

Notes on the Flora of Taylor County, Texas

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While the senior author was in training at Camp Barkeley, Taylor County, Texas, from September 1942 to February 1944, a nearly complete collection of native plants was made from that region. Specimens were forwarded to Mr. V. L. Cory, then of the Agricultural Experiment Station at Sonora, Texas. Most of them were identified immediately, but others were referred to specialists for study and determination. This paper lists the species collected, with habitat-, locality-, and other noteworthy information concerning them. Four sets of specimens representing nearly every species listed are deposited in herbaria at the University of California at Berkeley, the Missouri Botanical Garden at St. Louis, the S. M. Tracy Herbarium of the A. & M. College of Texas, College Station, and the Southern Methodist University at Dallas.

Taylor County lies 180 miles west of Dallas in central Texas. It is an area 36 by 36 miles, extending from 99°38' to 100°10' West Longitude, and from 32°05' to 30°32' North Latitude. The elevation at Abilene is 1726 feet above sea level; but northern outliers of Edwards Plateau in the southern half of the country are 700 to 800 feet above the surrounding plains (Fig. 1). The rim-rock of this table is approximately at the 2,250 foot contour, and the highest prairies are at the 2,500 foot level. This plateau forms the divide between the drainages of the Colorado River and Red River.

Climate

Taylor County receives an average rainfall of 24.5 inches (as recorded at Abilene for a period of 55 years prior to 1940). The region, however, is semi-arid because of the long growing season (which averages 233 days without frost), the high temperatures during the summer months, and the prevailing winds.

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There is a long, droughty summer during June, July and August. In those months, an average precipitation of 6.7 inches is insufficient to sustain plant growth under long days, and high temperatures which commonly attain 110°F. during early afternoons. Winds are prevailingly from the south at this season.

September, October and November have an average precipitation of 6.6 inches, accompanied by autumnal cooling. This usually revives effectively most vegetation. Some plants (especially the Compositae) flower at this time; and most grasses and forbs carry on photosynthesis. The first frost occurs on an average about November 11. The cold season, however, does not begin until mid-December.

The winter months (December, January and February) are dry, with an average of only 3.3 inches of rain. Cold north winds alternate for periods of 2 to 3 days with days which are warm with winds from the south; but the air masses moving south have lost their severity so that it is a very rare occasion when temperatures reach zero Fahrenheit. For these reasons there are many warm days, when temperatures of 50 to 70 degrees F. permit growth of certain plants. This is especially true in restricted areas protected from winds. Sunshine warms considerably for several hours at a time the soil and air close to the ground. This permits growth of a large number of winter annuals; some grasses and nearly all the perennial forbs have winter rosettes; and some thriving species of shrubs are evergreen.

Utilization of accumulated soil moisture, together with mild temperatures and reception of sustaining rains of 7.9 inches make the spring months (from early March to late May) the most effective growing season. Nearly all the species develop vegetatively, flower, and mature their fruits during this period.

General observations indicate that the Edwards Plateau is more favorable to plant growth largely because of its higher elevation (700 to 800 feet) above the plains. In the first place, the temperatures are lower. This was especially noticeable on winter days. Also, the highlands probably receive more rain than is recorded at Abilene. Spring-flower-

ing of species on the plateau is from one to two weeks later than that of the same species on the plains. The better-vegetated grasslands (with considerable growth of *Buchloe dactyloides*, *Andropogon scoparius polycladus* and *Bouteloua curtipendula*—all typically northern grasses—and a number of species not found at lower elevations) indicate more favorable conditions for plant growth. Conversely the abundant growth of *Prosopis juliflora glandulosa*, *Opuntia Lindheimeri*, *Stipa leucotricha*, *Andropogon virginicus* and *Hilaria Belangeri* (all typically southern species) indicates warmer conditions of the plains region.

Local Areas where Plants were Collected

Most of the collecting was done near Camp Berkeley, within walking distance of quarters. Within a radius of two miles of the camp there were several good collecting grounds with considerable variation in habitat, each with a number of characteristic species. Approximately one-half mile east of the camp was a prairie on rocky soil which had never been grazed excessively. On the west border and also one mile from the south gate were areas of heavily eroded red clay soil, which are very droughty and sparsely vegetated. One mile from the southwest corner of the camp in the vicinity of the shooting grounds was a considerable acreage of fine sandy soil; and still farther south, the steep, rocky, north slopes of the Edwards Escarpment. On these steep slopes are ravines, areas variously exposed to the prevailing southern winds, grass-covered ridges, and exposed stones and cliffs of limestone as well as sandstone formations. The extensive acreage of abandoned fields presented a rich flora of winter annuals and pioneer grasses and forbs. Valley habitats with deep soil, small drainages, and ponds occasionally flooded during heavy rains, added variety. Overgrazed pastures presented an interesting group of species.

Occasional trips were made by bus or automobile to several localities ten to fifteen miles from the camp. Since bus transportation was available to Abilene a few areas in the vicinity of that city were favorites for collecting. To the east are Lake Lytle and the ponds and streams below the dam. On the north edge of the city limits is an extensive area of very sandy soil which has been blown into small dunes, and acre-

ages formerly cropped have been abandoned. The railroad right-of-way and a few parcels of ungrazed land in the vicinity of the dam at Lake Lytle were interesting because there a number of species not found elsewhere were collected; and climax grasses seldom found in other places grew in well developed communities.

Occasional trips were made to the vicinity of Buffalo Gap, and the Boy Scouts Camp, Abilene State Park, Lake Abilene and the Military Reservation, located successively from east to west up Elm Creek Valley. This valley is protected on



Fig. 1.—North slope of Edwards Plateau, covered with *Quercus texana* and *Juniperus Pinchoti*.

north and south by high hills. Elm Creek has a flow of water except during the dry season, but Lake Abilene has stabilized its flow below the dam. A high water-table supports well-developed deciduous woods on both sides of the creek through its entire length. In a few areas are subirrigated meadows dominated by tall grasses and forbs. There are a few small ponds in places where gravel has been excavated.

In the Edwards Plateau, six miles southwest of View, and still farther along State Highway 156 across Elm Creek to

the plateau southeast of Inkum, were areas of exceptional interest. Here were prairie depressions which flooded during the early part of the growing season. Level prairies and those gently sloping northward have a relatively deep soil; and other grasslands have large, flat rocks exposed to the surface. In the high valleys were a few springs and areas of seepage.

General Plant Communities

For the most part, Taylor County is grassland, but the rough, stony lands of the Edwards Plateau and areas along streams and drainages, support communities of trees and shrubs. Excessive grazing and absence of prairie fires since the coming of white man has favored development of bushy vegetation in many areas which otherwise probably would support grass vegetation.

Areas which have been protected from grazing (especially those along railroads and a few parcels near Abilene) are dominated by *Stipa leucotricha* and *Andropogon virginicus*. Prairies on the high table lands were characterized by a considerable growth of *Andropogon scoparius poly-cladus*, *Bouteloua curtipendula* and *Buchloe dactyloides*. Pastures and ranges which are heavily grazed do not have these species in quantity; and there are found instead those grasses and forbs which more readily withstand grazing.

Among them, especially, are species of *Aristida*, *Triodia*, *Buchloe* and *Hilaria*. Over-grazed lands on sandy and rocky soils are covered by species of all four of these genera, but the droughty, red-clay soils are covered largely with *Buchloe* and *Hilaria Belangeri*.

The north slopes of the Edwards Escarpment are covered with shrubs or small trees—largely *Quercus texana* in the most favorable places and *Quercus Mohriana* on less protected slopes. Other shrubs to be noted are *Rhus trilobata*, *Rhus copallina*, *Forestiera pubescens*, *Ungnadia speciosa*, *Cercis canadensis texensis* and *Quercus Mohriana*. Wind-swept ridges, rocky hill-tops and south-exposures are dominated largely by *Juniperus Pinchoti* and *Juniperus Ashei*. Pastures in the low plains have local development of woody plants—*Prosopis juliflora glandulosa* as well as *Condalia*

obtusifolia, *Opuntia Lindheimeri* and *Berberis trifoliata* (Fig. 2). Along the streams is a woodland consisting of *Ulmus americana*, *Celtis reticulata*, *Bumelia lanuginosa*, *Carya Pecan*, *Juglans microcarpa*, *Quercus virginiana*, and *Sapindus Drummondii* (Figures 3 and 4).

Along Elm Creek (especially below Lakes Abilene and Lytle) are subirrigated meadows dominated largely by *Cynodon Dactylon*. In addition there are a number of tall grasses, forbs and sedges.

Genetic Composition of the Flora

Altogether, 540 species and varieties of ferns and seed plants (89 families) were collected. The chief of them include *Compositae*, with 93 species, *Gramineae* (74), *Leguminosae* (40), *Euphorbiaceae* (29), *Cyperaceae* (19), *Onagraceae* (17), *Labiatae* (13), *Solanaceae* (12), and *Umbelliferae* (12 species),

Plants of *Populus* and *Desmodium* were observed, but specimens were not collected since fruits or flowers were absent; and one each of *Rubus* and *Kuhnia* still remain to be identified or described as new. While most of the plants of the region are included in this list, some may yet be added.

Life Forms

Seventy-eight species or seven per cent of the flora have a woody growth. There are 26 species and varieties of trees, 29 species of shrubs and in addition four *Compositae*, seven cacti and three liliaceous plants with varying amounts of woody tissue. There are fourteen kinds of long vines, eight distinctly woody. In addition seventeen species of herbaceous forbs have short vine-like stems growing prostrate, or nearly so upon the ground.

Ninety-three per cent of the flora is herbaceous. Six species were classified as entirely aquatic and 35 species as semiaquatic, or living on the shores, being submerged when water-levels are high. There are 387 classified as upland forbs, half of which are short lived, including annuals, winter annuals and biennials. Some of the biennials, however, may extend their life span a few years. The other half of the upland herbaceous flora includes distinctly long-lived perennials.

Approximately fifty winter annuals are common in abandoned fields. Their ability to grow during the winter makes possible quick development during the first warm March days, so they complete their flowering and mature seed before the dry, hot season begins in early June. During the spring growing-season, and especially toward its end, they probably exhaust much of the moisture accumulated in the soil during winter and early spring. This is disadvantageous to the summer annuals which grow best in cultivated fields, where the winter annuals are destroyed by plowing during the early growing season.

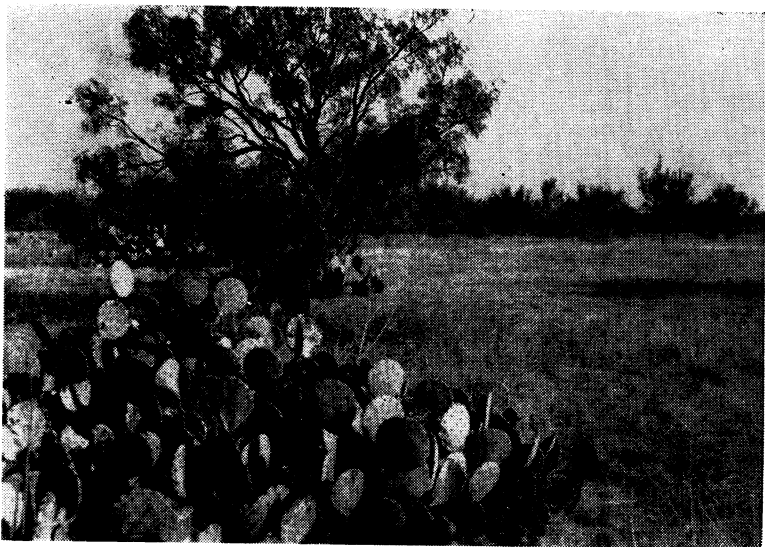


Fig. 2.—Pasture east of Camp Barkeley on deep soil and gentle slope, with flora composed largely of *Hilaria Belangeri* and *Buchloe dactyloides*. The conspicuous arboreous species are *Prosopis juliflora glandulosa* [mesquite], and the cactus, *Opuntia Lindheimeri*.

Some of the most important winter annuals present in abandoned fields include *Bromus catharticus*, *Vulpia octoflora*, *Hordeum pusillum*, *Panicum fasciculatum* var. *reticulatum*, *Monolepis Nuttalliana*, *Corydalis montana*, *Descurainia pinnata*, *D. halictorum*, *Draba platycarpa*, *Lepidium oblongum*, *Linum pratense*, *Erodium cicutarium*, *E. texanum*, *Ammoselinum Popei*, *Chaerophyllum Teinturierii*, *Daucus*

pusillus, *Spermolepis divaricata*, *S. echinata*, *Nama hispidum*, *N. hispidum* var. *Mentzelii*, *Lappula texana*, *Verbena bipinnatifida*, *Chamaesaracha conioides*, *Plantago Helleri*, *P. rhodosperma*, *P. spinulosa*, *Aphanostephus ramosissimus*, *Erigeron canadensis*, *Evax multicaulis*, *E. prolifera*, *Lactuca scariola*, *Pyrrophappus multicaulis* and *Senecio imparipinnatus*.

Noteworthy summer annuals include *Salsola pestifer*, *Helianthus annuus*, *Polygonum ramosissimum*, *Chenopodium leptophyllum*, *Amaranthus retroflexus*, *A. albus*, *Portulaca oleracea*, *Euphorbia glyptosperma*, *E. serpens*, *E. maculata* and *E. strictospora*.

Plants which are biennials and quick growing perennials found in abandoned fields include *Cassia pumilio*, *Hoffmannseggia densiflora*, *Oxalis corniculata*, *Physalis lobata*, *P. mollis*, *Solanum carolinense*, *S. elaeagnifolium*, *Aplopappus ciliatus*, *Lindheimera texana*, *Berlandiera lyrata*, *Oenothera triloba*, *Sporobolus cryptandrus*, *Schedonnardus paniculatus* and *Sorghum halepense*.

A winter climate partly favorable to plant growth is reflected in the presence of 23 species with evergreen leaves or stems. These include species of *Adiantum*, *Pellaea*, *Juniperus*, *Nolina*, *Yucca*, *Phoradendron*, *Berberis*, *Quercus*, certain *Cactaceae*, *Dyssodia*, *Gutierrezia* and *Lycium*. *Smilax* and *Zanthoxylum* keep their leaves longer in the fall than most deciduous species (Fig. 5).

Most plants flower in the spring season from mid March to late May. Tables 1 and 2 give the flowering period for the common species of the prairies and woodlands during the spring of 1943. Few flower in the summer, but among those which do may be mentioned *Condalia obtusifolia* from 6 to 20 of June and *Prosopis juliflora glandulosa*, at sporadic intervals. In the fall certain species blossom a second time, and a few Compositae are characteristically autumnal, especially species in the following genera: *Gutierrezia*, *Franseria*, *Iva*, *Artemisia*, *Selloa*, *Solidago*, *Eupatorium*, *Aplopappus* and *Grindelia*. *Lycium* flowered in late October, 1943; *Juniperus*, from November 1 to December 15; *Ephedra*, first half of February 1943; *Phoradendron*, during the middle two weeks

of January; *Berberis*, February 15 to March 15; *Ulmus* February 17 to 20 and *Carex planostachys*, February 8 to 14.

The Annotated List

The following annotated list of the plants of Taylor Co., Texas, follows the system of Engler and Prantl. Genera within the families of flowering plants are listed alphabetically, but the species within any single genus are arranged for convenience in presentation of locality and habitat.

PTERIDOPHYTA

POLYPODIACEAE: *Adiantum Capillus-Veneris* L. was found only once growing in a crevice of sandstone rock 5 to 6 feet above the stream in Elm Creek Valley. *Pellaea atropurpurea* (L.) Link grew occasionally in the protected ravines on the north slope of Edwards Plateau and was especially abundant on sandy soil beneath juniper trees in one locality on the lower slope of Edwards Escarpment 2½ miles south of Camp Barkeley.

MARSILEACEAE: *Marsilea vestita* Hook. & Grev. grows in depressions which are flooded during the rainy seasons, but which dry up during the hot, dry summer. It was found within the limits of Camp Barkeley as well as on the top of Edwards Plateau about 12 miles southwest of View. It spreads by means of stolons forming small colonies upon the mud.

EQUISETACEAE: A single record of *Equisetum prealtum* Raf. was made from the upper part of Elm Creek where it grew on a moist bank.

SPERMATOPHYTA

GYMNOSPERMS

PINACEAE: *Juniperus Pinchoti* Sudw. is a very common shrub to small tree on rocky escarpments, and shallow soils in the valleys. Since it is not palatable to stock, excessive grazing of pastures favors its growth. Cutting does not destroy the plant, for new shoots grow abundantly from the stumps. Pollination occurs in November and early December, and the fruits of prior twelve months ripen at the same time. *J. Ashei* Buchholz was found on the lower slopes of the north side of the Edwards Escarpment.

EPHEDERACEAE: *Ephedra antisyphilitica* Berl. ex. C. A. Meyer occurs on the droughty, clay soils immediately south of Camp Barkeley. It grows on sparsely-vegetated areas, but seldom among other shrubs. Pistillate and staminate strobili develop on separate bushes. Pollination occurred between February 1 and 15, 1943, and fruits matured in early April.

MONOCOTYLEDONOUS ANGIOSPERMS

TYPHACEAE: *Typha angustifolia* L. grows in protected inlets of Lakes Abilene and Lytle and in small ponds which do not dry up in summer.

NAJADACEAE: *Najas guadalupensis* (Spreng.) Morong, *Potamogeton Berchtoldi* Fieber and *P. illinoensis* Morong are aquatic plants floating and submerged in the quiet waters of Lakes Abilene and Lytle.

ALISMACEAE: *Echinodorus cordifolius* (L.) Griseb. occurs in a pond above a small dam of Elm Creek east of Abilene, and *Sagittaria falcata* Pursh on the shores of the same creek near Buffalo Gap.

GRAMINEAE, FESTUCEAE: Both brome grasses *Bromus catharticus* Vahl. and *B. japonicus* Thunb. var. *porrectus* Hack., are annual, pioneer species in abandoned fields and in severely grazed pastures. The latter, however, was found only a few times.

Eragrostis Barrelieri Daveau, *E. cilianensis* (All.) Link, *E. intermedia* Hitchc., *E. pectinacea* (Michx.) Nees and *E. curtipedicellata* Buckl. are pioneer grasses in disturbed land, abandoned fields, gardens and road sides. *E. reptans* (Michx.) Nees grew on muddy shores of ponds. *E. sessilis-pica* Buckl. and *E. secundiflora* Presl occurred only on rocky soil in Abilene State Park.

Vulpia octoflora (Walt.) Rydb. was found in abandoned fields and on exposed rocks on Edwards Plateau. It is a winter annual which matures and dies by early summer.

Melica nitens (Scribn.) Nutt. was found in open woods along Elm Creek at Abilene State Park.

Poa arachnifera Torr., growing in staminate and pistillate colonies, is frequent in grassland along ravines and dry runs.

Triodia albescens Vasey is a common grass in depressions on the prairie and along drainages where water accumulates

for brief periods following heavy rains. It is sometimes a pioneer in abandoned fields and other disturbed land. Both *T. mutica* (Torr.) Scribn. and *T. pilosa* (Buckl.) Merr. are common in grasslands on rocky soil. *T. flava* (L.) Smyth was found only once in woods along Elm Creek in Abilene State Park.

GRAMINEAE, HORDEAE: *Agropyron Smithii* Rydb. grows occasionally in the prairies and along railroad tracks.

Elymus virginicus L. was found along the prairie drainages, and *E. virginicus* var. *glabriflorus* (Vasey) Bush is common in woodlands of Elm Creek Valley.

Hordeum pusillum Nutt. is a winter annual which grows in large numbers in disturbed and excessively grazed pastures.

GRAMINEAE, AVENEAE: *Sphenopholis obtusata* (Michx.) Scribn. grew on the moist banks of Elm Creek below Lakes Abilene and Lytle.

Trisetum interruptum Buckl. was found only once on a prairie southeast of Abilene. It grew in a small depression where water accumulates during the rainy season, but becomes dry during the summer.

GRAMINEAE, PHALARIDEAE: *Phalaris caroliniana* Walt. was a common winter annual in open woodlands and mesquite thickets on the flood plains.

GRAMINEAE, AGROSTIDEAE: *Agrostis semiverticillata* (Forsk.) C. Chr. occupies the shores of permanent streams in the upper portions of Elm Creek.

Limnodea arkansana (Nutt.) L. H. Dewey was found only near the hard limestone outcrops on the top of Edwards Escarpment.

Muhlenbergia capillaris (Lam.) Trin. was confined to the banks of Elm Creek at one locality 10 miles southwest of View.

Sporobolus asper (Michx.) Kunth grew occasionally along the prairie drainages, and *S. neglectus* Nash was found on the north slopes of Edwards Escarpment. Both *S. cryptandrus* (Torr.) A. Gray and *S. pyramidatus* (Lam.) Hitchc. were pioneer grasses in abandoned fields.

Polypogon monspeliensis (L.) Desf. grew abundantly in the subirrigated meadows below Lakes Lytle and Abilene.

Stipa leucotricha Trin. & Rupr. grows mainly on the sandy soils and in the lower portions of the prairie along the drainages but occasionally on the uplands, especially beneath canopies of mesquite trees or on level land where soils are deep and where run-off is not excessive. Very well developed communities were found along railroad right-of-ways and on the east side of Abilene on parcels of land where there had been little grazing.

Stipa grows in bunches 3 to 8 inches in diameter. Green leaves 2 to 3 inches high are present among numerous dead ones through October, November and February. By mid March, 1943 the leaves were 4 to 6 inches high. Flowering took place during the first days of May and seeds were mature one month later. Its habit of growing in the cool period of the year subjects it to grazing by animals seeking green forage. It is therefore able to survive in quantity only where grazing is light.

GRAMINEAE, ZOYSIEAE: *Hilaria Belangeri* (Steud.) Nash grows commonly on the red clay soils and in the flood plains. It is a short grass with stolons similar to those of *Buchloe* from which it is difficult to distinguish except when flowering heads are present. *H. mutica* (Buckl.) Benth. is rare and grows on the very droughty, red clay soils where there is little other vegetation.

GRAMINEAE, CHLORIDEAE: *Cynodon Dactylon* (L.) Pers. was the most common grass in the subirrigated meadows along the permanent streams.

Bouteloua curtipendula (Michx.) Torr. occurred commonly on the north slopes of Edwards Plateau. *B. hirsuta* Lag. dominated the very rocky soils of the treeless ridges on the steep north slopes of Edwards Escarpment. *B. rigidisetia* (Steud.) Hitchc. and *B. trifida* Thurb. were uncommon on sandy soils near the bases of Edwards Escarpment south of Camp Barkeley.

Buchloe dactyloides (Nutt.) Engelm. forms large colonies on the bottom lands and on the red clay soils of Camp Barkeley. It commonly grows with *Hilaria Belangeri*.

Chloris cucullata Bisch., and *C. verticillata* Nutt. were found only on the soils of the broad deposition-fans near the base of Edwards Escarpment.

Eriochloa sericea (Scheele) Munro grew on the bases of large limestone boulders exposed on the upper slopes of Edwards Plateau.

Both *Leptochloa filiformis* (Lam.) Beauv. and *L. fascicularis* (Lam.) A. Gray are annual grasses which pioneer on muddy shores of ponds below the dam at Lake Lytle. *L. dubia* (H. B. K.) Nees grows occasionally on very rocky soil on the plateau and steep hill sides.

Paspalum distichum L. spreading by long rhizomes formed colonies along the drainages at Camp Barkeley. Other species are confined to sandy soils, but never occur in large numbers. They include *P. pubescens* Muhl., *P. dilatatum* Poir. and *P. pubiflorum* Rupr.

Schedonnardus paniculatus (Nutt.) Trel. is a pioneer, perennial grass in abandoned fields.

GRAMINEAE, ANDROPOGONEAE: *Andropogon saccharoides* Sw. grows commonly with *Stipa leucotricha*. It is, however, a summer and fall flowering grass, and is dormant during the winter. Like *Stipa* it is readily destroyed by excessive grazing of cattle. *A. scoparius* Michx. var. *polycladus* Scribn. & Ball, is common on the deep soils of the north slopes on top of Edwards Plateau and is scattered over the steep, rocky hillsides where semi-desert scrub is not well developed. *A. virginicus* L. var. *abbreviatus* (Hack.) Fern. and Grisc. was collected only once on the shores of Elm Creek in its upper valley.

Sorghastrum nutans (L.) Nash grows occasionally in the subirrigated lands along Elm Creek in the vicinity of Abilene State Park.

Sorghum halepense (L.) Pers. is present in cultivated fields to the extent of becoming a great pest. Johnson grass spreads by rhizomes forming large colonies when uncontrolled. It is frequently used as a hay crop.

CYPERACEAE: *Carex Brittoniana* Bailey is the most common sedge because it grows on the shores of the small drainages, ponds and lakes where the soils do not become excessively dry during the summer. *C. Emoryi* Dewey is confined to the banks of Elm Creek in its upper valley, and *C. microdonta* Torr. & Hook. is present in small numbers only at a few springs in a high valley near the top of Edwards

Plateau 18 miles southwest of View. *C. Muhlenbergii* Schkuhr occurs beneath large trees of oak, elm and pecan west of Buffalo Gap, and *C. planostachys* Kunze is common under thickets of red oak on the rocky, north slopes of Edwards Escarpment.

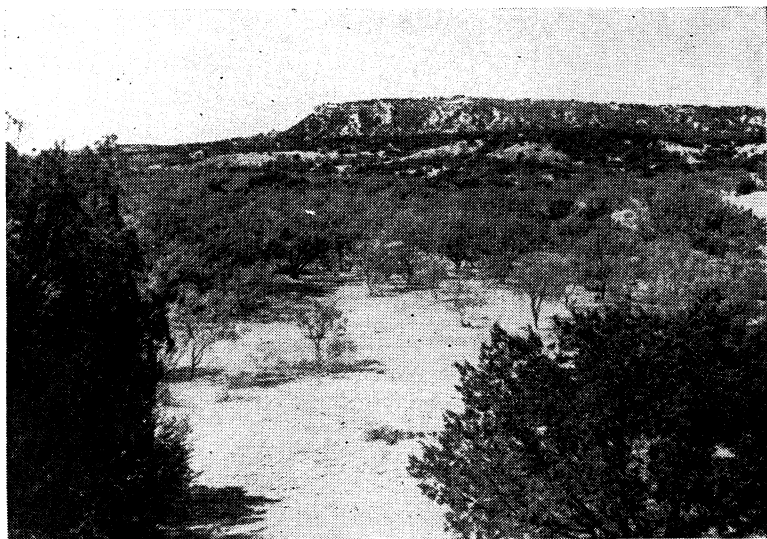


Fig. 3.—View of Edwards Plateau looking west from near Buffalo Gap. *Juniperus* occupies the step slopes in foreground and background. The low lands are covered with grasses and an open stand of *Prosopis juliflora*.

Cyperus acuminatus Torr. & Hook. is an annual plant in shallow mud holes on the prairies. *C. odoratus* L., *C. strigosus* L. and *C. Hallii* Britton grow on the shores of streams and lakes where moisture is present during much of the growing season. Both *C. Schweinitzii* Torr. and *C. uniflorus* Torr. & Hook. are pioneer plants in abandoned fields on very sandy soil one mile north of Abilene.

Eleocharis macrostachya Britton occurs in a wide range of aquatic habitats from the clay mud holes on the prairies which are dry for long periods in summer to the protected shores of the lakes. Its stiff stems and large seeds distinguish it from the slender, small-seeded *E. calva* Torr. which is confined to the permanently aquatic habitats in Elm Creek Valley west of Buffalo Gap and in areas of

springs and seepages in a valley near the top of Edwards Plateau. *E. Wolfii* A. Gray grows in the mud holes on the high tableland where it matures by middle May before the summer heat. *E. leptos* (Steud.) Svenson was collected with mature seed on muddy shores of a small pond below the dam of Lake Lytle in late July 1943.

Fimbristylis VahlII (Lam.) Link was found only once on muddy shores of a small pond below Lake Lytle.

Fuirena squarrosa Michx. prefers areas where moisture is present throughout the growing season. Such habitats occur below the dams of Lake Lytle and Abilene and on the shores of ponds formed by excavation of gravel near Abilene State Park.

Scirpus californicus (Mey.) Steud. and *S. acutus* Muhl. formed colonies in ponds and in protected areas in the lakes.

LEMNACEAE: *Lema minor* L. floats on the water of small pools below the dam at Lake Lytle.

COMMELINACEAE: This family is unimportant in the flora of Taylor County. A few plants of *Commelina erecta* L. var. *angustifolia* (Michx.) Fern. were collected on the sandy shores of Elm Creek east of Abilene. *Tradescantia occidentalis* (Britton) Smyth was found in similar soil in open woods west of Buffalo Gap.

JUNACACEAE: *Juncus bufonius* L., *J. effusus* L., *J. filipendulus* Buckl., *J. marginatus* Rostk., *J. setosus* (Coville) Small, *J. tenuis* Willd. and *J. texanus* (Engelm.) Coville were found in the semi-aquatic habitats along the streams, ponds and lakes.

LILIACEAE: *Allium perdulce* S. V. Fraser is common in the grasslands on sandy or rocky soil.

Brodiaea coerulea (Scheele) Macbride grew in grassland on clay soil one mile south of Camp Barkeley and on the east side of Abilene.

Nolina texana S. Wats. was found only once on a south-east slope of a deep valley on the north side of Edwards Plateau 8 miles southwest of View. It grew on a sandstone formation.

Nothoscordum bivalve (L.) Britton is a very common forb in the grasslands on a wide variety of soil texture and habi-

tat. Its white flowers appeared for nearly two months after March first and again in late September 1943.

Long vines of *Smilax Bona-nox* L. climb over the thickets and small trees along the streams. Its leaves remain green longer than most deciduous species until mid December, and the spiny stems are green throughout the year.

Yucca constricta Buckl. is common in all the grasslands on sandy and rocky soils. *Y. Torreyi* Shafer, a palm-like species 6 to 8 feet high, was found only on the poorly vegetated, red clay soils near Abilene State Park.

AMARYLLIDACEAE: *Cooperia Drummondii* Herb. grows in the grasslands. Its scapose white flowers appeared after rains in mid-September 1942 and in the last week of May 1943. Plants flowered again the mid-October 1943, and seeds were ripe six weeks later. Leaves developed with the flowers in the fall and lasted throughout the winter and spring. This plant commonly appears after good rains throughout the growing season, and is frequently known as the rain lily. This species is of special value and interest to the flower-gardener.

IRIDACEAE: *Sisyrinchium graminoides* Bicknell was found on the rocky prairies among the grasses and herbs.

DICOTYLEDONOUS ANGIOSPERMS

SALICACEAE: *Salix nigra* Marsh. and *S. nigra* var. *Lindheimeri* Schneider grew along the permanent streams and on the shores of the lakes.

JUGLANDACEAE: *Carya Pecan* (Marsh) Engel. & Graebn. grows in numbers along Elm Creek above Buffalo Gap. *Juglans microcarpa* Berl. ex Berl. & Chovell was common in Elm Creek Valley. It grows 15 to 25 feet high and usually several trunks develop giving the plant a bush-like appearance. *J. major* (Torr.) Heller with tall, straight trunks was found along the creek at Abilene State Park.

FAGACEAE: *Quercus breviloba* (Torr.) Sarg. grows as a bush a few feet high to small trees of 30 feet in the upper valley of Elm Creek. *Q. marylandica* Muench and *Q. stellata* Wang. var. *rufescens* Sarg. were trees 30 to 40 feet high on the sandy lands one mile north of Abilene. *Q. virginiana*

Miller, which has evergreen leaves persisting through winter and falling in spring, was especially abundant in the vicinity of Buffalo Gap and in the upper valley of Elm Creek, probably in areas where the water table is within several feet of the surface. *Q. Mohriana* Buckl. grew 2 to 4 feet high in colonies in the less protected slopes of Edwards Escarpment, and *Q. texana* Buckl., a small tree 10 to 25 feet high, was dominant on the protected, north slopes and ravines.

ULMACEAE: *Celtis reticulata* Torr. and *C. reticulata* var. *anomala* (Sarg.) Palmer are frequent trees along the drainages. *Ulmus americana* L. is a common tree along the creeks and streams.

URTICACEAE: *Parietaria pennsylvanica* Muhl. is an annual weedy forb beneath canopies of trees in the valleys of Edwards Plateau.

SANTALACEAE: Plants of *Comandra pallida* A. DC. were collected on the rocky, steep, north slopes of Edwards Escarpment. It grew in open places between widely spaced bunches of grass.

LORANTHACEAE: *Phoradendron flavescens* (Pursh) Nutt. is a common plant on the branches of mesquite. Pollination took place in mid January 1943 and numerous white fruits matured in November on the pistillate colonies.

POLYGONACEAE: *Eriogonum annuum* Nutt. occurs on the very sandy soils, especially where the grasses have been destroyed by excessive grazing or by plowing. *E. longifolium* Nutt. is a common perennial forb in grasslands on rocky soil.

Polygonum lapathifolium L. and *P. longistylum* Small are annual plants on the shores of streams and lakes. A few specimens of *P. ramosissimum* Michx., a weedy annual, were found in an abandoned field near Buffalo Gap.

Rumex altissimus Wood and *R. crispus* L. grow in moist soils along the drainages which do not become excessively dry during the summer.

(To be concluded in the June issue)