

FLORISTICS OF THREE BOGS IN WESTERN LOUISIANA

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ABSTRACT

The floristics, species diversity, and soil characteristics of three west Louisiana bogs are described and compared with other bogs in the region.

KEY WORDS: Pitcher plant bog, hillside seepage bog, Louisiana, floristics, *Sarracenia*, Kisatchie National Forest

INTRODUCTION

In two previous papers we describe the floristic composition of four west Louisiana pitcher plant bogs (*a.k.a.*, hillside seepage bogs) (MacRoberts & MacRoberts 1988, 1990a). In the present paper we describe the floristic composition and species diversity of one pitcher plant bog and two bogs that lacked pitcher plants.

The reason we undertook this study is twofold. First, almost nothing has been published about bogs west of the Mississippi River delta (see literature in MacRoberts & MacRoberts 1988, 1990a; Nixon & Ward 1986; Bridges & Orzell 1989; Frost, *et al.* 1986). Second, we thought that there were two types of bogs in our study area: ones that lacked pitcher plants and seemed to be drier, and ones that had pitcher plants and appeared to be wetter. In other words, there appeared to be a soil moisture difference. Also, the drier bogs had extensive stands of *Ctenium aromaticum* (Walt.) Wood, a grass absent from the four very wet bogs we had studied previously.

STUDY SITES

Frog Arrow, 360A, and 360B bogs are located in the Kisatchie Ranger District of the Kisatchie National Forest, Natchitoches Parish, about 9 km east of Lotus at the headwaters of the Bayou L'Ivrogne drainage, at about 100 m above sea level. The three bogs are within a 0.7 km radius of each other.

Table 1. Soil Characteristics.

Site	Exchangeable ions (ppm)					
	pH	P	K	Ca	Mg	OM%
360A	5.3	2	31	900	14	1.1
360B	5.8	2	29	120	23	1.0
Frog Arrow	5.0	1	20	100	13	1.4

Only one of them (Frog Arrow) has *Sarracenia*. All three have *Ctenium*. Frog Arrow measures 2.4 ha; 360A measures 2.2 ha; 360B measures 0.9 ha.

Frog Arrow is a relatively flat bog with a slight slope. 360A and 360B have a greater slope, ca. 3-5 degrees. All three are surrounded by upland longleaf pine forest. 360A and 360B abut riparian woodland at their lower edge. Frog Arrow abuts riparian habitat on one side only. All three are open, with a few scattered pines and shrubs (MacRoberts & MacRoberts 1990b). All occur on Anacoco loam (fine, montmorillonitic, thermic Vertic Albaqualfs) with Malbis soil (fine loamy, siliceous, thermic Plinthic Paleudults) upslope (Martin, *al.* 1990). *Sphagnum* is present in all the bogs but is not abundant. The climate is described in our previous papers and in Martin, *et al.* (1990). All three bogs have been variously damaged by logging. All were prescribed burned in the winter (nongrowing season) of 1989-1990.

METHODS

We visited the bogs at two week intervals from April through October 1990. Voucher specimens for many of the species were collected. Rare or easily identifiable plants were not collected. We follow MacRoberts (1984, 1989) for scientific nomenclature. Soil samples taken from the upper 15 cm of each bog were analyzed by A & L Agricultural Laboratories, Memphis, Tennessee.

In order to determine species diversity we established ten one meter square plots and two twenty-five meter square plots in Frog Arrow and 360A bogs and recorded species in them every two weeks.

RESULTS

Table 1 gives soil information for the three bogs.

Table 2 lists the species found at the bogs. "F" indicates presence at Frog Arrow, "A" indicates presence at 360A, and "B" indicates presence at 360B. Absence of a letter indicates presence at all three bogs.

Table 2. Taxa present at Frog Arrow, 360A, and 360B bogs.

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- DENNSTAEDTIACEAE – *Pteridium aquilinum* (L.) Kuhn.
- LYCOPODIACEAE – *Lycopodium alopecuroides* L., *L. appressum* (Chapm.) Lloyd & Underw., *L. carolinianum* L.
- OSMUNDACEAE – *Osmunda cinnamomea* L. (F), *O. regalis* L. (F, B).
- PINACEAE – *Pinus palustris* P. Mill., *P. taeda* L.
- AMARYLLIDACEAE – *Hypoxis rigida* Chapm.
- BURMANNIACEAE – *Burmannia capitata* (Walt.) Mart. (F, B).
- CYPERACEAE – *Carex glaucescens* Ell. (F, B), *Dichromena latifolia* Baldw. ex Ell. (F), *Eleocharis tuberculosa* (Michx.) Roem. & Schult. (F, B), *Fuirena squarrosa* Michx., *Rhynchospora chalarocephala* Fern. & Gale (F), *R. globularis* (Chapm.) Small var. *globularis*, *R. glomerata* (L.) Vahl. (F), *R. gracilentia* A. Gray (A), *R. oligantha* A. Gray, *R. plumosa* Ell., *R. pusilla* Chapm. ex M.A. Curtis (F, A), *R. rariflora* (Michx.) Ell., *Scleria ciliata* Michx. (F), *S. georgiana* Core (B), *S. reticularis* Michx.
- ERIOCAULACEAE – *Eriocaulon decangulare* L., *Lachnocaulon anceps* (Walt.) Morong.
- JUNCACEAE – *Juncus scirpoides* Lam., *J. trigonocarpus* Steud. (F).
- LILIACEAE – *Aletris aurea* Walt., *Smilax laurifolia* L., *S. rotundifolia* L. (A, B).
- ORCHIDACEAE – *Calopogon tuberosus* (L.) B.S.P., *Platanthera integra* (Nutt.) A. Gray ex Beck, *P. nivea* (Nutt.) Luer. (A), *Pogonia ophioglossoides* (L.) Juss. (F), *Spiranthes cernua* (L.) L.C. Rich. (F, A), *S. vernalis* Engelm. & A. Gray.
- POACEAE – *Andropogon gerardii* Vitman, *Andropogon virginicus* L. (F, A), *Anthraenantia rufa* (Ell.) Schultes, *Aristida virgata* Trin., *Ctenium aromaticum* (Walt.) Wood, *Dichanthelium acuminatum* (Sw.) Gould & Clark, *D. dichotomum* (L.) Gould (A), *D. scoparium* (Lam.) Gould, *Eragrostis spectabilis* (Pursh) Steud., *Muhlenbergia expansa* (Poir.) Trin., *Panicum virgatum* L., *Paspalum floridanum* Michx. (F), *Paspalum laeve* Michx., *Setaria geniculata* (Lam.) Beauv. (A), *Tridens ambiguus* (Ell.) Schultes.
- XYRIDACEAE – *Xyris ambigua* Beyr. ex Kunth, *X. baldwiniana* Schultes, *X. caroliniana* Walt., *X. difformis* Chapm. var. *curtissii* (Malme) Kral, *X. drummondii* Malme, *X. torta* Smith.
- ACERACEAE – *Acer rubrum* L.
- ANACARDIACEAE – *Rhus copallina* L. (F, A), *Toxicodendron radicans* (L.) Kuntze (F), *T. vernix* (L.) Kuntze (F, A).
- APIACEAE – *Eryngium integrifolium* Walt., *Oxypolis rigidior* (L.) Raf. (F), *Ptilimnium capillaceum* (Michx.) Raf. (F, B).

Table 2 (continued).

- AQUIFOLIACEAE - *Ilex opaca* Ait. (F), *I. vomitoria* Ait.
ASCLEPIADACEAE - *Asclepias longifolia* Michx., *A. obovata* Elliott (B).
ASTERACEAE - *Aster ericoides* L. (A, B), *Bigelovia nuttallii* Anderson (A), *Chaptalia tomentosa* Vent., *Coreopsis linifolia* Nutt., *Eupatorium leucolepis* (DC.) Torrey & A. Gray, *E. rotundifolium* L., *Helianthus angustifolius* L., *Heterotheca graminifolia* (Michx.) Shinnars (F, A), *Liatris pycnostachya* Michx., *Marshallia tenuifolia* Raf., *Senecio tomentosa* Michx. (A, B), *Solidago nitida* Torrey & A. Gray (A, B).
CAMPANULACEAE - *Lobelia reverchonii* B.L. Turner.
CAPRIFOLIACEAE - *Viburnum nudum* L. (F, A).
CLUSIACEAE - *Hypericum fasciculatum* Lam., *H. setosum* L. (F), *H. stans* (Michx.) Adams & Robson.
DROSERACEAE - *Drosera brevifolia* Pursh, *D. capillaris* Poir.
ERICACEAE - *Vaccinium corymbosum* L.
FABACEAE - *Tephrosia onobrychoides* Nutt.
GENTIANACEAE - *Bartonia paniculata* (Michx.) Muhl. (A), *Sabatia gentianoides* Ell.
HAMAMELIDACEAE - *Liquidambar styraciflua* L.
LAMIACEAE - *Scutellaria integrifolia* L.
LAURACEAE - *Persea borbonia* (L.) Spreng.
LENTIBULARIACEAE - *Pinguicula pumila* Michx., *Utricularia cornuta* Michx., *U. juncea* Vahl, *U. subulata* L.
LINACEAE - *Linum medium* (Planch.) Britt.
LOGANIACEAE - *Cynoctonum sessilifolium* (Walt.) St. Hil. (A), *Gelsimium sempervirens* (L.) St. Hil. (A, B).
MAGNOLIACEAE - *Magnolia virginiana* L.
MELASTOMATACEAE - *Rhexia lutea* Walt., *R. mariana* L. var. *mariana*, *R. petiolata* Walt.
MYRICACEAE - *Myrica cerifera* L. *M. heterophylla* Raf.
NYSSACEAE - *Nyssa sylvatica* Marsh.
ONAGRACEAE - *Ludwigia hirtella* Raf., *L. linearis* Walt. (A, B).
POLYGALACEAE - *Polygala cruciata* L., *P. incarnata* L. (A, B), *P. mariana* P. Mill. (A), *P. nana* (Michx.) DC. (A), *P. ramosa* Ell.
ROSACEAE - *Rubus louisianus* Berger.
RUBIACEAE - *Hedyotis uniflora* (L.) Lam. (F, B).

Table 2 (continued).

SARRACENIACEAE – *Sarracenia alata* Wood. (F).

SCROPHULARIACEAE – *Agalinis purpurea* (L.) Penn., *Gratiola pilosa* Michx. (F, A).

VIOLACEAE – *Viola primulifolia* L. (F, A).

* *Asclepias viridiflora* Raf. reported from Strange Road Bog (MacRoberts & MacRoberts 1988) should be *A. obovata* Elliott.

DISCUSSION

The soils of these three bogs are similar and are similar to the soils of the bogs we have studied previously except that they are, in general, a little less acidic.

We recorded 123 taxa for the three bogs, representing 80 genera and 43 families. Frog Arrow had 104 taxa; 73 genera, and 42 families. 360A had 101 taxa: 70 genera and 39 families. 360B had 92 taxa: 66 genera and 39 families. The average number of taxa for the three bogs is 99 species, which is comparable to bogs we have studied earlier and to bogs in east Texas (Nixon & Ward 1986). The three bogs had 88% of the 48 species listed by Nixon & Ward (1986) for six east Texas bogs and 85% of the 52 most prevalent species listed by Bridges & Orzell (1989) for bogs in southwestern Louisiana and southeastern Texas.

Sorensen's index of similarity (see Nixon & Ward 1986) shows that these bogs are floristically similar: Frog Arrow/360A (83), Frog Arrow/360B (84), 360A/360B (86). They are less like Middle Branch and Strange Road bogs (index of similarity in mid- to low 60's) than like Fixit (*a.k.a.* Bog Bayou L'Ivrogne) and Woodcock (index of similarity in mid- to low 70's) (MacRoberts & MacRoberts 1988, 1990a). Nonetheless, our original premise – that the three bogs in the present study would be substantially floristically different from the bogs we had studied earlier in this area – was not supported. The bogs differed primarily in the presence or absence of a few conspicuous species.

The four one meter square plots in Frog Arrow bog had from 16 to 21 species and the six one meter square plots in 360A bog had from 14 to 22 species (not counting *Sphagnum*). The average of the ten samples was 18.6 species. The two twenty-five meter square plots had 33 species (Frog Arrow) and 32 species (360A). Allen, *et al.* (1988) found about 20 species per square meter in bogs in Vernon Parish, Louisiana.

Our figures are considerably below those given by Walker & Peet (1983) for pine-wiregrass savannas in North Carolina. They found between 22 and 35

species per square meter and between 43 and 57 species per twenty-five square meters, depending on moisture and fire gradient.

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