic depositions resting

unconformably on a Triassic formation. The area is a near flat plateau bounded on the south and east by steep escarpments. At the top of the escarpment is a resistive limestone formation termed, because of its position, the cap rock. Overlying the cap rock is a loessal deposition of sands of varying thickness. These wind-blown sands are Quaternary depositions. The areas below the cap rock, eroded by river action, have exposed areas of Jurassic and Triassic depositions with some exposure of Permian materials in the eastern half of the region. (Figure 1) (Oetkin and Feray, 1963, Reeves and Suggs, 1964)

Topography

The region can be divided into two physiographic types, the High Plains or Llano Estacado and the Rolling Plains. The High Plains, a part of the Great Plains, is a relatively high plateau characterized by a near flat to gently rolling featureless surface. The area is dissected by the Canadian and Red River systems in the north and the Brazos and Colorado systems in the south. The plateau area varies in elevation from approximately 4,400 feet on the west side to approximately 3,000 feet on the southeast.

For the most part the contact between the plains plateau and the river eroded areas of the Rolling Plains is sharply marked by the cap rock escarpment, the walls of which are often steep and, along the Canadian and Red Rivers, may be as much as 800 feet high.



Figure 1. Geological map. Undivided Cenozoic depositions, unshaded; Jurassic and Triassic, stippled; Permian, horizontal lines; Quaternary, solid black.

The land area beneath the cap rock, the Rolling Plains, varies in topography from gently rolling to moderately rough. The region varies in elevation from approximately 3,000 to 1,300 feet.

The highest point in the region occurs in Bailey County north of Muleshoe along the western margin of the area. This point, 4,400 feet, represents the highest portion of the plateau that slopes gently southeastward to the lowest point, 1,300 feet, along the Red River in Hardeman County on the east.

Alluvial sands forming sand hills are found adjacent to the Canadian River and its tributaries in the northwest corner of the Panhandle in Ochiltree, Lipscomb, Roberts, Hemphill, Wheeler, Collingsworth, and Childress counties. Wind deposited sands are found in a north-south band along the western portion of the region. These recent depositions occur discontinuously almost the whole length of the western side of the region. Although most of the deposits are stabilized by vegetation there are local areas of moving dunes.

Throughout the flat plateau of the High Plains are numerous shallow depressions termed "playa lakes." These lakes vary in size from a few feet to several miles in diameter and from a few inches to over a hundred feet in depth. The playas are the result of leaching during wet periods and wind deflation during dry periods. Most of them contain water only following rains; however, some of the larger and deeper lakes retain permanent but usually highly saline

water (Wendorf, 1961; Oetkin and Feray, 1963; Reeves and Suggs, 1964).

The two largest topographic features of the Texas Panhandle are the canyon of the Canadian River and the Palo Duro Canyon of the Prairie Dog Town Fork of the Red River.

The valley of the Canadian River occurs in a west-east direction completely across the Texas Panhandle through Oldham, Hartley, Moore, Potter, Hutchinson, Carson, Roberts, and Hemphill counties. In some areas the canyon walls are abrupt and steep and in others, particularly on the eastern side, the margins are extended and not abrupt. Tributary streams occur throughout the length of the river and the bed of these and of the Canadian proper are often several miles in width.

The Palo Duro Canyon is a spectacular canyon characterized by steep bluffs as much as 800 feet high and distinctly marked brightly colored strata visible along the canyon walls and on isolated buttes within the canyon proper. The canyon is a river eroded structure although the Prairie Dog Town Fork of the Red River flows intermittently now, except after the occasional strong thunderstorms of the area when it becomes a large and erosively active stream.

Soils

Soils in the High Plains region range from clays on the hardland sites in the north to medium textures on mixed land sites and sands in the southern portion. Surface soils

are usually underlain by the limestone of the cap rock at a depth of 2 to 5 feet.

Soils of the Rolling Plains vary from tight clays, red-bed clays, and shales to coarse sands along the outwash terraces of streams.

The land areas immediately adjacent to canyon edges are often eroded to the cap rock limestone and present a well drained, often rocky, surface that differs markedly from the soils of the adjacent flat lands or the surfaces of the canyon walls.

CHAPTER II

CLIMATE

Because of the location of the Panhandle and South Plains in the rain shadow of the Rocky Mountains, the climate is continental. The elevation which for the most part is above 3,000 feet, also exerts an important climatic influence. The climate is markedly similar throughout the region probably due to the absence of major topographic variety. The whole region is semi-arid with low and irregularly distributed precipitation, high evaporation and pronounced daily and seasonal ranges in temperature.

During the approximately fifty years of weather records there has been great year to year variation in precipitation. In drought years annual precipitations as low as 5.0 inches and, in usually wet years, as high as 40.0 inches have been recorded. Throughout the area the average annual precipitation is 20.23 inches. The yearly averages range from a low of 16.33 inches in Dallam County in the northwest to 24.75 inches in Hardeman County in the southeast (Texas Almanac, 1964-1965).

Seasonal distribution of precipitation is highly variable with April-May and September-October the highest rainfall months. Normally there is a summer dry period with

high temperatures and high evaporation rates. Throughout the year daily temperature variations of 30 degrees are not uncommon. These marked daily variations are due in large part to the high degree of radiational cooling characteristic of the region.

High winds are characteristic of the region. The prevailing winds are from the south-southwest with an annual average velocity of 12-15 miles per hour. Most months have winds recorded of 30 and 40 miles per hour. During the spring months winds of sustained velocities in excess of 30 miles are not uncommon. These winds sometimes produce what is locally called "sand storms" that are of 1 to 4 days duration. The dessication of surface soils during these storms is great.

CHAPTER III

TAXONOMIC HISTORY

The first plant collection in the Texas Panhandle was made by Edwin James who was attached to Major Stephen H. Long's expedition to the west under the auspices of the federal government. Major Long's group, returning from the Rocky Mountains, entered the Texas Panhandle along the Canadian River in Oldham County, on August 4, 1820. They went down the Canadian River Valley, leaving Texas probably on August 11. James made a collection of plants and, in his Journal, included some descriptions of the vegetation of the area as well as some rather complete descriptions of specific plants. The collections made on the whole expedition were described by Dr. John Torrey (Torrey, John, 1828).

The following are excerpts from James' "Diary and Journal Notes" (from microfilm of original in The Columbia University Library, New York):

Aug. 5. . . . The soil within these banks and bluffs [of the Canadian River in Oldham County] is a highly colored red sand, but fertile and in many places covered by a luxuriant crop of vegetables [herbaceous plants]. The timber is mostly cottonwood, but among the shrubs we find in considerable plenty, currants (the fruits of *ribes aureum*) [*Ribes aureum* Pursh] and grapes now fully ripe. . . . Two fruitcose species of Cactus one of which has long solitary spines with a small yellow flower, and red, small, edible fruit [Opuntia

leptocaulis DC.], the other has very large thorny spines being thickly beset with them. This species [*Opuntia imbricata* (Haw.) DC.] is smaller but has thicker trunk and branches than the other.

Throughout his diary during the period of August 4-10, James listed species as he recognized them and gave descriptions of others. In his descriptions he often began with a classification outline according to the Linnaean sexual system as in the following description of *Stenosiphon virgatus* Spach;

Oct. Mon. Tube of the calyx slender and long thickening upwards divisions lance linear reflected upon the tube. Cor. petals nearly equal exceeding the corolla. Stigma 4 toothed. Capsule 1 celled 1. seeded. Root perennial, fusiform. Stem nearly erect, irregularly branching, smooth. Leaves alternate, smooth, sessile, linear lanceolate entire. Flowers in a terminal crowded spike. After flowering the rachis of the spike extends itself and the fruit is in a scattered spike small sessile triangular much shorter than the linear somewhat carinate bract which is deciduous falling off soon after the flower. The flowers are white having in the calyx a tinge of brownish purple, and they are about the size of those of *Gaura coccinea*. The plant is about 3. or 4. feet high, the leaves small and short and the stem under the whole before the flowers appear has somewhat the appearance of common flax. Hab. in the sands of the river. Midrib of the leaf translucent.

On August 2, 1845, James William Abert, an army lieutenant, was detailed by John Charles Fremont as commander of a group of approximately thirty persons, to survey the Canadian River from its source to the head waters of the Washita River. Abert was known to be interested in all branches of natural history but was apparently more interested in animals than plants (McKelvey, 1955.)

Abert's group entered the Texas Panhandle on Sept. 3rd along the Canadian River in what is now Oldham County. On Sept. 15, he turned the group south to make contact with the Washita River but mistakenly followed the North Fork of the Red River for some time. From Sept. 17th through the 23rd the party was on the upper waters of the Washita and, on the 24th, they turned north and camped on the Canadian River in Oklahoma near Antelope Hills in Roger Mills County.

Despite the fact that Abert mentioned having collected plants on this expedition there are none cited for the area in the list prepared by John Torrey and appended to Abert's report (Abert, in Emory, 1848).

In his published "Journal" (Abert, 1846) he included several lucid descriptions of the area. On Sept. 4, they were on "a sandy waterless waste" and Abert indicated their sufferings were:

. . . greatly alleviated by the refreshing fruit of the plum tree [*Prunus angustifolia* Marsh] . . . equal to any of the cultivated varieties . . . tasted in the United States.

On Sept. 5, or 6, as they travelled along the Canadian River, Abert mentioned having seen "troublesome sand-burs" [*Cenchrus* sp.] that covered the ground and an abundance of "musquit" [*Prosopis glandulosa* Torr.] and the "cardinal flower" [*Lobelia cardinalis* L.] and "cucurbita aurantis" [*Cucurbita foetidissima* H.B.K.].

Abert's description of the Llano Estacado gives an indication of the less than favorable conditions encountered

by the early explorers. Continuing from his "Journal":

September 17: This is the day we look back upon . . . as the day of anxiety . . . we entered upon the famous table land known to the Spaniards as 'el llano estacado'. This is the most extensive and continuous of the plains lying in the desert country. . . . The only water . . . is contained in pools or lakes [playa lakes], often at great distances asunder, and with banks so low that the traveler . . . often passes them unnoticed. The sun was pouring down hear as heavy as clouds do rain. . . .

Captain Randolph Marcy, exploring the Red River in 1852, entered the Texas Panhandle in early June. His route led him up the North Fork of the Red River probably as far north as the present Carson and Gray Counties, then south on the east side of the cap rock to near the present town of Canyon in Randall County. The expedition then went down the Prairie Dog Town Fork of the Red River and passed out of Texas in mid July. They were probably in the Palo Duro Canyon during the last week of June or the first of July.

Plant collections made during this expedition were reported in Marcy's report (Marcy, 1854) by Dr. John Torrey. Dr. Torrey listed 202 species, a large portion of which were collected while the expedition was in Texas.

In his account of the trip (Marcy, 1854) Capt. Marcy gave a description of the sandy lands near what is now Shamrock in Wheeler County.

June 5 . . . the country we traversed was exceedingly monotonous and uninteresting, being a continuous succession of barren sand-hills, producing no other herbage than the artemisia [*Artemisia filifolia* Torrey] and a dense growth of dwarf oak bushes [*Quercus mohriana* Buckl. ex. Rydb.] about

eighteen inches high, which seem to have attained their full maturity, and bear an abundance of small acorns . . . and is always found upon a very sandy soil.

One of the exploration parties under the direction of the Secretary of War to survey a possible railroad route from the Mississippi River to the Pacific Ocean was assigned a route along the thirty-fifth parallel. The group was commanded by Lt. A. W. Whipple and included a medical doctor and biologist, Dr. J. M. Bigelow.

The expedition entered the Texas Panhandle on September 6, 1853, having spent the previous night near Antelope Hills (Roger Mills County) in western Oklahoma. For the next twelve days the group travelled up the Canadian River Valley or adjacent to it. On Sept. 26, they crossed into New Mexico near the Canadian River in what is now Oldham County.

The Whipple group was quite successful throughout the expedition and an account of the Botany of the expedition was published in 1857 (Johnston, 1943) as a part of the general report. The report was quite inclusive with a general description of the botany and an account of the forest trees by Bigelow, a report on the Cactaceae by George Engelmann and Bigelow, on the mosses and liverworts by W. S. Sullivant and a description of general botanical collections by John Torrey. The account was part 5 of the complete report of Whipple's expedition and consisted of 193 pages of text and descriptions and 59 full page plates. A number of new species were described (Bigelow, 1857).

Dr. Bigelow, in his general account of the botany of the country, reported finding Pinyon Pine (Pinus edulis Engelm.) along the northern and eastern bluffs of the Llano Estacado in the Texas Panhandle region. The author has not found any pines within the area today nor have any of the local residents contacted any memory of its having been seen there. Dr. D. S. Correll of the Renner Research Foundation, Renner, Texas, has indicated that he has collected the pinyon within 30 miles of the western border of the Texas Panhandle so the possibility of its occurrence in 1853 is not too remote.

McVaugh discussed a short visit to the Texas Panhandle by the plant collector G. C. Nealley in the summer of 1888 (McVaugh, 1946: 74). Nealley, a collector for the Division of Botany of The United States Department of Agriculture, was under the direction of Dr. George Vasey. He collected, primarily in Texas, from 1887 through 1892, but made but one trip to the Texas Panhandle in 1888.

Nealley started his Panhandle collections on June 2 in Quanah (Hardeman County) and continued in the area through July 4. He collected between Quanah and Amarillo and made trips to Tascosa, Field and Sandborn, Armstrong, and Clarendon. The specimens collected were sent to Dr. Vasey and were used by John Coulter (1891) in his Botany of Western Texas. Nealley published a report on the forage plants of western Texas (Nealley, 1888) which was based, at least in part, on the information obtained on this trip.

J. M. Holzinger published a list of species collected by M. A. Carleton in 1891. Carleton's collections were made in Oklahoma, Kansas and northwestern Texas (Holzinger, 1892). Of the species listed by Holzinger, 39 were cited from locations known to be in the Texas Panhandle and one new species, Euphorbia strictior Holzinger, was described from Oldham County.

Ernest J. Palmer collected in the Texas Panhandle during the summer of 1918. His collections were made primarily in the Palo Duro Canyon in Randall and Armstrong counties. From this short period Palmer produced a 14 page paper on the ligneous flora of the staked plains (Palmer, 1920) in which he listed 45 species of trees, shrubs, and woody subshrubs he had collected.

H. C. Benke, reporting on some plants from the middle west (Benke, 1932), listed 29 species that he observed in the middle of April in the Texas Panhandle.

The author (Rowell, 1957) published an account of the summer flora of a limited area in Hemphill County in the northeast portion of the Panhandle. Two hundred ninety-seven species were reported, two of which were previously unreported for Texas, and four were major distributional records.

Other significant collections from the Texas Panhandle include those of C. S. Wallis, in the herbarium of Oklahoma State University, Stillwater; E. L. Reed, in the herbarium of Texas Technological College, Lubbock; D. S. Correll in the

herbarium of the Texas Research Foundation, Renner; B. C. Tharp, in the herbarium of the University of Texas, Austin; Lloyd Shinnars, in the Herbarium of Southern Methodist University. These collections have not been the subject of any specific publications.

CHAPTER IV

SOME ECOLOGICAL CONSIDERATIONS

The Texas Panhandle and South Plains is a fluvial deposit on an uplifted base from the Rocky Mountains regions to the west. The development of the region began near the start of the Cenozoic Era 50 to 60 million years ago.

With the initiation of the uplift of the Rocky Mountains in the Oligocene the warm, moist climate present through the Eocene began to change toward aridity. With the elevation of the mountains to the west the region became affected by the "rain shadow" of the mountains and was cut off from moisture of Pacific Ocean origin (Wendorf, 1961).

By the Miocene Epoch the increasing aridity had brought about the replacement of the warm temperate forest by grasslands. Fossil records from the late Miocene and the Pliocene contain the fruits of some thirty species of grasses representing contemporary genera (Stipa, Setaria, and Panicum). The fossil records also indicate a predominance of grazing species of mammals (Weaver and Albertson, 1956).

During Pleistocene glaciation fluctuation periods the area was subjected to climatic and floristic changes. The climatic changes induced the migration of different floras, with the introduction of species from either warmer or

cooler, more moist or more arid areas. These changes are thought to explain the presence in the extant vegetation of elements with origins in the northern United States, Mexico and Central American plateaus, and from the south and southeastern United States (Weaver and Albertson, 1956).

B. W. Allred (in Weaver and Albertson, 1956) recognized two major vegetation types in the Texas Panhandle and South Plains. These were the Mixed Prairie Climax and the High Plains Bluestem Postclimax Community (Figure 2).

The High Plains Bluestem Postclimax Community occupies the greatest area in the Texas Panhandle and South Plains (Figures 3 and 4). Allred stated that the community occurs in areas of coarse sand and canyon breaks. Grasses that formerly made up the major portion of the cover, and still occur in some abundance are Sorghastrum nutans, Andropogon scoparius, Panicum virgatum, Andropogon hallii, Eragrostis trichodes, Calamovilfa gigantea, Bouteloua curtipedula, and Elymus canadensis. According to Allred Chloris cucullata, Paspalum setaceum, var. ciliatifolium, and var. stramineum, Sporobolus cryptandrus, and Aristida purpurea have increased under grazing.

In deep sandy soils Quercus (Q. mohriana in the east, Q. havardi in the west) and Artemisia filifolia form types of savannah with the climax grasses of the community. In areas that have been heavily grazed the oaks or the Artemisia develop into dense growths that virtually eliminate all other species. In many sites in sandy lands and especially in sand

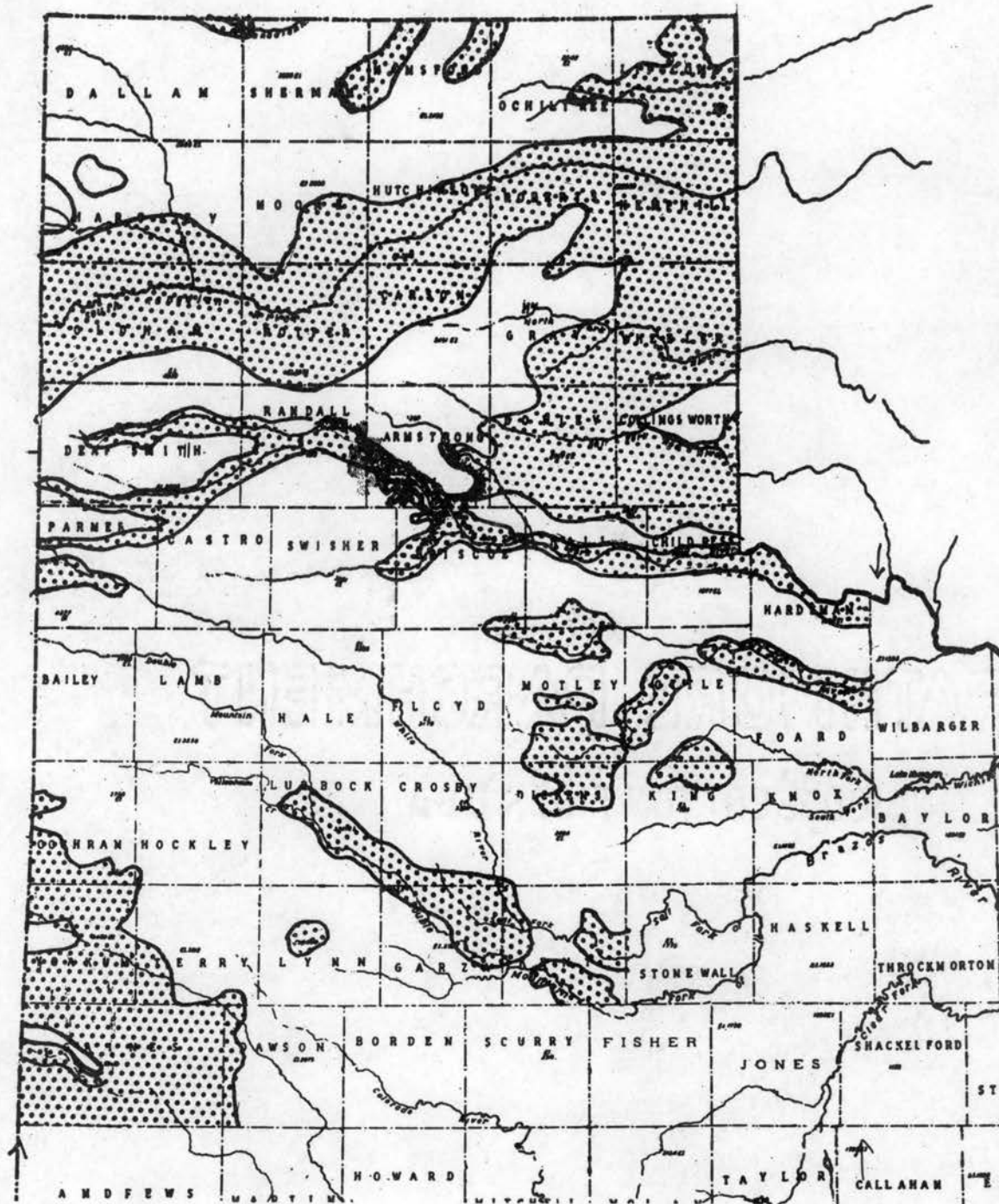


Figure 2. Vegetation map. Mixed Prairie Climax, unmarked;
High Plains Bluestem Postclimax Community,
stippled.



Figure 3. Highplains Bluestem Postclimax Community.
General View.



Figure 4. Highplains Bluestem Postclimax Community.
Detail View.

hills adjacent to river courses there are occasional dense stands in limited areas of Prunus angustifolia or Rhus aromatica. Cenchrus incertus, C. pauciflorus, Festuca octoflora, Eragrostis oxylepis, Helianthus petiolaris, Croton texensis and Eriogonum annuum constitute aspect dominants in areas of disturbance due to over grazing or farming.

The Mixed Prairie Climax (Figure 5) occupies most of the flat tableland area of the region. The name is derived from the dominance of both mid and short grass species.

The dominant mid grasses are Bouteloua curtipendula, Andropogon saccharoides, Sporobolus cryptandrus and Aristida purpurea. The more important short grasses are Bouteloua gracilis, Buchloe dactyloides and Bouteloua hirsuta (Allred, 1956).

In areas of disturbance due to overgrazing or farming practices there are disclimax communities. These communities may be composed primarily of short grasses such as Bouteloua gracilis or Buchloe dactyloides or be dominated by Prosopis glandulosa and/or Yucca campestris with a grass component of Aristida purpurea or other species that increase under disturbance conditions.

Within the vegetation types described above the author has recognized five floristic types. These are described below and are assigned symbols for reference in the species list (Chapter VI).



Figure 5. Climax Mixed Prairie.

Floristic Areas

High Plains Bluestem Postclimax Community. This floristic type is most frequently encountered in the deep sands of the northeastern counties (all or parts of Ochiltree, Lipscomb, Roberts, Hemphill, Gray, Wheeler, Donley, and Collingsworth) and western boundary counties (Dallam, Hartley, Oldham, Deaf Smith, Parmer, Bailey, Cochran, Yoakum, and Lamb). The same floristic composition occurs in the sands and sandy limestone loams of canyon walls and dry stream banks in the Canadian and Red River systems (Figures 3 and 4). This type will be designated as "Pl" in the species list.

Riparian vegetation under the direct influence of permanent moisture from streams, springs, and seepages. This type shows considerable floristic affinity with the coastal plain flora of southeast Oklahoma and east Texas. A number of the species from this type exhibit disjunctive distribution with the coastal plains flora of those areas. Although this type is primarily found in the Canadian, Washita and Red River systems of the eastern portion of the study area, there are similar, localized developments in the western (for example; the Punta de Agua Creek in Hartley County) and north central (for example; Tulia Lake in Swisher County) portions (Figure 6). This type will be designated as "R" in the species list.



Figure 6. Riparian Vegetation of Canadian River
Bottomlands.

Climax Mixed Prairie. This floristic type is best expressed in the flat to rolling high plains in the northern half of the area, but does occur, although less extensively, throughout. In the southern half of the area this type is somewhat less well defined, probably due to a more intensive and extensive cultivation pattern coupled with a somewhat higher average temperature range and a concomitant higher evaporation rate (Figure 5). This type will be designated as "Pr" in the species list.

Cap rock ledge, upper canyon break floristic type. The vegetation that develops on the rocky ledges of the cap rock and upper canyon breaks is, to the author, an ecotonal type with species characteristic of both of the types above. The plants growing in this type are often depauperate in comparison with those of the same species found in the other types. In addition, some species have been found only in this type (Hymenoxys acaulis, and Eriogonum jamesii are two examples) (Figure 7). This type will be designated as "CR" in the species list.

Grasslands, nominally of the High Plains Bluestem Post-climax Community, of the rolling red plains of the southeastern and south central counties (Lynn, Garza, Kent, Crosby, Dickens, King, Floyd, Motley, Cottle, Briscoe, Hall, and Childress, all or in part). The flora in these areas has a marked increase in shrubby species such as Juniperus pinchotii, Prosopis glandulosa, Zizyphus obtusifolius, and herbaceous species such as Aristida purpurea, A. glauca,

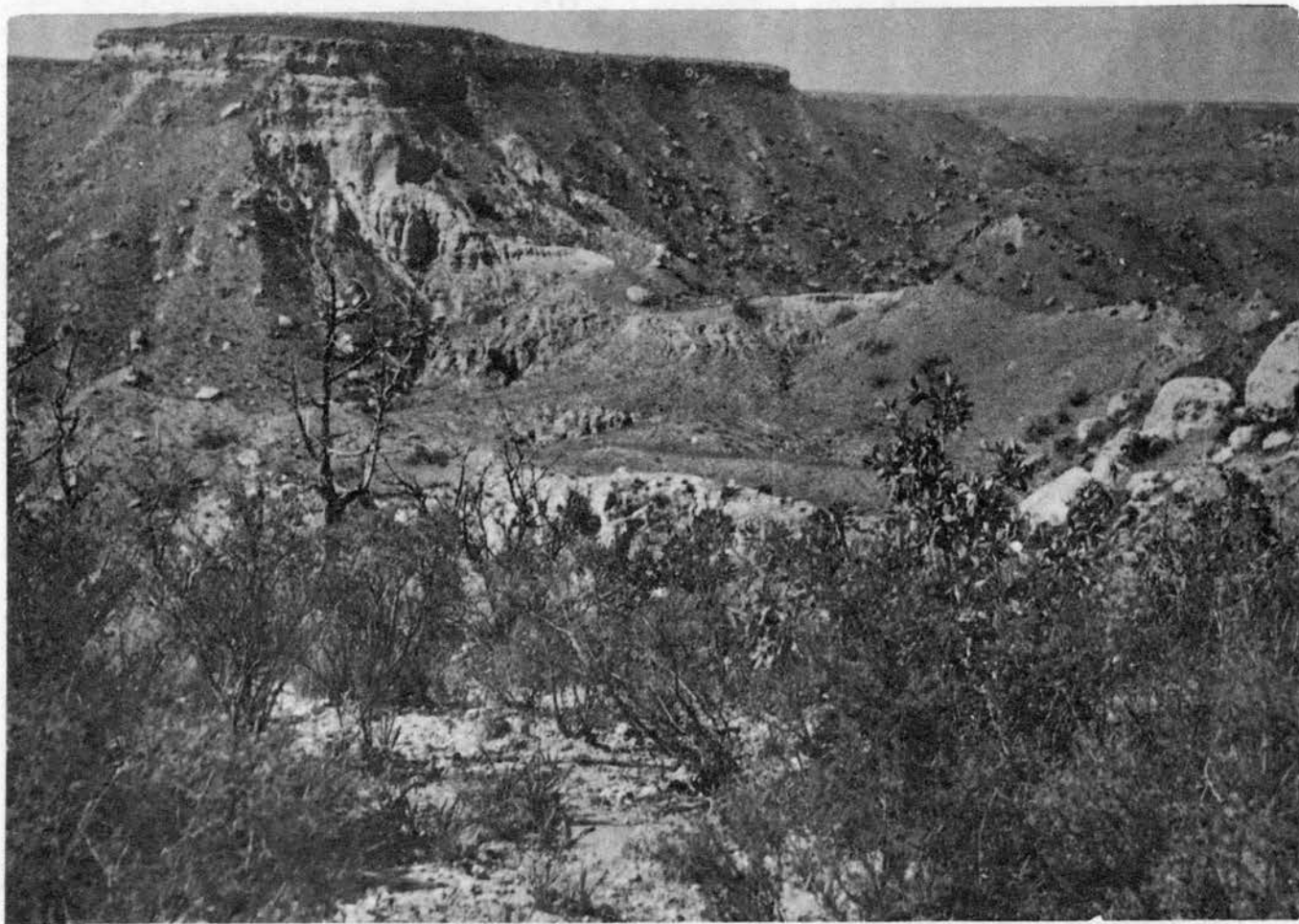


Figure 7. Cap rock Ledges and Upper Canyon Breaks.

Psilostrophe villosa, and Xanthisma texanum. Permian red sandy soils and red sandstone outcrops are frequent in the areas developing this type. This type will be designated as "RP" in the species list.

Playa Lake type. The playa lakes described in Chapter I have a characteristic floristic composition. Those few having permanent water have many of the species associated with the stream riparia. Those with water through only the summer (derived almost entirely from summer thunderstorms) develop a somewhat different and later flora. In either case the disruptive effect of fluctuating water levels, accumulation of dissolved mineral salts and a locally higher concentration of clays probably work in concert in the production of a floristic composition that differs from that of the surrounding prairies. This type will be designated as "L" in the species list.

CHAPTER V

RANGE EXTENSIONS AND ADDITIONS TO THE FLORA OF TEXAS

The collections of the taxa listed below constitute new records of distribution based on the monographs, revisions and other taxonomic literature consulted in the course of this study.

In the list, each binomial is followed by a reference to the previously reported Texas ranges utilizing the vegetational areas of Gould (1962), letters designating the floristic areas of the author as described in Chapter IV, and by a listing of the counties from which collections were examined in this study. The sequence followed is that utilized in Chapter VI.

Additions to the Flora of Texas

ASTRAGALUS PUNICEUS Osterh., var. PUNICEUS; not reported for Texas by Barneby (1964) or Turner (1959); Pr; Deaf Smith.

LUPINUS PLATTENSIS S. Wats.; Turner (1959) stated that this species should be found in the Texas Panhandle but that it had not yet been reported in the state; Pl; Hartley.

AGOSERIS CUSPIDATA (Pursh) Raf.; previously unreported for Texas; Pr; Lipscomb.

BIDENS TRIPARTITA L.; previously unreported for Texas; R;

Hemphill.

IVA AXILLARIS Pursh; previously unreported for Texas; Pr;
Bailey.

LIATRIS LANCIFOLIA (Greene) Kittell; previously unreported
from Texas (Gaiser, 1946); Pl; Oldham.

Range Extensions

POTAMOGETON CRISPUS L.: Pine woods, Blackland Prairie and
Edwards Plateau; R; Hemphill.

POTAMOGETON FOLIOSUS Raf.; var. *FOLIOSUS*; Blackland Prairies,
Cross Timbers and Prairies, Trans-Pecos; R; Hemphill, Swisher.

POTAMOGETON NATANS L.; Blackland Prairies, Edwards Plateau,
Trans-Pecos; R; Garza.

POTAMOGETON PECTINATUS L.; Gulf Prairies and Marshes, Black-
land Prairies, Edwards Plateau, Trans-Pecos; R, L; Castro,
Hemphill.

RUPPIA MARITIMA L.; Gulf Prairies and Marshes, South Texas
Plains; R; Hall.

ARISTIDA DIVARICATA Humb. and Bonpl.; Edwards Plateau, Trans-
Pecos; Pl, Pr; Castro, Parmer.

ARISTIDA FENDLERI Steud.; Edwards Plateau Trans-Pecos; Pl,
Pr, CR, RP; Crosby, Dallam, Hartley, Lubbock.

ARISTIDA ROEMERIANA Scheele; Gulf Prairies and Marshes,
South Texas Plains, Edwards Plateau, Trans-Pecos; Pr;
Dickens, Floyd, Garza, Lubbock, Oldham, Randall.

MUHLENBERGIA SCBOLIFERA (Muhl.) Trin., var. *SETIGERA* Scribn.;
Pine woods, Post Oak Savannah; R; Hemphill.

PANICUM HILLMANI Chase; Edwards Plateau; Fr; Lubbock.

CAREX BREVIOR Mack.; Pine woods, Gulf Prairies, Post Oak Savannah, Blackland Prairies, Cross Timbers and Prairies, Edwards Plateau; R; Hemphill.

CAREX HYSTRICINA Muhl.; Edwards Plateau, Trans-Pecos; R; Armstrong, Hartley, Hemphill.

CAREX TRIANGULARIS Boeckl.; Pine woods, Gulf Prairies and Marshes, Post Oak Savannah, Edwards Plateau; R; Hemphill, Wheeler.

ELEOCHARIS CYLINDRICA Buckl.; Gulf Prairies and Marshes; R; Lubbock.

NOLINA TEXANA S. Wats. Most northern known Texas record but reported from western Cimarron County, Oklahoma (Waterfall, 1966); RP; Garza.

ZEPHYRANTHES BRAZOSSENSIS Traub.; Gulf Prairies and Marshes, Blackland Prairies, Cross Timbers and Prairies, Edwards Plateau; Pl; Bailey, Garza, Lynn.

EPIPACTIS GIGANTEA Dougl. ex Hook.; Blackland Prairies, Cross Timbers and Prairies, Edwards Plateau, Trans-Pecos; E.; Garza.

ANEMOPSIS CALIFORNICA (Nutt.) H. and A.; Trans-Pecos; R; Hemphill, Lubbock.

PARIETARIA PENNSYLVANICA Muhl.; Gulf Prairies and Marshes; Post Oak Savannah, Blackland Prairies, Cross Timbers and Prairies, Edwards Plateau, Trans-Pecos; R; Hemphill.

POLYGONUM SCANDENS L.; Post Oak Savannah, Blackland Prairies; R; Wheeler.

ATRIPLEX CONFERTIFOLIA (Torr.) S. Wats.; Presidio County of the Trans-Pecos only according to Brown (1956); RP; Garza.

EUROTIA LANATA (Pursh) Moq.; Rolling Prairies, Trans-Pecos; CR; Hemphill.

SUAEDA SUFFRUTESCENS Wats.; Edwards Plateau, Trans-Pecos; Pr, RP; Bailey, Hall.

AMARANTHUS TAMARISCINUS Nutt.; Saur (1955) cites this species from north central Texas only; Pl; Garza, Hemphill, Lipscomb.

MYOSURUS MINIMUS L.; all regions of Texas but the High Plains; L; Armstrong, Garza, Lynn.

BERBERIS SWAZEYI Buckl.; Edwards Plateau; CR; Bailey.

CAMELINA MICROCARPA Andrz.; Pine woods, Blackland Prairies, Cross Timbers and Prairies; weed of sandy disturbed sites; Lipscomb, Lubbock, Wheeler.

ERYSIMUM REPANDUM L.; Blackland Prairies, Cross Timbers and Prairies; Pr; Gray, Lipscomb, Lubbock, Ochiltree.

APIOS AMERICANA Medic, var. *TURRIGERA* Fern. Pine woods, Blackland Prairies, Edwards Plateau; R; Hemphill.

CASSIA PUMILIO Gray; Edwards Plateau, South Texas Plains, Trans-Pecos; RP; Dawson, Garza.

CASSIA ROEMERIANA Scheele; Cross Timbers and Prairies, Edwards Plateau, Trans-Pecos; Pl, RP, CR; Bailey, Gaines, Lubbock, Lynn.

DALEA MULTIFLORA (Nutt.) Shimmers; Cross Timbers and Prairies, Edwards Plateau, Gulf Prairies; R; Hemphill.

DESMANTHUS LEPTOLOBUS Torr. and Gray; Cross Timbers and Prairies, Post Oak Savannah; Pr; Lipscomb.

DESMODIUM PANICULATUM (L.) DC., var. DILLENII (Darl.) Isely;
Pine woods, Post Oak Savannah, Blackland Prairies, Edwards
Plateau, Gulf Prairies and Marshes; R; Hemphill, Wheeler.

HOFFMANSEGGIA DREPANOCARPA Gray; Trans-Pecos; RP; Borden,
Lubbock.

PSORALEA DIGITATA Nutt., var. DIGITATA; Cross Timbers and
Prairies; Pl; Wheeler.

STROPHOSTYLES HELVOLA (L.) Ell.; eastern one-third of state;
R; Hemphill.

PEGANUM HARMALA L.; previously reported no farther north
than Ward and Pecos Counties in the Trans-Pecos (Cory, 1949);
RP; Garza.

POLYGALA MACRADENIA Gray; reported for the Trans-Pecos only
(Blake, 1924, Gould, 1962); RP; Garza.

ABUTILON PARVULUM Gray; Edwards Plateau, Trans-Pecos; Pl;
Lubbock.

HIBISCUS TRIONEUM L.; Edwards Plateau; L; Swisher.

VIOLA PRATINCOLA Greene; Russell (1965) lists this species
from adjacent Oklahoma, for Texas, the Cross Timbers and
Prairies are the nearest records; R; Hemphill, Wheeler.

EPILOBIUM COLORATUM Biehler; Trans-Pecos (Munz, 1944); R;
Oldham, Wheeler.

OENOTHERA BRACHYCARPA Gray, var. BRACHYCARPA; Edwards Pla-
teau (Munz, 1944); RP; Crosby, Garza, Lubbock.

BERULA PUSILLA (Nutt.) Fern., Edwards Plateau, Trans-Pecos
(Mathias and Constance, 1951); R; Hutchinson, Lubbock, Old-
ham.

DAUCUS PUSILLUS Michx.; Gulf Prairies and Marshes, Trans-Pecos (Mathias and Constance, 1941); RP; Lubbock.

LOMATUM DAUCIFOLIUM (Nutt.) Coult. and Rose; Blackland Prairies, Cross Timbers and Prairies (Mathias and Constance, 1941); Pl; Hemphill.

SANICULA CANADENSIS L.; eastern third of state (Mathias and Constance, 1941); R; Hemphill.

GARRYA OVATA Benth.; Edwards Plateau, Trans-Pecos; CR; Briscoe.

SAMOLUS PARVIFLORUS Raf.; Gulf Prairies and Marshes; R; Armstrong, Hemphill, Hutchinson, Lubbock, Oldham, Randall.

LIMONIUM LIMBATUM Small; Trans-Pecos, although reported from the adjacent Oklahoma County by Waterfall (1966); RP; Hall.

CRESSA TRUXILLENsis H. B. K.; Blackland Prairies, Trans-Pecos; Pr; Bailey, Garza.

UTRICULARIA VULGARIS L.; Pine woods, Gulf Prairies and Marshes; R; Wheeler.

DYSCHORISTE LINEARIS (Torr. and Gray) Kuntze; Edwards Plateau, Trans-Pecos and southeastern third of state; Pl, RP; Crosby, Dawson, Dickens, Floyd, Garza, Kent.

RUELLIA HUMILIS Nutt.; southeastern half of state and Edwards Plateau (Tharp and Barkley, 1949); R; Wheeler.

CYCLANTHERA DISSECTA (Torr. and Gray) Arn.; previously known from all regions except the Rolling Plains and High Plains; Pl; Ochiltree.

ASTER PRAEALTUS Poir; Edwards Plateau and southeastern third of state; Pl; Hemphill, Randall.

BAHIA PEDATA Gray; previously reported only from the Trans-Pecos in Texas and northeastern New Mexico (Ellison, 1964); Pl; Dallam.

BIDENS FRONDOSA L., var. FRONDOSA; Edwards Plateau and south and eastern third of state; R; Hemphill.

GNAPHALIUM CHILENSE Spreng.; Trans-Pecos; R, L; Bailey, Garza, Wheeler.

HAPLOPAPPUS HETEROPHYLLUS (Gray) Blake; Trans-Pecos; Pl, RP; Bailey, Garza, Randall.

SENECIO TRIDENTICULATUS Rydb.; Edwards Plateau and Trans-Pecos (Barkley, 1962); CR; Ochiltree, Roberts.

XANTHIUM SPINOSUM L.; Cross Timbers and Prairies, Edwards Plateau, Trans-Pecos; L; Bailey, Terry.

ZEXMENIA HISPIDA H.B.K.; Edwards Plateau south and east; RP; Kent.

CHAPTER VI

TAXA, HABITATS AND DISTRIBUTION

In the following account, the letters following the name of each species indicates general distribution according to the floristic areas described in Chapter IV.

EQUISETACEAE

EQUISETUM (Correll, 1956)

E. ARVENSE L. This species was cited by Correll for only one locality in Texas, Buffalo Springs Creek, Lubbock County, E. L. Reed 3616. The specimen cited is in the herbarium of Texas Technological College. No other specimens seen.

E. KANSANUM Schaffn. Pl, R; early summer; sandy soils of stream banks; 2 sheets. COUNTIES: Hemphill.

E. LAEVIGATUM A.Br. (E. hyemale L., var. intermedium A.A. Eat.); Pl, R; sandy soils of streams; June through August; 9 sheets. COUNTIES: Armstrong, Crosby, Hutchinson, Lubbock, Randall.

E. PREALTUM Raf. (E. hyemale L., var. affine (Engelm.) A.A. Eat., var. robustum (A.Br.) A.A. Eat., var. pseudohyemale (Farw.) Morton, var. elatum (Engelm.) Morton); Pl, R; sandy

soil of stream banks; September; 2 sheets. COUNTIES: Randall.

POLYPODIACEAE
(Correll, 1956)

ADIANTHUM

A CAPILLUS-VENERIS L. R; seepage areas, cliff faces of canyons; April through September; 13 sheets. COUNTIES: Armstrong, Briscoe, Crosby, Dickens, Randall.

CHEILANTHES

C. FEEI Moore; R; seepage areas, cliff faces of canyons; June through September; 6 sheets. COUNTIES: Armstrong, Crosby, Lubbock, Ochiltree.

C. FENDLERI Hook.; R; seepage areas, cliff faces of canyons; June; 3 sheets. COUNTIES: Crosby.

NOTHOLAENA

N. SINUATA (Lag.) Kaulf., var. INTEGERRIMA Hook.; Pl, RP; sandstone and limestone ledges of canyons; March to September; 3 sheets. COUNTIES: Armstrong, Dawson, Dickens.

N. SINUATA (Lag.) Kaulf., var. COCHISENSIS (Gooding) Weatherby. Reported by Correll (1956) in Motley County. None seen.

PELLAEA

P. ATROPURPUREA (L.) Link; R; moist rocky crevices of canyon walls; June; 4 sheets. COUNTIES: Armstrong, Briscoe.

MARSILEACEAE
(Correll, 1956)

MARSILEA

M. MUCRONATA A. Br.; L; margins of playa lakes; July to October; 7 sheets. COUNTIES: Hale, Lipscomb, Lubbock, Ochiltree.

M. UNCINATA A. Br.; L; margins of playa lakes; April to August; one sheet. COUNTIES: Carson.

PINACEAE

JUNIPERUS
(Hall, et al., 1961)

Hall, et al. (1961) indicated that Juniperus in the Texas Panhandle consists of introgressants of J. ashei into J. pinchoti complicated by the presence of genes of J. virginiana and J. scopulorum. The author has chosen to cite below those specimens which can be assigned with some degree of confidence to the species indicated.

J. ASHEI Bucholz; Fl, CR; sands and sandy limestone loams of cap rock ledges and canyon breaks; July; 2 sheets. COUNTIES: Roberts.

J. MONOSPERMA (Engelm.) Sarg.; Fl, CR; sands and sandy limestone loams of canyon breaks; mid August through September; 4 sheets. COUNTIES: Lubbock, Randall.

J. PINCHOTI Sudworth; Fl; sands and sandy limestone loams of canyon breaks; mid August through September; 9 sheets. COUNTIES: Randall, Garza, Cottle.

J. SCOPULORUM Sarg.; Pl; sands and sandy limestone loams of canyon breaks; July and August; 12 sheets. COUNTIES: Armstrong, Briscoe, Randall, Roberts.

GNETACEAE

EPHEDRA (Cory, 1938)

E. ANTISYPHILITICA Berl. ex C. A. Meyer, var. ANTISYPHILITICA (including E. texana Reed) Pl, CR; sands and sandy limestone loams of cap rock ledges and canyon breaks; May; 31 sheets. COUNTIES: Armstrong, Crosby, Garza, Lubbock.

E. CORYI Reed; Pr, RP; sands of grasslands and prairies; late April and early May; 18 sheets. COUNTIES: Dawson, Gaines, Lynn, Terry.

E. TORREYANA Wats.; Pl, RP; sands of grasslands and lower canyon breaks; late April and early May; 9 sheets. COUNTIES: Lamb, Moore, Randall.

TYPHACEAE

TYPHA (Hotchkiss, 1949)

T. DOMINGENSIS Pers. (T. truxillensis H.B.K., T. angustifolia p.p. of authors.) Pl, R, L; margins of streams, playa lakes, stock tanks; June through August; 10 sheets. COUNTIES: Armstrong, Floyd, Hemphill, Lubbock, Randall.

T. LATIFOLIA L., forma LATIFOLIA. R; margin of artificial lake; August; one sheet. COUNTIES: Swisher.

ZOSTERACEAE
(Fernald, 1932, Ogden, 1943)

POTAMOGETON

P. CRISPUS L. R; one collection, Lake Marvin, Hemphill County; May; 2 sheets. COUNTIES: Hemphill.

P. FOLIOSUS Raf., var. FOLIOSUS; R, L; playa lakes and bottomland springs; late May to mid August; 18 sheets. COUNTIES: Hemphill, Swisher.

P. NATANS L.; R; permanent pond; September; one sheet. COUNTIES: Garza.

P. NODOSUS Poir; R; spring-fed streams and lakes; late June through August; 10 sheets. COUNTIES: Hemphill.

P. PECTINATUS L.; R, L; spring-fed lakes, permanent playa lakes; June; 10 sheets. COUNTIES: Castro, Hemphill.

RUPPIA
(Morong, 1893)

R. MARITIMA L.; one collection, Estelline Salt Springs near the Red River in Hall County; April; 2 sheets. COUNTIES: Hall.

ZANICHELLIA
(Morong, 1893)

Z. PALUSTRIS L.; Pr, RP; stocktanks; April through July; 2 sheets. COUNTIES: Bailey, Dickens.

NAJADACEAE

NAJAS
(Morong, 1893)

N. GUADUALUPENSIS (Spreng.) Magnus; R, L; streams,

springs, and permanent playa lakes; June through August; 5 sheets. COUNTIES: Castro, Hartley, Hemphill.

ALISMATACEAE

ECHINODORUS

E. BERTEROI (Spreng.) Fassett, var. *LANCEOLATUS* (Engelm.) Fassett; R, L; alkaline lakes, playa lakes; July through August; 8 sheets. COUNTIES: Bailey, Carson, Crosby.

SAGITTARIA

S. LATIFOLIA Willd., var. *OBTUSA* (Muhl.) Wieg.; R; margins of creeks and spring-fed lakes; mid June through August; 7 sheets. COUNTIES: Hartley, Hemphill, Oldham.

S. LONGILOBA Engelm.; L; margins of playa lakes; June to mid September; 25 sheets. COUNTIES: Armstrong, Bailey, Crosby, Dickens, Floyd, Garza, Hemphill, Lubbock, Swisher.

GRAMINEAE

(Hitchcock and Chase, 1950)

AEGILOPS

A. CYLINDRICA Host., var. *CYLINDRICA*; Pl, Pr; sands of prairies and disturbed roadsides; May through June; 8 sheets. COUNTIES: Garza, Gray, Lubbock, Wheeler.

AGROPYRON

A. CRISTATUM (L.) Gaertn.; Introduced in deep sandy loam grassland on Gene Howe Wildlife Management Area, Hemphill County. The small introduction is surviving and spreading moderately.

A. INERME (Scribn. and Smith) Rydb. This species is attributed to the Climax Mixed Prairie by Gould (Gould, 1962). No specimens seen.

A. SMITHII Rydb.; Pl, Pr, RP; sandy loam of grasslands throughout area; late May through June; 18 sheets. COUNTIES: Briscoe, Crosby, Dallam, Floyd, Hale, Hemphill, Moore, Potter, Randall, Wheeler.

A. TRACHYCAULUM (Linke) Malte; attributed to both the Climax Mixed Prairie and the High Plains Bluestem community areas by Gould (1962). None seen.

AGROSTIS

A. ALBA L.; R; sands of stream margins and river bottom lands; late April through early September; 9 sheets. COUNTIES: Hemphill, Hutchinson, Wheeler.

A. SEMIVERTICILLATA (Forsk.) C. Christ (A. verticillata Vill.); R; moist sands adjacent to springs and streams; April through June; 2 sheets. COUNTIES: Hartley, Hutchinson.

ANDROPOGON (Gould, 1957)

A. BARBINODIS Lag., var. BARBINODIS; Pl, Pr, CR, sandy loam, sands of stream banks, canyon breaks and roadside ditches; mid May through June; 11 sheets. COUNTIES: Crosby, Floyd, Garza, Hemphill, Lubbock, Randall.

A. BARBINODIS Lag., var. PERFORATUS (Trin.) Gould; RP; sandy loam, canyon breaks; mid May through June; 3 sheets.

COUNTIES: Borden, Dickens, Motley.

A. GERARDI Vitman (A. furcatus Muhl., A. provincialis Lam.); Pl, Pr, CR; sands, sandy loams of stream margins and canyon breaks; July through September; 11 sheets. COUNTIES: Armstrong, Hutchinson, Lubbock, Potter, Randall.

A. HALLII Hack.; Pl, Pr, CR; sands of sand hills, stream banks, canyon breaks; August through September; 11 sheets. COUNTIES: Collingsworth, Dallam, Garza, Hemphill, Lipscomb, Ochiltree, Randall, Roberts, Wheeler.

A. SACCHAROIDES Swartz, var. TORREYANUS (Steud.) Hack.; Pl, Pr, CR, RP; sandy loam soils throughout area; June through September; 23 sheets. COUNTIES: Armstrong, Cottle, Garza, Hemphill, Hutchinson, Lipscomb, Lubbock, Ochiltree, Roberts.

A. SCOPARIUS Michx. (incl. var. frequens F. T. Hubb., var. neomexicanus (Nash) Hitchc.); Pl, Pr, CR; sandy soils in prairies, stream banks, canyon breaks and sides; August through September; 18 sheets. COUNTIES: Garza, Hemphill, Lubbock, Lipscomb, Ochiltree, Roberts, Wheeler.

A. SPRINGFIELDII Gould. This species, described by Gould (1957) and attributed by him to Dawson County, was not identifiable in any of the collections examined by the author.

A. VIRGINICUS L., var. CORYMBOSUS (Chapm.) Fern. and Grisc. (A. glomeratus (Walt.) B.S.P.). This taxon was listed for the Texas Panhandle by Gould (1962) but no specimens were seen by the author.

ARISTIDA

A. ADSCENSIONIS L.; Pr; sandy loam of prairies; August; 3 sheets. COUNTIES: Dallam.

A. BARBATA Fourn.; Pr; sandy loam of prairies; July through September; 3 sheets. COUNTIES: Hemphill, Lubbock.

A. DIVARICATA Humb. and Bompl.; Pl, Pr; sandy loam of prairies and roadsides; late June through August; 2 sheets. COUNTIES: Castro, Parmer.

A. FENDLERIANA Steud.; Pl, Pr, CR, RP; sandy loam of prairies and canyon breaks; June through mid August; 4 sheets. COUNTIES: Crosby, Dallam, Hartley, Lubbock.

A. GLAUCA (Nees) Walp.; Pr, CR, RP; sandy loam of prairies and canyon breaks; late March through June; 8 sheets. COUNTIES: Borden, Briscoe, Dickens.

A. LONGISETA Steud.; Pl, Pr, CR, RP; sands, sandy loams of prairies and canyon breaks; late May through August; 51 sheets. COUNTIES: Bailey, Briscoe, Castro, Cottle, Dallam, Dickens, Hartley, Hockley, Lipscomb, Lubbock, Ochiltree, Potter, Roberts, Sherman, Wheeler.

A. OLIGANTHA Michx. Reported for Panhandle and South Plains by Gould (1962). None seen.

A. PURPUREA Nutt.; Pl, Pr, CR, RP; sandy loam and deep sands of prairies and sand hills adjacent to streams; late March through August; 24 sheets. COUNTIES: Armstrong, Borden, Cottle, Crosby, Dickens, Hartley, Hemphill, Hockley, Lubbock, Ochiltree, Roberts, Wheeler.

A. ROEMERIANA Scheele; Pr; sandy loam of prairies and canyon breaks; May; 7 sheets. COUNTIES: Dickens, Floyd, Garza, Lubbock, Oldham, Randall.

BOUTELOUA

B. BARBATA Lag.; RP; sandy loam of grasslands; August; 2 sheets. COUNTIES: Kent.

B. CURTIPENDULA (Michx.) Torr.; Pl, Pr, CR, RP; sandy loam, sands and gravels of prairies, canyon breaks, cap rock ledges; May through September; 35 sheets. COUNTIES: Bailey, Borden, Cottle, Dallam, Dickens, Floyd, Garza, Hemphill, Kent, Lipscomb, Lubbock, Ochiltree, Potter, Randall, Roberts, Sherman.

B. ERIOPODA (Torr.) Torr.; CR, RP; tight sandy loam of grasslands; June; 2 sheets. COUNTIES: Armstrong, Garza.

B. GRACILIS (Willd. ex H.B.K.) Lag.; Pl, Pr, CR, RP; sandy loams and sands of cap rock ledges, canyon breaks and prairies; June through September; 41 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Cottle, Crosby, Dallam, Dickens, Hartley, Hemphill, Lipscomb, Lubbock, Sherman.

B. HIRSUTA Lag.; Pl, Pr, CR; sandy loam and sandy clays of prairies, cap rock ledges; June through September; 29 sheets. COUNTIES: Briscoe, Hemphill, Hutchinson, Kent, Lubbock, Ochiltree, Potter, Roberts.

B. RIGIDISETA (Steud.) Hitchc.; Pl, CR, RP; cap rock ledges, canyon breaks, oak shinnery; May through June; 12 sheets. COUNTIES: Borden, Dickens, Garza, Kent, Lubbock.

B. SIMPLEX Lag. Reported for Panhandle and South Plains by Gould (1962). None seen.

B. TRIFIDA Thurb. Reported for Panhandle and South Plains by Gould (1962). None seen.

BRACHIARIA

B. CILIATISSIMA (Buckl.) Chase; RP; sands of oak shinery and mesquite grasslands; mid June through mid August; 3 sheets. COUNTIES: Cottle, Kent.

BROMUS

B. JAPONICUS Thumb.; Pl, Pr, CR, RP; sands and sandy loam of disturbed areas, bottomlands of streams; mid April through June; 14 sheets. COUNTIES: Briscoe, Crosby, Dallam, Garza, Hemphill, Lubbock, Potter.

B. TECTORUM L., var. TECTORUM; Pl, Pr, RP; sands and sandy loam of stream margins and disturbed areas; May through June; 11 sheets. COUNTIES: Bailey, Hemphill, Lipscomb, Lubbock, Wheeler.

B. UNIOLOIDES (Willd.) H.B.K. (B. catharticus Vahl.) Pl, R, Pr, CR, RP; sands, loams, gravels of disturbed areas; mid April through July; 34 sheets. COUNTIES: Armstrong, Briscoe, Cottle, Crosby, Dickens, Garza, Lubbock, Motley, Roberts.

BUCHLOE

B. DACTYLOIDES (Nutt.) Engelm.; Pl, Pr, CR, RP; sandy loam of prairies throughout area; May through September; 23

sheets. COUNTIES: Armstrong, Bailey, Borden, Briscoe, Garza, Lubbock, Randall.

CALAMOVILFA

C. GIGANTEA (Nutt.) Scribn. and Merr.; Pl; deep sands; late June through September; 16 sheets. COUNTIES: Hartley, Hemphill, Hockley, Lipscomb, Potter, Roberts.

CENCHRUS

C. INCERTUS M.A. Curtis; Pl, R, Pr, CR, RP; sands and sandy loam under disturbance throughout the area; May through October; 13 sheets. COUNTIES: Borden, Dickens, Garza, Hemphill, Hutchinson, Lubbock.

C. PAUCIFLORUS Benth. (incl. *C. longispinus* (Hack.) Fern.); Pl, R, Pr, CR, RP; sands and sandy loam under disturbance throughout the area; late June through September; 8 sheets. COUNTIES: Collingsworth, Hemphill, Lubbock, Ochiltree, Roberts.

CHLORIS

C. CUCULLATA Bisch.; Pr, CR, RP; sandy loam of disturbed areas; March through September; 21 sheets. COUNTIES: Borden, Dickens, Garza, Hemphill, Lamb, Lubbock, Motley, Randall.

C. VERTICILLATA Nutt.; Pl, R, Pr, CR; sands and sandy loams of prairies, especially under disturbance, cap rock ledges and canyon walls and floors; May through August; 19 sheets. COUNTIES: Borden, Crosby, Dallam, Hemphill,

Hutchinson, Lubbock, Lynn.

C. VIRGATA Swartz.; Pl, Pr; sandy loam and sands of disturbed prairies; late June through August; 20 sheets.

COUNTIES: Dallam, Hemphill, Lubbock.

CYNODON

C. DACTYLON Pers.; Pl, R, L; sandy loam and sands adjacent to streams and margins of playa lakes; March through July; 8 sheets. COUNTIES: Armstrong, Borden, Garza, Hemphill, Lubbock.

DIGITARIA

D. SANGUINALIS (L.) Scop.; Pl, Pr; sandy loam of disturbed areas near cattle feeding areas and old building sites; July; 5 sheets. COUNTIES: Hemphill, Lubbock.

DISTICHLIS

D. SPICATA L., var. STRICTA (Torr.) Beetle (D. stricta (Torr.) Rydb.); Pl, R, RP; saline flats; June to September; 16 sheets. COUNTIES: Bailey, Dallam, Hall, Hemphill, Hutchinson, Lipscomb, Lubbock, Roberts.

ECHINOCHLOA

E. COLONUM (L.) Linke; one collection seen, weed on campus, Texas Tech College, Lubbock, Lubbock Co. 24 September.

E. CRUSGALLII (L.) Beauv. (incl. var. microstachya (Wieg.) Shinnors and var. zelayensis (H.B.K.) Hitchc.); Pl, R, Pr; ditches and stream margins throughout the area; July

and August; 5 sheets. COUNTIES: Hemphill, Hockley, Lubbock, Ochiltree, Roberts.

ELYMUS

E. CANADENSIS L. (including var. canadensis and var. brachystachys (Scribn. and Ball) Farwell); Pl, R; sandy soils near streams and lower canyon breaks; June through July; 9 sheets. COUNTIES: Armstrong, Floyd, Garza, Hemphill, Hutchinson, Ochiltree, Oldham.

E. VIRGINICUS L.; Pl, Pr, CR; cap rock ledges, canyon breaks and sands adjacent to streams; July. COUNTIES: Hemphill, Ochiltree, Roberts, Swisher.

ENNEAPOGON

E. DESVAUXII Beauv. (Pappophorum wrightii Wats.); CR; cap rock ledges and rocky canyon sides; September; 2 sheets. COUNTIES: Lubbock, Ochiltree.

ERAGROSTIS

E. ARIDA Hitchc.; Pr; one collection of this species seen (probably from cap rock ledges) from Oldham County; August.

E. BARRELLERI DeVeau; Pr; sandy loam of disturbed prairie sites; July through September; 5 sheets. COUNTIES: Dallam, Lubbock.

E. CURTIPEDICELLATA Buckl.; Pl, RP; sands, sandy loam, sandstone ledges; late May to early June; 14 sheets. COUNTIES: Castro, Hemphill, Lubbock, Wheeler.

E. CURVULA (Schrad.) Nees. Although cited for the region by Gould (1962) the author has seen no specimens that can be assigned to this species.

E. MEGASTACHYA (Loel.) Link. (E. cilianensis (All.) Link.); Pl, RP; sands, sandy loams of stream margins and dune areas; late June through September; 9 sheets. COUNTIES: Bailey, Cottle, Hemphill, Lubbock, Ochiltree, Randall.

E. OXYLEPIS (Torr.) Torr. (incl. var. oxylepis and var. beyrichii (J. G. Sm.) Shinnery); deep sands; June through early October; 15 sheets. COUNTIES: Bailey, Garza, Hemphill, Lipscomb, Lubbock, Terry.

E. PECTINACEA (Michx.) Nees (E. diffusa Buckl.) Pr; sands and sandy loam of disturbed areas; late May through September; 9 sheets. COUNTIES: Lubbock, Parmer.

E. PERPLEXA L. H. Harvey. This species is reported for the Climax Mixed Prairie by Gould (1962). None seen.

E. SESSILISPICA Buckl.; Pr; sandy soils of disturbed prairie sites; late June through July; 5 sheets. COUNTIES: Hemphill, Terry.

E. SPECTABILIS (Pursh) Steud.; Pl; sand hills; August; 2 sheets. COUNTIES: Hemphill.

E. TRICHODES (Nutt.) Wood, var. TRICHODES; Pl, R, RP; sandy prairies and sand hills; July through October; 8 sheets. COUNTIES: Castro, Garza, Hemphill, Lipscomb.

E. TRICHODES (Nutt.) Wood, var. PILIFERA (Scheele) Fern.; Pl; sandy loam of canyon walls; early October; 2 sheets. COUNTIES: Randall.

ERIOCHLOA

E. CONTRACTA Hitchc. Cited for the Panhandle and South Plains by Gould (1962). None seen.

ERIONEURON
(Tateoka, 1961)

E. GRANDIFLORUM (Vasey) Tateoka (Tridens grandiflorus (Vasey) Woot. and Standl.) Reported by area by Gould (1962). None seen.

E. PILOSUM (Buckl.) Nash (Tridens pilosus (Vasey) Hitchc.) Pl, Pr, CR; sands, sandy and limestone loams, and gravels most frequently near or on cap rock and canyon breaks; late April through August; 15 sheets. COUNTIES: Bailey, Cottle, Deaf Smith, Garza, Hemphill, Lubbock, Ochiltree, Parmer, Potter, Roberts.

E. PULCHELLUM (H.B.K.) Tateoka (Tridens pulchellus (H.B.K.) Hitchc.) Reported for area by Gould (1962). None seen.

FESTUCA

F. OCTOFLORA Walt. (Vulpia octoflora (Walt.) Rydb.); Pl, R, Pr, CR, RP; sands, sandy loam in grasslands under disturbance; May through June; 12 sheets. COUNTIES: Bailey, Briscoe, Garza, Hemphill, Lubbock, Randall, Roberts.

HILARIA

H. BELANGERI (Steud.) Nash. Reported for area by Gould (1962). None seen.

H. JAMESII (Torr.) Benth. Reported for area by Gould (1962). None seen.

H. MUTICA (Buckl.) Benth.; Pl, Pr, CR, RP; sandy soils of prairies, cap rock ledges and canyon breaks; mid April through July; 8 sheets. COUNTIES: Armstrong, Garza, Kent, Lynn.

HORDEUM

H. JUBATUM L.; Pl, Pr, CR; sandy soils in disturbed areas throughout; June through early July; 21 sheets. COUNTIES: Deaf Smith, Hemphill, Lubbock, Oldham, Roberts.

H. LEPORINUM Link.; Pr; introduced species, one collection in sandy loam, near runway of air strip, Lubbock Co.; 13 March.

H. PUSILLUM Nutt.; Pl, R, Pr, CR, RP; disturbed sandy soils of prairies, streams and canyons; mid April through early July; 25 sheets. COUNTIES: Borden, Cottle, Crosby, Dawson, Hemphill, Lynn, Lubbock, Motley, Roberts.

H. STEBBINSII Covas. Introduced species that has established itself in vacant lots, roadsides and disturbed prairies sites; April through May; 7 sheets. COUNTIES: Garza, Lubbock.

HETEROPOGON

H. CONTORTUS (L.) Beauv. One collection, from the Palo Duro Canyon, Randall County, 24 July.

KOELERIA

K. MACRANTHA (Lebed.) Spreng. (K. cristata (L.) Pers.)

Reported for Panhandle and South Plains by Gould (1962).

None seen.

LEERSIA

L. ORYZOIDES (L.) Swartz; R; in riparian associations along creeks and spring-fed lakes; September through October; 3 sheets. COUNTIES: Hemphill.

LEPTOCHLOA

L. DUBIA (H.B.K.) Nees. Reported for Panhandle and South Plains by Gould (1962). None seen.

L. FASCICULARIS (Lam.) Gray. Reported for Panhandle and South Plains by Gould (1962). None seen.

LEPTOLOMA

L. COGNATUM (Schultes) Chase; Pl, Pr; deep sands of sand hills, disturbed prairies and canyon breaks; May through July; 9 sheets. COUNTIES: Crosby, Garza, Hemphill, Lubbock.

LIMNODEA

L. ARKANSANA (Nutt.) L. H. Dewey. One collection along margins of cap rock, Buffalo Spring Creek, Lubbock, County; 29 May.

LYCURUS

L. PHLEOIDES H.B.K. One collection, in sandy loam near cap rock, Yellow House Canyon, Lubbock, Lubbock, County; July.

MELICA

M. NITENS (Scribn.) Nutt. One collection seen from

open prairie near Lubbock, Lubbock County; July.

MUHLENBERGIA

M. ARENACEA (Buckl.) Hitchc. Reported for region by Gould (1962). None seen.

M. ARENICOLA Buckl.; Pl, Pr, CR; sands and sandy loams of prairies, cap rock ledges and dry stream banks; July and August; 8 sheets. COUNTIES: Dallam, Hartley, Lubbock, Oldham.

M. ASPERIFOLIA (Nees and Mey.) Parodi; Pl; sands of stream banks; August and September; 8 sheets. COUNTIES: Hartley, Hemphill, Hutchinson, Lipscomb.

M. PORTERI Scribn. Reported for high plains of area by Gould (1962). None seen.

M. RACEMOSA (Michx.) B.S.P. Reported for Panhandle by Gould (1962). None seen.

M. REPENS (Presl.) Hitchc. Reported for Panhandle by Gould (1962). None seen.

M. SOBOLIFERA (Muhl.) Trin., var. SETIGERA Scribn. One collection, margin of spring-fed lake in Hemphill County; 8 October; 2 sheets.

M. TEXANA Buckl. Reported for region by Gould (1962). None seen.

M. TORREYI (Kunth) Hitch. and Chase; C.; sandy loam of prairie; July; one sheet. COUNTIES: Lubbock.

M. VILLOSA Swallen. Gould (1962) listed this species as occurring in the area. None seen.

MUNROA

M. SQUARROSA (Nutt.) Torr.; Pl, CR, RP; sands and sandy loams on heavily grazed pastures, adjacent to Prairie Dog Towns and cap rock margins; June through August; 15 sheets. COUNTIES: Cottle, Dallam, Hemphill, Potter.

ORYZOPSIS

O. HYMENOIDES (Roem. and Schult.) Ricker. Reported from the Panhandle by Gould (1962). None seen.

PANICUM

P. ANTIDOTALE Retz.; RP; sandy loam, mesquite grassland; May; one sheet. COUNTIES: Garza.

P. CAPILLARE L.; Pl, Pr; sandy loam of prairies, roadside ditches, sandhills; July and September; 12 sheets. COUNTIES: Collingsworth, Hemphill, Lipscomb, Lubbock, Ochiltree, Randall, Roberts.

P. FASCICULATUM Swartz. Cited for Panhandle by Gould (1962). None seen.

P. HALLII Vasey; Pl, Pr, RP; sandy loam of rolling prairies and canyon breaks, deep sands adjacent to streams; late May to mid July; 9 sheets. COUNTIES: Bailey, Cottle, Garza, Oldham, Roberts, Wheeler.

P. HILLIMANI Chase; Pr; sandy loam of disturbed prairie; August; one sheet. COUNTIES: Lubbock.

P. MILLIACEUM L. An introduced species but collected in open grasslands in Dallam County; June; one sheet.

P. OBTUSUM H.B.K.; Pl, R, RP; sands and sandy loam in stream bottoms and adjacent lower canyon breaks; mid June until mid September; 28 sheets. COUNTIES: Bailey, Briscoe, Dickens, Hartley, Hemphill, Hutchinson, Lubbock, Ochiltree, Randall, Roberts.

P. OLIGOSANTHES Schult., var. HELLERI (Nash) Fern.; Pl; deep sands in sand hills of Canadian River valley and tributaries; June and July; 9 sheets. COUNTIES: Hemphill, Lipscomb.

P. OLIGOSANTHES Schult., var. SCRIBNERIANUM Nash; Pl; deep sands of sand hills; October; 7 sheets. COUNTIES: Lipscomb, Lubbock.

P. RAMISETUM Scribn.; RP; sandy loam of canyon breaks; May; 3 sheets. COUNTIES: Crosby.

P. REVERCHONII Vasey. Recorded for Panhandle by Gould (1962). None seen.

P. TEXANUM Buckl.; Pl; Sandy loam of canyon breaks; late May; one sheet. COUNTIES: Randall.

P. VIRGATUM L.; Pl, Pr; sands and sandy loam of stream bottoms, sand hills, prairies; mid June to early October; 21 sheets. COUNTIES: Dallam, Hemphill, Lipscomb.

PASPALUM
(Banks 1966)

P. DISTICHUM L., var. DISTICHUM; Pl, R; sands in moist areas adjacent to streams; June; 4 sheets. COUNTIES: Floyd, Hemphill.

P. PUBIFLORUM Rupr. and Fourn.; RP; sands adjacent to streams; July; 3 sheets. COUNTIES: Crosby.

P. SETACEUM Michx., var. *CILIATIFOLIUM* (Michx.) Vasey (*P. ciliatifolium* Michx., var. *ciliatifolium*); Pl; deep sands of sand hills adjacent to Canadian River; June; 6 sheets. COUNTIES: Hemphill.

P. SETACEUM Michx., var. *STRAMINEUM* (Nash) Banks (*P. ciliatifolium* Michx., var. *straminium* (Nash) Fern., *P. stramineum* Nash); Pl, Pr, RP; sands and sandy loam of sand hills, mesquite grasslands, Prairie Dog towns; mid June through early October; 8 sheets. COUNTIES: Dallam, Dickens, Hemphill, Lipscomb.

PHALARIS

P. CAROLINIANA Walt.; Pl, L; sands and sandy loams of stream beds and margins of playa lakes; April through June; 9 sheets. COUNTIES: Borden, Dickens, Garza, Hemphill, Lubbock, Randall.

PHRAGMITES

P. COMMUNIS Trin.; Pl, R; moist situations in canyons and adjacent to streams; late June to early September; 5 sheets. COUNTIES: Armstrong, Hemphill, Randall.

POA

P. ARACHNIFERA Torr.; Pl, R, RP; deep sands and sandy loam of sand hills, riparia, and lower canyon breaks; late April through early June; 10 sheets. COUNTIES: Briscoe, Childress, Cottle, Crosby, Hall, Hemphill, Lubbock.

P. ARIDA Vasey; Pl, R, RP; sandy loam of stream riparia and lower canyon breaks; late April through May; 19 sheets. COUNTIES: Briscoe, Garza, Hall, Hutchinson, Lipscomb, Lubbock, Roberts, Wheeler.

P. COMPRESSA L.; Pr; introduced; sandy loam of disturbed prairies sites; May; one sheet. COUNTIES: Lubbock.

P. PRATENSIS L.; Pr; introduced; sandy loam of disturbed prairie sites; late April through mid May; 5 sheets. COUNTIES: Lubbock.

POLYPOGON

P. MONSPELIENSIS (L.) Desf.; Pl, R; moist sites in lower canyon breaks and riparian situations; June through mid August; 18 sheets. COUNTIES: Dallam, Garza, Hartley, Hemphill, Lubbock, Randall, Roberts.

REDFIELDIA

P. FLEXUOSA (Thurb.) Vasey. Reported for Panhandle by Gould (1962). None seen.

SCHEDONNARDUS

S. PANICULATA (Nutt.) Trel.; Pr, CR; sandy and clay loams of prairies and cap rock margins; late April through mid July; 27 sheets. COUNTIES: Briscoe, Dallam, Deaf Smith, Garza, Gray, Lubbock, Lynn, Ochiltree, Roberts, Wheeler.

SCLEROPOGON

S. BREVIFOLIUS Phil. Reported for Panhandle by Gould (1962). None seen.

SECALE

S. CEREALE L.; occasionally escaping to sandy loams of cultivated field margins, pastures and roadsides; May; 2 sheets. COUNTIES: Lubbock.

SETARIA
(Rominger, 1962)

S. GENICULATA (Lam.) Beauv.; Pl, R; sands in stream riparia and lower canyon walls; mid June through July; 8 sheets.

S. LEUCOPILA (Scribn. and Merr.) K. Schum. (incl. S. macrostachya H.B.K. as used in many southwestern floras); Pl, CR, RP; sands and sandy loams of rolling to rough country and sand hills; 34 sheets. COUNTIES: Bailey, Borden, Bristcoe, Cottle, Dickens, Floyd, Garza, Hemphill, Lubbock, Oldham, Randall.

S. LUTESCENS (Weig.) F. T. Hubbard; Pl, Pr, Cr; sands, sandy loams of prairies, cap rock ledges and canyon breaks; late June through August; 7 sheets. COUNTIES: Hemphill, Lipscomb, Lubbock, Roberts.

S. VIRIDIS (L.) Beauv.; Pl, RP; sands and sandy loams of sand hills, canyon breaks and stream margins; late June through September; 13 sheets. COUNTIES: Hemphill, Lubbock, Ochiltree, Roberts.

SITANION

S. HYSTERIX (Nutt.) J. G. Smith; Pl, Pr, RP; sands, sandy loam of roadsides, disturbed prairies, sand hills; mid

April through mid June; 38 sheets. COUNTIES: Armstrong, Bailey, Deaf Smith, Dickens, Garza, Kent, Lipscomb, Lubbock, Lynn.

SORGHASTRUM

S. NUTANS (L.) Nash.; Pl, RP; sands and loose sandy loams of rolling prairies, sand hills and stream margins; August through early October; 14 sheets. COUNTIES: Garza, Hemphill, Hutchinson, Lipscomb, Lubbock, Ochiltree, Parmer, Randall, Roberts.

SORGHUM

S. HALPENSE (L.) Pers.; Pl, Pr, CR, RP; sandy loams, clay loams, disturbed sites; May through mid July; 12 sheets. COUNTIES: Bailey, Dickens, Floyd, Garza, Hutchinson, Lubbock.

SPARTINA (Fernald, 1933)

S. PECTINATA Link; Pl, RP; saline flats; late June through September; 11 sheets. COUNTIES: Hall, Hemphill, Lubbock, Oldham.

SPHENOPHOLIS

S. OBTUSATA (Michx.) Scribn.; Pl, R; moist sands adjacent to streams; June; 2 sheets. COUNTIES: Armstrong, Hemphill.

SPOROBOLUS

S. AIROIDES Torr.; Pl, R, Pr; sands and sandy loams of prairies, river bottoms and lower canyon breaks; mid June

through September; 22 sheets. COUNTIES: Armstrong, Bailey, Dallam, Hall, Hemphill, Lubbock, Roberts.

S. CONTRACTUS Hitchc. Reported by Gould (1962). None seen.

S. CRYPTANDRUS (Torr.) Gray; Pl, RP; sands and sandy loams of prairies, sand hills, stream beds, canyon breaks; late May through September; 31 sheets. COUNTIES: Armstrong, Dallam, Garza, Hemphill, Hockley, Lubbock, Ochiltree, Roberts, Wheeler.

S. FLEXUOSUS (Thurb.) Rydb.; CR; limestone loams, cap rock ledges; July; one sheet. COUNTIES: Roberts.

S. GIGANTEUS Nash. Pl; deep sands of sand hills; July; 2 sheets. COUNTIES: Garza, Hemphill.

S. TEXANUS Vasey; Pl; sands of stream beds; September; one sheet. COUNTIES: Lipscomb.

STENOTAPHRUM

S. SECUNDATUM (Walt.) Kuntze. Reported for all regions of Texas by Gould (1962). None seen.

STIPA

S. COMATA Trin. and Rupr.; Pl, Pr, CR; sands, sandy loams of prairies, cap rock ledges, canyon breaks and stream bottomlands; late April through June; 6 sheets. COUNTIES: Dallam, Garza, Hockley, Lubbock.

S. COLUMBIANA Macoun. Reported from area by Gould (1962). None seen.

S. LEUCOTRICHA Trin. and Rupr. Reported for all regions of Texas by Gould (1962). None seen.

S. NEOMEXICANA (Thurb.) Scribn.; Pl, Pr, CR; sands and sandy loams of prairies, cap rock ledges and canyon breaks; mid May through mid July; 14 sheets. COUNTIES: Armstrong, Bailey, Garza, Lubbock, Roberts.

S. ROBUSTA (Vasey) Scribn. Reported for area by Gould (1962). None seen.

TRICHACHNE

T. CALIFORNICA (Benth.) Chase; RP; red sandy loam and sandstone ledges, grasslands; mid June through July; 9 sheets. COUNTIES: Cottle, Dickens, Motley.

TRIDENS

T. ALBESCENS (Vasey) Woot. and Standl.; Pl, Pr, CR; sandy loam of prairies, canyon breaks; May through August; 19 sheets. COUNTIES: Bailey, Borden, Cottle, Floyd, Garza, Hartley, Kent, Lubbock, Lynn, Parmer.

T. FLAVUS (L.) Hitchc. var. FLAVUS; R; sands adjacent to streams; July; 2 sheets. COUNTIES: Hemphill.

T. MUTICUS (Torr.) Nash, var. MUTICUS; Pl, RP; sands of canyon breaks and stream banks; May through August; 5 sheets. COUNTIES: Garza, Lubbock.

T. MUTICUS (Torr.) Nash, var. ELONGATUS (Buckl.) Shimmers; Pl, RP; sands and gravels of canyon sides and stream banks; late May through August; 10 sheets. COUNTIES: Armstrong, Briscoe, Cottle, Dickens, Gloyd, Garza, Parmer,

Wheeler.

T. PILOSUS (Buckl.) Hitchc.; Pl, CR, RP; sands and sandy loams of cap rock ledges, rolling prairies; early May through July; 31 sheets. COUNTIES: Borden, Briscoe, Cottle, Dallam, Floyd, Garza, Kent, Lipscomb, Lubbock, Lynn, Ochiltree, Potter, Roberts, Sherman.

TRIPLASIS

T. PURPUREA (Walt.) Chapman; Pl; sands, stream bottomlands; September; 2 sheets. COUNTIES: Hemphill.

TRIPSACUM

T. DACTYLOIDES L.; R; sands of meadows adjacent to streams; May through June; 5 sheets. COUNTIES: Crosby, Deaf Smith, Hemphill.

CYPERACEAE (Svenson, 1947)

CAREX (MacKenzie, 1931, 1940)

C. AUREA Nutt. Reported by Johnston (1964) for Randall County, Ceta Canyon, seepage on shaded hillside, 26 June. None seen.

C. AUSTRINA (Small) Mack.; R; moist sand near stream; May; one sheet. COUNTIES: Motley.

C. BREVIOR Mack.; R; margins of springfed lakes, bottomland meadows; June; 4 sheets. COUNTIES: Hemphill.

C. HYSTRICINA Muhl.; R; moist sand of stream margins; June; 8 sheets. COUNTIES: Armstrong, Hartley, Hemphill.

C. LANUGINOSA Michx.; R; moist sand of streams and river meadows; mid May through June; 5 sheets. COUNTIES: Hemphill, Oldham.

C. PLANOSTACHYS Kuntze; Pl; dry sandy loam and limestone gravel in shade of shrubs of upper canyon walls; March; 3 sheets. COUNTIES: Floyd.

C. TRIANGULARIS Boeckl.; R; moist sand of stream margins; late May through June; 4 sheets. COUNTIES: Hemphill, Wheeler.

CYPERUS
(MacKenzie, 1931)

C. ARISTATUS Rottb.; R; moist sands of stream margins; June-July; 2 sheets. COUNTIES: Hemphill.

C. ESCULENTUS L.; Pr; sandy loam, roadsides, September; one sheet. COUNTIES: Parmer.

C. FILICULMIS Vahl.; R, Pr; moist sands of streams and prairie swales; June through September; 2 sheets. COUNTIES: Hemphill, Lipscomb.

C. ODORATUS L.; R; moist sands of streams, spring-fed lakes; August through early October; 13 sheets. COUNTIES: Bailey, Hemphill, Lubbock, Sherman.

C. SCHWEINTZII Torr.; Pl, Pr; sands and sandy loams of sand hills, prairies; mid June through early August; 18 sheets. COUNTIES: Cottle, Dallam, Hemphill, Hockley, Lipscomb.

C. UNIFLORUS Torr. and Hook; Pl, Pr; sands of prairies; June and July; 9 sheets. COUNTIES: Cottle, Gaines, Hockley, Terry.

ELEOCHARIS
(Svenson, 1957)

E. CYLINDRICA Buckl. One sheet without data other than Lubbock, Texas. (E. L. Reed 3132, July, 1930). M. Johnston, in personal communication, indicated that this specimen is the only one from Texas in any Texas herbarium.

E. MACROSTACHYA Britton; R, L; margins of streams and playa lakes throughout area; mid June through mid September; 31 sheets. COUNTIES: Bailey, Castro, Floyd, Garza, Hale, Hemphill, Lipscomb, Lubbock, Ochiltree, Randall, Swisher.

E. MONTEVIDENSIS Kunth; R, L; margins of streams and playa lakes; late April through mid July; 15 sheets. COUNTIES: Armstrong, Collingsworth, Dickens, Floyd, Hemphill, Hutchinson, Lipscomb, Lubbock, Motley.

E. REVENCHONII Svens.; L; margins of playa lakes; June through September; 3 sheets. COUNTIES: Hale, Randall.

E. ROSTELLATA Torr.; R; margins of streams; mid May through early July; 5 sheets. COUNTIES: Briscoe, Hemphill, Lubbock.

FUIRENA

F. SIMPLEX Vahl.; R; stream margins, sub-irrigated riverbottom meadows; July through early September; 11 sheets. COUNTIES: Hemphill, Lubbock, Oldham, Randall.

SCIRPUS
(Svenson, 1947)

S. AMERICANUS Pers., var. POLYPHYLLUS (Boeckl.) Beetle; Pl, R, Pr, RP; moist sites of stream margins and canyon wall

seepage areas; early April through mid July; 40 sheets.

COUNTIES: Armstrong, Briscoe, Collingsworth, Cottle, Garza, Hemphill, Hutchinson, Lipscomb, Lubbock, Motley, Randall, Roberts, Swisher, Wheeler.

S. ACUTUS Muhl.; Pl, L; margins of saline lakes and gypsum saturated stream banks; June; 2 sheets. COUNTIES: Bailey, Briscoe, Lubbock.

S. CHILENSIS Nees (S. olneyi Gray). Gould (1962) lists this species for the Texas Panhandle. None seen.

S. PALUDOSUS A. Nels. (S. maritimus L., var. paludosus (A Nels.) Kukemsh.); Pl, Pr; margin of saline lake (Bailey Co.) and stream banks; late June through July; 6 sheets. COUNTIES: Bailey, Hemphill, Lubbock.

S. LINEATUS Michx.; R; moist meadows and stream banks, bottomlands of Canadian River; late May through June; 12 sheets. COUNTIES: Hemphill.

S. PALLIDUS (Britt.) Fern.; R; moist meadows, bottomlands of the Canadian River; June; 4 sheets. COUNTIES: Hemphill.

S. SUPINUS L., var. HALLII (Gray) Gray; L; playa lake margins; September; 3 sheets. COUNTIES: Garza, Hale.

S. VALIDUS Vahl. (including var. creber Fern.) This species cited for Coyote Lake, Bailey County by Beetle (1941) but the author has seen only one collection of 5 sheets made in July from a playa lake in Lubbock, Lubbock County.

LEMNACEAE
(Daubs, 1965)

LEMNA

L. MINOR L.; R; still ponds of streams and springs; late June through August; 15 sheets. COUNTIES: Hemphill, Oldham.

L. VALDIVIANA Phil.; R; still ponds of streams and springs; May; 3 sheets. COUNTIES: Hemphill.

SPIRODELA

S. POLYRHIZA (L.) Schleid.; R; still ponds of streams and springs; late June through August; 15 sheets. COUNTIES: Hemphill, Oldham.

COMMELINACEAE

COMMELINA

C. ERECTA L., var. ANGUSTIFOLIA (Michx.) Fern., forma ANGUSTIFOLIA; Pr; sands of prairies; mid June through early July; 2 sheets. COUNTIES: Lipscomb, Potter.

C. ERECTA L., var. ANGUSTIFOLIA (Michx.) Fern., forma CRISPA (Woot.) Fern.; Pl, R, Pr, RP; sands in grasslands, canyon breaks, stream borders, sand hills; late May through October; 35 sheets. COUNTIES: Armstrong, Bailey, Cottle, Crosby, Dallam, Dickens, Gaines, Hartley, Hemphill, Hockley, Hutchinson, Lipscomb, Lubbock, Motley, Wheeler.

TRADESCANTIA

T. OCCIDENTALIS (Britt.) Smyth; Pl, R; sands and sandy loams of sand hills, grasslands, canyon breaks and stream

margins; mid April through early July; 40 sheets. COUNTIES: Armstrong, Briscoe, Childress, Cottle, Crosby, Dallam, Dickens, Garza, Hartley, Hemphill, Hutchinson, Lubbock, Motley, Oldham, Roberts, Terry, Wheeler.

PONTEDERIACEAE
(Alexander, 1937)

HETERANTHERA

H. LIMOSA (Sw.) Willd.; L; margins of playa lakes; July; 3 sheets. COUNTIES: Bailey, Lubbock.

H. MEXICANA Wats. (Eurystemon mexicanum (Wats.) Alex.); L; margin of playa lake; July; 7 sheets. COUNTIES: Carson.

JUNCACEAE

JUNCUS

J. BALTICUS Willd.; R; moist river bottomlands and sub-irrigated meadows; June; 2 sheets. COUNTIES: Dallam, Hemphill.

J. TENUIS Willd., var. DUDLEYI (Wieg.) Hern. (J. dudleyi Wieg.); R; moist river bottomlands; spring-fed lake margins; June; 14 sheets. COUNTIES: Hemphill.

J. INTERIOR Wieg. (incl. J. brachyphyllus Wieg.); R; stream margins and moist river bottomlands; late May through early July; 7 sheets. COUNTIES: Armstrong, Hemphill.

J. TORREYI Cov.; R; stream margins and moist river bottomlands; mid June through August; 12 sheets. COUNTIES: Armstrong, Garza, Hartley, Hemphill, Hutchinson.

J. VALIDUS Cov. Reported for Panhandle by Gould (1962).
None seen.

LILLIACEAE

ALLIUM (Ownby, 1950)

A. DRUMMONDI Reg.; Pl, Pr, RP; sands, sandy loams of grasslands, canyon breaks; mid March through early June; 51 sheets. COUNTIES: Armstrong, Briscoe, Cottle, Crosby, Garza, Hemphill, Hutchinson, Lipscomb, Lubbock, Lynn, Motley, Randall.

A. PERDULCE S. V. Fras., var. PERDULCE; Pl, Pr, CR, RP; sandy and rocky loam of grasslands, canyon breaks; late March through mid May; 31 sheets. COUNTIES: Bailey, Crosby, Dickens, Garza, Hemphill, Hockley, Hutchinson, Lubbock, Lynn, Ochiltree, Randall, Terry, Wheeler.

ANDROSTEPHIUM

A. CORERULEUM (Scheele) Greene, forma COERULEUM; RP; red sands at bases of canyons and dry stream beds; April; 4 sheets. COUNTIES: Armstrong, Bailey, Hardeman.

NOLINA

N. TEXANA S. Wats.; RP; tops of buttes in sandy limestone loam; April; 11 sheets. COUNTIES: Garza.

NOTHOSCORDUM

N. BIVALVE (L.) Britton; Pl, Pr, RP, L; sands and sandy loams of grasslands, waste places, playa lake margins;

mid April through June; 21 sheets. COUNTIES: Bailey, Childress, Crosby, Floyd, Garza, Hale, Hartley, Lubbock, Wheeler.

YUCCA

Y. CAMPESTRIS McKelv.; Pl, Pr, CR, RP; sands, sandy and limestone loams of prairies and upper canyon breaks throughout the area; late May through late June; 67 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Castro, Childress, Crosby, Dawson, Floyd, Hall, Hemphill, Lamb, Lubbock, Swisher. The plants that are represented in collections from the Texas Panhandle and South Plains exhibit a marked amount of variation in the characteristics normally used in classification. The author as well as several others has found it difficult to determine a satisfactory treatment for them. Webber (1953) suggested that they were hybrids between Y. elata and Y. constricta. Gould (1962) included them under Y. angustifolia. The present author has chosen Y. campestris as most nearly representing the material examined.

AMARYLLIDACEAE

ZEPHYRANTHES

Z. BRAZOSSENSIS Traub. (Cooperia drummondii Herb.); Pr; sandy loam of prairie; May; one sheet. COUNTIES: Borden.

Z. LONGIFOLIA Hemsl.; Pr; sandy loam of prairies; June and July; 4 sheets. COUNTIES: Bailey, Garza, Lynn.

IRIDACEAE

SISYRINCHIUM

(Fernald, 1946, Gould, 1962)

S. ANGUSTIFOLIUM Mill. (sensu Fernald, 1946); Pl, Pr, RP; sands and sandy loams of grasslands, canyon breaks and stream banks; late April through early July; 62 sheets.
 COUNTIES: Briscoe, Crosby, Dickens, Garza, Hemphill, Lipscomb, Lubbock, Lynn, Randall, Wheeler.

Gould (1962) cites *S. demissum* Greene and *S. ensigerum* Bicknell from the Texas Panhandle. The author has not been able to assign any of the specimens examined to those taxa.

ORCHIDACEAE

CYPRIPEDIUM

C. CALCEOLUS L., var. *PUBESCENS* (Willd.) Corr. This species was reported by Correll (1947) based on a collection by B. C. Tharp in Bailey County in 1929. The author has repeatedly searched the general area and probably the same playa lake (directions given orally by Dr. Tharp in 1957) and found no evidence of the species.

EPIPACTIS

E. GIGANTEA Dougl. ex Hook.; RP; one location, Cooper's Canyon, Garza County. This one area, a mesic (seepage moist) cliffside in a narrow canyon, is the only known location of this species in the Texas Panhandle and South Plains.

SPIRANTHES

S. VERNALIS Engelm. and Gray; R; moist meadows of

Canadian River; late July; 2 sheets. COUNTIES: Hemphill.

SAURURACEAE

ANEMOPSIS

A. CALIFORNICA (Nutt.) H. and A.; R; moist meadow near spring-fed stream in bottomlands; June; 19 collections.

COUNTIES: Hemphill, Lubbock.

SALICACEAE

POPULUS

P. DELTOIDES Marsh. (including P. sargentii Dode); Pl, R, Pr, RP; banks of streams throughout area; flowering in early April through May, fruit maturing in June, July; 12 sheets. COUNTIES: Armstrong, Borden, Briscoe, Childress, Dallam, Hartley, Hemphill, Hutchinson, Lubbock.

SALIX
(Ball, 1949)

S. AMYGDALOIDES Anderss. The typical variety and var. wrightii (Anderss.) Schneider are listed for the Texas Panhandle by Correll in Gould (1962) but the author was unable to discern any constancy in separation of these taxa. Pl, R, Pr; sandy loam of canyon wall seepages, small streams and permanent earthen stock-watering tanks in prairies; fruiting late May through late July; 5 sheets. COUNTIES: Armstrong, Hemphill, Hutchinson, Randall.

S. EXIGUA Nutt. (including S. stenophylla Rydb. and S. nevadensis Wats.). Cited in Gould (1962) for Texas Panhandle. None seen.

S. GODDINGII Ball, var. VARIABILIS Ball. Cited for Texas Panhandle by Gould (1962). None seen.

S. INTERIOR Rowlee (including forma interior and forma wheeleri (Rowlee) Rouleau that were not separable in specimens examined); Pl, R; sands adjacent to streams; May and June; 9 sheets. COUNTIES: Hartley, Hemphill, Hutchinson, Randall, Roberts.

S. NIGRA Marsh; Pl, R, Pr, L; sands and sandy loams of moist margins of streams, stock tanks and playa lakes; April and May; 24 sheets. COUNTIES: Armstrong, Briscoe, Childress, Cottle, Crosby, Garza, Hartley, Hemphill, Lipscomb, Lubbock, Oldham, Randall, Roberts.

JUGLANDACEAE

Juglans major (Torr.) Heller and J. microcarpa Berland. (J. rupestris Engelm.) are listed for the Texas Panhandle by Gould (1962). The author has seen no specimens that were not obviously cultivars nor has he seen any evidence of establishment and spreading from any of the cultivars.

FAGACEAE

QUERCUS

Q. HAVARDII Rydb.; Pl, Cr, RP; sands and sandy loams of canyon sides and upper breaks and sand hills. This species forms dense "shinnery" growth in sand hills in the eastern Panhandle. Flowering occurs in April and May and mature acorns are found in late July through early September; 33 sheets. COUNTIES: Dickens, Gaines, Hemphill,

Lubbock, Motley, Terry, Wheeler.

Q. HAVARDII Rydb. X Q. STELLATA Wang. The author has seen three specimens annotated by J. M. Tucker in 1964 bearing this designation. They were collected in Hemphill, Terry, and Wheeler Counties.

Q. MOHRIANA Buckle. ex Rydb. Pl, CR, RP; limestone loams and sands of cap rock ledges and canyon walls; flowering in May and mature fruit present in late August and September; 20 sheets. COUNTIES: Armstrong, Briscoe, Randall.

Q. STELLATA Wang. The specimens included here have morphological indications of introgression with Q. havardii. Pl; deep sands of sand hills; fruits present in August and September; 3 sheets. COUNTIES: Hemphill, Wheeler.

URTICACEAE

BOEHMERIA

B. CYLINDRICA (L.) Willd., var. DRUMMONDIANA Wedd.; R; moist situations along streams and canyon-side springs; July through October; 8 sheets. COUNTIES: Hemphill, Hutchinson.

PARIETARIA

P. PENNSYLVANICA Muhl., var. PENNSYLVANICA; R; moist meadows of streams; June through July; 4 sheets. COUNTIES: Hemphill.

ULMACEAE

ULMUS

U. AMERICANA L., var. AMERICANA; R; one specimen by V. E. Wiedeman 132, 9 April 1959 with the following information: "Tree about 5 m. tall. Bank of Washita River 1/2 mi. w. of Oklahoma-Texas border [Hemphill Co.]. Believed to be a western record.", three specimens of E. L. Reed 4069, 7 September, 1934 labelled "Canadian Valley," Canadian [Hemphill Co.], Texas. The above represent all the material seen by the author. These plants probably represent introductions but are established in the areas indicated.

CELTIS

C. LAEVIGATA Willd. (including var. Smallii (Beadle) Sarg. and var. brachyphylla Sarg., C. texana Scheel). The following probably represent introductions, having been found near the sites of present or past homes, but they are established and young plants are present in the immediate areas. Pl, RP; sandy loam of stream banks; flowering in May, mature fruits in July and August; 4 sheets. COUNTIES: Crosby, Ochiltree.

C. RETICULATA Torr.; Pl, RP; sands and sandy loams of canyon walls and sandhills; flowering in April, fruiting in July and August; 9 sheets. COUNTIES: Bailey, Borden, Hemphill, Hutchinson, Lubbock, Ochiltree, Roberts.

MORACEAE

MACLURA

M. POMIFERA (Raf.) Schneider (Toxylon pomiferum Raf.); Pl, Pr. This species has been widely planted along fence rows and in wind breaks. The author has seen none of these plantings naturally reproducing themselves.

MORUS

M. ALBA L. Cultivated specimens in sandy soils near homesites throughout the area. No natural reproduction observed.

M. MICROPHYLLA Buckl.; Pl, RP; sandy loams of canyon sides and stream margins; April; 6 sheets. COUNTIES: Childress, Crosby, Hemphill, Lubbock.

LORANTHACEAE

PHODADENDRON

P. SEROTINUM (Raf.) M. C. Johnst., var. PUBESCENS (Engelm. ex Gray) M. C. Johnston (P. flavescens (Pursh) Nutt., var. pubescens Engelm. ex Gray); RP; parasitic on Prosopis glandulosa Torr.; fruiting in winter; 4 sheets. COUNTIES: Garza, Lubbock.

SANTALACEAE

COMMANDRA
(Piehl, 1965)

C. PALLIDA DC.; Pl, CR, RP; parasitic on shrubs on sands and limestone loams of cap rock ledges and canyon walls; late April through June; 21 sheets. COUNTIES:

Briscoe, Crosby, Dallam, Dawson, Floyd, Gaines, Garza, Hemphill, Lubbock, Ochiltree, Randall.

RAFFLESIACEAE

PILOSTYLES

P. THURBERI Gray (incl. *P. covillei* Rose); CR, RP; parasitic on *Dalea formosa* Torr. and *D. frutescens* Gray. The host shrubs most frequently occur in limestone loam or gravel or sandy loam on cap rock ledges and canyon walls; May through July; 80 sheets. COUNTIES: Armstrong, Borden, Cottle, Crosby, Dawson, Deaf Smith, Dickens, Foard, Floyd, Garza, Gray, Hartley, Kent, King, Lubbock, Lynn, Motley, Ochiltree.

POLYGONACEAE

ERIOGONUM

E. ALATUM Torr., var. *GLABRIUSCULUM* Torr.; Pl, Pr, CR, RP; sandy loam of grasslands and canyon walls; mid July through early September; 7 sheets. COUNTIES: Armstrong, Hall, Lipscomb, Roberts.

E. ANNUUM Nutt.; Pl, Pr, CR, RP; deep sands and sandy loams, most abundant on overgrazed sandy pastures and abandoned fields; July through early October; 30 sheets. COUNTIES: Crosby, Dallam, Dickens, Garza, Hartley, Hemphill, Hutchinson, Lipscomb, Lubbock, Potter, Randall, Roberts.

E. JAMESII Benth.; CR; cap rock ledges and upper canyon breaks, limestone rocks and loam; July and September; 16 sheets. COUNTIES: Armstrong, Floyd, Oldham, Randall.

E. LACHNOGYNUM Torr.; Pr, CR; cap rock ledges and upper canyon breaks, limestone rocks and loam; early June through August; 18 sheets. COUNTIES: Hansford, Hartley, Hemphill, Moore, Ochiltree.

E. LONGIFOLIUM Nutt.; Pl, Pr, CR; limestone and sandy loams, upper breaks of canyons and cap rock ledges; June through early September; 39 sheets. COUNTIES: Armstrong, Bailey, Crosby, Dallam, Floyd, Garza, Hartley, Hemphill, Hockley, Hutchinson, Lamb, Lipscomb, Lubbock, Ochiltree, Roberts, Sherman, Terry.

E. TENELLUM TORR.; CR; cap rock ledges, rocky limestone loam; July; 1 sheet. COUNTIES: Bailey.

E. TRISTE Wats. Gould (1962) listed this species for the Texas Panhandle, probably referable to E. alatum var. glabriuscum. None seen.

E. WRIGHTII Torr. Gould (1962) listed this species for the Texas Panhandle. None seen.

POLYGONELLA
(Horton, 1963)

P. AMERICANA (Fisch. and Mey.) Small; Pl; deep sands of sand hills; September; 3 sheets. COUNTIES: Lamb, Parmer.

POLYGONUM

P. AVICULARE L. (P. buxiforme Sm., P. neglectum Besser); Pl, R, Pr, L; moist soil adjacent to streams, roadside ditches, stock tanks and playa lakes; June through September; 5 sheets. COUNTIES: Dallam, Hemphill, Lubbock, Roberts.

P. BICORNE Raf. (P. longistylum Sm.); Pl, R, Pr, RP, L; moist sands and sandy loams of stream banks, and playa lakes; mid June through early October; 20 sheets. COUNTIES: Bailey, Castro, Crosby, Floyd, Lipscomb, Lubbock, Lynn, Randall, Roberts, Sherman, Swisher.

P. COCCINEUM Muhl.; Pl, R, L; moist soils along margins of streams and playa lakes; late July through August; 5 sheets. COUNTIES: Castro, Hemphill, Randall.

P. HYDROPIPEROIDES Michx., var. HYDROPIPEROIDES; R, L; margins of spring-fed lakes, playa lakes; September through October; 5 sheets. COUNTIES: Hemphill, Lubbock.

P. LAPATHIFOLIUM L. (P. incarnatum Ell.); Pl, R, Pr, RP, L; moist soils of streams, spring-fed lakes, playa lakes; August through early October; 20 sheets. COUNTIES: Castro, Hemphill, Hutchinson, Lubbock, Sherman.

P. PENNSYLVANICUM L.; L; margins of playa lakes; August; 2 sheets. COUNTIES: Lubbock.

P. PUNCTATUM Ell. (varietal separation unsatisfactory with materials examined by the author); R; margin of spring-fed lakes; late June through September; 4 sheets. COUNTIES: Hemphill.

P. RAMOSISSIMUM Michx. (P. prolificum (Sm.) Robins.); Pl, L; playa lakes and moist swales in sand hills; late August through early October; 13 sheets. COUNTIES: Dallam, Lipscomb, Ochiltree, Randall.

P. SCANDENS L.; R; scandant on understory brush along streams; August; 3 sheets. COUNTIES: Wheeler.

RUMEX

R. ALTISSIMUS Wood; Pl, R, RP, L; moist soils of streams, playa lakes, barditches; late April through mid June; 16 sheets. COUNTIES: Briscoe, Collingsworth, Cottle, Garza, Hall, Lubbock, Oldham, Yoakum.

R. CRISPUS L.; R, L; moist soils along streams and playa lakes; mid June through mid July; 7 sheets. COUNTIES: Armstrong, Floyd, Hemphill, Hutchinson, Lubbock.

R. HYMENOSEPALUS Torr.; Pr, RP; sands and sandy loams of disturbed grasslands and roadsides; late March through early May; 17 sheets. COUNTIES: Bailey, Childress, Crosby, Foard, Garza, Lynn, Lubbock, Motley, Oldham, Terry.

CHENOPODIACEAE
(Standley, 1916)

ATRIPLEX
(Brown, 1956)

A. ARGENTEA Nutt.; Pl, Pr, RP; saline sites of streambeds; July through September; 7 sheets. COUNTIES: Bailey, Cottle, Garza, Hall, Randall.

A. CANESCENS (Pursh) Nutt.; Pl, Pr, RP; saline sandy and limestone loams; May, June; 13 sheets. COUNTIES: Armstrong, Bailey, Gaines, Garza, Motley.

A. CONFERTIFOLIA (Torr.) S. Wats.; RP; saline flats along canyon bases; flowering in late April through May, fruiting in July and August; 3 sheets. COUNTIES: Garza.

CHENOPODIUM

C. ALBUM L. (C. viride L., C. berlandieri Moq.); R, RP, L; sandy loam of streambottoms, playa and artificial lake margins; mid June through September; 6 sheets. COUNTIES: Garza, Hemphill, Lubbock, Randall, Swisher.

C. HYBRIDUM L., var. GIGANTOSPERMUM (Aellen) Rouleau (C. gigantospermum Aellen); R; sands of moist meadows of streambottoms; mid August through September; 5 sheets. COUNTIES: Hemphill.

C. INCANUM (Wats.) Heller; Pl, Pr, CR, RP; deep sands and sandy loams of grasslands and disturbed sites; 19 sheets. COUNTIES: Armstrong, Bailey, Hemphill, Hutchinson, Lamb, Lubbock, Lynn, Parmer.

C. LEPTOPHYLLUM Nutt.; Pl, Pr, RP, L; sands and sandy loams of grasslands, playa lake margins and disturbed sites; mid June through August; 23 sheets. COUNTIES: Armstrong, Bailey, Cottle, Dallam, Dickens, Floyd, Garza, Hemphill, Lubbock, Ochiltree, Potter, Randall.

CORISPERMUM

C. NITIDUM Kit.; Pl; deep sands of sand hills; October; 7 sheets. COUNTIES: Hemphill, Lipscomb.

CYCLOLOMA

C. ATRIPLICIFOLIUM (Spreng.) Coult.; Pl; deep sands and sandy loams of sand hills and prairies; mid June through September; 19 sheets. COUNTIES: Bailey, Dickens, Hemphill, Lipscomb, Ochiltree.

EUROTIA

E. LANATA (Pursh) Moq., var. *SUBSPINOSA* (Rydb.) Kearney and Peebles; CR; cap rock ledges in limestone loam; September; 3 sheets. COUNTIES: Hemphill.

KOCHIA

K. SCOPARIA (L.) Schrader (including *K. alata* Bates); Pl, Pr; sands of grasslands and disturbed prairie sites; mid June through September; 7 sheets. COUNTIES: Bailey, Hemphill, Potter, Wheeler.

MONOLEPIS

M. NUTTALLIANA (Schult.) Greene. Two collections seen weed in waste places, Lubbock, Lubbock County, April and margin of alkaline lake, Bailey County, February.

SALSOLA

S. KALI L., var. *TENUIFOLIA* Tausch.; Pl, R, Pr, CR, RP, L; sands and sandy loam of disturbed areas; 10 sheets. COUNTIES: Armstrong, Bailey, Borden, Garza, Hemphill, Hutchinson, Lipscomb, Lubbock.

SUAEDA

S. SUFFRUTESCENS Wats.; Pl, RP; highly saline flats; June, July; 2 sheets. COUNTIES: Bailey, Hall.

S. DEPRESSA (Pursh) Wats. (including *S. linearis* (Ell.) Moq. of north Texas reports); saline flats; September; 2 sheets. COUNTIES: Hall.

AMARANTHACEAE
(Standley, 1917)

AMARANTHUS
(Saur, 1955)

A. ARENICOLA I. M. Johnst. (A. Torreyi (Gray) Benth. p.p.); Pl, Pr, CR, RP; sands and sandy loam of sand hills, stream banks and canyon breaks; late June through September; 3 sheets. COUNTIES: Floyd, Hemphill.

A. GRAECIZANS L. (A. blitoides Wats.); Pr, CR; sand and limestone loams of disturbed areas; 6 sheets. COUNTIES: Lubbock, Ochiltree.

A. PALMERI Wats. Saur (1955) lists Lubbock County for this species. None seen.

A. PRINGLEI Wats. (A. torreyi (Gray) Benth. p.p.); Pl; deep sands of sand hills; October; 1 sheet. COUNTIES: Lipscomb.

A. RETROFLEXUS L.; Pl, Pr; sandy loam of disturbed prairies, abandoned fields and roadsides; August through September; 13 sheets. COUNTIES: Bailey, Dallam, Lubbock, Ochiltree.

A. TAMARISCINUS Nutt.; Pl; deep sands of sand hills and stream banks; June through July; 4 sheets. COUNTIES: Garza, Hemphill, Lipscomb.

BRAYULINEA

B. DENSA (Humb. and Bonpl.) Small. (Guillemia densa (Willd.) Moq.); RP; sandstone outcrops at base of canyons; June; 3 sheets. COUNTIES: Garza, Lubbock.

FROELICHIA

F. ARIZONICA Thornber. Gould (1962) lists this species for the Texas Panhandle. None seen.

F. FLORIDANA (Nutt.) Moq. (F. campestris Small, F. drummondii Moq.); Pl; deep sands of sand hills and grasslands; July through early October; 7 sheets. COUNTIES: Hartley, Hemphill, Hockley, Lipscomb, Terry.

F. GRACILIS (Hook.) Moq.; Pl, Pr; dry sandy loams of prairies and grasslands; June; 10 sheets. COUNTIES: Hemphill, Motley.

GOSSYPIANTHUS

G. LANUGINOSUS (Poir.) Moq. (including G. sheldoni Uline and Bray, G. rigidiflorus Hook.); Pl; sands and sandy loams of grasslands; July; 2 sheets. COUNTIES: Bailey, Cottle.

TIDESTROMIA

T. LANUGINOSA (Nutt.) Standl., var. LANUGINOSA; Pl, Pr, RP; sands, tight sandy loams, limestone loams of prairies, creek banks; late June through early October; 13 sheets. COUNTIES: Bailey, Dickens, Hansford, Kent, Lynn, Oldham, Roberts, Wheeler.

NYCTAGINACEAE

ABRONIA

A FRAGRANS Nutt.; Pl, Pr, RP; deep loose sands throughout the area; mid March through mid July; 34 sheets.

COUNTIES: Childress, Cottle, Crosby, Garza, Hemphill, Hockley, Lubbock, Oldham, Roberts.

ACLEISANTHES

A. LONGIFLORA Gray; RP; deep sandy loam of river beds; August; 2 sheets. COUNTIES: Garza.

ALLIONIA

A. INCARNATA L.; Pl; sands adjacent to streams; July through early September; 4 sheets. COUNTIES: Garza, Randall.

MIRABILIS (Shinners, 1951)

The plants in this genus exhibit polymorphism under the influence of seasonal and edaphic variations. The author has chosen to follow the treatment used by Waterfall (1966). The treatment presented by Shinners (1951) in which several new species were described, has not been found adequate for the materials examined by the author.

M. ALBIDUS (Walt.) Heimerl.; Pl; sand and sandy loams of canyon sides and stream margins; June through late September; 6 sheets. COUNTIES: Briscoe, Dallam, Lubbock, Ochiltree, Swisher.

M. CARLTONI (Standl.) Standl. Shinners (1951) cites this species as a restricted endemic of the Rolling Red Plains in Cottle, Wheeler, and Wilbarger counties. The only specimens seen by the author that could be attributed to this species came from cap rock ledges in Hartley County.

M. EXALATA Small.; Pl; deep loose sands of sand hills and stream banks; late May through early October; 9 sheets. COUNTIES: Hemphill, Lipscomb, Wheeler.

M. LINEARIS (Pursh) Heimerl., var. LINEARIS; Pl, Pr, RP; sands and sandy loams of grasslands; May through September; 31 sheets. COUNTIES: Bailey, Briscoe, Cottle, Dallam, Garza, Hartley, Hemphill, Lamb, Lubbock, Ochiltree, Oldham, Parmer, Yoakum.

M. LINEARIS (Pursh) Heimerl., var. SUBHISPIDA Heimerl.; Pl, Pr, CR, RP; sandy loams, limestone loams of grasslands, cap rock ledges and canyon sides; June through early October; 12 sheets. COUNTIES: Garza, Hansford, Lubbock, Ochiltree.

M. NYCTAGINEA (Michx.) MacM.; R; moist sand of creek banks; late May through mid September; 6 sheets. COUNTIES: Wheeler.

SELINOCARPUS

S. DIFFUSA Gray; Pr, CR; tight sandy loams or limestone loams, cap rock ledges and upper canyon walls; May and June; 3 sheets. COUNTIES: Lubbock, Oldham.

PHYTOLACCACEAE

PHYTOLACCA

P. AMERICANA L.; R; moist sands of river bottomlands; late May through early October; 10 sheets. COUNTIES: Hemphill, Wheeler.

AIZOACEAE

MOLLUGO

M. VERTICILLATA L.; Pl, Pr; deep sands of sand hills and sandy loams of grasslands and prairies; late May through early October; 7 sheets. COUNTIES: Hartley, Hemphill, Lubbock.

SESUVIUM

S. VERRUCOSUM Raf. (S. sessile Pers. of authors.); Pl, Pr; saline sites; 3 sheets. COUNTIES: Bailey, Hall, Lynn.

PORTULACACEAE

PORTULACA

P. MUNDULA I. M. Johnst.; Pl, Pr, RP; sands of sand hills and grasslands; mid June through early September; 10 sheets. COUNTIES: Hartley, Hemphill, Lubbock, Motley.

TALINUM

T. AURANTIACUM Engelm.; CR; sands and sandy loam of cap rock ledges and upper canyon breaks; July and August; 2 sheets. COUNTIES: Garza, Lubbock.

T. CALYGINUM Engelm.; CR; sandy loam of cap rock ledges and upper canyon breaks; June; 2 sheets. COUNTIES: Armstrong.

T. PARVIFLORUM Nutt.; Pl, Pr, CR; sands and sandy loam of sand hills, grasslands and upper canyon breaks; mid June through mid August; 3 sheets. COUNTIES: Armstrong, Hockley, Terry.

CARYOPHYLLACEAE

ARENARIA
(Maquire, 1951)

A. STRICTA Michx., var. TEXANA Robinson; CR; sand and limestone loam, cap rock ledges and upper canyon breaks; June through early October; 8 sheets. COUNTIES: Lubbock, Ochiltree.

LOEFLINGIA

L. TEXANA Hook.; Pl; deep loose sand of sand hills; June; 2 sheets. COUNTIES: Hemphill, Hockley.

SILENE

S. ANTIRRHINA L., forma ANTIRRHINA; Pl; sandy loam of canyon walls; late May through June; 2 sheets. COUNTIES: Lubbock.

S. ANTIRRHINA L., forma DEANEANA Fern.; Pl; deep loose sands of sand hills; May; 1 sheet. COUNTIES: Hemphill.

STELLARIA

S. MEDIA (L.) Cyrill; sandy loams of lawns; May; one sheet. COUNTIES: Lubbock.

ILLECEBRACEAE

PARONYCHIA
(Correll, 1966)

P. JAMESII Torr. and Gray, var. JAMESII; Pl, CR, RP; dry sandy loams and sands of cap rock ledges, canyon walls and grasslands; June through September; 10 sheets. COUNTIES: Bailey, Dickens, Hansford, Hemphill, Lubbock, Parmer, Terry,

Wheeler.

P. JAMESII Torr. and Gray, var. *PRAELONGIFOLIA* Correll;
Pl, CR, RP; dry sandy loams and sands of cap rock ledges,
canyon walls and grasslands; June through July; 11 sheets.
COUNTIES: Armstrong, Bailey, Dallam, Hemphill, Hutchinson,
Lamb, Lubbock, Motley, Potter, Terry.

P. SESSILIFLORA Nutt.; CR; sandy limestone loams of
cap rock ledges; late June through September; 10 sheets.
COUNTIES: Hartley, Hansford, Hemphill, Moore, Ochiltree,
Oldham.

CERATOPHYLLACEAE

CERATOPHYLLUM

C. DEMERSUM L., var. *DEMERSUM*; R; waters of spring-fed
streams and lakes; late June through August; 10 sheets.
COUNTIES: Hemphill.

RANUNCULACEAE

ANEMONE

A. DECAPETALA Ard., var. *HETEROPHYLLA* (Nutt.) Britt.;
Pl, RP; sand and limestone loams of lower canyon breaks;
late March through May; 22 sheets. COUNTIES: Briscoe,
Crosby, Floyd, Garza, Hemphill, Lubbock, Ochiltree, Wheeler.

CLEMATIS

C. DRUMMONDII Torr. and Gray; Pl; sandy loams of grass-
lands; June and July; 2 sheets. COUNTIES: Lubbock.

C. PITCHERI Torr. and Gray; Pl, RP; sandy limestone loams of canyon breaks; June and July; 7 sheets. COUNTIES: Armstrong, Briscoe.

DELPHINUM

D. VIRESCENS Nutt. (including var. macroceratalis (Rydb.) Cory and var. wooteni (Rydb.) Evans, which did not separate satisfactorily with the material studied.); Pl, Pr, RP; sands and sandy loams of grasslands and prairies; May and June; 18 sheets. COUNTIES: Armstrong, Cottle, Dallam, Garza, Hartley, Hemphill, Hockley, Lubbock, Oldham, Roberts.

MYOSURUS

M. MINIMUS L.; L; tight clay loams of playa lake margins; late April through mid May; 3 sheets. COUNTIES: Armstrong, Garza, Lynn.

RANUNCULUS (Benson, 1951)

R. CYMBALARIA Pursh, var. SAXIMONTANUS Fern.; R; moist sands of stream margins; late April through early September; 9 sheets. COUNTIES: Briscoe, Hartley, Hemphill, Swisher.

R. LONGIROSTRIS Godr.; R; floating in still waters of streams and spring-fed lakes; 18 sheets. COUNTIES: Deaf Smith, Hemphill, Wheeler.

R. SCELERATUS L.; R; moist sand and shallow water of stream banks; mid April through May; 14 sheets. COUNTIES: Wheeler.

BERBERIDACEAE

B. SWAZEYI Buckl.; CR; cap rock ledges; May; 2 sheets.

COUNTIES: Bailey.

B. TRIFOLIOLATA Moric.; Pl, CR, RP; sand and limestone loams of cap rock ledges and canyon breaks; late March through early May; 13 sheets. COUNTIES: Armstrong, Borden, Crosby, Garza, Lubbock.

PAPAVERACEAE

ARGEMONE

(Ownbey, 1958)

A. POLYANTHEMOS (Fedde) G. B. Ownb. (A. intermedia of authors not Sweet); Pl, Pr, RP; sandy loam of canyon breaks, prairies, and grasslands; mid April through June; 21 sheets. COUNTIES: Briscoe, Cottle, Garza, Hardeman, Hemphill, Hutchinson, Lubbock, Motley.

A. SQUARROSA Greene, ssp. GLABRATA Ownb.; Pr; sandy loams and clay loams of prairies; mid June through July; 6 sheets. COUNTIES: Bailey, Hartley, Lamb, Ochiltree.

FUMARIACEAE

CORYDALIS

(Ownbey, 1947)

C. AUREA Willd., var. OCCIDENTALIS Engelm. Ownbey (1947) does not indicate any other species than this for the Texas Panhandle and South Plains. In the specimens examined by the author there was a great deal of variation especially in floral bracts and seed sculpturing. Pl, Pr, RP; sands and sandy loams particularly in areas of disturbance;

late March through early May; 37 sheets. COUNTIES: Armstrong, Cochran, Cottle, Crosby, Dickens, Garza, Hockley, Lipscomb, Lubbock, Lynn, Motley, Randall, Terry, Yoakum.

CRUCIFERAE

CAMELINA

C. MICROCARPA Andrz.; weed of sandy disturbed sites; early May; 3 sheets. COUNTIES: Lipscomb, Lubbock, Wheeler.

CAPSELLA

C. BURSA-PASTORIS (L.) Medic.; weed of sandy disturbed areas; late March through early May; 9 sheets. COUNTIES: Borden, Hale, Lubbock, Wheeler.

DESCURAINIA (Seling, 1939)

D. PINNATA (Walt.) Britt. (including several varieties that are not clearly distinct in material examined); weed of sandy soils in disturbed areas; late March through early May; 25 sheets. COUNTIES: Bailey, Cottle, Crosby, Garza, Hemphill, Hutchinson, Lamb, Lipscomb, Lubbock, Lynn, Motley.

D. SOPHIA (L.) Webb; weed of sandy disturbed sites; early March through early May; 33 sheets. COUNTIES: Cottle, Crosby, Garza, Hale, Lipscomb, Lubbock, Lynn, Potter.

DITHYRAEA (Payson, 1918)

D. WISLIZENI Engelm., var. PALMERI Pays.; Pl, RP; deep sands of sand hills and grasslands; mid April through early October; 58 sheets. COUNTIES: Bailey, Briscoe, Childress,

Cottle, Crosby, Dickens, Gaines, Garza, Gray, Hale, Harde-
man, Hartley, Hemphill, Hockley, Kent, Lubbock, Lynn, Motley,
Randall, Roberts, Wheeler.

DRABA
(Fernald, 1934)

D. CUNEIFOLIA Nutt., var. CUNEIFOLIA; Pl, Pr, RP; sands
and sandy loams of canyon walls and disturbed prairie sites;
mid March through early May; 11 sheets. COUNTIES: Briscoe,
Dawson, Floyd, Hemphill, Lubbock, Motley.

ERYSIMUM
(Rossbach, 1958)

E. CAPITATUM (Dougl.) Greene (E. asperum (Nutt.) DC.);
Pr, RP; deep sands and sandy loams of sand hills and prairies;
April through May; 15 sheets. COUNTIES: Bailey, Gray, Hart-
ley, Hutchinson, Lamb, Lipscomb, Lynn, Ochiltree.

E. REPANDUM L.,; Pr; sandy loams of prairies; late
March through early May; 8 sheets. COUNTIES: Gray, Lip-
scomb, Lubbock, Ochiltree.

LEPIDIDIUM

L. AUSTRINUM Small; Pl, RP; sands and sandy loam of
grasslands and disturbed sites; mid April through early May;
11 sheets. COUNTIES: Garza, Lubbock.

L. DENSIFLORUM Schrad.; Pl, RP; sands and sandy loams
of grasslands, canyon breaks and disturbed sites; 8 sheets.
COUNTIES: Armstrong, Hall, Hemphill, Lipscomb, Lubbock,
Ochiltree.

L. OBLONGUM Small; Pl, CR, RP; sands and sandy loams of cap rock ledges, canyon breaks, grasslands; late March through early May; 22 sheets. COUNTIES: Armstrong, Bailey, Garza, Hale, Hockley, Lamb, Lipscomb, Lubbock, Motley.

LESQUERELLA

L. FENDLERI (Gray) Wats.; Pr; tight limestone loams of prairies; late March through early May; 3 sheets. COUNTIES: Gaines, Bailey.

L. GORDONI (Gray) Wats.; Pl, Pr, CR, RP; sandy loams of canyon walls, streambeds and grasslands; 63 sheets. COUNTIES: Armstrong, Bailey, Borden, Briscoe, Childress, Crosby, Cottle, Floyd, Garza, Hardeman, Hemphill, King, Lamb, Lipscomb, Lubbock, Lynn, Motley, Randall.

L. OVALIFOLIA Rydb., var. OVALIFOLIA; Pr, CR, RP; tight limestone and sandy loams of cap rock ledges and prairie borders; 57 sheets. COUNTIES: Briscoe, Crosby, Dallam, Dickens, Donley, Floyd, Gaines, Garza, Gray, Hartley, Hutchinson, Lubbock, Motley, Ochiltree, Oldham, Randall, Roberts, Wheeler.

NASTURTIUM

N. OFFICINALE R.Br. (Rorippa nasturtium-aquaticum (L.) Hayek); R; in spring-fed streams; April through June; 9 sheets. COUNTIES: Collingsworth, Floyd, Hartley, Hemphill, Lubbock, Motley, Wheeler.

RORIPPA

R. ISLANDICA (Oeder) Borbas; R; moist sites adjacent to spring-fed streams; June; 2 sheets. COUNTIES: Hemphill.

R. SINUATA (Nutt.) Hitchc.; R, L; margins of streams and playa lakes; late April through June; 20 sheets. COUNTIES: Armstrong, Bailey, Castro, Childress, Floyd, Hemphill, Lipscomb, Parmer.

SIBARIA

S. VIRGINICA (L.) Rollins; RP; sandy loam of heavily grazed grasslands; April; 2 sheets. COUNTIES: Garza.

SISYMBRIUM

S. ALTISSIMUM L.; Pr; sandy soils of disturbed areas; early May; 4 sheets. COUNTIES: Lubbock, Ochiltree.

S. IRIO L.; Pl, Pr; sandy loams of disturbed areas; March through early May; 21 sheets. COUNTIES: Crosby, Garza, Lubbock, Randall.

S. OFFICINALE (L.) Scop., var. LEIOCARPUM DC. Listed for Texas Panhandle by Gould (1962). None seen.

CAPPARIDACEAE

CLEOME

C. SERRULATA Pursh; Pl, R; sands of stream bottoms; late July through September; 9 sheets. COUNTIES: Hemphill, Ochiltree.

CLEOMELLA

C. ANGUSTIFOLIA Torr.; R; sands of stream bottoms; mid July through August; 3 sheets. COUNTIES: Hemphill.

CRISTATELLA

C. JAMESII Torr. and Gray (Polanisia jamesii (T. & G.) Iltis); Pl; deep sands of sand hills; August through September; 3 sheets. COUNTIES: Lamb, Potter.

POLANISIA

(Ernst, 1963 Iltis, 1958, 1966)

P. DODECANDRA (L.) DC., var. TRACHYSPERMA (T. & G.) Iltis (P. trachysperma T. & G.); Pl, Pr, CR; sand and limestone loams of prairie margins, cap rock ledges and canyon sides and bases; 13 sheets. COUNTIES: Armstrong, Dallam, Hansford, Hutchinson, Lipscomb, Lubbock, Ochiltree, Sherman.

SAXIFRAGACEAE

RIBES

R. ODORATUM Wendl.; Pl, CR, RP; sands and limestone loams of canyon walls and stream margins; late March through early May; 22 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Crosby, Dickens, Garza, Hartley, Hemphill, Lubbock, Motley, Randall, Wheeler.

ROSACEAE

AGRIMONIA

A. PARVIFLORA Ait., R; moist sands adjacent to spring-fed streams and lakes; mid August through early October; 6

sheets. COUNTIES: Hemphill, Wheeler.

CERCOCARPUS
(Martin, 1950, McVaugh, 1952)

C. MONTANUS Raf., var. ARGENTEUS (Rydb.) F. L. Martin
(C. argenteus Rydb.); CR; limestone rocks of cap rock ledges
and upper canyon breaks; late April through early May; 25
sheets. COUNTIES: Armstrong, Briscoe, Floyd, Lipscomb,
Randall, Roberts.

GEUM

G. CANADENSE Jacq., var. CAMPORUM (Rydb.) Fern. and
Seath.; R; moist sands adjacent to spring-fed streams and
lakes; late June through July; 3 sheets. COUNTIES: Hemp-
hill.

POTENTILLA
(Shinners, 1955)

P. RIVALIS Nutt.; R; moist sands of spring-fed streams
and lakes; June; 5 sheets. COUNTIES: Floyd, Hartley,
Hemphill, Swisher.

PRUNUS

P. ANGUSTIFOLIA Marsh; Pl, Pr, RP; deep sands of
prairies, grasslands, sand hills and canyon bases; flower-
ing in late March through early May, fruiting June through
August; 21 sheets. COUNTIES: Armstrong, Borden, Childress,
Crosby, Floyd, Hartley, Hemphill, Lubbock, Motley, Ochiltree,
Wheeler.

P. GRACILIS Engelm. and Gray; Fl; deep sands of sand hills; late April through mid May; 4 sheets. COUNTIES: Bailey.

P. VIRGINIANA L. sens. lat.; Fl; sandy limestone loams of upper canyon breaks, fruiting in July; 3 sheets. COUNTIES: Oldham, Randall.

LEGUMINOSAE
(Turner, 1959)

ACACIA

A. ANGUSTISSIMA (Mill.) Kuntze, var. *HIRTA* (Nutt.) Robinson; RP; sands and sandy loams of grasslands; late June through July; 7 sheets. COUNTIES: Dickens, Garza, Hall.

AMORPHA

A. CANESCENS (Nutt.) Pursh; Fl, R; sandy loams in streambeds; July; 2 sheets. COUNTIES: Lipscomb.

A. FRUTICOSA L., var. *ANGUSTIFOLIA* Pursh; Fl, R; sands of stream riparia; late May through July; 13 sheets. COUNTIES: Hemphill, Lipscomb, Randall, Wheeler.

APIOS

A. AMERICANA Medic., var. *TURRIGERA* Fern.; R; wet ground, Canadian River Valley, Canadian; 6 September; one sheet. COUNTIES: Hemphill.

ASTRAGALUS
(Barneby, 1964)

A. CRASSICARPUS Nutt., var. *CRASSICARPUS*; Pl, Pr, CP; sandy loam and limestone gravel of cap rock ledges and canyon

sides; April through mid May; 13 sheets. COUNTIES: Lubbock, Oldham, Parmer, Randall.

A. GRACILIS Nutt.; Pl, Pr, RP; sandy limestone loams of prairies, grasslands and canyon sides; late April through early July; 17 sheets. COUNTIES: Armstrong, Crosby, Deaf Smith, Garza, Kent, Lubbock, Oldham, Randall.

A. LINDHEIMERI Gray; RP; sands and sandy clay loams of grasslands and rocky canyon sides; mid March through early May; 29 sheets. COUNTIES: Crosby, Dickens, Garza, King, Lubbock.

A. LOTIFLORUS Hook. (including var. lotiflorus and var. nebraskensis which Barneby (1964) did not recognize); Pl, Pr, CR, RP; sandy limestone loams of prairie margins, cap rock ledges and canyon sides; early April through May; 28 sheets. COUNTIES: Armstrong, Briscoe, Childress, Cottle, Floyd, Garza, Lipscomb, Lubbock, Roberts.

A. MISSOURIENSIS Nutt.; Pl, CR, RP; sandy limestone loams of cap rock ledges, canyon sides; mid March through April; 70 sheets. COUNTIES: Armstrong, Bailey, Borden, Briscoe, Childress, Cottle, Crosby, Dallam, Dawson, Dickens, Floyd, Garza, Hemphill, Kent, Lipscomb, Lubbock, Lynn, Motley, Potter, Randall.

A. MOLLISSMUS Torr., var. MOLLISSIMUS (including some specimens that show some of the characteristics of var. earlei (Rydb.) Tidestr.); Pl, Pr, RP; sands, sandy and limestone loams of prairies, grasslands and canyon sides; late March through early June; 40 sheets. COUNTIES: Armstrong,

Borden, Childress, Cottle, Gaines, Garza, Hemphill, Lamb, Lubbock, Motley, Parmer, Wheeler.

A. NUTTALLIANUS DC., var AUSTRINUS (Nutt.) Barneby (including A. austrinus (Small) Schultz and A. nuttallianus var. trichocarpus Torr. and Gray as used by Turner but not Barneby); Pl, Pr, RP; sands and sandy loams of prairies and grasslands; April through May; 23 sheets. COUNTIES: Briscoe, Cottle, Crosby, Dawson, Garza, Hemphill, Lubbock, Randall.

A. PLATTENSIS Nutt.; Pl, Pr, RP; deep sands and sandy limestone loams of grasslands and sand hills; late March through early May; 20 sheets. COUNTIES: Dickens, Garza, Hemphill, Lubbock, Moore, Motley.

A. PUNICEUS Osterh., var. PUNICEUS; Pr; tight sandy loams of prairies; June; 5 sheets. COUNTIES: Deaf Smith.

A. RACEMOSUS Pursh, var. RACEMOSUS; Pl, Pr, CR, RP; rocky sandy loams of low bluffs, cap rock ledges and canyon sides; late May through June; 10 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Lynn, Randall.

A. WOOTONII Sheld. Reported by Drake (1965) from Hutchinson County, 6 May, 1964. None seen.

BAPTISIA

B. AUSTRALIS (L.) R.Br., var MINOR (Lehm.) Fern. (B. minor Lehm.); Pl; deep sands of sand hills; mid May through early June; 4 sheets. COUNTIES: Hemphill, Lipscomb, Wheeler.

CASSIA

C. FASCICULATA Michx, (including var. rostrata (Woot. and Standl.) Turner); Pl; deep sands of sand hills and grasslands; mid July through early October; 14 sheets. COUNTIES: Hemphill, Lipscomb, Roberts.

C. PUMILIO Gray; RP; sands and sandy limestone loams of grasslands; late April through early June; 6 sheets. COUNTIES: Dawson, Garza.

C. ROEMERIANA Scheele; Pl, CR, RP; sandy limestone loams of cap rock ledges, canyon walls and bases; May through early June; 6 sheets. COUNTIES: Bailey, Gaines, Lubbock, Lynn.

DALEA

(including Petalostemum)

D. AUREA Nutt.; Pl, CR, RP; sand and limestone loams of canyon sides and cap rock ledges and gravel hillsides; June through mid July; 24 sheets. COUNTIES: Armstrong, Briscoe, Cottle, Crosby, Dickens, Floyd, Hemphill, Hutchinson, Lubbock, Motley, Ochiltree, Roberts.

D. CANDIDA Willd., var. OLIGOPHYLLA (Torr.) Shinners (D. oligophylla (Torr.) Shinners); Pl, RP; sands and limestone gravels of grasslands and lower canyon walls; late June through mid July; 23 sheets. COUNTIES: Bailey, Briscoe, Dickens, Garza, Hemphill, Lubbock, Lynn, Randall, Roberts, Terry.

D. FORMOSA Torrey; Pl, CR, RP; rocky ledges of cap rock breaks and canyons; 59 sheets. COUNTIES: Armstrong, Bailey,

Borden, Briscoe, Cottle, Crosby, Dickens, Floyd, Garza, Hardeman, Kent, Lubbock, Lynn, Motley, Ochiltree, Oldham, Randall, Roberts.

D. *FRUTESCENS* Gray, var. *FRUTESCENS*; RP; gravel loams; September and October; 4 sheets. COUNTIES: Cottle, Foard.

D. *JAMESII* (Torr.) Torr. and Gray; Pl; limestone loams, sandy loams of canyon sides; mid May through mid June; 4 sheets. COUNTIES: Bailey, Dallam, Lubbock.

D. *LANATA* Spreng.; Pl; deep sands of sand hills and grasslands; mid June through early September; 13 sheets. COUNTIES: Hemphill, Hockley, Hutchinson, Lamb, Lynn, Oldham, Potter, Roberts, Wheeler.

D. *LAXIFLORA* Pursh (*D. enneandra* Nutt.); Pl, RP; sands and sandy loams of canyon walls and streambeds; 21 sheets. COUNTIES: Armstrong, Crosby, Dallam, Dickens, Hartley, Hemphill, Lipscomb, Motley, Ochiltree, Potter, Randall, Roberts.

D. *MULTIFLORA* (Nutt.) Shinnery; R; sands adjacent to river; July; one sheet. COUNTIES: Hemphill.

D. *NANA* Torrey (*Parosela nana* (Torr.) Heller, *P. leseuri* Tharp and Barkley); Pl, RP; sands and gravel loams of grasslands; late April through mid August; 21 sheets. COUNTIES: Dallam, Gaines, Garza, Hemphill, Lubbock, Potter.

D. *TENUIFOLIA* (Gray) Shinnery; Pl, CR, RP; sandy loams of cap rock ledges, gravelly hillsides and deep sands of sand hills; May through early July; 49 sheets. COUNTIES: Bailey, Briscoe, Crosby, Dallam, Floyd, Gray, Hartley,

Hemphill, Hutchinson, Lamb, Lipscomb, Lubbock, Motley, Oldham.

D. VILLOSA (Nutt.) Spreng.; Pl; deep sands and sandy loams of sand hills and grasslands; mid June through August; 8 sheets. COUNTIES: Hemphill, Hockley, Lipscomb.

DESMANTHUS

D. COOLEYI (Eaton) Trel. (including D. jamesii Torrey and Gray); Pl, Pr, CR; sands and sandy loams of prairies, cap rock ledges and canyon sides; June through early August; 30 sheets. COUNTIES: Bailey, Dallam, Hockley, Lamb, Lubbock, Parmer, Randall, Swisher.

D. ILLINOENSIS (Michx.) MacM; Pl, R, RP; sands adjacent to streams; 15 sheets. COUNTIES: Crosby, Dickens, Floyd, Lubbock, Motley, Ochiltree.

D. LEPTOLOBUS Torrey and Gray; Pr; sandy loam, disturbed prairies; July; 2 sheets. COUNTIES: Lipscomb.

DESMODIUM

D. ILLINOENSIS Gray; R; moist sands of meadows and stream banks; late August through mid September; 4 sheets. COUNTIES: Hemphill, Wheeler.

D. PANICULATUM (L.) DC., var. DILLENII (Darl.) Isely; R; moist sands adjacent to streams; late August through mid September; 5 sheets. COUNTIES: Hemphill, Wheeler.

GLEDITSIA

G. TRIACANTHOS L.; Pl, R, Pr; found in cultivation as wind breaks and yard plants in sandy soils throughout the

area. The author has seen no evidence of establishment outside of cultivation.

GLYCYRRHIZA

G. LEPIDOTA Pursh; Pl, R, RP; moist sandy loams of stream margins and meadows; mid May through mid June; 26 sheets. COUNTIES: Armstrong, Cottle, Floyd, Hartley, Hemphill, Hutchinson, Lamb, Lipscomb, Lubbock, Roberts, Swisher.

GYMNOCLADUS

G. DIOICA (L.) Koch. Reported from Texas Panhandle by Gould (1962). Turner (1959) reports as not having seen any specimens from Texas. None seen by this author.

HEDYSARUM

H. BOREALE Nutt. Reported by Drake (1965) from Canadian River breaks north of Phillips, Hutchinson County, 26 May, 1964. None seen.

HOFFMANSEGGIA

H. DENSIFLORA Benth.; Pl, Pr, RP; sandy loams of grasslands and prairies under disturbance; April through August; 66 sheets. COUNTIES: Armstrong, Bailey, Borden, Cottle, Crosby, Dickens, Floyd, Garza, Lamb, Lubbock, Kent, King, Lynn, Ochiltree, Oldham, Potter.

H. DREPANOCARPA Gray; Pl; disturbed sites in sandy soils of grasslands; May and June; 7 sheets. COUNTIES: Borden, Lubbock.

H. JAMESII Torr. and Gray; Pl, RP; sands of grasslands and sand hills; late May through July; 40 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Crosby, Dallam, Dawson, Dickens, Garza, Gray, Hartley, Hemphill, Hutchinson, Lamb, Lubbock, Motley, Roberts.

INDIGOFERA

I. MINIATA Ortega, var. LEPTOSEPALA (Nutt.) Turner (I. leptosepala Nutt.); Pl; sands of grasslands and sand hills; June and July; 11 sheets. COUNTIES: Hemphill, Lipscomb.

KRAMERIA

K. LANCEOLATA Torr. (K. secundiflora of authors, not De Candole, according to Turner (1959); Pl, CR, RP; sand and gravel loams of cap rock breaks, canyon walls and grasslands; late April through June; 65 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Crosby, Dickens, Floyd, Garza, Gray, Hartley, Hemphill, Hutchinson, Lamb, Lubbock, Motley, Roberts, Sherman, Wheeler.

LESPEDA

(Clewell, 1966, Rowell, 1957)

L. CAPITATA Michx.; R; Escaped cultivar, deep sandy loam of sand hills adjacent to Canadian and Washita Rivers; July; 2 sheets. COUNTIES: Hemphill, Wheeler.

L. STUVEI Nutt.; R; sands of sand hills adjacent to Canadian and Washita Rivers; July; August; 4 sheets. COUNTIES: Hemphill, Wheeler.

LUPINUS

L. PLATTENSIS S. Wats.; Pl; deep sands adjacent to Punta de Aqua Creek; May through early June; 5 sheets.

COUNTIES: Hartley.

MEDICAGO

M. SATIVA L.; Pl, Pr, RP; escaped cultivar in sands and sandy loams of disturbed areas; May through June; 10 sheets.

COUNTIES: Garza, Hemphill, Lubbock.

MELILOTUS

M. ALBA Desv.; Pl; sands and sandy loams of disturbed grasslands, escaped cultivar; June and July; 5 sheets.

COUNTIES: Hemphill, Hutchinson, Lubbock.

M. OFFICINALIS (L.) Lam.; Pl; sands and sandy loams of disturbed grasslands, escaped cultivar; April through June; 8 sheets. COUNTIES: Floyd, Lubbock, Randall.

MIMOSA

M. BIUNCIFERA Benth.; RP; sands and sandy loams of rolling grasslands; mid June through July; 11 sheets. COUNTIES: Bailey, Dawson, Kent, King, Lamb, Lubbock.

M. BOREALIS Gray; Pl, Pr, RP; tight sandy loams of prairies and grasslands; May through early June; 33 sheets. COUNTIES: Armstrong, Crosby, Garza, Gray, Hutchinson, King, Lubbock, Lynn, Motley, Ochiltree, Oldham.

OXYTROPIS

O. LAMBERTII Pursh, var. ARTICULATA (Greene) Barneby; Pl, CR; limestone gravel and loams of cap rock ledges and canyon walls; mid April through May; 41 sheets. COUNTIES: Armstrong, Crosby, Floyd, Garza, Gray, Hartley, Hemphill, Lubbock, Ochiltree, Randall, Roberts, Wheeler.

PROSOPIS

P. GLANDULOSA Torr., var. GLANDULOSA; Pl, Pr, RP; sands and sandy loams; late May through mid July; 40 sheets. COUNTIES: Armstrong, Bailey, Borden, Briscoe, Cottle, Crosby, Dawson, Dickens, Floyd, Gaines, Garza, Hardeman, Hemphill, Hutchinson, Kent, King, Lubbock, Lynn, Motley, Randall.

PSORALEA
(Shinners, 1951)

P. ARGOPHYLLA Pursh. Gould (1962) cites this species for The Texas Panhandle. Turner (1959) stated that the species had not been collected in Texas but was to be expected, having been collected in Cimarron County, Oklahoma. None seen.

P. CUSPIDATA Pursh; Pl, RP; sand and gravel loams of canyon walls; May through June; 12 sheets. COUNTIES: Briscoe, Cottle, Dickens, Garza, Gray, Hemphill, Ochiltree, Roberts.

P. DIGITATA Nutt., var. DIGITATA; Pl; deep sandy loam of sand hills; May; 2 sheets. COUNTIES: Wheeler.

P. HYPOGEA Nutt. (incl. *P. scaposa* (Gray) Macbride, var. *breviscapa* Shinnery as far as Texas Panhandle material is concerned); Pl, RP; sands and loose limestone loams of canyon walls and bases; mid April through early June; 4 sheets. COUNTIES: Lubbock, Randall.

P. LANCEOLATA Pursh; Pl; deep sands adjacent to streams; June; 8 sheets. COUNTIES: Dallam, Floyd, Hartley, Oldham.

P. LINEARIFOLIA Torr. and Gray; Pl, CR, RP; sands and limestone loam of cap rock ledges and canyon sides; April through June; 15 sheets. COUNTIES: Briscoe, Crosby, Floyd, Hemphill, Hutchinson, Ochiltree, Oldham.

P. TENUIFLORA Pursh (including *P. floribunda* Nutt., *P. obtusiloba* T. & G.); Pl, Pr, RP; sandy limestone loams of prairies and grasslands; June through July; 23 sheets. COUNTIES: Bailey, Briscoe, Dallam, Deaf Smith, Floyd, Hartley, Hutchinson, Lamb, Lubbock, Ochiltree, Oldham, Parmer, Swisher, Wheeler.

ROBINIA

R. PSEUDO-ACACIA L. Planted, sustaining but not observed spreading, in deep sands and sandy loams throughout area. Flowering in April and May.

SCHRANKIA

S. OCCIDENTALIS (Woot. and Standl.) Standl.; RP; sands and sandy loams of grasslands; late April through June; 23 sheets. COUNTIES: Briscoe, Cottle, Crosby, Garza, Hemphill, Lamb, Lubbock.

S. UNCINATA Willd. (incl. S. nuttallii (DC.) Standl.); Pl, Pr, RP; sands and sandy loams of prairies and grasslands; 17 sheets. COUNTIES: Armstrong, Briscoe, Crosby, Dallam, Dickens, Floyd, Hemphill, Lubbock, Motley, Terry.

SOPHORA

S. NUTTALLIANA Turner (S. sericea Nutt.); Pr; tight sandy loam of prairies; late April through early June; 51 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Childress, Crosby, Dallam, Dickens, Garza, Hartley, Hockley, Lipscomb, Lubbock, Lynn, Ochiltree, Oldham, Parmer, Potter, Randall, Wheeler.

STROPHOSTYLES

S. HELVOLA (L.) Ell. (Phaseolus helvolus L.); R; stream riparia; September; 3 sheets. COUNTIES: Hemphill.

S. LEIOSPERMA (Torr. and Gray) Piper (Phaseolus leiospermus Torr. and Gray); R; stream riparia; mid July through early September; 7 sheets. COUNTIES: Hemphill, Randall, Roberts.

TEPHROSIA

T. VIRGINIANA (L.) Pers., var. VIRGINIANA; Pl, Pr; deep sands of sand hills and prairies; late May through June; 8 sheets. COUNTIES: Bailey, Hemphill, Lamb, Lipscomb, Wheeler.

VICIA

V. AMERICANA Muhl., var. LINEARIS (Nutt.) Watson (V. linearis (Nutt.) Greene); Pl; sands of sand hills and grasslands; May; 4 sheets. COUNTIES: Randall, Wheeler.

V. DASYCARPA Ten.; Pl, Pr; weed of disturbed prairies and grassland, introduced from Europe; May; one sheet. COUNTIES: Lubbock.

V. LEAVENWORTHII Torr. and Gray; Pl, RP; rocky canyon sides; April and May; 3 sheets. COUNTIES: Briscoe, Lubbock, Ochiltree.

V. PRODUCTA Rydb. (sens. Waterfall, 1966); Pl, Pr, RP; disturbed sandy loam of prairies and grasslands; 16 sheets. COUNTIES: Briscoe, Dallam, Gray, Lubbock.

GERANIACEAE

ERODIUM

E. CICUTARIUM (L.) L'Her.; RP; sandy loams of grasslands usually in disturbed sites; March through early May; 43 sheets. COUNTIES: Crosby, Dickens, Garza, Lubbock, Lynn, Motley, Randall.

E. TEXANUM Gray; RP; sandy loams of grasslands, usually in disturbed sites; March through early May; 28 sheets. COUNTIES: Dickens, Garza, Kent, Lubbock, Lynn, Motley.

GERANIUM

G. CAROLINIANUM L. (G. langelossii Greene); RP; red sandy loams of grasslands; May; one sheet. COUNTIES: Childress.

OXALIDACEAE

OXALIS

O. DILLENII Jacq. (including O. stricta of Texas reports); Pl, RP; sands and sandy loams of grasslands and disturbed sites; April through mid May; 17 sheets. COUNTIES: Borden, Garza, Hall, Lubbock.

LINACEAE
(Rogers, 1963)

LINUM

L. ARISTATUM Engelm., var. ARISTATUM Reported for the Texas Panhandle (Hutchinson Co.) by Drake (1965). The author has not seen any specimens that confirm this determination.

L. HUDSONIOIDES Planchon; RP; sandy loam of canyon sides; May; 2 sheets. COUNTIES: Lubbock.

L. LEWISII Pursh, var. PRATENSE Norton (L. pratense (Norton) Small); Pl, Pr, CR, RP; sands and limestone loams of prairies, grasslands, cap rock ledges and river banks; mid April through May; 51 sheets. COUNTIES: Armstrong, Childress, Crosby, Dallam, Dickens, Garza, Gray, Hemphill, Lipscomb, Lubbock, Lynn, Roberts, Terry.

L. RIGIDUM Pursh, var. RIGIDUM; Pl, Pr, CR, RP; sands, and sandy and limestone loams of rolling prairies, grasslands, cap rock ledges and canyon walls; late May through mid July; 12 sheets. COUNTIES: Briscoe, Crosby, Dickens, Hartley, Hemphill, Lipscomb, Lubbock, Ochiltree.

L. RIGIDUM Pursh, var. BERLANDIERI (Hook.) Torr. and Gray; Pl, Pr, RP; sand and limestone loams of rolling

prairies, grasslands, and canyon breaks; late April through early July; 21 sheets. COUNTIES: Dickens, Garza, Lubbock, Motley, Ochiltree, Oldham.

L. RIGIDUM Pursh, var. COMPACTUM (Nelson) Rogers; Pl; tight sandy loam of grasslands; April; one sheet. COUNTIES: Lubbock.

ZYGOPHYLLACEAE

KALLSTROEMIA

K. HIRSUTISSIMA Vail; Pl, RP; tight sandy loams of heavily grazed prairies and grasslands and in disturbed sites; mid July through early September; 8 sheets. COUNTIES: Armstrong, Bailey, Cottle, Randall.

PEGANUM (Cory, 1949)

P. HARMALA L.; RP; sandy limestone loam at base of canyons; late April through May; 3 sheets. COUNTIES: Garza.

TRIBULUS

T. TERRESTRIS L.; Pl, Pr, RP; sandy loams of heavily grazed prairies, grasslands, and disturbed sites throughout area; June through August; 26 sheets. COUNTIES: Bailey, Borden, Cottle, Crosby, Dallam, Dickens, Floyd, Hemphill, Lubbock, Randall.

RUTACEAE
(Bailey, 1962)

PTELEA

P. TRIFOLIATA L. (including ssp. mollis T. & G., and ssp. polydenia (Greene) Bailey which the author was unable to separate with the materials studied); Pl, RP; limestone and sandy loams of canyon sides; May; 20 sheets. COUNTIES: Armstrong, Briscoe, Crosby, Floyd, Hemphill, Kent, Ochiltree, Potter, Randall, Roberts.

THAMNOSMA

T. TEXANA (Gray) Torr.; CR; limestone loam of cap rock ledges; July; 3 sheets. COUNTIES: Garza, Lubbock.

POLYGALACEAE
(Blake, 1924)

POLYGALA

P. ALBA Nutt.; Pl, CR, RP; limestone and sandy loams of cap rock ledges, canyon sides and grasslands; mid April through June; 69 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Cottle, Crosby, Dickens, Floyd, Garza, Gray, Hartley, Hemphill, Lipscomb, Lubbock, Moore, Motley, Ochiltree, Oldham, Parmer, Randall, Roberts, Wheeler, Yoakum.

P. TWEEDYI Britt.; CR, RP; limestone and sandy loam of cap rock ledges and upper canyon breaks; mid June through July; 7 sheets. COUNTIES: Dawson, Garza, Lubbock.

P. MACRADENIA Gray; E.; limestone loam of canyon sides; April; one sheet. COUNTIES: Garza.

EUPHORBIACEAE

ACALYPHA

A. OSTRYAEOFOLIA Ridd.; CR; limestone loam of cap rock ledges; August; one sheet. COUNTIES: Lubbock.

CNIDOSCOLUS

C. TEXANUS (Muell. Arg.) Small; Pl, RP; deep sands of grasslands and sand hills; May through June; 5 sheets. COUNTIES: Dickens, Hemphill, Kent, Motley.

CROTON
(Johnston, 1959)

C. DIOICUS Cav. (C. neomexicanus Muell. Arg.); CR, RP; sandy limestone loams of cap rock ledges and canyon walls; late April through June; 29 sheets. COUNTIES: Briscoe, Gaines, Garza, Lubbock.

C. GLANDULOSUS L., var. LINDHEIMERI Muell. Arg. (intergrading with var. septentrionalis Muell, Arg. in some of the materials examined.) Pl; deep sands of sand hills; July through early October; 7 sheets. COUNTIES: Lipscomb.

C. MONANTHOGYNUS Michx.; CR; limestone loam of cap rock ledges; September through early October; 3 sheets. COUNTIES: Ochiltree.

C. POTTSII (Klotzsch) Muell. Arg. (C. corymbulosus Engelm.); CR, RP; sand and limestone loams of cap rock ledges and canyon sides; late April through early July; 36 sheets. COUNTIES: Bailey, Dawson, Gaines, Garza, Kent, Lubbock.

C. *TEXENSIS* (Klotzsch) Muell. Arg.; Pl, Pr, RP; deep sands and sandy loams of grasslands, prairies, and canyon sides; June through early October; 37 sheets. COUNTIES: Crosby, Dallam, Garza, Hartley, Hemphill, Hutchinson, Lipscomb, Lubbock, Ochiltree, Potter, Roberts, Wheeler.

DITAXIS

D. *HUMILIS* (Engelm. and Gray) Pax (*Argythamnia humilis* (Engelm. and Gray) Muell. Arg., var. *humilis*); CR; sand and limestone loams of cap rock ledges and upper canyon breaks; June through August; 9 sheets. COUNTIES: Bailey, Deaf Smith, Gray, Lubbock, Oldham, Potter.

D. *MERCURIALINA* (Nutt.) Coulter (*Argythamnia mercurialina* (Nutt.) Muell. Arg., var. *mercurialina*); Pl, CR, RP; sand and gravel loams of canyon sides and grasslands; mid May through July; 26 sheets. COUNTIES: Armstrong, Bailey, Collingsworth, Crosby, Hutchinson, Lubbock, Motley, Ochiltree.

EUPHORBIA (Wheeler, 1941)

E. *ALBOMARGINATA* Torr. and Gray; Pl, Pr; sandy loams of prairies; 21 sheets. COUNTIES: Bailey, Borden, Crosby, Hartley, Hemphill, Hockley, Lubbock, Ochiltree, Parmer, Randall.

E. *DENTATA* Michx., forma *DENTATA*; Pl, Pr, RP; sands and sandy loams, principally along upper stream banks; mid June through early October; 25 sheets. COUNTIES: Armstrong, Bailey, Cottle, Dickens, Hemphill, Hutchinson, Lipscomb,

Lubbock, Ochiltree, Oldham, Roberts, Wheeler.

E. FENDLERI Torr. and Gray, var. FENDLERI; Pl, CR, RP; limestone and sandy loams and gravels of cap rock ledges and canyon sides; 31 sheets. COUNTIES: Bailey, Briscoe, Dallam, Dickens, Garza, Hartley, Hemphill, Lamb, Lubbock, Lipscomb, Ochiltree, Parmer, Potter, Roberts, Wheeler.

E. GEYERI Engelm.; Pr; sandy loam of prairies; July; 2 sheets. COUNTIES: Lipscomb.

E. GLYPTOSPERMA Engelm; Pl, RP; sandy and gravel loams of grasslands and rocky hillsides; late June through September; 12 sheets. COUNTIES: Collingsworth, Cottle, Dallam, Hemphill, Ochiltree, Wheeler.

E. HEXAGONA Nutt.; Pl; sand and gravel loams of grasslands and stream banks; late July through August; 7 sheets. COUNTIES: Hemphill, Lipscomb, Roberts.

E. LATA Engelm.; Pl, CR, RP; sand and clay loams of cap rock ledges, upper canyon breaks and grasslands; late April through early July; 24 sheets. COUNTIES: Bailey, Cottle, Dallam, Garza, Hutchinson, Lubbock, Ochiltree, Oldham, Roberts.

E. MARGINATA Pursh; Pl, R, Pr, CR, RP, L; tight sandy loams of stream bottom lands, prairies, grasslands and playa lake margins; mid July through September; 21 sheets. COUNTIES: Bailey, Castro, Floyd, Hemphill, Hutchinson, Lipscomb, Lubbock, Ochiltree, Wheeler.

E. MISSURICA Raf. (incl. var. missurica and var. intermedia (Engelm.) L. C. Wheeler); Pl; sands and sandy

loams of sand hills and grasslands; late August through September; 19 sheets. COUNTIES: Bailey, Collingsworth, Dallam, Garza, Hemphill, Hockley, Oldham, Potter, Roberts, Wheeler.

E. NUTANS Lag. (E. maculata L.); Pl; deep sandy loam of sand hills and lower canyon walls; July through early September; 3 sheets. COUNTIES: Hemphill, Randall.

E. PROSTRATA Ait. (E. chamaesyce L.); Pl; sandy loams of grasslands; May through early August; 3 sheets. COUNTIES: Lubbock, Randall.

E. SERPENS H.B.K.; Pl; sandy loams of grasslands; July and September; 2 sheets. COUNTIES: Lubbock.

E. SERPYPHLLA Pers.; Pl; sands of sand hills; June; one sheet. COUNTIES: Hemphill.

E. SPATHULATA Lam. (E. dictyosperma Fisch. and May.); Pl; tight sandy loam of grasslands; mid April through early June; 14 sheets. COUNTIES: Bailey, Crosby, Garza, Hemphill, Kent, Lubbock, Ochiltree.

E. STRICTIOR Holz.; Pl; sandy gravel of river banks; June; 3 sheets. COUNTIES: Oldham.

E. STRICTOSPORA Engelm.; Pl; loose sandy loam of grasslands; late June through early October; 4 sheets. COUNTIES: Bailey, Lubbock, Hemphill.

E. WRIGHTII Torr. and Gray; RP; tight sandy loams and sandstone ledges; mid April through May; 16 sheets. COUNTIES: Garza.

PHYLLANTHUS

P. ABNORMIS Baill.; RP; sandy loam of grasslands; July; 6 sheets. COUNTIES: Dawson.

REVERCHONIA

R. ARENARIA Gray; Pl; deep loose sand of sand hills; June through August; 4 sheets. COUNTIES: Hartley, Hockley.

STILLINGIA
(Rogers, 1951)

S. SYLVATICA L.; Pl, RP; sands of grasslands and sand hills; mid May through early August; 16 sheets. COUNTIES: Bailey, Hartley, Hemphill, Hutchinson, Lipscomb, Oldham, Roberts, Wheeler.

S. TRECULIANA (Muell. ARG.) I. M. Johnst.; RP; sandy limestone loam of canyon sides; May; 2 sheets. COUNTIES: Lubbock.

TRAGIA
(Johnston, 1962)

T. RAMOSA Torr. (T. nepetaefolia Cav.); Pl, CR, RP; limestone and sandy loams of cap rock ledges and upper canyon breaks; May through August; 16 sheets. COUNTIES: Armstrong, Cottle, Floyd, Lubbock, Ochiltree, Oldham, Roberts, Wheeler.

CALLITRICHACEAE

CALLITRICHE
(Fassett, 1951)

C. HETEROPHYLLA Pursh; var. HETEROPHYLLA; R; still waters of springs in Canadian River bottomlands; May; 5

sheets. COUNTIES: Hemphill.

ANACARDIACEAE
(Barkley, 1943)

RHUS

R. AROMATICA Ait., var. PILOSISSIMA Engler (including some specimens that grade toward var. flabelliformis Shinners); Pl, CR, RP; limestone and sandy loams of cap rock breaks and canyon walls; March through early May; 40 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Childress, Crosby, Dickens, Floyd, Garza, Hemphill, Hutchinson, Kent, Lamb, Lipscomb, Lubbock, Moore, Motley, Ochiltree, Oldham, Randall.

R. COPALLINA L., var. LANCEOLATA Gray. Reported for Armstrong County by Barkley (1943). None seen.

R. GLABRA L.; R; deep sands of bottomlands of Canadian River; June; 4 sheets. COUNTIES: Hemphill.

R. MICROPHYLLA Engelm.; Pl, CR, RP; limestone and sandy loams of cap rock ledges, canyon walls; late March through April; 12 sheets. COUNTIES: Armstrong, Dickens, Lubbock.

R. RADICANS L., var. RADICANS (including var. vulgaris); Pl, CR, RP; rocky loams of canyon breaks and scandant on trees in river bottoms; April and May; 5 sheets. COUNTIES: Briscoe, Hutchinson, Randall.

CELASTRACEAE

FORSELLESIA

F. PLANITIERUM Ensign (Glossopetalon planitierum (Ensign) St. John); Pl, CR, RP; sand and limestone loams of

cap rock ledges and upper canyon breaks; late April through early June; 16 sheets. COUNTIES: Armstrong, Briscoe, Crosby, Dickens, Lubbock, Randall.

F. SPINESCENS (Gray) Greene. Reported for Texas Panhandle by Gould (1962). Probably referable to Forsellesia planitierum. None seen.

SAPINDACEAE

CARDIOSPERMUM

C. HALICACABUM L.; R; scandant on trees in bottomlands, Canadian River; August; 3 sheets. COUNTIES: Hemphill.

SAPINDUS

S. DRUMMONDII Hook. and Arn. (S. saponaria L., var. drummondii (Hook. and Arn.) Benson); Pl, R; deep sands of stream banks; June and July; 14 sheets. COUNTIES: Crosby, Hemphill, Hutchinson, Lubbock, Ochiltree, Wheeler.

RHAMNACEAE

CEANOTHUS

C. HERBACEUS Raf., var. PUBESCENS (Torr. and Gray) Shinnery; Pl; deep sands of canyon walls and sand hills; May through June; 9 sheets. COUNTIES: Bailey, Hartley, Hemphill, Lamb, Wheeler.

CONDALIA
(Johnston, 1962)

C. ERICOIDES (Gray) M. C. Johnst. (Microrhamnus ericoides Gray); CR; cap rock ledges; March, April; 2

sheets. COUNTIES: Dawson, Garza.

ZIZIPUS
(Johnston, 1963)

Z. OBTUSIFOLIA (Hook.) Gray, var. OBTUSIFOLIA (Condalia obtusifolia (Hook.) Weberb.); Pl, RP; sands and tight sandy loams of grasslands and canyon sides; May through June; 11 sheets. COUNTIES: Armstrong, Bailey, Cottle, Dawson, Gaines, Garza, Lubbock, Motley.

VITACEAE

AMPELOPSIS

A. CORDATA Michx. (C. ampelopsis Pers.); R; scandant on trees in stream bottoms; June; 6 sheets. COUNTIES: Hemphill, Wheeler.

PARTHENOCISSUS

P. QUINQUEFOLIA (L.) Planch., forma QUINQUEFOLIA; Pl, R; scandant on trees and shrubs in stream bottoms and moist canyons; mid May through early July; 9 sheets. COUNTIES: Armstrong, Crosby, Hemphill, Randall.

VITIS

V. ACERIFOLIA Raf. (V. longii, including V. doaniana); Pl, R, RP; moist canyon walls and stream banks; May through early June; 26 sheets. COUNTIES: Armstrong, Briscoe, Childress, Crosby, Dallam, Dickens, Floyd, Hemphill, Hutchinson, Lubbock, Ochiltree, Randall, Wheeler.

V. RIPARIA Michx.; Pl, R; scandant on trees in river bottom woods; June; 3 sheets. COUNTIES: Hemphill.

MALVACEAE

ABUTILON (Kearney, 1955)

A. INCANUM (Link.) Sweet; Pr; tight limestone loams of prairies; July; 2 sheets. COUNTIES: Bailey.

A. PARVULUM Gray; Pl; sandy limestone loams of canyon sides; June through August; 8 sheets. COUNTIES: Lubbock.

CALLIRHOE (Waterfall, 1951)

C. INVOLUCRATA (Nutt.) Gray, var. INVOLUCRATA; Pl, RP; sands and sandy loams of sand hills and dry river banks; May through June; 11 sheets. COUNTIES: Childress, Crosby, Dickens, Hemphill, Motley, Ochiltree.

C. INVOLUCRATA (Nutt.) Gray, var. LINEARILOBA (Torr. and Gray) Gray; Pl, RP; sands and sandy loams and gravel hills of dry river banks and grasslands and prairies; late April through June; 34 sheets. COUNTIES: Cottle, Crosby, Garza, Gray, Hemphill, Hutchinson, Lubbock, Wheeler.

C. LEIOCARPA Martin; Pl; sands of sand hills and grasslands; May through September; 7 sheets. COUNTIES: Cottle, Hardeman, Lubbock.

HIBISCUS

H. LASIOCARPUS Cav.; R; moist bottomland meadow of Canadian River; mid July through early August; 7 sheets.

COUNTIES: Hemphill.

H. MILITARIS Cav.; R; moist bottomland meadows of Canadian River; August to early September; 4 sheets. COUNTIES: Hemphill.

H. TRIONEUM L.; L; tight clay loams of playa lake margins; September; 2 sheets. COUNTIES: Swisher.

MALVA

M. NEGLECTA Wallr.; R; in sandy loams near stock pens; late April through July; 6 sheets. COUNTIES: Hemphill.

SIDA

(Clement, 1957, Kearney, 1954)

S. LEPIDOTA Gray, var. SAGITTAEFOLIA Gray; L; tight sandy clay loam of playa lake margins; June through July; 5 sheets. COUNTIES: Bailey, Dawson, Garza, Lubbock.

S. LEPROSA (Ort.) K. Schum., var. HEDERACEA (Dougl.) K. Schum. (S. hederacea (Dougl.) Torr.); L; tight clay loams of playa lake margins; June through September; 9 sheets. COUNTIES: Floyd, Lubbock, Parmer.

S. PHYSCOCALYX Gray (S. hastata St. Hill.); Pl, RP, CR; sandy loam of cap rock ledges and canyon walls; late May through early September; 6 sheets. COUNTIES: Bailey, Cottle, Dickens, Lubbock.

SPHAERALCEA

(Kearney, 1935)

S. ANGUSTIFOLIA (Cav.) Don., var. CUSPIDATA Gray; Pl, RP; sands and sandy loams of disturbed sites in grasslands,

canyon sides and dry stream banks; mid May through August; 18 sheets. COUNTIES: Bailey, Dickens, Floyd, Garza, Hartley, Hemphill, Lubbock, Motley, Randall.

S. COCCINEA (Pursh) Rydb., var. *COCCINEA*; Pl, Pr, CR, RP; sandy loams (usually under disturbance) of prairies, grasslands, cap rock ledges and canyon walls; late March through July; 103 sheets. COUNTIES: Bailey, Borden, Briscoe, Carson, Cottle, Crosby, Dallam, Deaf Smith, Dickens, Floyd, Gaines, Garza, Gray, Hale, Hartley, Hemphill, Hockley, Hutchinson, Lubbock, Lynn, Motley, Ochiltree, Parmer, Potter, Randall.

S. HASTULATA Gray; RP; sandy loams at bases of canyons; mid April through May; 9 sheets. COUNTIES: Garza, Lubbock. The assignment of this name to the specimens from these counties is tentative pending more detailed study of the genus within the region.

ELATINACEAE

BERGIA

B. TEXANA (Hook.) Seub.; L; margins of playa lakes; July and August; 3 sheets. COUNTIES: Carson, Garza.

TAMARICACEAE

TAMARIX (Gorschkova, 1957)

T. GALLICA L. (possibly several taxa may be involved according to Gorschkova (1957)); Pl, R, RP; river banks throughout the area; late March through July; 38 sheets.

COUNTIES: Armstrong, Bailey, Childress, Cottle, Crosby, Dickens, Foard, Garza, Gaines, Hemphill, Hutchinson, Lubbock, Motley, Roberts, Terry.

VIOLACEAE

HYBANTHUS

(Morton, 1944, Shinnars, 1951)

H. VERTICILLATUS (Ort.) Baill. (H. linearis (Torr.) Shinnars); Pl, CR; sandy clay loam of cap rock ledges and canyon sides; May; 4 sheets. COUNTIES: Hemphill, Lubbock, Oldham.

VIOLA

(Russell, 1965)

V. PRATINCOLA Greene; R; black silt loam, moist river bottom meadows, shade; mid April through May; 3 sheets. COUNTIES: Hemphill, Wheeler.

LOASACEAE

CEVALLIA

C. SINUATA Lag.; Pl, CR, RP; rocky ledges of cap rock ledges and canyons; July through mid September; 11 sheets. COUNTIES: Cottle, Crosby, Lubbock, Randall.

MENTZELIA

(Darlington, 1934, Thompson, 1963)

M. DECAPETALA (Pursh) Urban and Gilg.; Pl, CR; sandy loam of cap rock ledges and canyons; August through October; 7 sheets. COUNTIES: Dallam, Dickens, Hartley, Lubbock, Oldham.

M. OLIGOSPERMA Nutt.; Pl, CR, RP; limestone and sandstone ledges of canyons and grasslands; mid June through early September; 11 sheets. COUNTIES: Bailey, Crosby, Floyd, Hemphill, Lubbock, Ochiltree, Oldham, Roberts.

M. STRICTA (Osterh.) Stevens (Thompson (1963) indicates that this is synonymous with M. nuda (Pursh) Torr. and Gray); Pl, Pr, RP; sands and sandy loams of prairies, grasslands and canyons; June through early October; 38 sheets. COUNTIES: Armstrong, Briscoe, Cottle, Crosby, Garza, Hartley, Hemphill, Hutchinson, Kent, Lipscomb, Lubbock, Motley, Ochiltree, Potter, Roberts.

CACTACEAE

(Schulz and Runyon, 1930, Britton and Rose, 1919)

ECHINOCACTUS

E. TEXENSIS Hopffer; RP; tight sandy loam of grasslands; late April through early May; 5 sheets. COUNTIES: Cottle, Garza, Lubbock.

ECHINOCEREUS

E. REICHENBACHII (Tersch.) Haage; Pl, RP; sands and gravels of grasslands; May through early June; 9 sheets. COUNTIES: Cottle, Dickens, Hemphill, Lubbock, Roberts.

CORYPHANTHA

C. RADIOSA (Engelm.) Rydb.; Pr; tight sandy loam of prairies; late May; 2 sheets. COUNTIES: Armstrong.

MAMILLARIA

M. SIMILIS Engelm., var. ROBUSTIOR Engelm.; RP; sandy loam of canyon breaks; May; 2 sheets. COUNTIES: Lubbock.

M. VIVIPARA (Nutt.) Haw.; RP; tight sandy loam of grasslands; September; 2 sheets. COUNTIES: Garza.

OPUNTIA

O. IMBRICATA (Haw.) DC.; Pl, Pr, RP; tight sandy loams of prairies and grasslands; mid May through mid June; 6 sheets. COUNTIES: Bailey, Briscoe, Garza, Lubbock, Swisher.

O. LEPTOCAULIS DC.; Pl, Pr, RP; tight and loose sandy loams of prairies, grasslands and canyon breaks; April through May; 5 sheets. COUNTIES: Armstrong, Borden, Garza.

O. MACRORHIZA Engelm.; Pl, Pr, RP; sandy loams of prairies, grasslands, and canyon sides; May through June; 5 sheets. COUNTIES: Gaines, Hemphill, Lubbock.

O. PHAEACANTHA Engelm. and Bigel.; Pl, Pr; sandy loam of prairies and grasslands; June; 4 sheets. COUNTIES: Armstrong, Bailey, Lubbock.

O. POLYCANTHA Haworth; Pr; sandy loams of prairies; late May and early June; 6 sheets. COUNTIES: Armstrong.

LYTHRACEAE

AMMANNIA

A. AURICULATA Willd.; L; margins of playa lake; September; one sheet. COUNTIES: Hale.

A. COCCINEA Rottb.; R, RP; margin of streams at canyon bases; late June through August; 2 sheets. COUNTIES:

Hemphill, Lubbock.

LYTHRUM
(Shinners, 1953)

L. CALIFORNICUM Torr. and Gray (L. alatum Pursh, var. brevifolium Gray); L; margins of playa lakes; late June through mid August; 26 sheets. COUNTIES: Briscoe, Carson, Castro, Crosby, Dawson, Dickens, Floyd, Garza, Lipscomb, Lynn, Lubbock, Ochiltree.

ONAGRACEAE
(Munz, 1944)

EPILOBIUM

E. COLORATUM Biehler; R; moist sites adjacent to streams; July and August; 4 sheets. COUNTIES: Oldham, Wheeler.

GAURA

G. COCCINEA Nutt., var. COCCINEA; Pl, Pr, RP; sandy loams and sandy limestone loams of prairies and grasslands; late March through June; 46 sheets. COUNTIES: Armstrong, Cottle, Crosby, Dallam, Gaines, Garza, Hartley, Hemphill, Hutchinson, Lamb, Lipscomb, Lubbock, Lynn, Ochiltree, Oldham, Randall, Roberts, Terry.

G. COCCINEA Nutt., var. GLABRA (Lehm.) Torr. and Gray; Pl, Pr, RP; tight sandy loams of prairies and grasslands; late April through June; 8 sheets. COUNTIES: Bailey, Gaines, Garza, Kent, Lubbock.

G. COCCINEA Nutt., var. PARVIFOLIA (Torr.) Torr. and Gray; Pl, Pr, RP; sandy loams of prairies and grasslands;

late April through July; 5 sheets. COUNTIES: Crosby, Lubbock, Motley, Roberts.

G. PARVIFLORA Dougl., var. PARVIFLORA; Pl, RP; sandy loam of grasslands and canyon sides; late June through September; 11 sheets. COUNTIES: Cottle, Hartley, Hemphill, Lubbock, Oldham.

G. SINUATA Nutt.; RP; limestone gravel at canyon bases; June; 2 sheets. COUNTIES: Garza.

G. SUFFULTA Engelm., var. SUFFULTA; Pl, Pr, RP; sandy loams of grasslands and canyon sides; late April through June; 12 sheets. COUNTIES: Bailey, Crosby, Dickens, Garza, King, Lubbock.

G. VILLOSA Torr., var. VILLOSA; Pl, Pr, sands of prairies and grasslands; June and July; 5 sheets. COUNTIES: Hemphill, Lipscomb, Ochiltree, Roberts.

G. VILLOSA Torr., var. ARENICOLA Munz; Pl, RP; sands of grasslands and lower canyon breaks; late April through early June; 9 sheets. COUNTIES: Bailey, Crosby, Garza, Lubbock, Oldham, Potter, Terry.

OENOTHERA

O. ALBICAULIS Pursh; Pl, RP; sandy loams of grasslands, canyon bases and dry stream banks; April through June; 26 sheets. COUNTIES: Bailey, Briscoe, Childress, Cottle, Crosby, Dawson, Gaines, Garza, King, Lipscomb, Lubbock, Lynn, Roberts, Terry.

O. BRACHYCARPA Gray var. BRACHYCARPA; RP; limestone loams of canyon breaks; April and May, again in July after rains; 5 sheets. COUNTIES: Crosby, Garza, Lubbock.

O. CANESCENS Torr. and Frem.; L; tight clay loam of playa lake margins; May through early August; 24 sheets. COUNTIES: Bailey, Castro, Dickens, Garza, Hale, Lipscomb, Lubbock, Ochiltree, Parmer.

O. ENGELMANNII (Small) Munz; Pl, RP; deep sands of sand hills and stream banks; mid April through June; 19 sheets. COUNTIES: Bailey, Cottle, Dallam, Hemphill, Hockley, Kent, Lamb, Roberts, Wheeler.

O. GREGGII Gray, var. GREGGII; Pl; sandy limestone loams of canyon breaks; late April through June; 7 sheets. COUNTIES: Crosby, Lamb, Lubbock, Ochiltree.

O. GREGGII Gray, var. LAMPASANA (Buckl.) Munz; RP; sandy limestone loams of canyon breaks; April through early June; 48 sheets. COUNTIES: Bailey, Childress, Cottle, Crosby, Dickens, Gaines, Garza, Hale, Hardeman, Hockley, Kent, Lipscomb, Lubbock, Motley, Ochiltree, Parmer, Roberts.

O. HARTWEGII Benth., var. HARTWEGII; Pl, RP; sandy limestone loam of rock out crops in grasslands and canyon breaks; April through early June; 6 sheets. COUNTIES: Cottle, Deaf Smith, Dickens, Motley.

O. HARTWEGII Benth., var. FENDLERI (Gray) Gray; Pl; sandy limestone loams of canyon breaks; April; 2 sheets. COUNTIES: Garza, Lubbock.

O. HETEROPHYLLA Spach., var. RHOMBIPETALA (Nutt.)

Fosberg (O. rhombipetala Nutt.); Pl; deep sands of grasslands and river banks; late June through July; 14 sheets. COUNTIES: Dickens, Gaines, Garza, Gray, Hemphill, Motley.

O. JAMESII Torr. and Gray; Pl; deep sands of stream banks; mid August through September; 10 sheets. COUNTIES: Armstrong, Hemphill, Lipscomb, Ochiltree, Randall.

O. LACINIATA Hill, var. LACINIATA; Pl, Pr, RP; sandy loam of grasslands and prairies especially under heavy use; late April through June; 16 sheets. COUNTIES: Cottle, Dallam, Garza, Hemphill, Lipscomb, Lubbock.

O. LACINIATA Hill, var. GRANDIFLORA (S.Wats.) Robins. (O. grandis (Britt.) Smyth); Pl, Pr; sandy loams of prairies and grasslands especially under heavy use; late March through June; 41 sheets. COUNTIES: Crosby, Dawson, Hardeman, Hemphill, Kent, Lubbock, Lynn, Randall, Terry.

O. LAVANDULAEFOLIA Torr. and Gray, var. LAVANDULAEFOLIA; Pr; sandy loam of rocky out crops in prairies; April through May, later after rains; 4 sheets. COUNTIES: Hutchinson, Lipscomb, Ochiltree.

O. LAVANDULAEFOLIA Torr. and Gray, var. GLANDULOSA Munz; Pl, RP; sands of stream banks and sandy and rocky loam of grasslands and canyon breaks; late March through May; 10 sheets. COUNTIES: Armstrong, Borden, Briscoe, Dawson, Garza, Wheeler.

O. MISSOURIENSIS Sims, var. OKLAHOMENSIS; Pl, CR; sandy limestone loam of cap rock ledges and upper canyon breaks;

May through early July; 3 sheets. COUNTIES: Lubbock.

O. MISSOURIENSIS Sims, var. INCANA Gray; Pl, CR; sandy limestone loams of cap rock ledges and canyon walls; mid May through mid July; 31 sheets. COUNTIES: Armstrong, Crosby, Garza, Hemphill, Hutchinson, Lipscomb, Lubbock, Ochiltree, Potter, Randall, Swisher.

O. SERRULATA Nutt. The varieties used by Munz (1944) could not be satisfactorily used in the materials examined by the author. Varieties serrulata; pinifolia Engelm.; drummondii Torr. and Gray, as described by Munz, would be included here. Dry sands and sandy loams throughout the area but especially in grasslands, canyon bases, and disturbed prairie sites; April through early July; 75 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Cottle, Crosby, Dallam, Floyd, Garza, Gray, Hardeman, Hemphill, Lamb, Lipscomb, Lubbock, Lynn, Motley, Ochiltree, Oldham, Potter, Randall, Roberts, Wheeler.

O. SPECIOSA Nutt., var. SPECIOSA; RP; sandy clay loams of grasslands; late March through early May; 18 sheets. COUNTIES: Borden, Crosby, Dickens, Garza, Lubbock.

O. TRILOBA Nutt.; Pl, RP; tight sandy loams of grasslands; April and late June and July after rains; 8 sheets. COUNTIES: Armstrong, Garza, Lubbock, Ochiltree.

STENOSIPHON

S. VIRGATUS Spach (S. linifolium (Nutt.) Heynh.); Pl, Pr, RP; sandy loams of prairies, grasslands and canyon sides;

August and September; 10 sheets. COUNTIES: Crosby, Gray, Lipscomb, Lubbock, Ochiltree, Oldham, Randall.

UMBELLIFERAE
(Mathias and Constance, 1951)

AMMOSELINUM

A. POPEI Gray; Pl, Pr; sandy loams of prairies and grasslands; mid April through early May; 15 sheets. COUNTIES: Armstrong, Briscoe, Garza, Hemphill, Lubbock, Lynn.

BERULA

B. PUSILLA (Nutt.) Fern.; R; in moist sand or silty sand of spring-fed stream margins; June through August; 7 sheets. COUNTIES: Hutchinson, Lubbock, Oldham.

CICUTA

C. MACULATA L.; R; moist meadows of stream bottoms; late June through August; 15 sheets. COUNTIES: Armstrong, Hemphill, Randall.

CYMOPTERUS

C. ACAULIS (Pursh) Raf.; Pr; sandy loam of prairies; late April; one sheet. COUNTIES: Lipscomb.

C. MONTANUS (Nutt.) Torr. and Gray (including specimens identified as C. macrorhizus Buckley, and reports of C. bulbosus Nelson and C. Fendleri Gray as to specimens examined by the author); Pl, Pr; tight sandy loams of prairies and grasslands; mid March through April; 37 sheets. COUNTIES: Armstrong, Childress, Cottle, Crosby, Dallam,

Dickens, Garza, Gray, Hemphill, Hutchinson, King, Lipscomb, Lubbock, Lynn, Motley.

DAUCUS

D. PUSILLUS Michx.; RP; sandy loam of grasslands; July; one sheet. COUNTIES: Lubbock.

ERYNGIUM

E. DIFFUSUM Torr.; RP; sandy loam of grasslands; August; one sheet. COUNTIES: Dickens.

E. LEAVENWORTHII Torr. and Gray; RP; sands of grasslands; August; one sheet. COUNTIES: Dawson.

EURYTAENIA

E. TEXANA Torr. and Gray; RP; sandy loams of grasslands; 5 sheets. COUNTIES: Dickens, Gaines, Garza.

LOMATIUM

L. DAUCIFOLIUM (Nutt.) Coult. and Rose; Pl; sandy loam of limestone out crops in grasslands; April; one sheet. COUNTIES: Hemphill.

SANICULA

S. CANADENSIS L.; R; moist margins of spring-fed streams; mid June through early July; 6 sheets. COUNTIES: Hemphill.

SPERMOLEPIS

S. ECHINATA (Nutt.) Heller; Pl; sands of sand hills and grasslands; May; 7 sheets. COUNTIES: Hemphill, Lubbock.

CORNACEAE

CORNUS

C. DRUMMONDII Meyer; R; sands adjacent to spring-fed streams; May; 16 sheets. COUNTIES: Hemphill.

GARRYA

G. OVATA Benth.; CR; cap rock ledges; August; one sheet. COUNTIES: Briscoe.

PRIMULACEAE

SAMOLUS

S. EBRACTEATUS H.B.K., ssp. *CUNEATUS* (Small) R. Kunth (*S. cuneatus* Small); R; moist clay banks and margins of spring-fed streams; May through September; 8 sheets. COUNTIES: Collingsworth, Garza, Hemphill, Lubbock, Wheeler.

S. PARVIFLORUS Raf.; R; moist clay banks and margins of sub-irrigated bottomlands, meadows, and spring-fed streams; mid June through early August; 11 sheets. COUNTIES: Armstrong, Garza, Hemphill, Hutchinson, Lubbock, Oldham, Randall.

PLUMBAGINACEAE

LIMONIUM

L. LIMBATUM Small (*L. californicum* (Boiss.) Heller); RP; highly saline sites; July and August; 2 sheets. COUNTIES: Hall.

SAPOTACEAE

BUMELIA
(Cronquist, 1945)

B. LANUGINOSA (Michx.) Pers., var. OBLONGIFOLIA (Nutt.) Clarke; Pl; deep sands of sand hills; July; 2 sheets. COUNTIES: Hemphill.

EBENACEAE

DIOSPYROS

D. VIRGINIANA L., var. VIRGINIANA; R; sands of river bottoms; late May and early June; 4 sheets. COUNTIES: Hemphill.

OLEACEAE

FORESTIERA
(Johnston, 1957, Shinnars, 1950)

F. PUBESCENS Nutt., var. PUBESCENS; Pl; lower breaks of canyons; April and May; 7 sheets. COUNTIES: Armstrong, Briscoe, Randall.

F. PUBESCENS Nutt., var. GLABRIFOLIA Shinnars (the separation of this variety from the typical one above is dubious in as much as both are recognizable in adjacent stands with intermediates frequent); Pl; lower breaks of canyons; April and May; 4 sheets. COUNTIES: Randall.

GENTIANACEAE

EUSTOMA
(Shinnars, 1957)

E. GRANDIFLORUM (Raf.) Shinnars, var. GRANDIFLORUM (E. russellianum (Hook.) Griseb.) Pl, R, RP; tight clay loams

and sandy loams of stream bottomlands and spring-fed seepages of lower canyon breaks; late July and August; 14 sheets.

COUNTIES: Dickens, Garza, Hemphill, Lubbock, Oldham, Randall.

SABATIA
(Wilber, 1955)

S. CAMPESTRIS Nutt., forma CAMPESTRIS; RP; red sandy loams of grasslands; July; 2 sheets. COUNTIES: Dickens.

APOCYNACEAE

AMSONIA

A. CILIATA Walt., var. TEXANA (Gray) Coulter (A. angustifolia Michx.) RP; sandy loam of grassland hills and stream banks; mid April through mid May; 19 sheets. COUNTIES: Briscoe, Cottle, Crosby, Dickens, Lubbock.

APOCYNUM

A. CANNABINUM L., var. GLABERRIMUM A. DC.; Pl, RP; sands of sand hills and stream banks; June through mid July; 9 sheets. COUNTIES: Armstrong, Garza, Hartley, Hutchinson, Lamb, Lipscomb, Roberts.

A. CANNABINUM L., var. HYPERICIFOLIUM Gray (A. sibiricum Jacq.); Pl, R, RP; deep sands of stream banks, late April through June; 18 sheets. COUNTIES: Briscoe, Cottle, Garza, Hemphill, Lamb, Oldham, Swisher.

ASCLEPIADACEAE

ASCLEPIAS
(Woodson, 1954)

A. ARENARIA Torr.; Pl; deep sands of sand hills and stream banks; late June through July; 12 sheets. COUNTIES: Briscoe, Hemphill, Lamb, Lipscomb, Lubbock.

A. ASPERULA (Dcne.) Woods., var. DECUMBENS (Nutt.) Shinn. (Asclepiodora capricornu Woods., A. decumbens Nutt.) Pl, CR, RP; sands and sandy loams of cap rock ledges, prairies and grasslands; late April through June; 51 sheets. COUNTIES: Bailey, Briscoe, Collingsworth, Cottle, Crosby, Dickens, Floyd, Garza, Gray, Hemphill, Lipscomb, Lubbock, Lynn, Motley, Randall.

A. BRACHYSTEPHANA Engelm.; Pr; tight limestone loams of prairies; July through early September; 3 sheets. COUNTIES: Bailey.

A. ENGEIMANNIANA Woods.; Pl, CR, RP; sands and sandy limestone loams of cap rock ledges, canyon sides, stream banks; mid June through July; 34 sheets. COUNTIES: Bailey, Briscoe, Cottle, Crosby, Dickens, Floyd, Hansford, Hutchinson, Lamb, Lipscomb, Lubbock, Ochiltree, Oldham, Randall, Roberts.

A. INCARNATA L.; R; moist margins of spring-fed lakes and streams; August; 7 sheets. COUNTIES: Hemphill.

A. LATIFOLIA (Torr.) Raf.; Pr, RP; tight sandy loams of prairies and grasslands; mid June through July; 13 sheets. COUNTIES: Armstrong, Bailey, Cottle, Floyd, Kent, Lamb,

Lipscomb, Lubbock, Ochiltree.

A. OENOTHEROIDES Cham. and Schlecht.; Pr, RP; tight sandy loams of prairies and grasslands; mid May through July; 4 sheets. COUNTIES: Bailey, Garza.

A. PUMILA (Gray) Vail; Pr, CR; sandy loams of prairies and cap rock ledges; July through mid September; 17 sheets. COUNTIES: Armstrong, Bailey, Crosby, Hartley, Hemphill, Lipscomb, Lubbock, Ochiltree, Randall.

A. SPECIOSA Torr.; R; moist, sub-irrigated bottomlands, meadows, or stream banks; mid May through June; 13 sheets. COUNTIES: Collingsworth, Dallam, Hemphill, Lubbock, Swisher.

A. TUBEROSA L.; Pl, R, RP; deep loose sands of sand hills, stream banks and grasslands; late May through July; 12 sheets. COUNTIES: Armstrong, Briscoe, Hemphill, Hutchinson, Wheeler.

A. VERTICILLATA L. (including Panhandle reports of A. semi-verticillata (Gray) Vail); Pl, RP; sandy loams of grasslands and river banks; July and August; 3 sheets. COUNTIES: Bailey, Hemphill.

A. VIRIDIFLORA Raf., var. VIRIDIFLORA; Pl, CR, RP; sands and sandy loam of sand hills, grasslands, and upper canyon breaks; mid May through July; 24 sheets. COUNTIES: Armstrong, Briscoe, Crosby, Dallam, Floyd, Garza, Hartley, Hemphill, Lipscomb, Lubbock, Motley, Ochiltree, Oldham, Potter, Wheeler.

A. VIRIDIFLORA Raf., var. LANCEOLATA (Ives) Torr.; Pl, CR, RP; sand and sandy loam of cap rock ledges and canyon

sides; June and July; 4 sheets. COUNTIES: Armstrong, Briscoe, Lubbock.

MATELEA
(Shinners, 1964)

M. BIFLORA (Raf.) Woods. (Vincetoxicum biflorum (Raf.) Heller); CR, RP; scandant on shrubs in cap rock ledges and upper canyon breaks; late May through mid July; 4 sheets. COUNTIES: Bailey, Lubbock.

SARCOSTEMMA
(Shinners, 1964)

S. CRISPUM Benth.; Pl, RP; scandant on shrubs or trailing on ground of grasslands; June and July; 5 sheets. COUNTIES: Armstrong, Bailey, Lubbock.

S. CYNANCHOIDES Decne., var. CYNANCHOIDES; Pl, CR, RP; scandant on shrubs in cap rock ledges and upper canyon breaks; August through early September; 7 sheets. COUNTIES: Armstrong, Bailey, Hemphill, Randall.

CONVOLVULACEAE

CONVOLVULUS

C. ARVENSIS L.; Pl, Pr, RP; sands and tight sandy loams of prairies and grasslands; mid April through early August; 47 sheets. COUNTIES: Bailey, Briscoe, Crosby, Dickens, Garza, Hale, Hartley, Lamb, Lubbock, Lynn, Potter, Randall, Swisher.

C. HERMANNIOIDES Gray; Pl, Pr, CR, RP; sands and tight sandy limestone loams of cap rock ledges, canyon breaks, prairies and grasslands; May through July; 13 sheets.

COUNTIES: Bailey, Floyd, Garza, Kent, Lubbock.

C. INCANUS Vahl. (this and the previous species are dubiously distinct in the materials examined); Pl, Pr, RP; sands and tight sandy loams of cap rock ledges, canyon breaks, grasslands and prairies; May through July; 34 sheets.

COUNTIES: Armstrong, Bailey, Cottle, Crosby, Floyd, Garza, Lamb, Lubbock, Ochiltree, Randall.

C. SEPIUM L., var. SEPIUM; R; sands of stream banks; July; 2 sheets. COUNTIES: Ochiltree.

CRESSA

C. TRUXILLENIS H.B.K.; Pr; sandy limestone loam of prairies, June; 3 sheets. COUNTIES: Bailey, Garza.

CUSCUTA (Yunkers, 1943)

C. CUSPIDATA Engelm.; Pl, Pr; parasitic on perennial herbs in prairies and grasslands; mid August through mid September; 8 sheets. COUNTIES: Bailey, Collingsworth, Hemphill.

C. GLOMERATA Choisy. Yunkers (1943) lists this species as occurring in Hemphill County. None seen.

C. SQUAMATA Engelm.; Pr, L; parasitic on perennial herbs, often along margins of playa lakes; June and July; 7 sheets. COUNTIES: Hemphill, Hockley, Lubbock, Yoakum.

EVOLVULUS

E. NUTTALLIANUS R. and S. (E. pilosus Nutt., E. mollis Small); Pl, Pr, RP; sandy loam and sandy limestone loams of

grasslands and prairies; May through mid July; 30 sheets.

COUNTIES: Bailey, Cottle, Crosby, Dallam, Dickens, Hemphill, Lipscomb, Lubbock, Motley, Ochiltree, Palmer, Wheeler.

IPOMOEA

I. LEPTOPHYLLA Torr.; Pl, Pr, RP; deep sands of sand hills, grasslands and prairies; June and July; 17 sheets.

COUNTIES: Bailey, Gray, Hartley, Hemphill, Hockley, Hutchinson, Ochiltree, Oldham, Roberts.

I. PURPUREA (L.) Roth., var. PURPUREA; R; sands of river bottoms; July; one sheet. COUNTIES: Hemphill.

POLEMONIACEAE

GILIA

(Grant, 1954, 1956, Shinnars, 1963, Wherry, 1964)

G. RIGIDULA Benth., ssp. ACEROSA (Gray) Wherry; Pl, CR; sandy limestone loams of cap rock ledges and upper canyon breaks; mid March through June; 42 sheets. COUNTIES: Crosby, Dallam, Gaines, Garza, Hutchinson, Lubbock, Randall, Roberts.

G. LAXIFLORA (Coulter) Osterh.; Pl, Pr; sandy limestone loams of grasslands and prairies; mid April through June; 7 sheets. COUNTIES: Lubbock, Lynn.

G. LONGIFLORA (Torr.) Don; Pl, RP; deep sands and sandy loams of prairies, grasslands, sand hills and canyon breaks; late July through mid October; 22 sheets. COUNTIES: Cottle, Crosby, Dawson, Hemphill, Hutchinson, Lipscomb, Roberts, Wheeler.

HYDROPHYLLACEAE

NAMA

N. HISPIDUM Gray; Pl, RP; sandy loams and sands of grasslands; April through June; 18 sheets. COUNTIES: Cottle, Floyd, Garza, Lubbock, Lynn.

PHACELIA

(Constance, 1949, Shinnars, 1963, Voss, 1937)

P. INTEGRIFOLIA Torr.; Pl, CR, RP; sandy rocky loams of upper cap rock breaks and canyon walls; late April through June; 6 sheets. COUNTIES: Armstrong, Floyd, Garza, Lubbock.

P. POPEI Torr. and Gray, var. POPEI; Pl, RP; sands and sandy loams of grasslands and canyon walls and bases; April through mid May; 13 sheets. COUNTIES: Borden, Crosby, Dickens, Garza, Lubbock, Lynn.

BORAGINACEAE

(Johnston, 1964)

CRYPTANTHA

C. CORYI Johnston; Pl, CR, RP; sand and limestone loams of cap rock ledges, canyon walls, grasslands; mid April through May; 18 sheets. COUNTIES: Garza, Lubbock.

C. JAMESII (Torr.) Payson, var. JAMESII; Pl, Pr; deep sands of sand hills and dry river banks; late May through mid July; 26 sheets. COUNTIES: Bailey, Dallam, Donley, Floyd, Gaines, Gray, Hartley, Hemphill, Hockley, Hutchinson, Lamb, Lipscomb, Lubbock, Ochiltree, Oldham, Roberts.

C. MINIMA Rydb.; Pl, Pr, RP; sands and sandy loams of prairies and grasslands; late April through June; 32 sheets.

COUNTIES: Bailey, Cottle, Collingsworth, Crosby, Dallam, Dickens, Floyd, Gaines, Garza, Hartley, Hemphill, Lubbock, Motley, Ochiltree, Parmer, Roberts, Wheeler.

HELIOTROPIUM

H. CONVOLVULACEUM (Nutt.) Gray; Pl; deep sands of sand hills and stream banks; late June through early October; 9 sheets. COUNTIES: Dallam, Hemphill, Lamb, Lipscomb, Roberts.

H. CURASSAVICUM L., var. OBOVATUM DC.; L; margins of saline playa lakes; July through early August; 2 sheets. COUNTIES: Bailey, Randall.

H. CURASSAVICUM L., var. XEROPHYLLUM (Cockerell) Nels. and Macbr.; L; margins of saline playa lakes; mid June through mid September; 5 sheets. COUNTIES: Bailey, Lubbock, Lynn.

LAPPULA

L. REDOWSKII (Hornem.) Greene (Myosotis redowskii Hornem.); Pl, Pr, RP; sands and sandy loams of prairies and grasslands; mid April through June; 44 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Collingsworth, Cottle, Gaines, Garza, Gray, Hemphill, Lipscomb, Lubbock, Motley, Ochiltree, Oldham, Randall, Roberts, Wheeler.

L. TEXANA (Scheele) Greene (Echinospermum texanum Scheele); Pl, Pr; sands and sandy loams of grasslands and prairies; April to August; 11 sheets. COUNTIES: Bailey, Garza, Motley, Lubbock.

LITHOSPERMUM

L. CAROLINIENSE (Walt.) MacM. (Anonymos caroliniense Walt.); Pl; deep sands of sand hills; late May through mid June; 8 sheets. COUNTIES: Wheeler.

L. INCISUM Lehm.; Pl, Pr, RP; sandy loams and sands of grasslands and prairies; May and June; 85 sheets. COUNTIES: Borden, Bailey, Briscoe, Childress, Cottle, Crosby, Dallam, Dickens, Garza, Hartley, Hemphill, Hutchinson, Kent, Lamb, Lipscomb, Lubbock, Lynn, Motley, Ochiltree, Randall, Roberts, Wheeler.

VERBENACEAE
(Moldenke, 1942)

LIPPIA

L. CUNEIFOLIA (Torr.) Steud. (Phyla cuneifolia Torr.); Pl, Pr, RP, L; sandy loam and clay loams of prairies, grasslands and especially in margins of playa lakes; late May through August; 43 sheets. COUNTIES: Armstrong, Bailey, Carson, Dallam, Floyd, Garza, Hartley, Lipscomb, Lubbock, Lynn, Parmer, Randall, Swisher.

L. LANCEOLATA Michx. (Phyla lanceolata (Michx.) Greene); R; moist sands adjacent to streams; late June through early October; 12 sheets. COUNTIES: Hemphill, Lubbock.

VERBENA

V. BIPINNATIFIDA Torr. (including specimens which could be assigned to V. ambrosifolia Rydb., V. ciliata Benth., but because of intergradation of diagnostic characters, could not

be consistently recognized by the author.); Pl, Pr, RP; sands and sandy loams of low elevation prairies, grasslands, dry stream banks; mid April through June; 90 sheets. COUNTIES: Bailey, Cottle, Crosby, Dawson, Dickens, Floyd, Garza, Hardeman, Hartley, Hemphill, Hutchinson, Kent, King, Lubbock, Lynn, Motley, Ochiltree, Randall.

V. BRACTEATA Lag. and Rodr.; Pl, Pr, RP, L; sand and clay loams particularly in disturbed areas of prairies and grasslands, often very abundant in Prairie Dog Towns and the outer edges of playa lakes; April to late September; 61 sheets. COUNTIES: Armstrong, Bailey, Dallam, Dawson, Dickens, Floyd, Garza, Hartley, Hemphill, Hockley, Hutchinson, Lamb, Lipscomb, Lubbock, Lynn, Ochiltree, Parmer, Randall, Roberts, Terry, Wheeler.

V. HALEI Small; RP; tight limestone loams of disturbed grasslands; May; 2 sheets. COUNTIES: Garza.

V. Hastata L.; R; moist meadows of stream bottoms; August and September; 8 sheets. COUNTIES: Hemphill, Oldham.

V. PLICATA Greene; Pl, RP; sandy loams of grasslands and gravel hills; late April through mid June; 62 sheets. COUNTIES: Briscoe, Childress, Cottle, Crosby, Dawson, Dickens, Gaines, Garza, King, Lubbock, Lynn, Motley.

V. PUMILA Greene; Pl, RP; sands and sandy loams of grasslands; early March through early May; 22 sheets. COUNTIES: Armstrong, Bailey, Childress, Garza, Lubbock, Motley, Terry.

V. STRICTA Vent.; Pl, R; sands of stream bottoms; mid June through August; 17 sheets. COUNTIES: Hemphill.

V. URTICIFOLIA L.; R; moist meadows of stream bottoms; September and early October; 4 sheets. COUNTIES: Hemphill.

LABIATAE

HEDEOMA

H. DRUMMONDII Benth. (incl. var. drummondii and var. reverchonii Gray and E. sancta Small); Pl, CR, RP; rocky sandy loams of cap rock breaks and canyon walls; late May through early July; 24 sheets. COUNTIES: Bailey, Cottle, Dickens, Floyd, Hartley, Hemphill, Kent, Lipscomb, Lubbock, Motley, Ochiltree.

LAMIUM

L. AMPLEXICAULE L.; waste and cultivated sandy loams; March through mid May; 24 sheets. COUNTIES: Cottle, Garza, Hale, Hutchinson, Lubbock.

LYCOPUS

(Henderson, 1962)

L. AMERICANUS Muhl., var. SCARBIFOLIUS Fern. (L. sinuatus L.); R; moist soils of stream-bottom meadows; late July through early October; 5 sheets. COUNTIES: Hemphill, Oldham.

L. ASPER Greene; R; moist soils of stream-bottom meadows; August; 2 sheets. COUNTIES: Hemphill.

MARRUBIUM

M. VULGARE L.; Pl, Pr, RP; sands and sandy loams of disturbed sites in grasslands and prairies; mid May through June; 7 sheets. COUNTIES: Dallam, Lubbock.

MENTHA

M. ARVENSIS L.; R; moist soil of stream-bottom meadows; late June through early September; 4 sheets. COUNTIES: Hemphill, Wheeler.

MONARDA

(McClintock and Epling, 1942, Shinnars, 1953)

M. CITRIODORA Cerv. (M. dispersa Small); Pl, RP; sands of canyon walls and bases and stream banks; mid May through mid July; 34 sheets. COUNTIES: Briscoe, Cottle, Crosby, Dickens, Floyd, Garza, Kent, Lubbock, Ochiltree.

M. PECTINATA Nuttall; Pl, Pr, RP; sandy loams and sands of sand hills, prairies and grasslands; late April through early July; 30 sheets. COUNTIES: Armstrong, Bailey, Cochran, Cottle, Dallam, Garza, Hartley, Hemphill, Hockley, Hutchinson, Lubbock, Lynn.

M. PUNCTATA L., var. OCCIDENTALIS (Epl.) Palm. and Steyerl.; Pl, Pr, CR, RP; sands and sandy limestone loams of prairies, grasslands and canyon breaks; May and June; 26 sheets. COUNTIES: Bailey, Briscoe, Crosby, Dickens, Hemphill, Hockley, Kent, Lamb, Lipscomb, Lubbock, Lynn, Motley, Roberts, Terry, Wheeler.

SALVIA
(Epling, 1946)

S. AZUREA Lam., var. GRANDIFLORA Benth.; Pl; deep sands of sand hills; mid July through early October; 8 sheets. COUNTIES: Hemphill, Lipscomb.

S. REFLEXA Hornem. (S. lancefolia Poir.); Pr; sandy loam of prairies; late August through September; 3 sheets. COUNTIES: Collingsworth, Ochiltree, Sherman.

SCUTELLARIA
(Epling, 1942)

S. DRUMMONDII Benth.; RP; sandy loams of grasslands; mid March through mid May; 3 sheets. COUNTIES: Borden, Garza.

S. GALERICULATA L.; R; moist meadows of streams; July and September; 3 sheets. COUNTIES: Hemphill.

S. LATERIFLORA L.; R; moist soils of stream-bottom meadows; early July through August; 6 sheets. COUNTIES: Hemphill, Oldham, Wheeler.

S. RESINOSA Torr. var. RESINOSA; Pl, CR, RP; limestone rocks and sandy loams of cap rock ledges and breaks; April through early October; 37 sheets. COUNTIES: Borden, Collingsworth, Cottle, Crosby, Dickens, Gray, Hemphill, Hutchinson, Lipscomb, Lubbock, Motley, Ochiltree, Potter, Roberts, Wheeler.

S. WRIGHTII Gray, forma WRIGHTII (S. resinosa Torr., var. brevifolia (Gray) Penland); RP; rocky out crops of grass lands; 3 sheets. COUNTIES: Cottle, Hemphill, Motley.

TEUCRIUM

T. CANADENSE L.; R; moist soils of stream banks; late June through mid August; 14 sheets. COUNTIES: Hemphill, Randall, Roberts.

T. LACINIATUM Torr.; Pl, Pr, RP; sandy loams of prairies and grasslands; late April through June; 67 sheets. COUNTIES: Bailey, Borden, Crosby, Dickens, Gaines, Garza, King, Lubbock, Lynn, Motley, Oldham, Parmer, Potter, Wheeler.

SOLANACEAE

CHAMAESARACHA

C. CORONOPUS (Dunal) Gray; Pl; dry sands of river banks; mid June through early September; 3 sheets. COUNTIES: Lubbock, Oldham.

C. CONIOIDES (Moric.) Britt. (C. sordida (Dunal) Gray of Texas authors); Pl, Pr, RP; sands and sandy loam of prairies and grasslands, particularly under disturbance; mid April through mid June; 50 sheets. COUNTIES: Bailey, Cottle, Crosby, Dallam, Dickens, Floyd, Garza, Hale, Harde-
man, Hartley, Hemphill, Hockley, Hutchinson, Lubbock, Lynn, Oldham, Randall, Roberts, Terry.

DATURA

(Barkley, 1959)

D. STRAMONIUM L.; R; sands of stream banks; 4 sheets. COUNTIES: Hemphill, Randall, Swisher.

LYCIUM
(Hitchcock, 1932)

L. BERLANDIERI Dunal; Pl; limestone of lower breaks of canyons; August through early September; 4 sheets. COUNTIES: Lubbock, Randall.

PHYSALIS
(Waterfall, 1958)

P. ANGULATA L., var. PENDULA (Rydb.) Waterfall; R; moist sands adjacent to streams; July and August; 3 sheets. COUNTIES: Hemphill.

P. VISCOSA L., var. CINERASCENS (Dunal) Waterfall; Pl, RP; sands and sandy loams of grasslands and lower canyon breaks; late April through mid August; 59 sheets. COUNTIES: Bailey, Briscoe, Cottle, Crosby, Dickens, Donley, Floyd, Garza, Gray, Hale, Hemphill, Hockley, Lubbock, Lynn.

P. VIRGINIANA Mill., var. SONORAE (Torr.) Waterfall; Pl, R; sands of stream banks; 9 sheets. COUNTIES: Hemphill, Ochiltree, Roberts, Swisher, Wheeler.

P. VIRGINIANA Mill., var. HISPIDA Waterfall; Pl, CR, RP; sands and sandy loams of sand hills, grasslands, cap rock ledges and upper canyon breaks; late May through early October; 16 sheets. COUNTIES: Floyd, Gray, Hartley, Hemphill, Lipscomb, Potter, Roberts, Wheeler.

P. LOBATA Torr. (Quincula lobata Britt.); Pl, Pr, RP; sands and sandy loams of prairies and grasslands; April through mid August; 58 sheets. COUNTIES: Borden, Briscoe, Childress, Crosby, Dickens, Floyd, Garza, Hardeman, Hemphill,

King, Lamb, Lubbock, Lynn, Ochiltree, Randall, Roberts.

SOLANUM

S. CAROLINENSE L., forma CAROLINENSE; Pl, R; sands of stream banks; mid June through July; 4 sheets. COUNTIES: Hemphill.

S. ELAEAGNIFOLIUM Cav., forma ELAEAGNIFOLIUM; Pl, R, Pr, RP; sands and sandy loams of all areas, especially under disturbance; May through June; 73 sheets. COUNTIES: Bailey, Briscoe, Cottle, Crosby, Dallam, Dickens, Floyd, Garza, Hale, Hardeman, Hartley, Hemphill, Hockley, Hutchinson, Lamb, Lubbock, Lynn, Randall, Swisher, Wheeler.

S. ELAEAGNIFOLIUM Cav., forma ALBIFLORUM Cockerell; Pl; deep sands of sand hills; June; 5 sheets. COUNTIES: Hemphill, Lamb, Wheeler.

S. NIGRUM L., var. AMERICANUM (Mill.) Schulz; Pl, R; sands of sand hills and stream margins; late May through early October; 13 sheets. COUNTIES: Castro, Hemphill, Lubbock, Ochiltree.

S. ROSTRATUM Dunal; Pl, Pr, RP; sands and sandy loams of grasslands and prairies under disturbance; mid June through October; 17 sheets. COUNTIES: Armstrong, Bailey, Floyd, Garza, Hale, Hemphill, Lubbock.

S. TORREYI Gray, forma TORREYI (S. dimidiatum Raf.); R; sands adjacent to streams; June and July; 4 sheets. COUNTIES: Lubbock.

S. TRIFLORUM Nutt.; Pl; deep loose sands of sand hills; June; 5 sheets. COUNTIES: Armstrong, Deaf Smith, Hemphill.

SCROPHULARIACEAE
(Pennell, 1935, 1941)

BACOPA

B. ROTUNDIFOLIA (Michx.) Wettst. (Macuillamia rotundifolia (Michx.) Raf.); Pl, L; moist sands of canyon bottom streams and playa lakes; mid June through mid July; 3 sheets. COUNTIES: Bailey, Castro.

CASTILLEJA
(Pennell, 1941)

C. SESSILIFLORA Pursh; Pl, CR, RP; sandy limestone loams of cap rock ledges, canyon walls and grasslands; April through May; 33 sheets. COUNTIES: Armstrong, Bailey, Childress, Collingsworth, Cottle, Crosby, Garza, Lubbock, Randall.

LINARIA
(Kral, 1955)

L. CANADENSIS (L.) Dumont, var. TEXANA (Scheele) Fern; Pl, Pr, RP; sands of sand hills and sandy loams of prairies and grasslands; early April through early June; 12 sheets. COUNTIES: Cottle, Hemphill, Lubbock, Motley, Wheeler.

LINDERNIA

L. ANAGALLIDEA (Michx.) Pennell. Cited by Pennell (1941) for Crosby County. None seen.

MIMULUS
(Grant, 1925)

M. GLABRATUS H.B.K.; Pl, R; moist soils of stream margins; mid June through early July; 9 sheets. COUNTIES: Dallam, Hartley, Hemphill.

PENSTEMON

P. ALBIDUS Nutt.; Pl, Pr, RP; sand and limestone loams of cap rock ledges and canyon breaks; late April through June; 68 sheets. COUNTIES: Armstrong, Bailey, Cottle, Crosby, Dickens, Garza, Gray, Hartley, Lamb, Lubbock, Ochiltree, Potter, Roberts.

P. AMBIGUUS Torrey; Pl, Pr; sands of prairies, grasslands, and sand hills; May through June; 30 sheets. COUNTIES: Bailey, Crosby, Dallam, Dickens, Garza, Hartley, Hockley, Hutchinson, Lamb, Lubbock, Oldham, Terry.

P. BUCKLEYI Pennell; Pl, Pr, RP; sands of sand hills and grasslands; April through early June; 8 sheets. COUNTIES: Hemphill, Kent, Lubbock, Yoakum.

P. COBAEA Nutt.; RP; sandstone and limestone ledges of grasslands; May; 3 sheets. COUNTIES: Collingsworth, King.

P. FENDLERI Torr. and Gray; Pl, Pr, RP; gravels, sands, and sandy loams of prairies and grasslands; April through mid May; 70 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Castro, Childress, Cottle, Dallam, Dickens, Floyd, Garza, Hemphill, Lipscomb, Lubbock, Motley, Ochiltree, Randall, Roberts, Swisher, Terry, Wheeler.

VERONICA

V. PEREGRINA L., var. XALAPENSIS (H.B.K.) Pennell; R, L; moist soils of stream banks and playa lakes; mid April through mid May; 5 sheets. COUNTIES: Armstrong, Childress, Lubbock, Wheeler.

BIGNONIACEAE

CATALPA

C. SPECIOSA Warder. Frequently planted at home-sites along streams and in public places. Persisting but not observed to be spreading. Flowering in late May or June.

CHILOPSIS

C. LINEARIS (Cav.) DC., var. LINEARIS; Frequently planted at home-sites and along roadsides throughout the southern half of the area. Not known to occur naturally but persisting where planted. Flowering in late June and early July.

MARTYNIACEAE

PROBOSCIDEA

P. LOUISIANICA (Mill.) Thel. (Martynia louisianica Mill.); Pl, Pr, RP; sands and sandy loams of disturbed prairies and grasslands; mid June through mid July; 13 sheets. COUNTIES: Bailey, Dickens, Garza, Hemphill, Lubbock, Ochiltree, Randall, Swisher.

OROBANCHACEAE

OROBANCHE

O. LUDOVICIANA Nutt.; Pl, Pr, RP; parasitic on roots of shrubs in sands and sandy loams of sand hills, grasslands and prairies; June through September; 9 sheets.

COUNTIES: Armstrong, Dallam, Garza, Hall, Hemphill, Hartley.

O. MULTIFLORA Nutt.; RP; parasitic on roots of shrubs in sands adjacent to streams; May; 2 sheets; COUNTIES: Crosby.

LENTIBULARIACEAE

UTRICULARIA

U. VULGARIS L.; R; still waters of spring-fed stream; late May and early June; 5 sheets. COUNTIES: Wheeler.

ACANTHACEAE

DYSCHORISTE
(Kobuski, 1928)

D. LINEARIS (Torr. and Gray) Kuntze; Pl, RP; sandy limestone loam of canyon breaks; May through mid July; 18 sheets. COUNTIES: Crosby, Dawson, Dickens, Floyd, Garza, Kent.

RUELLIA

(Tharp and Barkley, 1949)

R. HUMILIS Nutt.; Pl; dry sandy loams of stream banks; August; 2 sheets. COUNTIES: Wheeler.

PLANTAGINACEAE

PLANTAGO

P. PURSHII R. and S., var. PURSHII (the varietal separations used by Shinners (1950) do not hold completely in the Texas Panhandle and are used by the author with reservations); Pl, Pr, CR, RP; sands and sandy loams of sand hills, grasslands and prairies; mid April through mid June; 18 sheets. COUNTIES: Bailey, Childress, Dallam, Garza, Hemphill, Hutchinson, Kent, Lubbock, Ochiltree, Wheeler.

P. PURSHII R. and S., var. BREVISCAPA Shinners. The characteristics attributed to this variety by Shinners (1950) can be attributed to part of almost any population of P. purshii examined in the Texas Panhandle. The author can not apply this name to any specific collection.

P. PURSHII R. and S., var. SPINULOSA (Decne.) Shinners (see notes on varieties above); Pl, Pr, CR, RP; sands and sandy loams of sand hills, grasslands and prairies; mid April through mid June; 27 sheets. COUNTIES: Armstrong, Crosby, Dallam, Floyd, Garza, Hemphill, King, Lubbock, Motley, Ochiltree, Roberts.

P. RHODOSPERMA Dcne.; Pl, Pr, RP; sands, sandy loams, limestone gravels of grasslands, sandhills and canyon bases; mid April through mid June; 36 sheets. COUNTIES: Briscoe, Cottle, Crosby, Dickens, Garza, Hemphill, King, Lubbock, Motley, Wheeler.

P. WRIGHTIANA Dcne.; RP; red sands of rolling eroded grasslands; late April through June; 5 sheets. COUNTIES:

Borden, Dickens, Garza, King, Lubbock.

RUBIACEAE

CEPHALANTHUS

C. OCCIDENTALIS L.; R; moist soils of stream banks; June and July; 11 sheets. COUNTIES: Deaf Smith, Hemphill, Hutchinson, Lipscomb, Roberts.

GALIUM

G. APARINE L.; R; moist sand of banks of spring-fed streams; May; 8 sheets. COUNTIES: Hemphill, Wheeler.

HEDYOTIS

H. ACEROSA Gray; CR; limestone loams of cap rock ledges and upper canyon breaks; June; 16 sheets. COUNTIES: Crosby, Garza, Hartley, Kent, Lubbock.

H. HUMIFUSA Gray; Pl; deep sands of sand hills and stream banks; late April through June; 7 sheets. COUNTIES: Crosby, Garza, Hemphill, Motley, Wheeler.

H. NIGRICANS (Lam.) Fosb. (including var. nigricans and var. rigiduiscula Gray); Pl, RP; sandy limestone soils of cap rock ledges and upper canyon breaks; mid June through mid September; 37 sheets. COUNTIES: Armstrong, Briscoe, Cottle, Dickens, Floyd, Garza, Hemphill, Lipscomb, Lubbock, Moore, Motley, Ochiltree, Roberts.

CAPRIFOLIACEAE

LONICERA

L. ALBIFLORA Torr. and Gray; Pl; sandy limestone loams of moist sites of canyon sides; late April and early June; 9 sheets. COUNTIES: Armstrong, Briscoe, Crosby, Garza, Randall.

CUCURBITACEAE

CUCURBITA

C. FOETIDISSIMA H.B.K.; Pl, Pr, RP; sands and sandy loams of sand hills, prairies and grasslands; May through June; 12 sheets. COUNTIES: Bailey, Briscoe, Dallam, Hale, Hartley, Hemphill, Lubbock.

CYCLANTHERA

C. DISSECTA (Torr. and Gray) Arn.; Pl; sands of creek banks; September; one sheet. COUNTIES: Ochiltree.

IBERVILLEA

I. LINDHEIMERI (Gray) Greene; Pl; scandant on shrubs of canyon sides; August; 3 sheets. COUNTIES: Armstrong.

MELOTHRIA

M. PENDULA L., var. CHLOROCARPA (Engelm.) Cogn.; R; scandant on low shrubs along stream bank; August; 2 sheets. COUNTIES: Wheeler.

CAMPANULACEAE
(McVaugh, 1951)

LOBELIA

L. CARDINALIS L., var. PHYLLOSTACHYA (Engelm) McVaugh;
R; moist soils of stream margins; August and September; 15
sheets. COUNTIES: Briscoe, Crosby, Hemphill, Hutchinson,
Lipscomb, Randall.

SPECULARIA

S. HOLZINGERI (McVaugh) Fern. (Triodanis holzingeri
McVaugh); Pl, Pr; sands and sandy loams of sand hills and
prairies; late May through June; 8 sheets. COUNTIES:
Hemphill, Lipscomb, Lubbock.

COMPOSITAE

ACHILLEA

A. LANULOSA Nutt., forma LANULOSA; Pl, Pr; tight sandy
loams of prairies and grasslands; late April through May;
4 sheets. COUNTIES: Baylor, Crosby, Gray, Hemphill.

AGOSERIS

A. CUSPIDATA (Pursh) Raf.; Pr; tight sandy loams of
prairies; early May; 2 sheets. COUNTIES: Lipscomb.

AMBLYOLEPIS

A. SETIGERA DC.; RP; sandy loams and sands of grass-
lands especially in disturbed sites; April through mid June;
8 sheets. COUNTIES: Borden, Dawson, Kent, Lubbock.

AMBROSIA

A. *PSILOSTACHYA* DC., var. *LINDHEIMERIANA* (Scheele) Blankenship; Pl, Pr, RP; sands and sandy loams of prairies, grasslands and stream banks; August through early October; 28 sheets. COUNTIES: Garza, Hall, Hemphill, Hutchinson, Lipscomb, Lubbock, Ochiltree.

A *TRIFIDA* L., var. *TEXANA* Scheele; R; sands of stream bottom; September; 3 sheets. COUNTIES: Hemphill.

APHANOSTEPHUS
(Shinners, 1946)

A. *PILOSUS* Buckl.; Pl; sands of grassland; mid May through early July; 2 sheets. COUNTIES: Lubbock.

A. *RAMOSISSIMUS* DC.; Pl, Pr; sands and sandy loams of prairies, grasslands and stream banks; 25 sheets. COUNTIES: Childress, Cottle, Crosby, Floyd, Garza, Hockley, Lipscomb, Lubbock, Lynn, Motley, Ochiltree, Roberts.

A. *RIDDELLII* Torr. and Gray; Pl, RP; sands and red sandy loams of grasslands; late April through June; 17 sheets. COUNTIES: Cottle, Crosby, Dickens, Garza, Hartley, Lubbock, Lynn.

A. *SKIRRHOBASIS* (DC.) Trel., var. *SKIRRHOBASIS*: Pl, RP; sands and sandy loams of grasslands, sand hills and stream banks; late June through mid July; 14 sheets. COUNTIES: Bailey, Cochran, Cottle, Hall, Hemphill, Lamb, Lubbock.

ARTEMISIA

A. *BIGELOVI* Gray. Reported for the Texas Panhandle by Gould (1962). None seen.

A. CARRUTHII Wood (A. kansana Britt., A. ludoviciana Nutt., var. Wrightii pro parte); Pl; sands of sand hills; September; 2 sheets. COUNTIES: Hemphill.

A. CAUDATA Michx.; Pl; sands of sand hills and stream banks; September through early October; 11 sheets. COUNTIES: Hemphill, Lipscomb, Lubbock, Ochiltree, Parmer.

A. FILIFOLIA Torr.; Pl, Pr, RP; sands of sand hills, prairies and grasslands; late August through early October; 20 sheets. COUNTIES: Dickens, Garza, Hemphill, Hockley, Hutchinson, Lamb, Lipscomb, Lubbock, Lynn, Sherman.

A. LUDOVICIANA Nutt., var. LUDOVICIANA (A. gnaphalodes Nutt.); Pl, Pr; sands and limestone loams of canyon breaks and margins of grasslands and prairies; September through early October; 10 sheets. COUNTIES: Garza, Hansford, Hockley, Ochiltree, Parmer, Randall.

A. LUDOVICIANA Nutt., var. ALBULA (Woot.) Shinnery; Pl; tight clay loams in sand hill swales; September and October; 2 sheets. COUNTIES: Hemphill.

A. LUDOVICIANA Nutt., var. MEXICANA (Willd.) Fern. (A. mexicana Willd., A. lindheimeriana Scheele.); Pl; sand and limestone loams of canyon sides; August; 2 sheets. COUNTIES: Armstrong, Oldham.

ASTER

A. ERICOIDES L. (A. multiflorus Ait.); Pl, Pr; sands and sandy loams of prairies and grasslands; August through September; 24 sheets. COUNTIES: Armstrong, Garza, Gray,

Hemphill, Hutchinson, Lipscomb, Lubbock.

A. FENDLERI Gray; Pl; limestone and sand loams of canyon sides; late June through September; 8 sheets. COUNTIES: Hemphill, Hutchinson, Lipscomb, Ochiltree, Roberts.

A. LEUCELENE Blake (Leucelene ericoides (Torr.) Greene); Pl, Pr, RP; sands and sandy loams of prairies and grasslands; mid April through mid July; 98 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Childress, Cottle, Crosby, Dallam, Dawson, Deaf Smith, Garza, Gray, Hall, Hartley, Hemphill, Hutchinson, Kent, Lipscomb, Lubbock, Lynn, Motley, Ochiltree, Parmer, Randall, Sherman, Wheeler.

A. OBLONGIFOLIUS Nutt.; Pl; loose sands of sand hills; September and early October; 3 sheets. COUNTIES: Lipscomb.

A. PRAEALTUS Poir (A. salicifolius Lam.); Pl; sands adjacent to streams; September and early October; 5 sheets. COUNTIES: Hemphill, Randall.

A. SUBULATUS Michx., var. LIGULATUS Shinnars; Pl, Pr, RP, L; sands and sandy loams of prairies, grasslands, sand hills and margins of playa lakes; August and September; 13 sheets. COUNTIES: Briscoe, Crosby, Hemphill, Hockley, Lipscomb, Lubbock, Roberts.

A. TANACETIFOLIUS H.B.K. (Machaeranthera tanacetifolius (H.B.K.) Shinnars); Pl, Pr, RP; sands and sandy loams of prairies and grasslands; mid April through June; 81 sheets. COUNTIES: Bailey, Borden, Briscoe, Dawson, Floyd, Gaines, Garza, Gray, Hale, Hall, Hartley, Hemphill, Hutchinson, Lubbock, Lynn, Ochiltree, Randall, Roberts.

BACCHARIS
(Mahler and Waterfall, 1964)

B. SALICINA Torr. and Gray; R, L; moist sites of stream margins and playa lakes; late June through August; 28 sheets. COUNTIES: Bailey, Briscoe, Garza, Hemphill, Hutchinson, Lipscomb, Lubbock, Oldham, Randall, Roberts.

B. WRIGHTII Gray; Pl; sandy loam of prairie margins and canyon breaks; mid May through June; 2 sheets. COUNTIES: Castro, Lubbock.

BAHIA
(Ellison, 1964)

B. PEDATA Gray; Pl; red sandy loams of stream banks; July; 2 sheets. COUNTIES: Dallam.

B. WOODHOUSEI Gray; Pr, L; tight clay loam of prairies and margins of playa lakes; late May through early July; 30 sheets. COUNTIES: Bailey, Carson, Castro, Dallam, Hartley, Hansford, Lamb, Lubbock, Lynn, Ochiltree, Oldham, Swisher.

BERLANDIERA
(Turner, 1951)

B. LYRATA Benth., var. LYRATA; Pl, Pr, RP; sands and sandy limestone loams of prairies, grasslands and canyon sides; mid April through mid September; 39 sheets. COUNTIES: Borden, Crosby, Deaf Smith, Dickens, Floyd, Gaines, Garza, Lamb, Lubbock, Lynn, Parmer.

B. TEXANA DC., var. TEXANA; Pl; sands of sand hills and sandy limestone loams of upper canyon breaks; mid June

through mid August; 16 sheets. COUNTIES: Briscoe, Donley, Hartley, Hemphill, Lipscomb, Roberts, Wheeler.

BIDENS

(Sherff and Alexander, 1955)

B. FRONDOSA L., var. FRONDOSA; R; moist soils adjacent to spring-fed lakes and streams; August through early October; 3 sheets. COUNTIES: Hemphill.

B. TRIPARTITA L. (including B. comosa (Gray) Wieg., B. connata Muhl, B. acuta Rydb.); R; moist sites of margins of spring-fed lakes and streams; October; 5 sheets. COUNTIES: Hemphill.

BRICKELLIA

B. CALIFORNICA (Torr. and Gray) Gray. Reported for Palo Duro Canyon (Randall, Armstrong, Briscoe Counties) by Palmer (1920) and listed for the Texas Panhandle by Gould (1962). None seen.

CENTAUREA

C. AMERICANA Nutt.; Pl, RP; sands and sandy limestone loams of grasslands and canyon walls; mid May through June; 17 sheets. COUNTIES: Armstrong, Briscoe, Garza, Hemphill, Lubbock.

CHRYSOTHAMNUS

C. PULCHELLUS (Gray) Greene, var. BAILEYI (Woot. and Standl.) Blake; Pl; sands of sand hills; September; 5 sheets. COUNTIES: Lamb, Lynn, Parmer, Roberts.

CHRYSOPSIS

C. VILLOSA (Pursh) Nutt., var. CANESCENS Gray (C. berlandieri Greene, Heterotheca canescens (DC.) Shinnery); Pl, CR; sands of sandhills and sandy limestone loam of cap rock ledges and canyon sides; June through mid July; 25 sheets. COUNTIES: Bailey, Crosby, Dickens, Floyd, Garza, Hemphill, Lamb, Lipscomb, Lubbock, Ochiltree, Randall, Swisher, Terry.

C. VILLOSA (Pursh) Nutt., var. STENOPHYLLA Gray (C. stenophylla (Torr. and Gray) Greene, Heterotheca stenophylla (Torr. and Gray) Shinnery); Pl, CR, RP; sands of sand hills and sandy limestone loams cap rock ledges and canyon sides; July and August; 7 sheets. COUNTIES: Hemphill, Hutchinson, Lipscomb, Lubbock, Potter, Roberts.

CICHORIUM

C. INTYBUS L.; Pr; tight sandy loams of disturbed prairie sites; late May and early June; 3 sheets. COUNTIES: Gray.

CIRSIUM

(Howell, 1943, 1959)

C. OCHROCENTRUM Gray; Pl, Pr, RP; sands and sandy limestone loams of prairies, grasslands and sand hills; June and July; 21 sheets. COUNTIES: Bailey, Carson, Dallam, Dickens, Floyd, Garza, Hartley, Hemphill, Lamb, Lubbock, Lynn, Ochiltree, Potter, Roberts.

C. TEXANUM Buckl., var TEXANUM (C. austrimum (Small) E. D. Schulz); Pl, RP; sands and loose sandy limestone loams of grasslands; mid April through May; 18 sheets. COUNTIES: Borden, Dickens, Garza, Lubbock.

C. UNDULATUM (Nutt.) Spreng. (C. megacephalum (Gray) Cockerell); Pl, RP; sands and limestone loams of stream banks and lower canyon breaks; late May through early July; 13 sheets. COUNTIES: Armstrong, Crosby, Garza, Hemphill, Hutchinson.

CONYZA
(Shinners, 1949)

C. CANADENSIS (L.) Cronq., var. CANADENSIS; Pl, RP; deep sands of sand hills and stream banks; late July through September; 8 sheets. COUNTIES: Crosby, Garza, Hemphill, Lipscomb, Lubbock, Sherman.

C. CANADENSIS (L.) Cronq., var. GLABRATA; Pl; sands of stream banks; September; 5 sheets. COUNTIES: Crosby, Hemphill, Roberts.

COREOPSIS
(Sherff and Alexander, 1955)

C. CARDAMINEFOLIA (DC.) Nutt.; RP; stream banks; June; one sheet. COUNTIES: Lubbock.

C. TINCTORIA Nutt.; Pl, RP, L; tight sandy loams of margins of playa lakes and stream banks; late June through August; 5 sheets. COUNTIES: Dallam, Floyd, Swisher, Yoakum.

CREPIS
(Johnston, 1965)

C. RUNCINATA Torr. and Gray, var. RUNCINATA. Reported from Dallam County, July 8, 1963 by Johnston (1965) as new to Texas. None seen.

DYSSODIA
(Johnston, 1956)

D. PAPPOSA (Nutt.) Rydb.; Pl, RP; sands and sandy loams of prairie margins, grasslands and sand hills; late June through September; 11 sheets. COUNTIES: Armstrong, Dallam, Hockley, Hutchinson, Lamb, Moore, Parmer, Roberts.

ECHINACEA
(Sharp, 1935)

E. ANGUSTIFOLIA DC., var ANGUSTIFOLIA; Pl, CR, RP; limestone loams of cap rock ledges and upper canyon breaks and gravel ridges of grasslands; June and July; 23 sheets. COUNTIES: Armstrong, Briscoe, Crosby, Gray, Hemphill, Lubbock, Ochiltree, Potter, Roberts.

ECLIPTA

E. ALBA (L.) Hassk.; R; moist sites adjacent to spring-fed streams and moist stream-bottom meadows; August and September; 3 sheets. COUNTIES: Hemphill.

ENGELMANNIA

E. PINNATIFIDA Torr. and Gray; Pl, Pr, RP; sands and sandy limestone loams of prairies, grasslands and canyon breaks; late April through September; 61 sheets. COUNTIES:

Bailey, Collingsworth, Crosby, Dallam, Floyd, Garza, Hartley, Hemphill, Hutchinson, Kent, Lipscomb, Lubbock, Lynn, Motley, Ochiltree, Parmer, Terry, Wheeler.

ERIGERON
(Cronquist, 1947)

E. BELLIDIATRUM Nutt., var. BELLIDIATRUM; Pl, RP; sands and loose sandy loam of grasslands and lower canyon breaks; May through July; 23 sheets. COUNTIES: Briscoe, Castro, Dallam, Floyd, Hemphill, Hutchinson, Lamb, Lipscomb, Lubbock, Potter, Roberts.

E. DIVERGENS Torr. and Gray, var. CINEREUS Gray (E. modestus Gray, E. nudiflorus Buckl.); Pl, Pr; tight limestone clay loam and sandy limestone loams of prairies and grasslands; April through May; 24 sheets. COUNTIES: Armstrong, Briscoe, Dickens, Floyd, Hale, Hemphill, Hutchinson, Lubbock, Lynn, Parmer, Randall, Wheeler.

E. FLAGELLARIS Gray. Not cited for Texas Panhandle by Cronquist (1947) but for adjacent areas in Oklahoma Panhandle by Waterfall (1966) and to be expected in the northern tier of counties.

EUPATORIUM

E. PERFOLIATUM L.; R; moist sites of stream banks and spring-fed lake margins; August through early October; 7 sheets. COUNTIES: Hemphill.

FILAGO
(Shinners, 1951, 1964)

F. NUTTALLII Shinners (Evax prolifera Nutt. ex DC.);
Pl, Pr, RP; sands and sandy limestone loams of prairies,
grasslands and sand hills; late April through early June; 9
sheets. COUNTIES: Garza, Hemphill, Lipscomb, Lubbock,
Ochiltree.

FLAVERIA

F. CAMPESTRIS J. R. JOHNSTON; R; sands of stream beds;
September; 11 sheets. COUNTIES: Hemphill, Lubbock.

FRANSERIA

F. ACANTHICARPA (Hook.) Cov. (Ambrosia acanthicarpa
Hooker); Pl; sands of sand hills and grasslands; August and
September; 6 sheets. COUNTIES: Dallam, Hemphill.

F. CONFERTIFOLIA (DC.) Rydb. (Ambrosia confertifolia
DC.). Reported for the Texas Panhandle by Gould (1962).
None seen.

F. TOMENTOSA Gray (Ambrosia grayi (Nels.) Shinners);
Pl; sands of grasslands; September; 3 sheets. COUNTIES:
Garza, Hale.

GAILLARDIA
(Biddulph, 1944)

G. LANCEOLATA Michx., var. FASTIGIATA (Greene) Water-
fall (G. fastigiata Greene, G. rigida Small); Pl; sands of
sand hills; August; 2 sheets. COUNTIES: Hemphill.

G. PINNATIFIDA Torr., var. PINNATIFIDA; Pl, Pr, RP; sands and sandy limestone loams of prairies, grasslands and canyon walls; April through early July; 38 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Childress, Collingsworth, Cottle, Crosby, Dickens, Garza, Hemphill, Kent, Lubbock, Parmer, Randall.

G. PULCHELLA Foug; Pl, Pr, RP; sands and sandy loams of prairies, grasslands, and sand hills; June through August; 81 sheets. COUNTIES: Bailey, Briscoe, Collingsworth, Cottle, Crosby, Dallam, Dickens, Gaines, Garza, Hall, Hemphill, Hutchinson, Lipscomb, Lubbock, Lynn, Motley, Potter, Roberts.

G. SUAVIS (Gray and Engelm.) Britt. and Rusby; Pl, RP; sandy limestone loams and sands of sand hills, canyon walls and grasslands; April and May; 15 sheets. COUNTIES: Collingsworth, Crosby, Dickens, Garza, King, Wheeler.

GNAPHALIUM

G. CHILENSE Spreng. (G. sulphurescens Rydb.); R; L; tight clay loams of saline playa lake margins and sandy clay of spring-fed stream margins; June and July; 3 sheets. COUNTIES: Bailey, Garza, Wheeler.

GRINDELIA

G. SQUARROSA (Pursh) Dunal, var. NUDA (Wood) Gray; Pl, RP; sands of stream bottoms; July and September; 5 sheets. COUNTIES: Bailey, Garza, Hemphill, Ochiltree.

GUTIERREZIA
(Solbrig, 1960)

G. DRACUNCULOIDES (DC.) Blake (Xanthocephalum dracuncu-
loides (DC.) Shinners); Pl, RP; sands and sandy limestone
loams of grasslands and stream bottoms; mid June through
September; 8 sheets. COUNTIES: Bailey, Crosby, Dickens,
Garza, Kent, Lubbock.

G. SAROTHRAE (Pursh) Britt. and Rusby (Xanthocephalum
sarothrae (Pursh) Shinners); Pl, Pr, RP; sands and sandy
loams of prairies and grasslands; late August through early
October; 38 sheets. COUNTIES: Armstrong, Bailey, Collings-
worth, Crosby, Garza, Hansford, Hartley, Hemphill, Hutchin-
son, Lamb, Lipscomb, Lubbock, Ochiltree, Roberts, Wheeler.

G. SPHAEROCEPHALA Gray, var. SPHAEROCEPHALA (Xanthocephalum
sphaerocephalum (Gray) Shinner, var. sphaerocephalum, G.
glutinosa (Schauer) Sch. Bip.); RP; sands of grasslands;
September; 2 sheets. COUNTIES: Crosby.

HAPLOESTHES

H. GREGGII Gray, var. TEXANA (Coulter) I. M. Johnston;
RP; red sands and red sandy loams of grasslands and low hill-
sides; June through mid July; 4 sheets. COUNTIES: Cottle,
Dickens, Lynn.

HAPLOPAPPUS
(Smith, 1965)

H. CILIATUS (Nutt.) DC. (Prionopsis ciliatus Nutt.);
Pl, CR, RP; sands and sandy loams of grasslands, sand hills
and canyon walls; mid July through early October; 19 sheets.

COUNTIES: Garza, Hemphill, Lipscomb, Lubbock, Oldham, Roberts.

H. DIVARICATUS (Nutt.) Gray, var. HOOKERIANUS (Torr. and Gray) Waterfall (H. validus (Rydb.) Cory, var. validus sig. Smith, (1965), Croptilon divaricatum (Nutt.) Raf., var. hookerianum (Torr. and Gray) Shinners); Pl; sands of sand hills and dry stream banks; mid July through early October; 5 sheets. COUNTIES: Hemphill, Lipscomb.

H. HETEROPHYLLA (Gray) Blake (Isocoma heterophylla (Gray) Greene, Isocoma wrightii (Gray) Greene); Pl, RP; sandy limestone loams of grasslands and canyon walls; June through early September; 7 sheets. COUNTIES: Bailey, Garza, Randall.

H. PHYLLOCEPHALUS DC., var. ANNUUS (Rydb.) Waterfall (Machaeranthera phyllocephala (DC.) Shinners, var. annua (Rydb.) Shinners, Sideranthus annuus Rydb.); Pl, RP; sands of stream banks; July through mid September; 9 sheets. COUNTIES: Armstrong, Garza, Hemphill, Lubbock, Roberts.

H. SPINULOSIS (Pursh) DC. (a conservative treatment of a highly variable group is used here to include specimens that, by other authors, might be assigned to H. australis, H. pinnata.); Pl, Pr, CR, RP; sands and sandy loams of prairies, grasslands, sand hills, canyon breaks and dry stream banks; late April through early October; 67 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Childress, Cottle, Crosby, Dallam, Deaf Smith, Dickens, Floyd, Gaines, Garza, Hansford, Hartley, Hemphill, Kent, King, Lipscomb, Lubbock,

Lynn, Ochiltree, Oldham, Parmer, Randall, Roberts, Swisher, Terry, Wheeler.

HELENIUM

H. AMARUM Raf., var. BADIUM (Gray) Waterfall (H. badium (Gray) Greene); Pl, RP, L; tight sand and clay loams of canyons and playa lakes; May; 7 sheets. COUNTIES: Hockley, Lubbock, Parmer, Swisher.

H. AUTUMNALE L.; R; moist clay and sandy loams of stream margins; late August through early October; 6 sheets. COUNTIES: Hemphill.

H. MICROCEPHALUM DC.; RP; moist clay loam of spring-fed stream margin and canyon wall seepage areas; August; 2 sheets. COUNTIES: Garza.

HELIANTHUS (Jackson, 1963)

H. ANNUUS L.; Pl, Pr, RP; sands and sandy loams of prairies, grasslands and sand hills; June through August; 7 sheets. COUNTIES: Bailey, Dallam, Garza, Hemphill, Lubbock, Potter.

H. CILIARIS DC.; Pl, Pr, RP; sands and tight sandy loams of prairies and grasslands; June through September; 32 sheets. COUNTIES: Armstrong, Bailey, Borden, Briscoe, Crosby, Dawson, Floyd, Garza, Hale, Hartley, Lipscomb, Lubbock, Ochiltree, Potter, Randall.

H. MAXIMILANI Schrad.; R; moist soils of stream banks and meadows; August through mid October; 7 sheets. COUNTIES:

Garza, Hemphill, Lubbock, Randall.

H. PETIOLARIS Nutt., var. PETIOLARIS; Pl, Pr, CR, RP; sands and sandy loams of prairies, grasslands, sand hills and canyon breaks; late April through early August; 44 sheets. COUNTIES: Briscoe, Childress, Crosby, Dallam, Dawson, Dickens, Gaines, Garza, Hartley, Hemphill, Hutchinson, Lipscomb, Lubbock, Ochiltree, Roberts.

HETEROTHECA

(Shinners, 1951, Wagenknecht, 1960)

H. LATIFOLIA Buckl. (Wagenknecht (1960) cited two varieties; var. latifolia and var. macgregoris for the Texas Panhandle. The author, using key characters used by Wagenknecht, was unable to separate the varieties satisfactorily.) Pl; sands of sand hills and stream bottoms; late July through early October; 9 sheets. COUNTIES: Bailey, Dallam, Garza, Hemphill, Hutchinson, Lipscomb, Lubbock.

HYMENOPAPPUS

(Turner, 1956)

H. FILIFOLIUS Hook, var. CINEREUS (Rydb.) I. M. Johnst. (H. cinereus Rydb.); CR; limestone ledges of cap rock; May through June; 13 sheets. COUNTIES: Donley, Gray, Hartley, Lubbock, Randall, Roberts.

H. FLAVESCENS Gray, var. FLAVESCENS; Pl, Pr, RP; sands and sandy loams of sand hills, grasslands, prairies, and stream banks; late April through early July; 48 sheets. COUNTIES: Bailey, Briscoe, Cottle, Crosby, Dallam, Dickens, Garza, Hartley, Hemphill, Hutchinson, Lamb, Lipscomb,

Lubbock, Motley, Ochiltree, Parmer, Wheeler.

H. TENUIFOLIUS Pursh; Pl, Pr, RP; sands and sandy limestone loams of prairies, grasslands and canyon breaks; late April through early July; 35 sheets. COUNTIES: Briscoe, Crosby, Dawson, Deaf Smith, Dickens, Floyd, Gaines, Garza, Hartley, Hemphill, Kent, Lubbock, Lynn, Ochiltree, Parmer, Roberts, Wheeler.

HYMENOXYYS

(Parker, 1950, Shinnars, 1951)

H. ACAULIS (Pursh) Parker (Tetraneuris acaulis (Pursh) Greene); CR; limestone loam of cap rock ledges; late May through September; 32 sheets. COUNTIES: Armstrong, Crosby, Donley, Garza, Gray, Hansford, Hartley, Hemphill, Lipscomb, Lubbock, Ochiltree, Oldham, Roberts, Terry.

H. LINEARIFOLIA Hook. (Tetraneuris linearifolia (Hook.) Greene); RP; tight sandy loams of grasslands; July; 3 sheets. COUNTIES: Cottle, King.

H. ODORATA DC. (Actinea odorata (DC.) Ktze.); Pl, Pr, RP; sands and sandy loams of prairies, grasslands and lower canyon breaks; late April through June; 38 sheets. COUNTIES: Bailey, Borden, Crosby, Dawson, Garza, Kent, Lubbock, Lynn, Moore, Parmer, Terry.

H. SCAPOSA (DC.) Parker, var. LINEARIS (Nutt.) Parker (including Tetraneuris fastigiata Greene, T. glabriuscula Rydb., Hymenoxys glabra (Nutt.) Shinnars, Actinella scaposa Nutt., var. linearis Nutt.); Pl, CR, RP; sands and sandy limestone loams of cap rock ledges, canyon breaks and

grasslands; early April through July; 82 sheets. COUNTIES: Bailey, Childress, Cottle, Crosby, Dallam, Dickens, Donley, Garza, Hemphill, Hutchinson, Lubbock, Lynn, Motley, Ochiltree, Oldham, Parmer, Randall, Terry, Wheeler.

IVA

I. AXILLARIS Pursh; Pr; tight sandy limestone loams of prairies; late June; 4 sheets. COUNTIES: Bailey.

I. CILIATA Willd. (I. annua L.); R; sands of stream bottoms; September; 2 sheets. COUNTIES: Hemphill.

I. XANTHIFOLIA Nutt.; Pl, RP; sands of stream banks and lower canyon breaks; September; 6 sheets. COUNTIES: Hemphill, Lubbock, Ochiltree, Roberts, Wheeler.

KUHNIA (SHINNERS, 1946)

K. EUPATORIOIDES L., var CORYMBULOSA Torr. and Gray. The plants from the Texas Panhandle have some of the aspects of K. chlorolepis Woot. and Standl. but are apparently growth forms of this taxon or perhaps intermediates between the two (Shinners, 1946). Pl, Pr; sands and sandy loams of disturbed sites of prairies and grasslands (especially Prairie Dog Towns) and dry sandy stream banks; September and early October; 33 sheets. COUNTIES: Briscoe, Hemphill, Lamb, Lubbock, Moore, Ochiltree, Parmer, Randall.

LACTUCA (Stebbins, 1939)

L. SCARIOLA L., forma SCARIOLA (L. serriola L. sig. Shinners, 1949); Pl, Pr; sands and sandy limestone loams

of prairies and grasslands under disturbance; June and early July; 5 sheets. COUNTIES: Bailey, Floyd, Garza, Hutchinson.

LIATRIS
(Gaiser, 1946)

L. LANCIFOLIA (Greene) Kittell; Pl; canyon breaks, sandy limestone loam; August; 2 sheets. COUNTIES: Oldham.

L. MUCRONATA DC. (incl. var. interrupta Gaiser, L. angustifolia (Bush) Gaiser); Pl; gravel dikes adjacent to streams; September; 2 sheets. COUNTIES: Hemphill.

L. PUNCTATA Hook. var. PUNCTATA (including material that approaches var. nebraskensis Gaiser); Pl, Pr, CR; sandy limestone loams of cap rock ledges, prairies margins and grasslands; late August through early October; 28 sheets. COUNTIES: Bailey, Collingsworth, Garza, Hansford, Hemphill, Hutchinson, Lipscomb, Lubbock, Ochiltree, Parmer, Roberts.

LINDHEIMERA
(Turner, 1951)

L. TEXANA Gray and Engelm.; RP; sands and sandy loams of grasslands and dry stream banks; April and May; 9 sheets. COUNTIES: Childress, Dickens, Garza, King, Motley.

LYGODESMIA
(Shinners, 1950)

L. APHYLLA DC., var. TEXANA Torr. and Gray (L. texana (Torr. and Gray) Greene); Pl, Pr, RP; sands and sandy limestone loams of prairies and grasslands; late May through mid July; 17 sheets. COUNTIES: Armstrong, Briscoe, Crosby,

Dickens, Garza, Hemphill, Kent, Lubbock, Roberts.

L. JUNCEA (Pursh) D. Don; Pl, Pr, CR; sands and tight sandy loams of prairies and upper canyon breaks; late May through mid July; 11 sheets. COUNTIES: Hemphill, Ochiltree, Roberts, Sherman, Terry.

L. PAUCIFLORA (Torr.) Nels; Pl, Pr; sands and tight sandy loams of grasslands and prairies; late April through mid June; 30 sheets. COUNTIES: Bailey, Briscoe, Crosby, Dallam, Deaf Smith, Floyd, Garza, Hartley, Hemphill, Lamb, Lubbock, Ochiltree, Parmer, Randall, Roberts, Sherman.

MELAMPODIUM

M. LEUCANTHUM Torr. and Gray; Pl, Pr, RP; limestone and sandy limestone loams of canyon breaks, rocky outcrops in prairies and grasslands; late April through July; 62 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Cottle, Crosby, Dallam, Dickens, Floyd, Gaines, Garza, Hartley, Hemphill, Hutchinson, Kent, Lamb, Lipscomb, Lubbock, Lynn, Motley, Ochiltree, Oldham, Parmer, Potter, Roberts, Terry.

PALAFIXIA

(Cory, 1946, Baltzer, 1944, Shinners, 1952)

P. SPHACELATA (Nutt. ex Torr.) Cory (Othake sphacelatum (Nutt. ex Torr.) Rydb.); Pl, RP; sands and sandy limestone loams of sand hills, grasslands and canyon breaks; mid June through early October; 36 sheets. COUNTIES: Bailey, Cottle, Dickens, Garza, Hartley, Hemphill, Hutchinson, Motley, Oldham, Potter, Roberts, Terry, Wheeler.

P. TEXANA DC., var. MACROLEPIS (Rydb.) Shinnery (Othake texanum (DC.) Bush, var. texanum); Pl, RP; sands and sandy loams of grasslands, canyon breaks, and dry stream banks; late June through mid September; 12 sheets. COUNTIES: Crosby, Gaines, Kent, Lubbock, Roberts.

P. TRIPTERIS (DC.) Shinnery, var. BREVIS Shinnery. Cited for the Texas Panhandle by Gould (1962) but not by Shinnery (1952). No specimens seen but to be expected in southern counties.

PECTIS

P. ANGUSTIFOLIA Torr.; RP; sands and sandy limestone loams of grasslands and rock ledge exposures; July through early September; 6 sheets. COUNTIES: Gaines, Lynn, Terry.

PEREZIA

P. NANA Gray; RP; tight sandy loams of grasslands; late April through May; 5 sheets. COUNTIES: Dawson, Garza, Lubbock, Terry.

PINAROPAPPUS

P. ROSEUS Less; Pl, Pr; tight sands of grasslands and prairies, May; 3 sheets. COUNTIES: Lubbock, Lynn.

PLUCHEA

P. PURPURASCENS (Sw.) DC.; R; moist sandy stream banks; August through early October; 5 sheets. COUNTIES: Garza, Hemphill, Wheeler.

PSILOSTROPHE
(Heiser, 1944)

P. VILLOSA Rydb. (very variable with some specimens showing possible gradation towards P. tagetina (Nutt.) Greene); Pl, Pr, RP; sands and sandy limestone loams of disturbed prairies and grasslands and canyon breaks; mid April through mid September; 74 sheets. COUNTIES: Armstrong, Briscoe, Childress, Cottle, Crosby, Dickens, Floyd, Gaines, Garza, Hardeman, Hartley, Hutchinson, Kent, Lipscomb, Lubbock, Moore, Motley, Ochiltree, Oldham, Roberts, Terry.

PYRRHOPAPPUS
(Shinners, 1951)

P. GEISERI Shinners. This taxon should be found along the south eastern margins of the Texas Panhandle according to distribution records in Oklahoma and north central Texas. None seen.

P. SCAPOSUS DC. (P. grandiflorus Nutt.); R; moist meadows of stream bottoms; May and June; 5 sheets.

P. ROTHROCKI Gray; R; moist meadows of stream bottoms; mid June through mid July; 5 sheets. COUNTIES: Hemphill, Hutchinson.

RATIBIDA
(Sharp, 1935)

R. COLUMNIFERA (Nutt.) Woot. and Standl., forma COLUMNIFERA; Pl, Pr, RP; sands and tight sandy loams of prairies and grasslands; late April through early July; 23 sheets. COUNTIES: Briscoe, Dickens, Floyd, Garza, Gray,

Hemphill, Lamb, Lubbock, Lipscomb, Moore, Ochiltree, Potter, Randall, Sherman.

R. COLUMNIFERA (Nutt.) Woot. and Standl., forma PULCHERRIMA (DC.) Fern; Pl, Pr, RP; sands and tight sandy loams of prairies and grasslands; late April through early July; 29 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Dallam, Dickens, Floyd, Garza, Hemphill, Kent, Lubbock, Lynn, Motley, Roberts, Swisher.

R. TAGETES (James) Barnh. (R. peduncularis (Torr. and Gray) Barnh., var. tagetes (James) Barnh.); Pr, RP; tight sandy loams of prairies and grasslands; mid June through early August; 19 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Deaf Smith, Floyd, Garza, Hartley, Lubbock, Lynn, Ochiltree, Oldham.

RUDBECKIA
(Sharp, 1935)

R. HIRTA L., var. PULCHERRIMA (R. serotina Nutt., R. bicolor Nutt.) Reported for Texas Panhandle by Gould (1962) and to be expected. None seen.

SENECIO

S. LONGILOBUS Benth.; Pl, Pr, CR, RP; sands and sandy limestone loams of prairie margins, grasslands, cap rock ledges and canyon walls; late April through May and again in the fall of moist warm years; 26 sheets. COUNTIES: Armstrong, Childress, Crosby, Dickens, Garza, Kent, Lamb, Lubbock, Lynn, Motley, Oldham.

S. RIDDELLII Torr. and Gray (S. spartinoides Torr. and Gray, var. fremontii (Torr. and Gray) Greene); Pl, Pr, RP; sands of sand hills and canyon sides and dry stream banks; September through mid October; 31 sheets. COUNTIES: Briscoe, Childress, Collingsworth, Dickens, Hemphill, Hutchinson, Lamb, Lipscomb, Lubbock, Ochiltree, Parmer, Roberts.

S. TRIDENTICULATUS Rydb. (Barkley, 1962); CR; cap rock ledges, limestone loam of crevices; May; 3 sheets. COUNTIES: Ochiltree, Roberts.

SOLIDAGO
(Shinners, 1951)

S. CANADENSIS L., var. SCABRA (Muhl.) Torr. and Gray (S. altissima L.); Pl; deep sands of sand hills and dry stream banks; September and early October; 4 sheets. COUNTIES: Garza, Hemphill, Lipscomb.

S. GIGANTEA Ait., var. LEIOPHYLLA Fern. (S. serotina Ait.); R; moist sands of stream margins and meadows; August through early October; 12 sheets. COUNTIES: Hemphill, Lipscomb, Lubbock, Sherman.

S. GYMNOSPERMOIDES (Greene) Fern. (Euthamia camphorum Greenm.); sands of sand hills and dry stream banks; September and early October; 7 sheets. COUNTIES: Crosby, Dickens, Hemphill, Lipscomb, Wheeler.

S. PETIOLARIS Ait., var. WARDII (Britt.) Fern. (S. wardii Britton, S. lindheimeriana Scheele); Pl, RP, CR; sands and limestone loams of cap rock ledges and canyon breaks; September and early October; 4 sheets. COUNTIES:

Dickens, Ochiltree, Roberts.

SONCHUS

S. ASPER (L.) Hill, forma GLANDULOSA Beckl.; R; sands and sandy loams of stream banks and meadows; late April through June; 14 sheets. COUNTIES: Armstrong, Briscoe, Cottle, Garza, Hemphill, Lubbock.

TARAXACUM (Shinners, 1949)

T. ERYTHROSPERMUM Andrz.; Pl, Pr; sandy loams and clay loams of waste places; late March through May; 28 sheets. COUNTIES: Carson, Hall, Kent, Lipscomb, Lubbock.

THELESPERMA (Sherff and Alexander, 1955, Shinners, 1950)

T. AMBIGUUM Gray (T. intermedium Rydb., T. megapotamicum (Spreng.) Kuntze, var. ambiguum (Gray) Shinners; Pl, Pr, RP; sands and sandy limestone loams of prairies, grasslands and canyon breaks; May through July; 35 sheets. COUNTIES: Armstrong, Crosby, Dallam, Dickens, Garza, Hockley, Kent, Lubbock, Lynn, Ochiltree, Randall.

T. MEGAPOTAMICUM (Spreng.) Kuntze (T. gracile (Torr.) Gray); Pl, Pr, RP; sands, sandstone ledges of grasslands and sandy clay loams of prairies and canyon breaks; late May through early July; 59 sheets. COUNTIES: Armstrong, Bailey, Briscoe, Cottle, Crosby, Dallam, Deaf Smith, Dickens, Floyd, Gaines, Garza, Hansford, Hartley, Hemphill, Hockley, Hutchinson, Lamb, Lipscomb, Lubbock, Lynn, Ochiltree, Oldham,

Parmer, Wheeler.

TOWSENDIA
(Beaman, 1957)

T. EXSCAPA (Richards.) Porter; Pl, RP; sands and sandy limestone loams of grasslands and canyon walls; March and April; 19 sheets. COUNTIES: Childress, Crosby, Floyd, Garza, Hemphill, Lubbock, Randall, Yoakum.

T. TEXENSIS Lars.; Pl, RP; sands and sandy limestone loams of canyon breaks and dry banks of streams; late April through mid September; 15 sheets. COUNTIES: Armstrong, Briscoe, Crosby, Hemphill, Moore, Motley, Randall, Roberts.

TRAGOPOGON
(Shinners, 1949)

T. MAJOR Jacq. (T. dubius Scop.); Pl, Pr, RP; sands and sandy loams of waste places of prairies and grasslands; mid May through June; 26 sheets. COUNTIES: Crosby, Dallam, Garza, Hartley, Hutchinson, Lamb, Lipscomb, Lubbock, Ochiltree, Randall.

VERBESINA

V. ENCELIoidES (Cav.) Benth. and Hook. (including var. exauriculata Robins and Greerman, Ximenesia encelioides (Cav.) ; Pl; sands of grasslands; late May through mid September; 7 sheets. COUNTIES: Bailey, Castro, Lubbock.

VERONIA

V. BALDWINII Torr. (including var. interior (Small) Schub. that did not seem separable from the specimens

examined); Pl, R; sands and sandy loams of sand hill swales and stream bottom lands; July and August; 18 sheets. COUNTIES: Hemphill, Hutchinson, Lipscomb, Randall.

V. MARGINATA (Torr.) Raf., var. MARGINATA; Pl, Pr, RP, L; sand and clay loams of prairies, playa lakes, and grasslands; late June through August; 18 sheets. COUNTIES: Bailey, Floyd, Garza, Hartley, Lubbock, Lynn, Sherman.

XANTHISMA
(Shinners, 1950)

X. TEXANUM DC., var. DRUMMONDII (Torr. and Gray) Gray; Pl, RP; sands and sandy loams of grasslands and dry stream banks; May through mid July; 38 sheets. COUNTIES: Bailey, Briscoe, Crosby, Dawson, Dickens, Garza, Hall, Hemphill, King, Lamb, Lubbock, Lynn, Motley, Terry, Wheeler.

XANTHIUM

X. SPINOSUM L.; L; tight clay loams of saline playa lakes; June; 4 sheets. COUNTIES: Bailey, Terry.

X. STRUMARIUM L. (sens. lat.); Pl, Pr, RP; sands and sandy loam of waste places and disturbed prairies and grasslands; mid July through early September; 9 sheets. COUNTIES: Hemphill, Hutchinson, Lubbock, Ochiltree, Roberts.

ZEXMENIA

Z. HISPIDA H.B.K.; RP; sandy loam of grasslands; June; one sheet. COUNTIES: Kent.

ZINNIA
(Torres, 1963)

Z. GRANDIFLORA Nutt. (Crassina grandiflora (Nutt.)
Ktze.); Pl, Pr, RP; sands and sandy loams of grasslands,
prairies, and canyon breaks; late April through September;
67 sheets. COUNTIES: Bailey, Briscoe, Cottle, Crosby,
Dallam, Deaf Smith, Dickens, Gaines, Garza, Hansford, Harde-
man, Hartley, Hutchinson, Kent, Lipscomb, Lubbock, Lynn,
Motley, Ochiltree, Parmer, Potter, Randall, Sherman, Wheeler.

CHAPTER VII

TABULAR VIEW OF THE FAMILIES

The following is a tabulation of the taxa enumerated in CHAPTER VI.

<u>Families</u>	<u>Genera</u>	<u>Species and Subordinate Taxa</u>
Equisetaceae	1	4
Polypodiaceae	4	6
Marsileaceae	1	2
Pinaceae	1	4
Gnetaceae	1	3
Typhaceae	1	2
Zosteraceae	3	6
Najadaceae	1	1
Alismataceae	2	3
Gramineae	59	152
Cyperaceae	5	27
Lemnaceae	2	3
Commelinaceae	2	3
Pontederiaceae	1	2
Juncaceae	1	5
Liliaceae	5	6
Amaryllidaceae	1	1

<u>Families</u>	<u>Genera</u>	<u>Species and Subordinate Taxa</u>
Iridaceae	1	1
Orchidaceae	3	3
Saururaceae	1	1
Salicaceae	2	6
Juglandaceae	1	2
Fagaceae	1	4
Urticaceae	2	2
Ulmaceae	2	3
Moraceae	2	3
Loranthaceae	1	1
Santalaceae	1	1
Rafflesiaceae	1	1
Polygonaceae	4	21
Chenopodiaceae	9	15
Amaranthaceae	5	12
Nyctaginaceae	5	10
Phytolaccaceae	1	1
Aizoaceae	2	2
Portulacaceae	2	4
Caryophyllaceae	4	5
Illecebraceae	1	3
Ceratophyllaceae	1	1
Ranunculaceae	5	7
Berberidaceae	1	2
Papaveraceae	1	2

<u>Families</u>	<u>Genera</u>	<u>Species and Subordinate Taxa</u>
Fumariaceae	1	1
Cruciferae	12	20
Capparidaceae	4	4
Saxifragaceae	1	1
Rosaceae	5	7
Leguminosae	30	69
Geraniaceae	2	3
Oxalidaceae	1	1
Linaceae	1	6
Zygophyllaceae	3	3
Rutaceae	2	2
Polygalaceae	1	3
Euphorbiaceae	9	31
Callitrichaceae	1	1
Anacardiaceae	1	5
Celastraceae	1	2
Sapindaceae	2	2
Rhamnaceae	3	3
Vitaceae	3	4
Malvaceae	6	14
Elatinaceae	1	1
Tamaricaceae	1	1
Violaceae	2	2
Loasaceae	2	4
Cactaceae	5	10

<u>Families</u>	<u>Genera</u>	<u>Species and Subordinate Taxa</u>
Lythraceae	2	3
Onagraceae	4	28
Umbelliferae	12	14
Cornaceae	2	2
Primulaceae	1	2
Plumbaginaceae	1	1
Sapotaceae	1	1
Ebenaceae	1	1
Oleaceae	1	2
Gentianaceae	2	2
Apocynaceae	2	3
Asclepiadaceae	3	16
Convolvulaceae	5	11
Polemoniaceae	1	3
Hydrophyllaceae	2	3
Boraginaceae	4	10
Verbenaceae	2	10
Labiatae	9	18
Solanaceae	5	16
Scrophulariaceae	7	11
Bignoniaceae	2	2
Martyniaceae	1	1
Orobanchaceae	1	2
Lentibulariaceae	1	1
Acanthaceae	2	2

<u>Families</u>	<u>Genera</u>	<u>Species and Subordinate Taxa</u>
Plantaginaceae	1	5
Rubiaceae	3	5
Caprifoliaceae	1	1
Cucurbitaceae	4	4
Campanulaceae	2	2
Compositae	70	138

TOTALS

<u>Families</u>	<u>Genera</u>	<u>Species and Subordinate taxa</u>
98	405	863

CHAPTER VIII

SUMMARY

After completion of a floristic study of the Gene Howe Wildlife Management Area in Hemphill County in 1956 (Rowell, 1957), the author realized the need for a similar study of the entire Texas Panhandle and South Plains. Since 1957 the author has collected intensively throughout the area and has authenticated the study with approximately 15,000 sheets in a series of approximately 4,500 collections which have been processed according to standard herbarium procedures. For the most part the collections have been distributed with the first set going to the Herbarium of Oklahoma State University, the second to Texas Technological College at Lubbock, Texas, and additional sets to other herbaria.

The author has supplemented his own collections with specimens from the research area in the herbaria of Oklahoma State University and Texas Technological College.

Monographs, revisions and other taxonomic literature in the Oklahoma State University Library and the personal libraries of Dr. U. T. Waterfall and the author were used in the identification of the specimens.

A total of 863 species and subordinate taxa representing 405 genera and 98 families were identified. The families having the greatest number of species and subordinate taxa were: Gramineae 152, Compositae 137, Leguminosae 69, Euphorbiaceae 31, Onagraceae 28, Cyperaceae 27, Polygonaceae 21, and Cruciferae 20. These eight families contain 56 per cent of the total species and subordinate taxa.

Sixty-nine major range extensions in the known distribution of the Texas flora were recorded by the author, of which six constituted taxa previously unrecorded for the state. These are listed separately in Chapter V and also incorporated in the general listing of Chapter VI.

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