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A Seasonal Study of the Vegetation on Levees<sup>1</sup>

GLEN N. MONTZ

## ABSTRACT

The frequency and percentage composition of plants was determined on levees in East St. Charles Parish (County), Louisiana. This parish is west of New Orleans and is bounded on the south by the Mississippi River and on the north by Lake Pontchartrain.

The vegetation was sampled by 55 line transects at the same locations in February-March, May-June and August-September.

Eighty-nine species were recorded in this study. Field notes indicate vernal, estival and autumnal flowering periods in the area. Eleven species were noted to flower only in the February-March study, six species only in the May-June study and eight species only in the August-September study.

## INTRODUCTION

Jefferson Parish is located to the east and St. John the Baptist Parish to the west of East St. Charles Parish. The area considered is between New Orleans and Baton Rouge in an area called the German Coast by its earliest settlers.

<sup>1</sup>Based on a portion of a dissertation submitted in May, 1970 to Louisiana State University in Baton Rouge, in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

The Mississippi River divides St. Charles Parish into two portions. The eastern segment was selected to study vegetation on the levees. The levees along the river and the Bonnet Carre Spillway were chosen for this study. The Bonnet Carre guide levees are parallel to the floodway.

The purpose of the investigation was to determine vegetation in the vernal, estival and autumnal periods on the levees. The study was conducted from May, 1968 to September, 1969.

The climate of the area permits the growth of plants throughout the entire year. Rainfall and mean annual temperatures during this study were fairly close to normal. The rainfall is sufficient for growth of plants throughout the year. There is usually much rain in the winter and the humidity is usually high the year round. The mean annual temperatures during this study were fairly close to normal. The coldest months, January and February, had mean monthly temperatures in 1969 of 54.2°F. and 54.6°F., respectively (Local Climatological Data, 1967-69).

#### METHODS

Line transects were used to study the flora on the levees. A modified line transect method consisted of the horizontal, linear measurement of plants at 10-foot intervals along the line (Brown, 1954).

Twine was stretched across the levees in order to follow a straight line. The Mississippi River levee is mowed regularly during the summer and fall and the Bonnet Carre guide levees are heavily grazed. Therefore, the twine had to be gathered after each study and placed again in the same location for the other seasonal studies.

Twine measuring 10 feet was tightly stretched between two stakes. This interval was used as the unit of length along the transect.

The sampling unit consisted of a single line transect. A predetermined number of sampling units for each area constituted a sample (Brown, 1954). Only one reading was taken where the stake touched as the transect was established along the study area. The plant root system that was hit by the stake was used to record a specimen at each 10-foot interval.

Five areas to record transects were chosen on the Mississippi River levee which were known to have visible differences in vegetation types. These locations were one mile east of the parish line in Montz, across from Annex Street in New Sarpy, across from Troxclair Lane in New Sarpy, across from Destrehan Drive in Destrehan and across from Fourth Street in St. Rose.

Six areas to record transects were chosen on the Bonnet Carre guide levees. The east guide levee locations were 0.3 miles north of the

River Road, between the Louisiana and Arkansas Railroad and the Airline Highway, and 2.0 miles north of the Airline Highway. The west guide levee study areas were 0.5 miles north of the River Road, 1.0 and 3.0 miles north of the Airline Highway.

Five transects with 10-foot intervals were recorded at each location in February-March, May-June and August-September for a seasonal study. Thus, 55 transects, recording 944 points, were examined at each levee location in the vernal study. In the estival sample at each levee area, 55 transects were made recording 935 points. In the autumnal seasonal study, 55 transects were used to record 965 points. Water levels from batture ponds were responsible at different locations in the spring and summer studies for the slight differences in number of points.

The February-March, May-June and August-September studies were chosen to examine the vernal, estival and autumnal flora, respectively, of the levees.

Frequently and percentage composition or abundance for each species were determined. Data on frequency are not included in this paper.

Scientific names were taken from Fernald (1950), Gleason (1952), Hitchcock (1950), and Small (1933).

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TABLE 1

Percentage composition of plants on the levees at three different periods of the year.

Species	Feb.-Mar.	May-June	Aug.-Sept.
<i>Axonopus affinis</i>	2.6	3.9	7.6
<i>Cynodon dactylon</i>	0.8	11.3	7.4
<i>Digitaria sanguinalis</i>	0.0	0.6	5.1
<i>Geranium carolinianum</i>	18.4	0.6	0.0
<i>Medicago hispida</i>	4.9	2.7	0.3
<i>Paspalum dilatatum</i>	7.4	12.8	13.0
<i>Rumex</i> spp. (2)	6.3	4.3	0.1
<i>Setaria lutescens</i>	0.1	0.1	5.0
<i>Sida rhombifolia</i>	3.2	6.6	7.6
<i>Sorghum halepense</i>	0.7	9.2	12.2
<i>Sporobolus poiretti</i>	10.1	13.0	9.8
<i>Stellaria media</i>	6.3	0.1	0.0
<i>Trifolium repens</i>	4.1	7.8	0.0

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TABLE 2

A list of the remaining species on the levees.

<i>Alternanthea philoxeroides</i>	<i>Medicago lupulina</i>
<i>Ampelopsis arborea</i>	<i>Mimosa strigillosa</i>
<i>Apium leptophyllum</i>	<i>Modiola caroliniana</i>
<i>Arthraxon hispidus</i>	<i>Oenothera speciosa</i>
<i>Bromus catharticus</i>	<i>Oxalis</i> sp.
<i>Bromus</i> sp.	<i>Oxalis stricta</i>
<i>Brunnichia cirrhosa</i>	<i>Panicum dichotomiflorum</i>
<i>Calyptracarpus vialis</i>	<i>Panicum rhizomatum</i>
<i>Campsis radicans</i>	<i>Panicum</i> sp.
<i>Capsella bursa-pastoris</i>	<i>Parthenium hysterophorus</i>
<i>Carex frankii</i>	<i>Paspalum conjugatum</i>
<i>Cerastium viscosum</i>	<i>Paspalum dissectum</i>
<i>Cirsium horridulum</i>	<i>Paspalum langei</i>
<i>Commelina virginica</i>	<i>Paspalum urvillei</i>
<i>Crepis japonica</i>	<i>Poa annua</i>
<i>Cyperus</i> sp.	<i>Pyrrhoppus carolinianus</i>
<i>Dichondra repens</i>	<i>Ranunculus sardous</i>
<i>Diodia virginiana</i>	<i>Rhus radicans</i>
<i>Duchesnea indica</i>	<i>Rosa bracteata</i>
<i>Echinochloa colonum</i>	<i>Rubus</i> sp.
<i>Eleocharis</i> sp.	<i>Rudbeckia amplexicaulis</i>
<i>Eleusine indica</i>	<i>Sambucus canadensis</i>
<i>Equisetum praealtum</i>	<i>Smilax</i> sp.
<i>Erigeron philadelphicus</i>	<i>Solanum carolinense</i>
<i>Galium aparine</i>	<i>Sonchus asper</i>
<i>Hordeum pusillum</i>	<i>Sphenopholis obtusata</i>
<i>Hydrocotyle</i> sp.	<i>Spilanthes americana</i>
<i>Hydrocotyle umbellata</i>	<i>Trifolium pratense</i>
<i>Ipomoea purpurea</i>	<i>Trifolium resupinatum</i>
<i>Iva ciliata</i>	<i>Verbena brasiliensis</i>
<i>Justicia lanceolata</i>	<i>Verbena</i> sp.
<i>Lactuca</i> sp.	<i>Vernonia</i> sp.
<i>Lamium amplexicaule</i>	<i>Veronica agrestis</i>
<i>Leonurus sibiricus</i>	<i>Veronica polita</i>
<i>Lepidium virginicum</i>	<i>Viola</i> sp.
<i>Lippia lanceolata</i>	<i>Vitis</i> sp.
<i>Lygodium japonicum</i>	<i>Xanthium pensylvanicum</i>
<i>Medicago arabica</i>	

## RESULTS

The higher and better drained land along the Mississippi River levee is the site of cultivated fields and human habitation. Here most of the original forest vegetation is gone. This area has a rich, mostly introduced, weedy flora.

Eighty-nine species were recorded in this study. Of the total number of plants recorded during the vernal, estival and autumnal studies, 60 percent, 48 percent and 37 percent, respectively, were introduced species. Overall, 48 percent were introduced species. This is undoubtedly a reflection of excessive disturbance due to human activity since all of the sites studied were extremely disturbed.

The percentage composition of plants for the three different study periods is given in Table 1. Species are included which have percentage compositions above 4.9 in any one of the seasonal periods concerned. Table 2 lists the remaining plants which were found at frequencies below 4.9 in any one seasonal period.

The most abundant species in the vernal, estival and autumnal periods were *Geranium carolinianum*, *Sporobolus poiretti* and *Paspalum dilatatum*, respectively (Table 1). *G. carolinianum* was abundant only in the vernal study.

Field notes indicate that some annual species begin growth in the winter and disappear in late spring and others start later and disappear in the summer and fall. *Medicago hispida* and *Stellaria media* were winter annuals recorded in the vernal study (Table 1). These annuals died in the late spring and were nowhere abundant in the fall sample. *Setaria lutescens*, a fall annual, was abundant in the autumnal study, but not in the vernal study (Table 1).

The abundant perennial plants such as *Axonopus affinis*, *Cynodon dactylon*, *Paspalum dilatatum*, *Rumex* spp., *Sida rhombifolia*, *Sorghum halepense* and *Sporobolus poiretti* were recorded in all three studies (Table 1). Field notes indicate that *Trifolium repens* was present in the autumnal study, even though it was not recorded on the transects. *Rumex* spp., were abundant in the vernal and estival studies. The remaining perennials were abundant mainly in the estival and autumnal periods (Table 1).

Extreme human activities on the Mississippi River levee and continuous grazing on the Bonnet Carre guide levees account for inconsistent percent values for these perennials.

It is interesting to note that *Sorghum halepense* was very abundant on the Mississippi River levee, but not on the guide levees. *Sida*

*rhombifolia* was very abundant on the guide levees, but not on the river levee.

The vegetation of the levees is not at all similar to that of the pioneer species on other sandy deposits. Of the 43 species that Brown (1929) found on a bare area caused by construction of a levee near Baton Rouge, 35 percent were found on the levees in this study. On abandoned farm land near New Orleans, Bonck and Penfound (1945) encountered 67 species, of which 30 percent were common to the levee study. Howard and Penfound (1942) found 102 species in the Bonnet Carre floodway in East St. Charles Parish. Of this total 19 percent were recorded on the levees in this study. It should be noted that trees and shrubs given in the above papers were not encountered in this study.

Field notes indicate that of all plants recorded, 11 species were noted to flower only in the vernal period, 6 species were observed to flower only in the estival study and 8 species were seen to flower only in the autumnal study. A survey of the field notes and data suggests that the area studied has three seasonal flowering periods.

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### Notes on *Sarracenia* subspecies

EDGAR T. WHERRY

*The two red pitcher-plants.*—Nearly 50 years ago I observed in upland North Carolina a red-flowered Pitcher-plant differing strikingly from the lowland *Sarracenia rubra* Walt.: the leaves were much larger and sparser, and the scent of the likewise larger flowers was but faint, instead of intensely rose-like. It was duly named in honor of Dr. Frank M. Jones, the foremost authority on pitcher-plant insects, *Sarracenia jonesii*. (1).

When this taxon ranges into mountain-front cataracts its habit becomes abnormal and it simulates the lowland one, and it was accordingly reclassified as *S. rubra* forma *jonesii* (Wherry) Bell. (2). Correspondingly in the 1965 *Atlas of the Vascular Plants of the Carolinas*, p. 184, the map of *S. "rubra"* bears dots in both upland and lowland counties.

Nothing would be gained by adding here to the already voluminous—and sterile—argumentation as to category-designation, so it may merely be pointed out that the most reasonable current plan is to apply the category of *forma* to deviants within a normal population without geographic segregation, and to class as *subspecies* those which also have distinctive—and often disjunct—geographic range. On this basis it is herewith proposed to make another status-change: *Sarracenia rubra* Walt. subsp. *jonesii* (Wherry) Wherry, stat. nov. The Upland Red Pitcher-plant can thereby be accepted for inclusion in the forthcoming *Flora Americana*, as it surely deserves.

*The two purple pitcher-plants.*—That the Linnaean *Sarracenia purpurea* comprises two morphologically and geographically distinct taxa was recognized by Rafinesque, (3) a long, glabrous-leaved northern *S. "gibbosa,"* and a short, pubescent-leaved southern *S. "venosa."* Although Linnaeus preserved no type specimen, his discussion indicates that his species represented the northern of these, which according to current