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A FLORISTIC AND ECOLOGICAL
SURVEY OF THE PTERIDOPHYTES
OF THE NORTHWESTERN HIGHLAND
RIM, KENTUCKY AND TENNESSEE

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LAURINA ISABELLA LYLE

A FLORISTIC AND ECOLOGICAL SURVEY OF THE
PTERIDOPHYTES OF THE NORTHWESTERN HIGHLAND RIM,
KENTUCKY AND TENNESSEE

An Abstract
Presented to
the Graduate Council of
Austin Peay State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science

by
Laurina Isabella Lyle
August, 1980

ABSTRACT

A floristic and ecological survey of the pteridophytes of the northwestern Highland Rim was conducted from 1 April 1979 through 30 June 1980. Fifty taxa, representing 13 families and 24 genera, were found or have been reported from the area. Forty-six of these were collected during this study, whereas previous collections and/or literature records accounted for the other four. Cheilanthes alabamensis was reported for the first time from Kentucky. Adiantum capillus-veneris, Asplenium ebenoides and Woodwardia areolata were documented for the first time from the study area. New county records totaled 39.

A FLORISTIC AND ECOLOGICAL SURVEY OF THE
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the Graduate Council of
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In Partial Fulfillment
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by
Laurina Isabella Lyle
August, 1980

To the Graduate Council:

I am submitting herewith a Thesis written by Laurina Isabella Lyle entitled "A Floristic and Ecological Survey of the Pteridophytes of the Northwestern Highland Rim, Kentucky and Tennessee." I recommend that it be accepted in partial fulfillment of the requirement of the degree Master of Science, with a major in Biology.



Major Professor

We have read this thesis and
recommend its acceptance


Second Committee Member


Third Committee Member

Accepted for the
Graduate Council


Dean of the Graduate School

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CHAPTER I

INTRODUCTION

NATURE OF THE PROBLEM

The pteridophytes of eastern North America are best represented in both diversity and numbers in the southern regions with a decline in both characteristics northward. For example, Small (1938) records 189 species from the southern United States, while Wofford and Evans (1979) map 80 for Tennessee, and Cranfill (in press) records 69 from Kentucky. These numbers also indicate a rather complete knowledge of the southeastern pteridophyte flora. However, examination of distribution maps shows many gaps, especially for some specific regions and physiographic provinces. One such area is the northern Highland Rim of Kentucky and Tennessee. Neither state has a recent "State Flora", and collecting has been especially limited in the Rim area. It was felt that an extensive and intensive study of the pteridophytes of this area was warranted.

The purpose of this study was to prepare a pteridophyte flora of the northwestern Highland Rim, utilizing existing data and new collections. Special consideration was given to confirming previous reports and to establishing habitat preferenda for the species encountered.

STUDY AREA

The northwestern Highland Rim lies within the Interior Low Plateau Province (Fenneman, 1938) and includes the area bounded on the north by the Dripping Springs Escarpment, on the west by the Tennessee River, on the east by the western edge of the Central Basin and on the south by

an arbitrary political boundary approximated by Interstate Highway 40 (Appendix I. Figure 1). Five counties in Kentucky and seven in Tennessee are included. The Kentucky counties are Christian, Logan, Lyon, Todd, and Trigg; Tennessee counties are Cheatham, Dickson, Humphreys, Houston, Robertson, Montgomery, and Stewart.

The northwestern Highland Rim is topographically a complex of plains, dissected uplands, deeply incised streams, basins, and alluvial plains (Quarterman and Powell, 1978). Several features such as sinkholes, springs, caverns, gulfs, bluffs, and deep stream gorges provide diverse habitat types.

Quarterman and Powell divide this area into two subsections: the western Highland Rim and the Pennyroyal Plain. The western Highland Rim subsection consists of several geological formations. The upland is developed upon St. Louis and Warsaw Limestones with some ridges and valleys consisting of the Fort Payne formation (cherty limestone). A few areas are capped with cherty gravels of the Tuscaloosa Formation of Cretaceous Age. The Pennyroyal Plain subsection in south-central Kentucky and north-central Tennessee is underlain by Ste. Genevieve, St. Louis and Warsaw Limestones, all of Mississippian Age, and is noted for its Karst topography. The Ste. Genevieve Limestone is known especially for numerous sinkholes and sinking streams.

Although the Dripping Springs Escarpment is the northern boundary of the study area, that portion which occurs in Christian, Todd and Logan counties was surveyed and included as a part of this study. The geology of the escarpment is a complex series consisting of a mixture of calcareous and non-calcareous shales, limestones, and siltstones.

REVIEW OF THE LITERATURE

Floristic and vegetational studies of the area are in the formative stages and the literature is fragmented. There are no publications exclusively treating the pteridophytes of the northwestern Highland Rim. Most are of statewide scope and give only county distributions with brief habitat descriptions.

The most informative and detailed publications concerned with the pteridophytes of Kentucky and Tennessee come from Cranfill (in press) and Shaver (1954) respectively.

Gattinger (1901) provided the earliest Tennessee flora, listing 63 pteridophytes, but none were specifically cited from the study area. Anderson (1930, 1931), Woodruff (1938), and Phillips (1968) contributed additional pteridophyte reports for Tennessee. Neither Shaver nor Anderson included the fern-allies in their publications. However, Shaver did include distribution maps, specimen citations, and habitat descriptions. Wofford and Evans (1979) compiled a distributional atlas of the Tennessee pteridophytes.

Cranfill updated the Kentucky pteridophyte report by Short (1835) to include 25 additional species. Other reports from Kentucky include Reed (1958, 1961, 1962, and 1965), Smith (1959), Brown (1963), McCoy and Hunter (1968), Baskin and Baskin (1978), and Cranfill and Lyle (1979). Literature sources with county distributions are summarized in Table II of Appendix III.

CHAPTER II

METHODS AND MATERIALS

Data were obtained from three sources: literature, regional herbaria and field studies. Literature records were used to compile a preliminary list of the pteridophytes known from the northwestern Highland Rim. Additional records came from herbaria at the following institutions: Austin Peay State University, Clarksville, Tennessee; Murray State University, Murray, Kentucky; University of Tennessee, Knoxville; and Vanderbilt University, Nashville, Tennessee. All specimens in these herbaria were assessed for correct identification.

Field studies were conducted from 1 April 1979 through 30 June 1980. Criteria used to select collecting sites were: (1) the likelihood that an area could support ferns based on topographic features, (2) communication with people who had knowledge of fern locations, and (3) literature descriptions of past collecting sites. Random and selected site collecting was also conducted. Literature, herbarium records, and new collections were used to prepare distribution maps for the area.

Radford, et al. (1968), Shaver (1954), and Sharp (1955) were the primary sources for identification. Ray Cranfill and Brian Boom provided verification for those taxa more difficult to identify. Voucher specimens are deposited in the herbarium of Austin Peay State University. Keys to families and species were made. General descriptions of habitat, distribution, and other pertinent information were compiled in an annotated checklist.

CHAPTER III

RESULTS

The pteridophytes of the northwestern Highland Rim include 13 families, 24 genera, and 50 sub-generic taxa. Keys to the families and sub-generic taxa constitutes the first portion of this chapter. In addition to observed characters, materials for keys were drawn from Radford, et al. (1968), Fernald (1950), Evans (1978), Sharp (1955), and Cranfill (in press). Following the keys is a detailed account of each taxon in the form of an annotated checklist.

Key to Families

1. Plants exist only in gametophytic state; many branching, ribbon-like prothallia A. Vittariaceae
1. Plants exhibit both gametophyte and sporophyte generations; branching, ribbon-like prothallia few2
2. Plants conspicuously jointed; leaves fused basally into sheaths; sporangia borne on peltate bodies in terminate plates
..... B. Equisetaceae
2. Plants not jointed; leaves not fused basally into sheaths; spores borne in variety of fashions but not peltate plates3
3. Sporangia in axils of scale-leaves or buried in pockets of tubular, quill-like leaves4
4. Plants with leaves slender and in tufts, very grass-like; stems from a bilobed corm C. Isoetaceae

4. Plants like 'coarse "moss"; stems branching and elongate.....5
5. Leaves of two kinds, ligulate; pale-green and herbaceous;
heterosporous.....D. Selaginellaceae
5. Leaves of one kind and not ligulate; small, narrowed and ever-
green; homosporous..... E. Lycopodiaceae
3. Sporangia borne on simple or branching fertile spikes or borne on
the under-surface or margins of leaf blades; leaves simple or
divided.....6
6. Sporangia borne on stalked, naked clusters of modified fronds,
pinnae or segments.....7
7. Fronds averaging less than 0.3 m tall.....
..... F. Ophioglossaceae
7. Frond averaging 0.5 m to 1.75 m tall..... G. Osmundaceae
6. Sporangia borne on undersurface or margin of frond.....8
8. Leaf blade delicate, one cell thick between the veins;
sporangia sessile at the base of bristle-like receptacles.....
..... H. Hymenophyllaceae
8. Leaf blade thicker, greater than two cells thick between
veins; sporangia borne in a variety of fashions.....9
9. Sori marginal and covered by reflexed marginal leaf tissue.....
.....10
10. Petioles green and straw colored; rhizome and leaf bases
covered with hairs only..... I. Dennstaedtiaceae
10. Petioles ebony or black; rhizome and leaf bases clothed with
scales..... J. Adiantaceae
9. Sori borne on the under-surface of leaf, if sporangia marginal,
indusia not continuous with leaf margins.....11

- 11. Fronds only pinnatifid and evergreen; sori round without
indusia or protective covering K. Polypodiaceae
- 11. Fronds pinnatifid or divided in a variety of fashions; sori
round to linear (if round, fronds not evergreen); indusia
present, rarely absent12
- 12. Sori linear and restricted to costa L. Blechnaceae
- 12. Sori round or linear along veins but not restricted to costa
..... M. Aspleniaceae

Keys to Genera, Species and Varieties

A. VITTARIACEAE

Only one species - Vittaria sp.

B. EQUISETACEAE

One genus - Equisetum

- 1. Aerial shoot soft and flexible, dimorphic; sterile shoot with many
whorls of secondary branches E. arvense
- 1. Aerial shoot hard and rigid, monomorphic; sterile shoots branchless
..... E. hyemale

C. ISOETACEAE

Only one species - Isoetes engelmanni

D. LYCOPODIACEAE

- 1. Sporophylls like sterile leaves or slightly reduced; not aggregated
into cones2
- 2. Microphylls broadest above middle; upper margins toothed
..... L. lucidulum
- 2. Microphylls more or less awl-shaped; margins slightly if at
all toothed L. porophilum

1. Sporophylls differing from sterile leaves; aggregated into terminal cones L. flabelliforme

E. SELAGINELLACEAE

Only one species - Selaginella apoda

F. OPHIOGLOSSACEAE

Two genera - Botrychium and Ophioglossum

1. Sterile portion of frond divided or dissected; fertile segment branched I. Botrychium

1. Sterile portion of frond simple; fertile segment simple II. Ophioglossum

I. Botrychium

1. Fronds deciduous, sterile segment joining axis of fertile segment B. virginianum

1. Fronds evergreen, sterile segment stalked 2

2. Blades mostly tripinnate; sterile portion highly dissected, bronzing in winter B. dissectum

2. Blades mostly bipinnate; sterile portion slightly dissected, bronzing only slightly in winter B. biternatum

II. Ophioglossum

1. Sterile portion of frond ending in a sharp tip O. engelmanni

1. Sterile portion of frond broadly obtuse O. vulgatum

G. OSMUNDACEAE

One genus - Osmunda

1. Fronds completely dimorphic; sterile frond without sporangia, pinnate-pinnatifid O. cinnamomea

1. Fertile and sterile leaflets occurring on the same frond; fertile

portion apical, bipinnate 0. regalis

H. HYMENOPHYLLACEAE

Only one species - Trichomanes boschianum

I. DENNSTAEDTIACEAE

Two genera - Dennstaedtia and Pteridium

1. Fronds ovate-lanceolate; indusia cup-like; petioles pilose
..... I. Dennstaedtia

1. Fronds triangular to ovate; sori with rudimentary inner indusia;
petioles glabrous II. Pteridium

I. Dennstaedtia

Only one species - Dennstaedtia punctilobula

II. Pteridium

Only one species - Pteridium aquilinum; two varieties.

1. Margins of ultimate segments moderately pubescent, longest segments
4X as long as broad..... var latiusculum

1. Margins of ultimate segments glabrous, longest entire segments
6-15X as long as broad var pseudocaudatum

J. ADIANTACEAE

Three genera - Adiantum, Pellaea, and Cheilanthes.

1. Fronds thin; margins of pinna or pinnule with discrete, widely
separated sori I. Adiantum

1. Fronds brittle; margins of pinna or pinnule with sori nearly
continuous2

2. Pinnae large, fronds never densely hairy II. Pellaea

2. Pinnae small, fronds often hairy III. Cheilanthes

I. Adiantum

1. Fronds dichotomous in a fan-like pattern, pinnules oblong

..... A. pedatum

1. Fronds pinnate with a strong, central axis, pinnules wedge-shaped

..... A. capillus-veneris

II. Pellaea

1. Stipe glabrous; ultimate segments less than 2X as long as wide

..... P. glabella

1. Stipe pubescent with whitish appressed hairs; ultimate segments

more than 2X as long as wide P. atropurpurea

III. Cheilanthes

1. Fronds with few hairs; stipe and midrib black

..... C. alabamensis

1. Fronds hairy; stipe and mid-rib red-brown C. lanosa

K. POLYPODIACEAE

Only one genus - Polypodium

1. Fronds green, lower surface glabrous P. virginianum

1. Fronds gray-green, lower surface rough with peltate scales

..... P. polypodioides

L. BLECHNACEAE

Only one species - Woodwardia areolata

M. ASPLENIACEAE

Eight Genera - Onoclea, Asplenium, Athyrium, Woodsia, Cystopteris,

Dryopteris, Thelypteris, and Polystichum.

1. Leaves dimorphic; fertile fronds with sporangia borne on contracted, rolled-up leaf segments I. Onoclea

1. Leaves monomorphic; fertile fronds never rolled-up; sporangia usually borne on unmodified segments 2

2. Sori round, without indusia II. Thelypteris

2. Sori elongate or round but with indusia3
3. Sori elongate or crescent shaped4
4. Fronds less than 0.3 m tall; more or less evergreen
..... III. Asplenium
4. Fronds more than 0.3 m tall; deciduous IV. Athyrium
3. Sori round or reniform5
5. Sori with indusia saccate6
6. Sorus with indusia rupturing into four or more segments
..... V. Woodsia
6. Sorus with indusium entire, not rupturing into segments
..... VI. Cystopteris
5. Sori with indusia reniform or peltate7
7. Indusia reniform; sori on unmodified leaflets
..... VII. Dryopteris
7. Indusia peltate; sori restricted to terminal reduced
leaflets VIII. Polystichum

I. Onoclea

Only one species - Onoclea sensibilis

II. Thelypteris

1. Fronds triangular; rachis with adnate wings between leaflets;
lowest pinnae larger than those above I. hexagonaptera
1. Fronds lanceolate to oblong-lanceolate; rachis wings absent;
lowest pinnae not larger than those above2
2. Lower pinnae reduced to auricles; veinlets in segments
simple I. novaboracensis
2. Lower pinnae not reduced; veinlets in segments once-forked
..... I. palustris

III. Asplenium

1. Fronds entire, lobed basally with extremely tapered tips
..... A. rhizophyllum
1. Fronds deeply lobed or compound2
 2. Frond pinnatifid with long attenuate tip
..... A. pinnatifidum
 2. Frond pinnately divided throughout or at least 1/3 of length ..
.....3
3. Blades once pinnate4
 4. Plants pinnate for 1/3 or less of its length; rachis brown
1/3 or 1/2 length A. ebenoides
 4. Plants pinnate for 1/2 or 2/3 of its length; rachis dark for
more than 1/2 of length5
 5. Fronds averaging 8-12 inches in length; leaves
dimorphic A. platyneuron
 5. Fronds averaging less than 6 inches in length, leaves
monomorphic6
6. Pinnae twice as long as wide; petiole and rachis black
..... A. resiliens
6. Pinnae seldom twice as long as wide, usually orbiculate; petiole
and rachis purple-brown A. trichomanes
3. Blades twice pinnate7
 7. Stipes green throughout; fronds bipinnate throughout; blades
ovate-triangular A. ruta-muraria
 7. Lower stipe dark; fronds bipinnate only at base; blade
lanceolate A. bradleyi

IV. Athyrium

1. Fronds 2-3 pinnate; sori crescent or "J" shaped... A. asplenoides
1. Fronds once pinnate; sori linear2
 2. Leaflets lobed; rachis pubescent A. thelypteroides
 2. Leaflets entire; rachis glabrous A. pycnocarpon

V. Woodsia

Only one species - Woodsia obtusa

VI. Cystopteris

1. Veins ending in teeth along margins of pinnules; leaf axis lacking bulblets C. protrusa
1. Veins ending in notches along margins of pinnules; leaf axis usually with bulblets2
 2. Fronds deltoid with tapering apices; bulblets spherical and smooth on rachis and pinnae C. bulbifera
 2. Fronds broadly deltoid with apices not as tapered; bulblets deformed and scaly, on rachis only C. tennesseensis

VII. Dryopteris

1. Sori marginal; fronds bipinnate and leathery, gray-green
..... D. marginalis
1. Sori medial; fronds tripinnate and chartaceous, bright to dark green D. intermedia

VIII. Polystichum

Only one species - Polystichum acrostichoides

Annotated Checklist

The following list of pteridophytes include specimens examined in four herbaria in Kentucky and Tennessee plus those collected during

this study. The specimens at the Vanderbilt and University of Tennessee Herbaria are predominantly from the Jesse Shaver collection and are mapped in a recent paper by Wofford and Evans (1979). Citations for these specimens are not included in the checklist. Herbarium abbreviations are: Austin Peay State University (APSU) and Murray State University (MSU).

The taxa are discussed using the following format. The families are listed in alphabetical order starting with the fern-allies. An account of each sub-generic taxon occurs in alphabetical order under its family and includes the following information in this order: scientific name and synonymy if appropriate; common name; state-wide distribution in Kentucky and Tennessee; regional abundance; regional distribution; regional habitat; and standard specimen citation. Nomenclature for common names follows Radford, et al. (1968), Cranfill (in press), and Shaver (1954). State-wide distributions were taken from Cranfill (in press), Shaver (1954), and Wofford and Evans (1979). Regional distribution maps (see Appendix II) summarize literature sources, herbarium specimens, and new collections. Literature sources are more fully detailed in Appendix III.

1. EQUISETACEAE

Equisetum arvense L. Field Horsetail. Scattered throughout Kentucky and Tennessee; rare but locally abundant in the four counties represented (Figure 3); open alluvium, creek and river banks, drainage areas, bottomlands.

KENTUCKY: TODD CO.: 2 miles east of Allegre, 11 June 1972, Settle, 04366 (APSU); Clifty Gorge, 12 Aug. 1979, Cranfill, Cotellino, Lyle, 10 (APSU).
 TENNESSEE: CHEATHAM CO.: Raccoon Creek, 26 June 1979, Scott,

15

Chester, Lyle, 83 (APSU). MONTGOMERY CO.: Lock B, 25 May 1969, Brock, Lee, Jensen, 04261 (APSU); Lock B, 2 May 1968, Schibig, 10 (APSU); Swan Lake, 14 May 1979, Lyle, 41 (APSU); Hematite Recreation Area, 15 May 1977, N. Snyder, 7 (APSU). STEWART CO.: Panther Creek, Fort Henry Rd. 21 April 1978, Carpenter, Stack, Chester, 3277 (APSU); LBL, 1½ miles north of 10P4, 21 May 1966, Clebsch, Ellis, 01196 (APSU).

Equisetum hyemale L. Scouring Rush. Scattered throughout Kentucky and Tennessee; rare but sometimes in extensive stands in the five counties represented (Figure 3); sandy alluvium and creek banks.

KENTUCKY: CHRISTIAN CO.: Little River, 28 June 1979, Rainwater, Dannenmaier, Lyle, 93 (APSU). TODD CO.: West Fork Creek at Carter's Rd. 17 Aug. 1979, Rainwater, Lyle, 208 (APSU). TENNESSEE: HOUSTON CO.: Yellow Creek, 13 miles southeast of Erin, 26 May 1969, Perry, s.n. (APSU). MONTGOMERY CO.: Coke Creek, Wall Branch, 14 May 1949, Brown, Clebsch, 681 (APSU); Foster's Cave, 15 July 1949, Silva, Clebsch, 396 (APSU); Parson's Creek, 24 Oct. 1949, Clebsch, 682 (APSU); Little Baron's Creek, 22 May 1967, Neblett, 150 (APSU). ROBERTSON CO.: Sulphur Fork Creek, 6 July 1979, W. Lyle, Lyle, 97 (APSU); Brushy Creek, 10 July 1979, Snyder, Petty, Williams, Lyle, 100 (APSU).

2. ISOETACEAE

Isoetes engelmanni A. Br. Engelmann's Quillwort. Rare in Kentucky and Tennessee where it is known best in the eastern portions; very rare and possibly extirpated; known from one site which has been altered for agricultural purposes (Figure 3); upland wet woodlands.

TENNESSEE: MONTGOMERY CO.: Oak Plains Rd. 1 mile south of US Highway 41-A, 17 April 1967, Chester, 1592 (APSU).

3. LYCOPODIACEAE

Lycopodium flabelliforme (Fern.) Branch. Ground Pine. Well represented in eastern Kentucky and Tennessee but infrequent in the Cumberland drainage area; locally abundant throughout the four counties represented (Figure 3); dry hillsides, often with Juniperus virginianum L., disturbed old fields, chert pits.

KENTUCKY: LOGAN CO.: Adairsville, early March, Lyne, s.n. (APSU).
 TENNESSEE: DICKSON CO.: Montgomery Bell State Park, 7 Sept. 1979,
 Chester, 4249 (APSU); Montgomery Bell State Park, 3 April 1979,
 Mahoney, s.n. (APSU); Montgomery Bell State Park, 5 June 1979,
 Chester, Mahoney, Robertson, Lyle, 58 (APSU); Hollaway Farm,
 Little Barton's Creek Rd. 22 July 1979, Lyle, 225 (APSU). MONT-
 GOMERY CO.: Lock B, 16 May 1966, Yarborough, Brown, s.n. (APSU),
 Poplar Springs, 23 Sept. 1972, Chester, 2559 (APSU); Dotsonville
 Community, Nov. 1975, McLeod, s.n. (APSU). STEWART CO.: Northwest
 facing hill, 2 miles north of Dover, above the Cumberland River,
 1 May 1979, Cheatham, s.n. (APSU).

Lycopodium lucidulum Michx. Shining Clubmoss. Eastern portions of
 Kentucky and Tennessee, and a few records westward in Kentucky; rare in
 county represented (Figure 3); report by Wofford and Evans (1979) from
 Montgomery County probably incorrect; sandstone ledges and out-
 croppings.

KENTUCKY: TODD CO.: 2 miles west of Todd-Logan county line,
 Hwy. 107, 25 July 1966, Austin, Gentry, 3078 (MSU); Clifty Gorge,
 1 mile south of Clifty, 7 May 1969, Chester, 2233 (APSU); Clifty
 Gorge, 12 Aug. 1979, Cotellino, Cranfill, Lyle, 158 (APSU).

Lycopodium porophyllum Lloyd and Underw. Cliff Clubmoss. The Cumber-
 land Plateau of Kentucky and Tennessee and sandstone formations of
 western Kentucky; rare in two counties represented (Figure 3); mesic
 sandstone ledges and cliffs.

KENTUCKY: CHRISTIAN CO.: Pennyryle State Park, 24 April 1966,
 McCoy, s.n. (MSU). TODD CO.: Clifty Gorge, 1 mile south of
 Clifty, 12 Aug. 1979, Cotellino, Cranfill, Lyle, 151 (APSU).

4. SELAGINELLACEAE

Selaginella apoda (L.) Spring. Small Spikemoss. Widely distributed
 throughout Kentucky and Tennessee, but few counties west of the Tennes-
 see River represented; frequent in eight counties represented (Figure
 4); shaded sandstone and limestone bluffs, cave entrances, stream banks.

KENTUCKY: TODD CO.: 2 miles west of Todd-Logan county line,
 north of Hwy. 107, 25 July 1966, Austin, Gentry, 3080 (MSU); 1 mile
 southeast of Alleghre, 28 March 1969, McReynolds, Chester, Settle,

TENNESSEE: CHEATHAM CO.: Sidneys Bluff, Ashland City, 6 April 1979, Chester, Scott, Lyle, 12 (APSU); Sycamore Creek, 1 mile south-southeast of Triangle Community Center, 7 June 1980, Lyle, 251 (APSU); Little Marrowbone Creek on Hwy. 12, 26 June 1979, Chester, Scott, Lyle, 91 (APSU). HUMPHREYS CO.: 2½ miles south of Hustburg, 30 Aug. 1979, Chester, Scott, Lyle, 201 (APSU). MONTGOMERY CO.: Lock B, 5 April 1979, Goss, Dannenmaier, Lyle, 3 (APSU); Dunbar Cave, 9 Nov. 1947, Clebsch, 1014 (APSU); Billy Dunlop Memorial Park, 26 March 1968, Bell, Gray, Goodlett, s.n. (APSU); Greenwood Cemetery, 29 Oct. 1949, Brown, Clebsch, 683 (APSU); 1½ miles west of Oakwood, 8 July 1950, Clebsch, s.n. (APSU); Billy Dunlop Memorial Park, 10 April 1979, Chester, 3349 (APSU). ROBERTSON CO.: Brushy Creek, 10 July 1979, Petty, Snyder, Williams, Lyle, 101 (APSU); "The Swamps", Springfield, 31 May 1979, Scott, Chester, 4010 (APSU). STEWART CO.: Crockett's Creek Baptist Church, 16 March 1966, Clebsch, Ellis, 00925 (APSU).

5. ADIANTACEAE

Adiantum capillus-veneris L. Southern Maidenhair. Eastern Highland Rim and Cumberland Plateau of Kentucky and Tennessee; rare, from several sites on Sulphur Fork Creek in Robertson County (Figure 4); moist, weathered limestone bluff, northeasterly facing.

TENNESSEE: ROBERTSON CO.: Sulphur Fork Creek, 6 July 1979, W. Lyle, s.n. (APSU); Sulphur Fork Creek, 19 Oct. 1979, Lyle, 95 (APSU).

Adiantum pedatum L. Maidenhair Fern. Widely dispersed throughout Kentucky and Tennessee; common in eleven counties represented (Figure 4); mesic ravines and woodlands, limestone and sandstone slopes, occasionally found on the slopes of sinkholes.

KENTUCKY: LOGAN CO.: Rainbow Rock natural bridge, 3½ miles east of Russellville on Hwy. 68, 15 Sept. 1979, Rainwater, Lyle, 212 (APSU). LYON CO.: Land Between the Lakes (hereafter abbreviated LBL), 2/3 mile northwest of Museum, marker 7E4, 24 June 1967, Phillips, 182 (APSU). TODD CO.: Wooded area around lake, 1½ miles east of Allegre, 28 April 1969, Settle, 04224 (APSU); Clifty Gorge, 1 mile south of Clifty, 12 Aug. 1979, Cotellino, Cranfill, Lyle, 154 (APSU). TRIGG CO.: LBL, Jones Creek, 18 June 1965, Phillips, 146 (APSU); Boatwright Hole, 11 Aug. 1979, Chester, Scott, Cranfill, Lyle, 145 (APSU); Hematite Lake, LBL, 2 May 1976, Mahoney, 3 (APSU); LBL, ½ mile north of marker 7E4, 22 April 1967, Wallen, Phillips, 107 (APSU); LBL, between markers 7H4 and 7H5,

17 April 1965, Clebsch, Phillips, 145 (APSU).
 TENNESSEE: CHEATHAM CO.: Sidneys Bluff, Ashland City, 6 April 1979, Chester, Scott, Lyle, 10 (APSU); Hwy. 12, 2 miles east of Cheap Hill, 8 Sept. 1967, Chester, 1836 (APSU). DICKSON CO.: Montgomery Bell State Park, 1 June 1979, Lyle, 57 (APSU); Turnbull Creek, 2.7 miles southwest of Svenson's Bluff, 31 June 1979, Chester, Scott, Lyle, 125 (APSU). HUMPHREYS CO.: $\frac{1}{2}$ mile east of Hurricane Mills, 14 Aug. 1979, Goss, Lyle, 180 (APSU). MONTGOMERY CO.: Hwy. 13 Montgomery-Stewart county line, 23 July 1949, Brown, Clebsch, 394 (APSU); Henrietta, 3 July 1965, Chester, 908 (APSU). ROBERTSON CO.: Sulphur Fork Creek, 14 July 1979, Lyle, 77 (APSU). STEWART CO.: Stewart State Forest, 10 May 1969, Brock, 04270 (APSU); LBL, $\frac{1}{4}$ mile west of marker 8M4, 29 June 1965, Clebsch, Phillips, 134 (APSU); $4\frac{1}{2}$ miles west of Dover, 3 June 1967, Riggins, 55 (APSU); LBL, Rushing Creek Camp Area, 7 June 1965, Phillips, 144 (APSU); LBL, Rayburn Creek between markers 9N3 and 9N4, 12 Aug. 1965, Phillips, 138 (APSU).

Cheilanthes alabamensis (Buckley) Kunze. Alabama Lip-Fern. Scattered throughout the Interior Low Plateaus, the Ridge and Valley Region and the Cumberland Plateau but absent west of Tennessee River in Tennessee; from one county in Kentucky; infrequent in the five counties represented (Figure 4); mesic limestone bluffs and outcroppings.

KENTUCKY: LOGAN CO.: 1.8 miles east of Keysburg, Hwy. 102, above the Red River, 15 April 1979, Cranfill, Lyle, 18 (APSU).
 TENNESSEE: CHEATHAM CO.: Bluff above Little Marrowbone Creek on the Cheatham-Davidson county line, 26 June 1979, Scott, Chester, Lyle, 78 (APSU); Salt Peter Cave, Neptune, Scott, Chester, Lyle, 109 (APSU). HUMPHREYS CO.: $\frac{1}{4}$ mile east of Cold Branch Landing, Painted Rock, 14 Aug. 1979, Goss, Lyle, 172 (APSU). MONTGOMERY CO.: Lynnwood Landing, 9 June 1948, Clebsch, 53 (APSU); Red Rocks Bluff, above the Cumberland River, 9 June 1948, Clebsch, 81 (APSU); King and Queen Bluffs above the Cumberland River, 30 March 1946, Clebsch, 316 (APSU). STEWART CO.: Horseford Hollow, 25 Nov. 1945, Cook, Clebsch, 317 (APSU).

Cheilanthes lanosa (Michx.) D. C. Eaton. Hairy Lip-Fern. Distributed throughout the middle and eastern portions of Kentucky and Tennessee; frequent in the ten counties represented (Figure 4); calcareous and non-calcareous substrates; most frequent on exposed limestone bluffs.

KENTUCKY: LYON CO.: Buzzard's Rock, Kuttawa, 31 Jan. 1960, McCoy, s.n. (MSU). TODD CO.: Pilot Rock, west of Alleghre, 4 Aug. 1979, Lyle, 137 (APSU). TRIGG CO.: LBL, Ferguson Spring, 16 Sept. 1965, Clebsch, Phillips, 192 (APSU).

TENNESSEE: CHEATHAM CO.: Salt Peter Cave, Neptune, 13 June 1979, Scott, Harker, s.n. (APSU); Svenson's Bluff, Craggie Hope Community, 24 Feb. 1979, Scott, Chester, 3328 (APSU); Cheatham Dam bluffs above railroad track, 6 April 1979, Scott, Chester, Lyle, 13 (APSU). DICKSON CO.: Hwy. 47, Sulphur Fork Creek, 24 Aug. 1979, DePriest, Rainwater, Lyle, 197 (APSU). HOUSTON CO.: White Oak Creek, Hwy. 6261, 23 Aug. 1979, Hinson, Lyle, 193 (APSU). HUMPHREYS CO.: Painted Rock, Cold Branch Landing, 14 Aug. 1979, Goss, Lyle, 171 (APSU). ROBERTSON CO.: Brushy Creek, 1.8 miles north-northeast of Stroudsville, 10 July 1979, Williams, Petty, Snyder, Lyle, 108 (APSU). STEWART CO.: LBL, Rushing Creek, 30 May 1969, Ellis, Phillips, 104 (APSU).

Pellaea atropurpurea (L.) Link. Purple Cliff-Brake. Scattered throughout the middle and eastern portions of Kentucky and Tennessee; common in 12 counties represented (Figure 4); exposed, xeric, limestone bluffs and outcroppings; rare on sandstone formations.

KENTUCKY: LOGAN CO.: Buzzard's Knob, Russellville, 17 Aug. 1979, Rainwater, Lyle, 207 (APSU). TODD CO.: Southeast of Allegre, 24 July 1969, Settle, 04541 (APSU); Cedar Bluff Church, 17 Aug. 1979, Rainwater, Lyle, 203 (APSU). TRIGG CO.: Taylors Bluff above Little River, 11 Aug. 1979, Cranfill, Scott, Chester, Lyle, 146 (APSU).

TENNESSEE: CHEATHAM CO.: Svenson's Bluff, Turnbull Creek, 24 Feb. 1979, Scott, Chester, 3329 (APSU); Railroad track bluff above Cheatham Dam, 6 April 1979, Scott, Chester, Lyle, 7 (APSU); Salt Peter Cave, Neptune, 17 July 1979, Scott, Chester, Lyle, 110 (APSU); Little Marrowbone Creek, Hwy. 12, 26 June 1979, Scott, Chester, Lyle, 80 (APSU); Sidneys Bluff, Ashland City, 26 June 1979, Scott, Chester, Lyle, 90 (APSU). DICKSON CO.: Turnbull Creek, 2.7 miles southeast of Svenson's Bluff, 31 July 1979, Chester, Scott, Lyle, 132 (APSU). HOUSTON CO.: Yellow Creek between Hwy. 13 and 6378, 5 Aug. 1979, Lyle, 139 (APSU); White Oak Creek, Hwy. 6261, 24 Aug. 1979, Hinson, Lyle, 196 (APSU). HUMPHREYS CO.: Cold Branch Landing, Painted Rock, 14 Aug. 1979, Goss, Lyle, 169 (APSU). MONTGOMERY CO.: Lock B, bluff above railroad tracks, 19 April 1979, Lyle, 21 (APSU); Foster's Cave, 21 July 1979, Chester, 4125 (APSU); King and Queen Bluffs above Cumberland River, 23 Nov. 1945, Clebsch, 1912 (APSU); Dunbar Cave, Swan Lake, 9 May 1976, Mahoney, 1 (APSU). ROBERTSON CO.: Brushy Creek, 1.8 miles north-northeast of Stroudsville, 10 July 1979, Petty, Williams, Snyder, Lyle, 102 (APSU). STEWART CO.: LBL, marker 10P1, 10 Oct. 1965, Ellis, 189 (APSU); LBL, Rushing Creek Campground, 30 May 1967, Phillips, Ellis, 102 (APSU).

Pellaea glabella Mett. Smooth Cliff-Brake. Primarily restricted to the eastern portions of Kentucky and Tennessee with a few extensions in

western Kentucky; infrequent in the three counties represented (Figure 5); most often on sheer limestone bluffs. 20

KENTUCKY: LOGAN CO.: Red River bluff, 1.8 miles east of Keysburg, 14 April 1979, Cranfill, Lyle, 19 (APSU).

6. ASPLENIACEAE

Asplenium bradleyi D. C. Eaton. Bradley's Spleenwort. Restricted to the Cumberland Plateau of Tennessee; scattered in the Cumberland Plateau, Cumberland Mountains, and western Kentucky; rare in the two counties represented (Figure 5); weathered, sandstone outcroppings.

KENTUCKY: CHRISTIAN CO.: Pennyryle State Park, Bluff Springs, 24 July 1979, Windom, Crow, Lyle, 120 (APSU).

Asplenium ebenoides R. R. Scott. Scott's Spleenwort. Rare scattered throughout Kentucky and Tennessee; known from one locale in Houston County (Figure 5); cherty limestone and shale, easterly facing bluff.

TENNESSEE HOUSTON CO.: Douglas Bluff, White Oak Creek, 24 Aug. 1979, Hinson, Lyle, 195 (APSU).

Asplenium pinnatifidum Nutt. Pinnatifid Spleenwort. Widely dispersed throughout Kentucky but restricted to the Cumberland Plateau Province and the Ridge and Valley Region of Tennessee; frequent on sandstone formations in the three counties represented (Figure 5); mesic to dry sandstone ledges and cliff crevices.

KENTUCKY: CHRISTIAN CO.: Pennyryle State Park, Bluff Springs, 24 July 1979, Crow, Windom, Lyle, 121 (APSU); Crofton, Dripping Springs Creek, 19 June 1979, S. Snyder, Lyle, 43 (APSU).
LOGAN CO.: Buzzard's Knob, 3 miles east of Russellville, Hwy. 68, 17 Aug. 1979, Rainwater, Lyle, 206 (APSU). TODD CO.: Pilot Rock, west of Allegre, 4 Aug. 1979, Lyle, 135 (APSU); 1 mile southeast of Allegre, 28 March 1969, Chester, Settle, 04207 (APSU); Lake Malone, east of Clifty, 14 June 1979, Cotellino, Cranfill, Lyle, 111 (APSU).

Asplenium platyneuron (L). Oakes. Ebony Spleenwort. Found in every county in Kentucky and Tennessee; very common in the 12 counties

represented (Figure 5); frequent in dry to mesic woodlands, often associated with Juniperus virginiana and Lonicera japonica.

KENTUCKY: CHRISTIAN CO.: Woods above Lake Tandy, 4 July 1968, Francis, 75 (APSU). LYON CO.: Roadside at Moss Creek, LBL, 11 June 1965, Phillips, 157 (APSU); LBL, streamside at Higgins Rd. 10 June 1965, Clebsch, Phillips, 160 (APSU); Brandon Chapel Rd. 11 June 1965, Clebsch, Phillips, 159 (APSU). TODD CO. 1½ miles east of Allegre, 3 June 1969, Settle, 04350 (APSU); Lake Malone Game Reserve, 14 July 1979, Cotellino, Lyle, 116 (APSU). TRIGG CO.: LBL, Hematite Lake, 2 May 1976, Mahoney, 5 (APSU); Junction of Laura Furnace Rd. and Bethlehem Cemetery Rd. 14 July 1975, Chester, 3044 (APSU); Jones Creek, LBL, 18 June 1965, Clebsch, Phillips, 156 (APSU); Hematite Lake, LBL, 7 June 1965, Clebsch, Phillips, 158 (APSU); LBL, ½ mile west of marker 6H1, 24 June 1967, Phillips, 185 (APSU). TENNESSEE: DICKSON CO.: Dickson City Lake, 20 May 1968, Filson, 9 (APSU). HUMPHREYS CO.: ½ mile east of Hurricane Mills, 14 Aug. 1979, Goss, Lyle, 183 (APSU). HOUSTON CO.: Wooded hillside above Yellow Creek, 13 miles northeast of Erin, 2 Oct. 1979, Lyle, 2 (APSU). MONTGOMERY CO.: Rotary Park, 12 May 1979, McMinn, s.n. (APSU); Shelton Branch, 25 July 1948, Clebsch, 171 (APSU); ½ mile north of Lock B Rd. 5 April 1979, Goss, Dannenmaier, Lyle, 4 (APSU); Goldenhorn Rd. 1.6 miles from Bud's Creek Rd. 15 May 1979, Lewis, 17 (APSU); Cooper's Creek Bridge, 14 July 1967, Chester, 1724 (APSU). STEWART CO.: LBL, Rushing Creek Camp, 7 June 1965, Clebsch, Phillips, 155 (APSU); LBL, Model, 24 June 1967, Phillips, 177 (APSU); LBL, Rayburn Creek Rd. between markers 9N3 and 9N4, 12 Aug. 1965, Clebsch, Phillips, 136 (APSU); LBL, between marker 9P1 and Hopewell Church, 22 June 1965, Clebsch, Phillips, 118 (APSU). ROBERTSON CO.: Brushy Creek, 1.8 miles north-northeast of Stroudsville, 10 July 1979, Williams, Petty, Snyder, Lyle, 104 (APSU).

Asplenium resiliens Kunze. Blackstem Spleenwort. Occurring in most counties east of the Tennessee River in Tennessee; scattered in the southern two-thirds of Kentucky; frequent in the 11 counties represented (Figure 5); moist limestone bluffs and outcroppings.

KENTUCKY: LOGAN CO.: 1.8 miles east of Keysburg above the Red River, 14 April 1979, Cranfill, Lyle, 17 (APSU). LYON CO.: Buzzard's Rock, 2 miles west of Kuttawa, 31 Oct. 1960, McCoy, s.n. (APSU); LBL, bluff between markers 4D1 and 4D4, 13 April 1967, Phillips, Wofford, 108 (APSU). TRIGG CO.: Taylors Bluff above Little River, 11 Aug. 1979, Cranfill, Chester, Scott, Lyle, 147 (APSU). TENNESSEE: CHEATHAM CO.: Sidneys Bluff, Ashland City, 19 June 1979, Stratton, Lyle, 49 (APSU). DICKSON CO.: Turnbull Creek, 2.5 miles on County Line Rd. 31 June 1979, Chester, Scott, Lyle,

134 (APSU). HOUSTON CO.: Yellow Creek between Hwy. 13 and 6378, 5 Aug. 1979, Lyle, 141 (APSU); White Oak Creek, Hwy. 6261 first right after Bethlehem Church, 24 Aug. 1979, Hinson, Lyle, 189 (APSU). MONTGOMERY CO.: Foster's Cave, 21 July 1979, Chester, 4123 (APSU); Riggins Mill on Yellow Creek, 16 April 1950, Clebsch, s.n. (APSU). ROBERTSON CO.: Brushy Creek, 1.8 miles north-northeast of Stroudsville, 10 July 1979, Petty, Williams, Snyder, Lyle, 75 (APSU). STEWART CO.: Cumberland River bluff, 2½ miles northwest of Cumberland City, 25 Nov. 1945, Clebsch, Cook, 314 (APSU); LBL, Rushing Creek Campground, 30 May 1967, Ellis, Phillips, 135 (APSU); Bear Creek, LBL, 9 April 1967, Wofford, 109 (APSU).

Asplenium rhizophyllum L. Walking Spleenwort. Scattered throughout Kentucky and Tennessee east of the Tennessee River; frequent in the 10 counties represented (Figure 6); shaded, mesic limestone bluffs and outcroppings; often found on tufts of moss above streams and mesic ravines.

KENTUCKY: LOGAN CO.: Rainbow Rock natural bridge, 3½ miles east of Russellville on Hwy. 68, 15 Sept. 1979, Rainwater, Lyle, 211 (APSU). LYON CO.: LBL, between markers 4D1 and 4D4, 13 April 1967, Phillips, Wofford, 125 (APSU); LBL, 13 April 1967, Phillips, 58 (APSU). TODD CO.: limestone bluff below Cedar Bluff Church, ½ mile northwest of Barkers Mill, 17 Aug. 1979, Rainwater, Lyle, 204 (APSU).

TENNESSEE: CHEATHAM CO.: Tempe Slivers Branch, Sycamore Creek, 6 March 1949, Clebsch, 392 (APSU); ½ mile from Hwy. 12, Little Marrowbone Creek, 26 June 1979, Scott, Chester, Lyle, 81 (APSU); Sidneys Bluff, Ashland City, 6 April 1979, Chester, Scott, Lyle, 8 (APSU). DICKSON CO.: Turnbull Creek, 2.5 miles on County Line Rd. 31 June 1979, Scott, Chester, Lyle, 131 (APSU); Montgomery Bell State Park, 5 June 1979, Chester, Mahoney, Lyle, 60 (APSU); Hwy. 48 at Big Bartons Creek, 24 Feb. 1979, Scott, Chester, 3325 (APSU). HOUSTON CO.: Hurricane Creek, Hayswood Hollow, 23 Aug. 1979, Hinson, Lyle, 194 (APSU); Yellow Creek between Hwy. 13 and 6378, 7 April 1979, Lyle, 5 (APSU). HUMPHREYS CO.: Big Richland Creek, 2½ miles north of Waverly on Hwy. 13, 14 Aug. 1979, Goss, Lyle, 181 (APSU). MONTGOMERY CO.: Hickory Point, MacAdoo Creek, 8 May 1979, Williams, Lyle, 28 (APSU); Shelton's Branch, 11 April 1968, Brock, Chester, 1992 (APSU); Foster's Cave, Cooper's Creek, 6 Oct. 1967, West, Mathews, Chester, 1934 (APSU); Ravine south of Henrietta, 3 July 1965, Chester, 900 (APSU); Foster's Cave, 6 Oct. 1967, Matthews, 7 (APSU); APSU Farm, 26 March 1968, Bell, Gray, Goodlett, s.n. (APSU). ROBERTSON CO.: Brushy Creek, 1.8 miles north-northeast of Stroudsville, 10 July 1979, Williams, Petty, Snyder, Lyle, 103 (APSU). STEWART CO.: Stewart State Forest, 29 Oct. 1967, Matthews, Brock, s.n. (APSU); LBL, Hopewell Church, 21 March 1966, Ellis, 173 (APSU); Stewart State Forest,

Asplenium ruta-muraria L. Asplenium cryptolepis Fern. Wall-Rue Spleenwort. Scattered throughout Tennessee east of the Tennessee River; confined to the Inner Bluegrass, Knobs and eastern half of the Mississippian Plateau of Kentucky; infrequent in the six counties represented (Figure 6); mesic limestone bluffs and outcroppings.

KENTUCKY: LOGAN CO.: 1¼ miles southeast of Keysburg, 14 Sept. 1979, Chester, Scott, Lyle, 227 (APSU).

TENNESSEE: CHEATHAM CO.: Salt Peter Cave, Neptune, 16 July 1979, Harker, Scott, s.n. (APSU); Little Marrowbone Creek, ½ mile from Hwy. 12, Scott, Chester, Lyle, 85 (APSU). HOUSTON CO.: White Oak Creek, Hwy. 6261, 24 Aug. 1979, Hinson, Lyle, 190 (APSU).

HUMPHREYS CO.: Painted Rock, Cold Branch Landing, 14 Aug. 1979, Goss, Lyle, 168 (APSU). MONTGOMERY CO.: Red Rocks Bluff above the Cumberland River, 9 June 1968, Clebsch, 52 (APSU).

Asplenium trichomanes L. Maidenhair Spleenwort. Sporadically distributed throughout Kentucky; rare in the Bluegrass and Mississippian Plateau; restricted to the eastern portion of Tennessee with one disjunct locale in Montgomery County; rare in the four counties represented (Figure 6); mesic sandstone and limestone formations.

KENTUCKY: LOGAN CO.: Rainbow Rock natural bridge, 3¼ miles east of Russellville, Hwy. 68, 15 Sept. 1979, Rainwater, Lyle, 213 (APSU). CHRISTIAN CO.: Pennyryle State Park, 24 April 1956, McCoy, s.n. (MSU). TODD CO.: Pea Ridge, 31 Oct. 1959, McCoy, s.n. (MSU); Clifty Gorge, 1 mile southeast of Clifty, 5 June 1980, Hinson, Lyle, 249 (APSU).

TENNESSEE: MONTGOMERY CO.: Approximately 1½ miles east of Wiles Chapel Church on Blooming Grove Rd. 30 March 1980, Lyle, 228 (APSU).

Athyrium asplenioides (Michx.) A. A. Eaton. Southern Lady Fern.

Widely distributed throughout Kentucky and Tennessee; common in the 10 counties represented (Figure 6); mesic sandstone, cherty limestone slopes, ravines, upland wet woodlands.

KENTUCKY: CHRISTIAN CO.: McGaughey Swamp, 28 June 1979, Rainwater, Dannenmaier, Lyle, 95 (APSU); Pennyryle State Park,

29 April 1956, McCoy, s.n. (MSU); Dripping Springs Creek, southwest of Crofton, 19 June 1979, S. Snyder, Lyle, 44 (APSU). LYON CO.: LBL, marker 6J1, 16 Sept. 1965, Clebsch, Phillips, 130 (APSU); LBL, 6D3, 20 May 1967, Phillips, 110 (APSU); 1/3 mile west of museum, 7E4, LBL, 24 June 1967, Phillips, 180 (APSU). TODD CO.: Lake Malone Game Reserve, east of Clifty Hwy. 107, 14 July 1979, Cotellino, Cranfill, Lyle, 115 (APSU); 1 mile southeast of Allegre, 19 July 1969, Settle, 04528 (APSU); Clifty Gorge, 1 mile south of Clifty, 12 Aug. 1979, Cranfill, Cotellino, Lyle, 149 (APSU); Pea Ridge, 31 Oct. 1961, McCoy s.n. (MSU). TRIGG CO.: LBL, Jones Creek, 17 June 1965, Clebsch, Phillips, 175 (APSU); LBL, Hematite Lake, 2 May 1976, Mahoney, 9 (APSU); LBL, Ford's Creek, 16 Sept. 1965, Clebsch, Phillips, 132 (APSU); LBL, Jake Creek, 17 Aug. 1965, Clebsch, Phillips, 140 (APSU). TENNESSEE: CHEATHAM CO.: Bluff Creek Access, Cheatham County Wildlife Reserve, 15 June 1979, Stratton, Lyle, 52 (APSU); Little Marrowbone Creek, ½ mile from Hwy. 12, 26 June 1979, Scott, Chester, Lyle, 87 (APSU). DICKSON CO.: Montgomery Bell State Park, 1 June 1979, Lyle, 68 (APSU); 2 miles north of White Bluff, Hwy. 47, 23 Aug. 1979, Rainwater, DePriest, Lyle, 192 (APSU). HUMPHREYS CO.: East-facing slope above Duck River, ¼ mile west of Cold Branch Landing, 14 Aug. 1979, Goss, Lyle, 174 (APSU). MONTGOMERY CO.: Poplar Springs, 1 Sept. 1973, Chester, Schibig, 2611 (APSU). ROBERTSON CO.: Beards Chapel, 11 May 1979, Chester, Scott, Lyle, 55 (APSU). STEWART CO.: LBL, 1/3 mile northwest of marker 8M4, Clebsch, Phillips, 133 (APSU); LBL, 9P3, 22 June 1965, Clebsch, Phillips, 121 (APSU).

Athyrium pycnocarpon (Spreng.) Tidest. Narrowleaf Spleenwort. Widely dispersed throughout Kentucky and Tennessee, predominantly found east of the Tennessee River; infrequent in the nine counties represented (Figure 6); mesic ravines in rich woods, seeps and north-facing slopes on both sandstone and limestone substrates.

KENTUCKY: LOGAN CO.: Diamond Springs Hotel, 11 June 1980, Scott, Lyle, 255 (APSU). TODD CO.: Lake Malone Game Reserve, east of Clifty on Hwy. 107, 14 July 1979, Cotellino, Lyle, 116 (APSU). TRIGG CO.: 6 miles east of Siloam Church, 21 May 1972, Alexander, 6 (MSU). TENNESSEE: CHEATHAM CO.: Sycamore Creek, 1 mile south-southeast of Triangle Community Center, 7 June 1980, Lyle, 254 (APSU). DICKSON CO.: Turnbull Creek, 2.7 miles southwest of Svenson's Bluff, 31 July 1979, Scott, Chester, Lyle, 130 (APSU). HOUSTON CO.: ½ mile south on Hwy. 6336 from Hwy. 13, 14 Oct. 1979, Lyle, 224 (APSU). HUMPHREYS CO.: Gaging station 390, west side of Tanksleys Bridge above Duck River, 14 Aug. 1979, Goss, Lyle, 176 (APSU). MONTGOMERY CO.: Red River Bluff, Rudolph Branch, 21 Oct. 1947, Clebsch, 1013 (APSU); Foster's Cave, Cooper's Creek, 18 June 1949, Brown, Clebsch, 393 (APSU); Wooten Springs, 19 July 1977,

Chester, 3210 (APSU). STEWART CO.: LBL, Bear Creek, 6 May 1979,
Chester, 3361 (APSU).

Athyrium thelypteroides (Michx.) Desv. Silvery Spleenwort. Scattered throughout Kentucky and Tennessee, absent in the Mississippian Embayment Region; occasional in the eight counties represented (Figure 6); rich woodland slopes and ravines, sandstone and limestone substrates.

KENTUCKY: LOGAN CO.: Diamond Springs Hotel, 11 June 1980, Scott, Lyle, 256 (APSU). TODD CO.: Clifty Gorge, 1 mile south of Clifty, 12 Aug. 1979, Cotellino, Cranfill, Lyle, 156 (APSU); 2 miles west of the Todd-Logan county line, 1 mile north of Hwy. 107, 25 July 1966, Austin, Gentry, 3093 (MSU). TRIGG CO.: 6 miles northwest of Cadiz, $\frac{1}{2}$ mile east of Siloam Church, 21 May 1972, Alexander, 7 (MSU).

TENNESSEE: CHEATHAM CO.: Sycamore Creek, 1 mile south-southeast of Triangle Community Center, 7 June 1980, Lyle, 250 (APSU).

HOUSTON CO.: Long Branch, 4 miles southeast of Tennessee Ridge, 20 June 1956, Clebsch, 52 (APSU). HUMPHREYS CO.: Gaging station 390, $\frac{1}{2}$ mile south of west side of Tanksleys Bridge, 14 Aug. 1979, Goss, Lyle, 177 (APSU).

Cystopteris bulbifera (L.) Berhn. Berry Bladder Fern. Found east of Tennessee River in Kentucky and Tennessee; absent in eastern portion of Kentucky; fairly frequent in the eight counties represented (Figure 7); often occurs on limestone ledges and bluffs above streams, infrequent on sandstone substrates.

KENTUCKY: CHRISTIAN CO.: Dripping Springs Creek, southwest of Crofton, 19 June 1979, S. Snyder, Lyle, 42 (APSU).

TENNESSEE: CHEATHAM CO.: Sidneys Bluff, Ashland City, 19 June 1979, Stratton, Lyle, 50 (APSU). DICKSON CO.: Turnbull Creek, 2.5 miles on County Line Rd. 24 July 1979, Chester, Scott, Lyle, 127 (APSU); Ruskin Cave, 23 Sept. 1979, Hinson, Lyle, 233 (APSU); Jones Creek, 5 June 1979, Chester, Lyle, 65 (APSU). HUMPHREYS CO.: Big Richland Creek, $2\frac{1}{2}$ miles north of Waverly on Hwy. 13, 14 Aug. 1979, Goss, Lyle, 185 (APSU). MONTGOMERY CO.: Coleman Cave, 2 miles south of Oakwood, 29 Sept. 1956, Ford, Clebsch, s.n. (APSU); Porters Bluff, 14 April 1979, Cranfill, Lyle, 235 (APSU); Bellamy Cave, 15 July 1949, Clebsch, Silva, 985 (APSU); Big West Fork Creek, 27 May 1948, Clebsch, 93 (APSU); Sheltons Branch, 25 July 1948, Clebsch, 172 (APSU). ROBERTSON CO.: Sulphur Fork Creek, 14 June 1979, Lyle, 75 (APSU); Sulphur Fork Creek, 9 July 1979, Lyle, 99 (APSU).

Cystopteris protrusa (Weatherby) Blasd. Fragile Fern. Found in most counties east of the Tennessee River with several counties represented along the Mississippi River in Tennessee; scattered throughout Kentucky; common in 12 counties represented (Figure 7); most often on mesic limestone ledges and bluffs, occasional on mesic sandstone substrates.

KENTUCKY: CHRISTIAN CO.: Pennyrite State Forest, Bluff Springs, 24 July 1979, Windom, Crow, Lyle, 122 (APSU). LOGAN CO.: 1½ mile southwest of Keysburg, 14 Sept. 1979, Chester, Scott, Lyle, 239 (APSU). TODD CO.: Lake Malone Game Reserve, Hwy. 107 east of Clifty, 14 July 1979, Cotellino, Lyle, 118 (APSU). TRIGG CO.: LBL, Hematite Lake, 7 June 1965, Clebsch, Phillips, 165 (APSU); Boatwright Hole, south of Cadiz, 11 Aug. 1979, Scott, Chester, Cranfill, Lyle, 167 (APSU).

TENNESSEE: CHEATHAM CO.: Sidneys Bluff, Ashland City, 15 June 1979, Stratton, Lyle, 48 (APSU); Raccoon Creek, 26 June 1979, Chester, Scott, Lyle, 82 (APSU). DICKSON CO.: Turnbull Creek, 2.5 miles on County Line Rd. 31 July 1979, Chester, Scott, Lyle, 135 (APSU); Jones Creek, 5 June 1979, Chester, Scott, Lyle, 66 (APSU); Ruskin Cave, 23 Sept. 1979, Hinson, Lyle, 230 (APSU).

MONTGOMERY CO.: Red Rocks Bluff above the Cumberland River, 9 June 1948, Clebsch, 92 (APSU); Haynes Lake, Dotsonville Community, 4 June 1979, Chester, 4029 (APSU); Sheltons Branch, 11 Oct. 1947, Clebsch, 1012 (APSU); Big West Fork Creek, 27 May 1948, Clebsch, 94 (APSU); north bank of Cumberland River parallel to Seven-Mile Island, 14 May 1978, Gunn, s.n. (APSU); Big West Fork Creek, 9 May 1948, Clebsch, 95 (APSU); Hickory Point, Little Mac-Adoo Creek at Williams Bridge, 8 May 1979, Williams, Lyle, 72 (APSU). STEWART CO.: LBL, Bear Creek, 24 June 1967, Phillips, 105 (APSU); Brandon Springs Trout Farm, 21 Oct. 1979, Lyle, 230 (APSU).

Cystopteris tennesseensis Shaver. Tennessee Bladder Fern. Distribution mainly limited to the middle portion of Tennessee and Kentucky with outliers in the Bluegrass and Knobs of Kentucky; fairly frequent in the seven counties represented (Figure 7); north-facing mesic limestone bluffs and ledges, occasional on sandstone substrates.

KENTUCKY: CHRISTIAN CO.: Dripping Springs Creek, southwest of Crofton, 19 June 1979, Snyder, Lyle, 45 (APSU). LOGAN CO.: 1½ miles southwest of Keysburg, 14 Sept. 1979, Scott, Chester, Lyle, 238 (APSU). TENNESSEE: DICKSON CO.: Ruskin Cave, 23 Sept. 1979, Hinson, Lyle, 232 (APSU). HOUSTON CO.: White Oak Creek, Hwy. 6261 south of Bethlehem Church, 24 Aug. 1979, Hinson, Lyle, 241 (APSU).

HUMPHREYS CO.: Cold Branch Landing, 14 Aug. 1979, Goss, Lyle, 170 (APSU). MONTGOMERY CO.: Poplar Springs Rd. 13 May 1979, Chester, Lyle, 37 (APSU).

Dryopteris intermedia (Willd.) Gray. Common Wood Fern. Scattered throughout Kentucky; confined to the edge of the eastern Highland Rim, Appalachian Valley and mountainous portions of Tennessee; rare but abundant at the two sites in Todd County (Figure 7); narrow sandstone gorges, steep north-facing sandstone slopes.

KENTUCKY: TODD CO.: Lake Malone Game Reserve, Hwy. 107 east of Clifty, 14 July 1979, Cotellino, L. Lyle, Lyle, 112 (APSU); Clifty Gorge, 1 mile south of Clifty city limits, 12 Aug. 1979, Cranfill, Cotellino, Lyle, 155 (APSU).

Dryopteris marginalis (L.) Gray. Marginal Shield Fern. Scattered throughout Kentucky and Tennessee; from the Cumberland River eastward in Tennessee, occurring predominantly from the edge of the eastern Highland Rim to the mountainous portion; rare but locally abundant in four counties represented (Figure 7); dry to mesic sandstone and limestone slopes and outcroppings.

KENTUCKY: LOGAN CO.: Diamond Spring Hotel, 11 June 1980, Scott, Lyle, 257 (APSU). TODD CO.: Pilot Rock, northwest of Allegre, 4 Aug. 1979, Lyle, 138 (APSU); Clifty Gorge, 1 mile south of Clifty, 12 Aug. 1979, Cotellino, Cranfill, Lyle, 157 (APSU); Lake Malone Game Reserve, Hwy. 107 east of Clifty, 14 Aug. 1979, Cotellino, Lyle, 114 (APSU); 2 miles southeast of Allegre, 31 July 1969, Settle, 04409 (APSU); Settle Lake, 1 Dec. 1968, Settle, Chester, s.n. (APSU).

TENNESSEE: CHEATHAM CO.: Little Marrowbone Creek, $\frac{1}{2}$ mile from Hwy. 12, 26 June 1979, Scott, Chester, Lyle, 79 (APSU).

Onoclea sensibilis L. Sensitive Fern. Widely distributed throughout Kentucky and Tennessee; frequent in the 11 counties represented (Figure 7); alluvial soils, bogs, drainage ditches, upland wet woodlands, muddy edges of ponds and small pools.

KENTUCKY: CHRISTIAN CO.: McGaughey Swamp, 28 June 1979, Rainwater, Dannenmaier, Lyle, 95 (APSU). LOGAN CO.: Diamond Springs Hotel, 11 June 1980, Scott, Lyle, 258 (APSU). LYON CO.: LBL,

1/3 mile west of marker 7E4, 24 June 1967, Phillips, 184 (APSU).
 TODD CO.: Clifty Gorge, 1 mile south of Clifty, 12 Aug. 1979,
 Cotellino, Cranfill, Lyle, 161 (APSU); 2 miles west of Todd-Logan
 county line, 1 mile north of Hwy. 107, 25 July 1966, Austin, Gentry,
 3105 (MSU); 1½ miles east of Allegre, along Lake, 26 Aug. 1968,
 Chester, Settle, 04446 (APSU). TRIGG CO.: LBL, ½ mile northwest
 of Ford's Creek, 16 Sept. 1965, Clebsch, Phillips, 131 (APSU); LBL,
 1 mile west of marker 6J4, Colson Creek Rd. 26 May 1966, Ellis,
 116 (APSU).

TENNESSEE: CHEATHAM CO.: Sycamore Creek, 1 mile south-southeast
 of Triangle Community Center, 7 June 1980, Lyle, 253 (APSU).
 DICKSON CO.: Montgomery Bell State Park, north of Hwy. 70 between
 park gate and White Bluff, 18 May 1979, Scott, Mahoney, Chester,
 3391 (APSU); Montgomery Bell State Park, 5 June 1979, Chester, Ma-
 honey, Lyle, 62 (APSU). HOUSTON CO.: Leatherwood Rd. 19 June
 1979, Lyle, 47 (APSU). HUMPHREYS CO.: 2½ miles southwest of
 Hustburg at gaging station, 30 Aug. 1979, Chester, Scott, Hinson,
 Lyle, 199 (APSU). MONTGOMERY CO.: Spring-fed pond at Spring
 Creek, 26 May 1979, Chester, 3393 (APSU); Fort Campbell Military
 Reservation, junction of Jordan Springs Rd. and Palmyra Rd. 27 May
 1974, Corgan, Chester, 2721 (APSU); West Fork Creek, 16 Sept. 1948,
 Clebsch, 173 (APSU); Mt. Carmel Community below Farm Pond, 27 April
 1975, Chester, 2944 (APSU). ROBERTSON CO.: "The Swamps" north of
 Springfield, 31 May 1979, Scott, Chester, 4002 (APSU). STEWART
 CO.: Stewart State Forest, 2 miles south of Carlisle, 1 May 1968,
 Brock, 03442 (APSU); Stewart State Forest, Gatlin Hollow, 29 April
 1969, Brock, 03889 (APSU); LBL, 2 miles north of Neville Bay,
 6 June 1977, Chester, 3196 (APSU); LBL, Blue Springs Rd. ¼ mile
 west of marker 9P3, 7 July 1965, Ellis, 114 (APSU).

Polystichum acrostichoides (Michx.) Schott. Christmas Fern. Occurs in
 almost every county in Kentucky and Tennessee; abundant in the 12 coun-
 ties represented (Figure 8); predominantly on mesic limestone and sand-
 stone slopes, upland wet woodlands, ravines in dry woods, alluvial
 bottomlands.

KENTUCKY: TODD CO.: Lake Malone Game Reserve, Hwy. 107 east of
 Clifty, 12 Aug. 1979, Cotellino, Cranfill, Lyle, 163 (APSU); Clifty
 Gorge, 1 mile south of Clifty, 12 Aug. 1979, Cranfill, Cotellino,
 Lyle, 152 (APSU); 2 miles east of Allegre, 1 June 1969, Settle,
 14453 (APSU). TRIGG CO.: LBL, ½ mile west of marker 6H1, 24 June
 1967, Phillips, 186 (APSU); LBL, Hematite Lake, 7 June 1965,
 Clebsch, Phillips, 154 (APSU).

TENNESSEE: CHEATHAM CO.: Sidneys Bluff, Ashland City, 6 April
 1979, Chester, Scott, Lyle, 11 (APSU). DICKSON CO.: Montgomery
 Bell State Park, 5 June 1979, Robertson, Chester, Mahoney, Lyle,
 64 (APSU); Hwy. 48, Big Bartons Creek, 24 Feb. 1979, Scott, Ches-
 ter, 3324 (APSU). HUMPHREYS CO.: 2½ miles southwest of Hustburg
 at pumping station, 30 Aug. 1979, Scott, Chester, Hinson, Lyle,

202 (APSU). MONTGOMERY CO.: APSU Farm, 28 March 1968, Bell, Gray, Goodlett, s.n. (APSU); Hickory Point, MacAdoo Creek, 8 May 1979, Williams, LyTe, 71 (APSU). STEWART CO.: Stewart State Forest, 29 Oct. 1967, Chester, Brock, Matthews, s.n. (APSU); Stewart State Forest, 29 April 1968, Brock, 03414 (APSU); LBL, Bear Creek, 24 June 1967, Phillips, 178 (APSU); LBL, near Model, 24 June 1967, Phillips, 187 (APSU).

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Thelypteris hexagonaptera (Michx.) Weatherby. Broad Beech Fern. Widely dispersed throughout Kentucky and Tennessee; common in 12 counties represented (Figure 8); dry to mesic slopes, upland wet woodlands, low-lying swampy areas.

KENTUCKY: CHRISTIAN CO.: McGaughey Swamp, 28 June 1979, Rainwater, Dannenmaier, Lyle, 92 (APSU). LOGAN CO.: 3¼ miles east of Russellville, Hwy. 68, 15 Sept. 1979, Rainwater, Lyle, 209 (APSU). LYON CO.: LBL, Moss Creek Dock, 11 June 1965, Clebsch, Phillips, 163 (APSU); LBL, 1/3 mile east of museum, marker 7E4, 24 June 1967, Phillips, 181 (APSU); 4 miles south of Hwy. 62 on Hwy. 93, Hammond Creek, 23 May 1972, Wilson, s.n. (MSU). TODD CO.: 1½ miles east of Allegre, 3 June 1969, Settle, 04340 (APSU); Clifty Gorge, 1 mile south of Clifty, 12 Aug. 1979, Cranfill, Cotellino, Lyle, 162 (APSU); 2 miles west of Todd-Logan county line, 25 June 1966, Austin, Gentry, 3029 (MSU); Lake Malone Game Reserve, Hwy. 107, east of Clifty, 12 Aug. 1979, Cranfill, Cotellino, Lyle, 164 (APSU). TRIGG CO.: LBL, Hematite Lake, 2 May 1976, Mahoney, 8 (APSU); LBL, Colson Creek Rd. 26 May 1966, Ellis, 113 (APSU); LBL, Junction of Laura Furnace Rd. and Bethlehem Cemetery Rd. 14 July 1975, Chester, 3045 (APSU); LBL, Jones Creek, 18 June 1965, Clebsch, 164 (APSU); LBL, Hematite Lake, 7 June 1965, Clebsch, Phillips, 162 (APSU); LBL, Orneton-Energy Rd. intersection, 18 June 1965, Clebsch, Phillips, 161 (APSU); LBL, Jake Creek, 17 Aug. 1965, Clebsch, Phillips, 139 (APSU).

TENNESSEE: DICKSON CO.: Montgomery Bell State Park, 1 June 1979, Lyle, 56 (APSU). HUMPHREYS CO.: Tanksley Bridge, west slope above Duck River, 14 Aug. 1979, Goss, Lyle, 175 (APSU). MONTGOMERY CO.: Sango, south of Hwy. 112, 30 July 1949, Brown, Clebsch, 679 (APSU); Poplar Springs Rd. 1 Sept. 1973, Schibig, Chester, 2612 (APSU); Lynnwood Landing, 17 July 1949, Brown, Clebsch, 392 (APSU). ROBERTSON CO.: Beards Chapel Church north of Cedar Hill, 11 May 1979, Scott, Chester, Lyle, 38 (APSU). STEWART CO.: LBL, 3/4 mile north of marker 9N3, Hwy. 49, 12 Aug. 1965, Phillips, Clebsch, 137 (APSU); Blue Springs Rd. 7 July 1965, Ellis, 115 (APSU).

Thelypteris novaboracensis (L.) Nieuw. New York Fern. Scattered throughout Kentucky and Tennessee but absent along the Mississippi

River; infrequent in the three counties represented (Figure 8); steep sandstone slopes, mesic limestone slopes.

KENTUCKY: TODD CO.: Clifty Gorge, 1 mile south of Clifty, 12 Aug. 1979, Cranfill, Cotellino, Lyle, 153 (APSU).

TENNESSEE: CHEATHAM CO.: Sycamore Creek, 1 mile south-southeast of Triangle Community Center, 7 June 1980, Lyle, 252 (APSU).

Thelypteris palustris Schott. Marsh Fern. Scattered throughout Kentucky and Tennessee but absent along the Mississippi River; rare in the three counties represented (Figure 8); acidic bogs and seeps. No specimens collected.

Woodsia obtusa (Spreng.) Torr. Common Woodsia. Found in almost every county in Tennessee; scattered throughout Kentucky; very common in the 12 counties represented (Figure 8); dry to mesic sandstone and limestone ridges and bluffs, rocky woods, often found with Juniperus virginiana.

KENTUCKY: CHRISTIAN CO.: Pennyryle State Park, 24 July 1979, Crow, Windom, Lyle, 123 (APSU); 2 miles north of Hwy. 272, 4 miles southwest of Gracey, 17 May 1969, Forrest, s.n. (APSU). LOGAN CO.: 1½ miles southwest of Keysburg, 14 Sept. 1979, Scott, Chester, Lyle, 245 (APSU). LYON CO.: LBL, between Pisgah Bay and Smith Bay, 25 June 1965, Clebsch, Phillips, 120 (APSU); LBL, old homestead at the head of Pisgah Bay, 10 June 1965, Clebsch, Phillips, 166 (APSU); LBL, Higgins Rd. to Smith Bay, 10 June 1965, Clebsch, Phillips, 168 (APSU); LBL, Denumbers Creek near post 4C1, 11 June 1965, Clebsch, Phillips, 169 (APSU); LBL, Moss Creek Dock, 11 June 1965, Clebsch, Phillips, 170 (APSU); LBL, 20 July 1965, Ellis, 11 (APSU). TODD CO.: 3 miles east of Allegre, 14 June 1967, Settle, 04502 (APSU). TRIGG CO.: LBL, near marker 6H4, 17 May 1967, Phillips, 112 (APSU); LBL, Ferguson Springs, 30 July 1965, Clebsch, Phillips, 117 (APSU); LBL, 3/4 mile north of marker 6K3, 24 June 1965, Clebsch, Phillips, 123 (APSU); LBL, Long Creek, 17 June 1965, Clebsch, Phillips, 167 (APSU); LBL, Silver Trail, 8 June 1965, Clebsch, Phillips, 172 (APSU).

TENNESSEE: DICKSON CO.: 3 miles east of Charlotte, Hwy. 47 at Sulphur Creek, 23 Aug. 1979, Rainwater, DePriest, Lyle, 198 (APSU); 5 miles on Barton Creek Rd. 1 mile north of Hwy. 49, 22 July 1979, Lyle, 108 (APSU); Ruskin Cave, 23 Sept. 1979, Hinson, Lyle, 231 (APSU). HOUSTON CO.: White Oak Creek, Hwy. 6261 first right south after Bethlehem Church, 24 Aug. 1979, Hinson, Lyle, 240 (APSU). HUMPHREYS CO.: Tanksleys Bridge, slope above the Duck River, 14 Aug. 1979, Goss, Lyle, 184 (APSU). MONTGOMERY CO.: Grant Springs, Sunnyview Community, 13 Oct. 1979, Chester, 4335 (APSU); Swan Lake, 14 May 1979, Dannenmaier, Lyle, 36 (APSU); Hickory

Point, MacAdoo Creek at Williams Bridge, 8 May 1979, Williams, Lyle, 29 (APSU); Lock B above railroad tracks, 19 April 1979, Lyle, 73 (APSU); Dunbar Cave, 9 May 1976, Mahoney, 7 (APSU); 3½ miles southeast of Clarksville, Cumberland River Bluffs, 23 May 1948, Clebsch, 51 (APSU). ROBERTSON CO.: Sulphur Fork Creek, above Hills Mill, 6 July 1979, Lyle, 98 (APSU). STEWART CO.: LBL, between markers 7N3 and 7N2, Clebsch, Phillips, 122 (APSU); Brandon Springs Trout Farm, 21 Oct. 1979, Lyle, 231 (APSU); LBL, near Model, east of marker 8L2, 24 June 1972, Phillips, 136 (APSU); LBL, midway between Hopewell Church and marker 9P1, 22 June 1965, Clebsch, Phillips, 199 (APSU); Cross Creeks, 10 May 1969, Brock, 04275 (APSU); LBL, Rushing Creek Camp Area, 7 June 1965, Clebsch, Phillips, 171 (APSU); LBL, Rushing Creek Camp Area, 30 May 1967, Ellis, Phillips, 103 (APSU).

7. BLECHNACEAE

Woodwardia areolata (L.) Moore. Netvein Chain Fern. Jackson Purchase area, Barrens of the Mississippian and Cumberland Plateaus of Kentucky; Mississippi Embayment Region, southwestern Highland Rim subsection, Central Basin, Cumberland Plateau and the Unakas of Tennessee; rare, from only one site in Humphreys County (Figure 8); east-facing limestone slope.

TENNESSEE: HUMPHREYS CO.: ½ mile east of Cold Branch Landing above the Duck River, 14 Aug. 1979, Goss, Lyle, 173 (APSU).

8. DENNSTAEDTIACEAE

Dennstaedtia punctilobula (Michx.) Moore. Hayscented Fern. Essentially restricted to eastern Kentucky with scattered collections westward; found in Tennessee eastward from the Cumberland Plateau; rare, from only one site in county represented (Figure 9); moist sandstone ravine at the base of a large rockhouse.

KENTUCKY: TODD CO.: Clifty Gorge, 1 mile south of Clifty, 12 Aug. 1979, Cranfill, Cotellino, Lyle, 159 (APSU).

Pteridium aquilinum (L.) Kuhn var. latiusculum (Desv.) Underw. Eastern Bracken Fern. Widely dispersed throughout Kentucky and Tennessee;

frequent in the ten counties represented (Figure 9); edge of fields, bottomlands, dry ridges and slopes, open woods.

KENTUCKY: TRIGG CO.: LBL, Jones Creek, $\frac{1}{4}$ mile west of marker 7K3, 18 June 1965, Clebsch, Phillips, 152 (APSU); LBL, $\frac{1}{2}$ mile west of marker 6J4, 22 Aug. 1967, Phillips, 199 (APSU); LBL, $\frac{1}{2}$ mile north of marker 7E4, 22 April 1967, Wallen, Phillips, 106 (APSU); LBL, Silver Trail, 8 June 1965, Clebsch, Phillips, 153 (APSU); LBL, 1 mile west of Hwy. 435 and marker 6J4 on Colson Creek Rd. 4 June 1966, Ellis, 141 (APSU); LBL, High Ridge Rd. to Pear Forest Resort, 17 June 1965, Clebsch, Phillips, 151 (APSU); LBL, $\frac{1}{3}$ mile west of 6J4, 22 Aug. 1967, Phillips, 198 (APSU); LBL, Redd Hollow, 23 June 1979, Lyle, 69 (APSU).

TENNESSEE: DICKSON CO.: Montgomery Bell State Park, north of Hwy. 70, 5 June 1979, Chester, 4035 (APSU); Montgomery Bell State Park, 1 June 1979, Lyle, 74 (APSU); Turnbull Creek, 2.5 miles on County Line Rd. 31 July 1979, Chester, Scott, Lyle, 126 (APSU); Montgomery Bell State Park, 5 June 1979, Chester, Mahoney, Robertson, Lyle, 67 (APSU); Bartons Creek Rd. 22 July 1979, Lyle, 106 (APSU). MONTGOMERY CO.: Boiling Springs Rd. Fort Campbell, 13 May 1979, Roberts, 16 (APSU).

Pteridium aquilinum (L.) Kuhn var. pseudocaudatum (Clute) Heller.

Southern Bracken Fern. Scattered throughout Tennessee; from a few counties on the Cumberland Plateau and western Kentucky; frequent in the seven counties represented (Figure 9); dry sandstone knobs, dry open woods and slopes, field borders, roadsides.

KENTUCKY: LOGAN CO.: Buzzard's Knob, $3\frac{1}{4}$ miles east of Russellville on Hwy. 68, 17 Aug. 1979, Rainwater, Lyle, 205 (APSU).

LYON CO.: LBL, $\frac{3}{4}$ miles north of marker 7E4, 22 Aug. 1967, Phillips, 196 (APSU). TRIGG CO.: LBL, $\frac{1}{2}$ mile west of marker 6H1, 24 July 1967, Phillips, 188 (APSU); LBL, Sugar Bay Rd. 22 Aug. 1967, Phillips, 197 (APSU); LBL, $\frac{1}{3}$ mile west of marker 6J4, 22 Aug. 1967, Phillips, 198 (APSU); LBL, between markers 5J1 and 5J4, 4 June 1966, Clebsch, Phillips, 151 (APSU).

TENNESSEE: DICKSON CO.: Bartons Creek Rd. 22 July 1979, Lyle, 105 (APSU). HUMPHREYS CO.: $2\frac{1}{2}$ miles north of Waverly on Hwy. 13, 14 Aug. 1979, Goss, Lyle, 186 (APSU). MONTGOMERY CO.: 2 miles southeast of Guthrie, Hwy. 41, 2 July 1949, Brown, Clebsch, 395 (APSU). STEWART CO.: LBL, Model, 20 Aug. 1967, Ellis, Phillips, 193 (APSU); LBL, $\frac{1}{4}$ mile southeast of marker 8L4, 20 Aug. 1967, Ellis, Phillips, 200 (APSU).

9. HYMENOPHYLLACEAE

Trichomanes boschianum Sturm ex Bosch. Filmy Fern. Rare in Kentucky

(known from six counties) and Tennessee (known from four counties); in Kentucky from the Cumberland Plateau and the Dripping Springs Escarpment; in Tennessee from the Cumberland Plateau and the Unakas; very rare, one county represented (Figure 9); moist rockhouses and sandstone outcrops with low light intensity.

KENTUCKY: TODD CO.: Indian Cave, Pea Ridge, 31 Oct. 1959, McCoy, s.n. (MSU).

10. OPHIOGLOSSACEAE

Botrychium biternatum (Sav.) Underw. B. dissectum var. tenuifolium (Underw.) Fernald. Southern Grapefern. Scattered throughout Kentucky and Tennessee; infrequent in the seven counties represented (Figure 9); upland wet woodlands, bottomland forests, often with Lonicera japonica.

KENTUCKY: LYON CO.: LBL, Cross Road Baptist Church, 3 Oct. 1977, Athey, 145 (APSU). TRIGG CO.: Boatwright Hole south of Cadiz, 11 Aug. 1979, Chester, Cranfill, Scott, Lyle, 144 (APSU).

TENNESSEE: DICKSON CO.: 3 miles east of Charlotte on Hwy. 47, 23 Aug. 1979, Rainwater, DePriest, Lyle, 188 (APSU). HUMPHREYS CO.: Tennessee National Wildlife Refuge, 30 Aug. 1979, Scott, Chester, Hinson, Lyle, 200 (APSU). MONTGOMERY CO.: Martin place above Long Pond Slough, 29 Sept. 1979, Chester, 4313 (APSU); Foster's Cave, 29 Sept. 1979, Chester, 4305 (APSU). STEWART CO.: LBL, 2/3 mile southeast of marker 7N3, 29 Aug. 1967, Wofford, Chester, 02977 (APSU); LBL, Model, 24 Sept. 1968, Phillips, s.n. (APSU).

Botrychium dissectum Spreng. B. dissectum var. obliquum (Muhl.) Clute. Common Grapefern. Widely dispersed throughout Kentucky and Tennessee; infrequent in the 10 counties represented (Figure 9); mesic upland woods, bottomland forests, often with B. biternatum and Lonicera japonica.

KENTUCKY: TODD CO.: Clifty Gorge, 1 mile south of Clifty, 12 Aug. 1979, Cotellino, Cranfill, Lyle, 165 (APSU); Clausen Fairway, 31 Oct. 1959, McCoy, s.n. (MSU); Lake Malone Game Reserve, Hwy. 107 east of Clifty, 12 Aug. 1979, Cotellino, Cranfill, Lyle, 166 (APSU). TRIGG CO.: Boatwright Hole, south of Cadiz, 11 Aug. 1979, Scott, Chester, Lyle, 143 (APSU).

TENNESSEE: DICKSON CO.: 3 miles east of Charlotte on Hwy. 47, 23 Aug. 1979, Rainwater, DePriest, Lyle, 187 (APSU). HOUSTON CO.: Hurricane Creek, 24 Aug. 1979, Hinson, Lyle, 259 (APSU). HUMPHREYS CO.: $\frac{1}{2}$ mile east of Hurricane Mills, 14 Aug. 1979, Goss, Lyle, 179 (APSU). MONTGOMERY CO.: Hematite Recreation Area, along railroad tracks, 9 Sept. 1977, Chester, 3427 (APSU); Spring Creek, 28 Oct. 1945, Clebsch, 313 (APSU); Cunningham Lake, 10 April 1949, Pickering, Phillips, Clebsch, 676 (APSU); east of Warfield, 10 Sept. 1949, Brown, Clebsch, 677 (APSU); Martin place above Long Pond Slough, 29 Sept. 1979, Chester, 4312 (APSU); Old field between Chester home and Cumberland River, 23 Oct. 1971, Chester, 2515 (APSU); Wooten Bluffs on Cumberland River, 8 Sept. 1979, Chester, 4274 (APSU). STEWART CO.: LBL, $\frac{2}{3}$ mile southwest of marker 7H3, 24 Oct. 1968, Phillips, 191 (APSU).

Botrychium virginianum (L.) Sw. Rattlesnake Fern. Widely distributed throughout Kentucky and Tennessee in almost every county; very common in the 12 counties represented (Figure 10); dry to mesic woodlands.

KENTUCKY: CHRISTIAN CO.: Pennyriple State Park, 24 July 1979, Crow, Windom, Lyle, 119 (APSU); 2 miles north of Hwy. 272, 17 May 1969, Forrest, s.n. (APSU). LOGAN CO.: Rainbow Rock natural bridge, $3\frac{1}{2}$ miles east of Russellville, Hwy. 68, 15 Sept. 1979, Rainwater, Lyle, 210 (APSU); 4 miles south of Olmstead, 17 May 1969, Lyne, s.n. (APSU). LYON CO.: LBL, Higgins Rd. to Smith Bay, 10 June 1965, Clebsch, Phillips, 147 (APSU). TODD CO.: $\frac{1}{2}$ mile east of Allegre, 3 June 1969, Settle, 14335 (APSU). TRIGG CO.: Boatwright Hole, south of Cadiz, 11 Aug. 1979, Chester, Scott, Cranfill, Lyle, 142 (APSU); LBL, Redd Hollow, 18 June 1965, Clebsch, Phillips, 150 (APSU); LBL, Hematite Lake, 2 May 1976, Mahoney, 4 (APSU).

TENNESSEE: CHEATHAM CO.: 15 miles southwest of Ashland City above Harpeth River, 4 May 1979, Stratton, 7 (APSU). DICKSON CO.: Montgomery Bell State Park, north natural area, 18 May 1979, Scott, Chester, 3388 (APSU); Montgomery Bell State Park, 5 June 1979, Chester, Mahoney, Robertson, Lyle, 63 (APSU); 2 miles south of Mt. Zion Methodist Church, 12 May 1968, Buckner, 1 (APSU). HUMPHREYS CO.: gaging station by Tanksleys Bridge, 14 Aug. 1979, Goss, Lyle, 178 (APSU). ROBERTSON CO.: 5 miles southeast of Saddlersville, 3 May 1969, Gregory, s.n. (APSU). MONTGOMERY CO.: River Ridge Trailer Court, 18 April 1978, Scott, 7 (APSU); Lock B by cave, 15 June 1948, Clebsch, 91 (APSU). STEWART CO.: LBL, $\frac{1}{2}$ mile east of marker 9P3, 21 May 1966, Ellis, 174 (APSU); Stewart State Forest, 1 May 1968, Brock, 03437 (APSU); LBL, Rushing Creek Camp Area, 7 June 1965, Clebsch, Phillips, 148 (APSU); LBL, $\frac{1}{2}$ mile southwest of Model, 29 June 1965, Clebsch, Phillips, 124 (APSU); LBL, Bear Creek, marker 9P1, 11 May 1967, Phillips, 127 (APSU).

Ophioglossum engelmanni Prantl. Limestone Adder's Tongue Fern. Mississippian Plateau of Kentucky, central to eastern Tennessee; rare in the

four counties represented (Figure 10); shallow soils with limestone substrates.

KENTUCKY: TODD CO.: 2 miles east of Elkton on Hwy. 68, lime quarry, 4 June 1961, McCoy, s.n. (MSU).

TENNESSEE: MONTGOMERY CO.: Foster's Cave, 11 miles west of Clarksville, 18 June 1949, Brown, Clebsch, 389 (APSU).

Ophioglossum vulgatum L. var. pycnostichum Fern. Southeastern Adder's Tongue Fern. From two counties in Kentucky (Cumberland Plateau and Mississippian Plateau) and scattered throughout Tennessee; rare in five counties represented (Figure 10); rich wooded slopes, swampy woods, bottomland, old fields.

KENTUCKY: TRIGG CO.: $\frac{1}{2}$ mile northeast of Siloam Church, 6 miles northwest of Cadiz, May 1972, Alexander, s.n. (MSU); LBL, Hematite Lake by photographic blind, 15 May 1980, Crow, Lyle, 248 (APSU).

TENNESSEE: MONTGOMERY CO.: Hays Farm on Red River, 24 May 1952, Clebsch, s.n. (APSU); Sheltons Branch, 2 miles east of Clarksville, 14 May 1949, Phillips, Clebsch, 388 (APSU). STEWART CO.: LBL, $\frac{1}{4}$ mile east of marker 9P3, 24 April 1967, Phillips, 126 (APSU).

11. OSMUNDACEAE

Osmunda cinnamomea L. Cinnamon Fern. Widely dispersed throughout Kentucky and Tennessee but absent along the Mississippi River; rare in the two counties represented (Figure 10); upland wet woodlands, mesic sandstone gorge.

KENTUCKY: TODD CO.: 2 miles south of Allegre, 31 July 1969, Settle, 04408 (APSU); Clifty Hollow, 1 mile south of Clifty, 7 May 1969, Chester, 2222 (APSU); Clifty Hollow, 12 Aug. 1979, Cotellino, Cranfill, Lyle, 150 (APSU).

TENNESSEE: ROBERTSON CO.: "The Swamps" north of Springfield, 29 June 1979, Scott, Chester, 4082 (APSU).

Osmunda regalis L. var. spectabilis (Willd.) A. Gray. Royal Fern. Widely dispersed throughout Kentucky and Tennessee; infrequent but locally abundant in the eight counties represented (Figure 10); swamps, wet areas in forests, mud flats around lakes.

KENTUCKY: LYON CO.: LBL, 1/3 mile west of museum, marker 7E4, 24 June 1967, Phillips, 183 (APSU). TODD CO.: 1 3/4 miles east of Alleghre, 12 Aug. 1969, Settle, 04430 (APSU). TRIGG CO.: LBL, Phillips, 128 (APSU); LBL, Mudd Springs, 16 Sept. 1965, Clebsch, 1976, Mahoney, 7 (APSU). TENNESSEE: DICKSON CO.: Montgomery Bell State Park, Hwy. 70, between park entrance and White Bluff, 18 June 1979, Scott, Chester, 3392 (APSU); Montgomery Bell State Park, swampy area near golf course by fairway 3, Chester, Mahoney, Robertson, Lyle, 61 (APSU). ROBERTSON CO.: Cedar Hill, swampy area along railroad track, 11 May 1979, Chester, Scott, Lyle, 54 (APSU).

12. POLYPODIACEAE

Polypodium polypodioides (L.) Watt. Resurrection Fern. Widely dispersed throughout Kentucky and Tennessee and known from almost every county; common in the 12 counties represented (Figure 10); mesic to xeric limestone bluffs, often epiphytic on Ulmus americana, occasional on sandstone outcroppings.

KENTUCKY: CHRISTIAN CO.: Pennyriple State Park, 25 April 1956, McCoy, s.n. (MSU); Pennyriple State Park, Freestone Springs, 24 July 1979, Crow, Windom, Lyle, 124 (APSU). LOGAN CO.: 1 1/4 miles south-east of Keysburg, 14 Sept. 1979, Scott, Chester, Lyle, 245 (APSU); 1.8 miles southeast of Red River, 14 April 1979, Cranfill, Lyle, 16 (APSU); Rainbow Rock natural bridge, 3 1/4 miles east of Russellville, Hwy. 68, 15 Sept. 1979, Rainwater, Lyle, 214 (APSU). LYON CO.: Buzzard's Rock, 2 miles west of Kuttawa, 31 Jan. 1960, McCoy, s.n. (MSU). TRIGG CO.: LBL, west of museum, marker 7E4, 24 June 1967, Phillips, 142 (APSU). TENNESSEE: CHEATHAM CO.: south of Craggie Hope Community on Svenson's Bluff above Turnbull Creek, 24 Feb. 1979, Scott, Chester, 3327 (APSU); Salt Peter Cave, Neptune, 13 June 1979, Harker, Scott, s.n. (APSU); Sidneys Bluff, Ashland City, 6 April 1979, Scott, Chester, Lyle, 9 (APSU). DICKSON CO.: Hwy. 48 at Big Bartons Creek, 24 Feb. 1979, Scott, Chester, 3326 (APSU); Turnbull Creek, 2.5 miles on County Line Rd. 31 July 1979, Scott, Chester, Lyle, 129 (APSU). HOUSTON CO.: Yellow Creek between Hwy. 13 and 6378, 5 Aug. 1979, Lyle, 140 (APSU); White Oak Creek, Hwy. 6261 south of Bethlehem Church, 24 Aug. 1979, Hinson, Lyle, 191 (APSU). MONTGOMERY CO.: Yellow Creek, Hwy. 48, 10 June 1950, Brown, Clebsch, 111 (APSU); Martins Rd. 11 May 1979, Chester, 2704 (APSU); APSU Farm, 26 March 1968, Bell, Gray, Goodlett, s.n. (APSU); Foster's Cave, 21 July 1979, Chester, 4124 (APSU); Trahern Spring, 7 April 1956, Clebsch, s.n. (APSU). ROBERTSON CO.: Sulphur Fork Creek, 6 July 1979, Lyle, 96 (APSU). STEWART CO.: LBL, Rushing Creek

Polypodium virginianum L. Rock cap Fern. Scattered predominantly on the sandstone formations of Kentucky and Tennessee; infrequent but locally abundant in the three counties represented (Figure 11); dry to mesic sandstone boulders, knobs and ledges.

KENTUCKY: LOGAN CO.: Rainbow Rock natural bridge, $3\frac{1}{4}$ miles east of Russellville on Hwy. 68, 15 Sept. 1979, Rainwater, Lyle, 214 (APSU). TODD CO.: Pea Ridge, 31 Oct. 1959, McCoy, s.n. (MSU); Pilot Rock, west of Allegre, 4 Aug. 1979, Lyle, 136 (APSU); Lake Malone Game Reserve, east of Clifty on Hwy. 107, 14 July 1979, Cotellino, Lyle, 113 (APSU); Clifty Gorge, 1 mile south of Clifty, 12 Aug. 1979, Cotellino, Cranfill, Lyle, 148 (APSU); $2\frac{1}{4}$ miles southeast of Allegre, 31 July 1969, Settle, 04418 (APSU).

13. VITTERIACEAE

Vittaria sp. J. Smith. Appalachian Gametophyte. Scattered throughout Kentucky (14 counties) and Tennessee (8 counties) on sandstone formations; infrequent in the two counties represented (Figure 11); existing only as a gametophyte; found in moist recesses of sandstone rockhouses where light intensity and temperature fluctuation is minimal.

KENTUCKY: CHRISTIAN CO.: Pennyrile State Park, east side of rockhouse by parking lot at Pennyrile Lake, 24 July 1979, Windom, Crow, Lyle, s.n. (APSU).

CHAPTER IV

DISCUSSION

The primary goal of this research was to correlate and combine decades of work by numerous collectors with an intensive field study, resulting in a complete pteridophyte flora for the study area. It was hoped that all earlier records could be verified but increased land usage and habitat destruction have resulted in the extreme rareness of some species, and several were not found at either the previously reported sites or at other sites considered appropriate. These taxa include: Isoetes engelmanni, Ophioglossum engelmanni, Trichomanes boschianum, and Thelypteris palustris.

Certain taxa are apparently limited by physiographic features which prohibit their widespread occurrence in the study area. For example, Dryopteris intermedia, was found only on the sandstone formations of the Dripping Springs Escarpment. Other taxa seemingly limited to the escarpment are: Lycopodium lucidulum, Lycopodium porophilum, Asplenium bradleyi, and Dennstaedtia punctilobula. Shaver (1954) reports the occasional occurrence of Polypodium virginianum on limestone formations but it appears mainly confined to sandstone substrates. Taxa apparently limited to limestone formations are: Asplenium ruta-muraria, Asplenium resiliens, Cheilanthes alabamensis, and Ophioglossum engelmanni.

The most common pteridophytes of the northwestern Highland Rim, based on frequency of collection and observation, are: Botrychium virginianum, Asplenium platyneuron, Thelypteris hexagonaptera,

Polystichum acrostichoides, Adiantum pedatum, Athyrium asplenioides,
Polypodium polypodioides, Pellaea atropurpurea, and Woodsia obtusa.

Revised distributional records for the study area include 39 county records (detailed in Table I) and one state record. Cheilanthes alabamensis was added to the Kentucky flora list (Cranfill and Lyle, 1979). New additions to the pteridophyte flora of the northwestern Highland Rim include: Adiantum capillus-veneris, Asplenium ebenoides, and Woodwardia areolata. Asplenium ruta-muraria was collected for the first time in the Kentucky portion of the study area and Osmunda cinnamomea for the first time in the Tennessee portion. Asplenium bradleyi, very rare in the study area, was rediscovered in Christian County 100 years after the last known collection.

Table I. New County Records 1.

Counties	CHR.	LOG.	LYO.	TOD.	TRI.	CHE.	DIC.	HOU.	HUM.	MON.	ROB.	STE.
Species												
<u>Equisetum hyemale</u>	*			*							*	
<u>Lycopodium flabelliforme</u>							*					
<u>Selaginella apoda</u>									*		*	
<u>Adiantum capillus-veneris</u>											*	
<u>Cheilanthes alabamensis</u>		**				*						*
<u>Asplenium ebenoides</u>								*				
<u>A. resiliens</u>					*							
<u>A. rhizophyllum</u>		*										
<u>A. ruta-muraria</u>		*						*				
<u>Athyrium asplenioides</u>	*											
<u>A. pycnocarpon</u>		*										
<u>A. thelypteroides</u>		*										

Table I, (continued)

Counties	CHR.	LOG.	LYO.	TOD.	TRI.	CHE.	DIC.	HOU.	HUM.	MON.	ROB.	STE.
Species												
<u>Cystopteris bulbifera</u>	*			*								
<u>C. protrusa</u>		*										
<u>C. tennesseensis</u>	*						*					
<u>Dryopteris marginalis</u>		*										
<u>Onoclea sensibilis</u>		*						*				
<u>Thelypteris hexagonaptera</u>	*											
<u>T. novaboracensis</u>				*		*						
<u>Woodwardia areolata</u>									*			
<u>Pteridium aquilinum</u> var. <u>pseudocaudatum</u>		*					*		*			
<u>Botrychium dissectum</u>				*	*			*				*
<u>Osmunda cinnamomea</u>											*	
<u>Polypodium virginianum</u>		*										

1. * County record

** State record

CHAPTER V

SUMMARY

A study of the pteridophytes of the northwestern Highland Rim, Kentucky and Tennessee, was conducted to determine their distributional and ecological status. A list of the pteridophyte flora was compiled from literature sources and specimens from four herbaria in Kentucky and Tennessee. A field study was undertaken, using selected site and random collecting techniques, to augment and expand the previously reported flora. Based on this information, the pteridophyte flora of the study area was found to include 13 families, 24 genera, and 50 sub-generic taxa.

All specimens were identified, preserved, and added to the Austin Peay State University Herbarium. All specimens examined in other herbaria were assessed for correct identification.

An annotated checklist detailing statewide distributions, regional distributions, regional abundance, and habitat was compiled. Keys to families, genera, species, and varieties were constructed. Thirty-nine new county records, one new state record, and three new records for the study area were compiled.

The relative abundance of each species discussed in the annotated checklist is based solely upon collection frequency and observation and is limited by the absence of quantitative data.

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APPENDIX I
REGIONAL AND PHYSIOGRAPHIC MAPS

1. Lyon
2. Trigg
3. Christian
4. Todd
5. Logan
6. Stewart
7. Montgomery
8. Robertson
9. Houston
10. Humphreys
11. Dickson
12. Cheatham

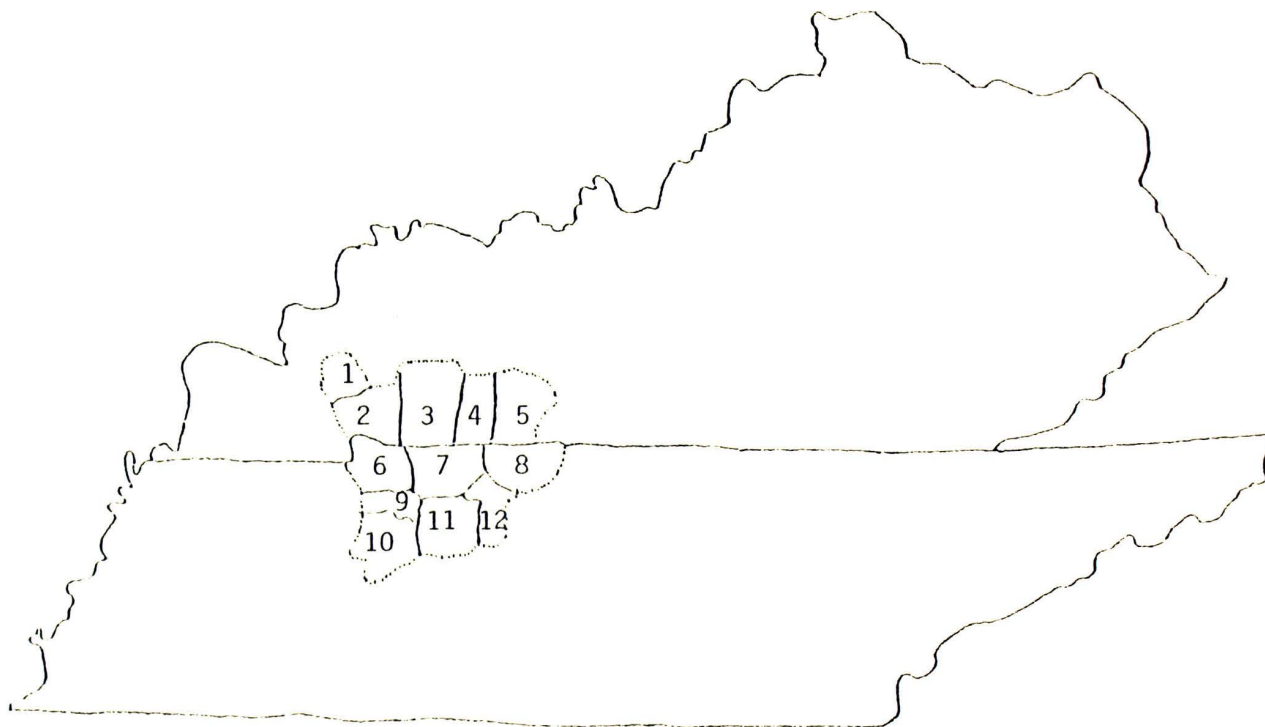


Figure 1. Counties of the Study Area in Kentucky and Tennessee.

1. Mississippi Alluvial Plain
2. Mississippi Embayment
3. Highland Rim
4. Central Basin
5. Cumberland Plateau
6. Appalachian Valley
7. Unakas
8. Hill Section
9. Bluegrass Section

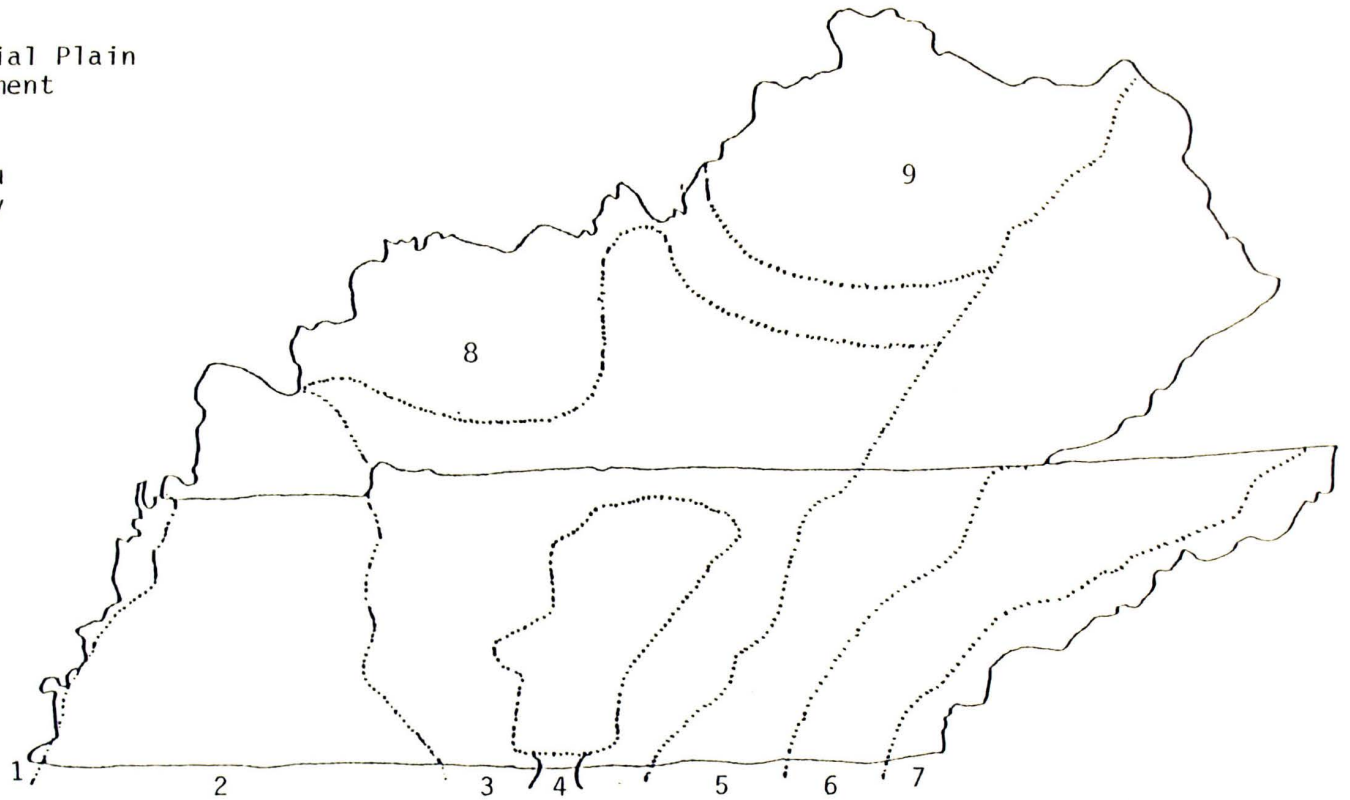


Figure 2. Physiographic and Floristic Regions of Tennessee and Kentucky;
(after Mahler, 1970 and Braun, 1950).

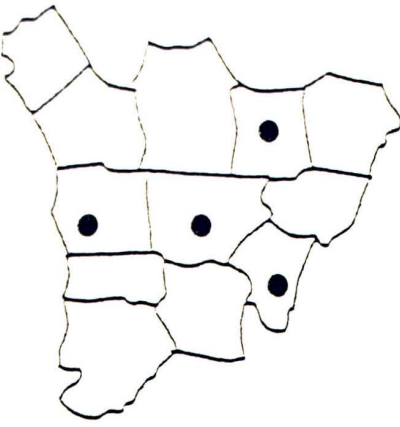
APPENDIX II

The following maps, Figure 3-11, indicate the sources of the present known pteridophyte records of the northwestern Highland Rim.

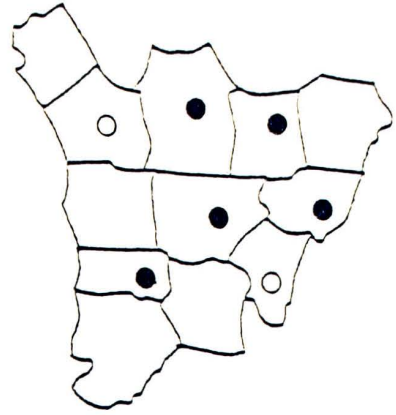
Symbols used include the following:

○ = Literature sources

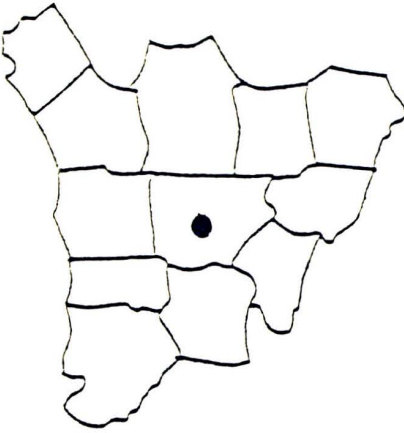
● = Herbarium or collected specimens, cited in the annotated checklist.



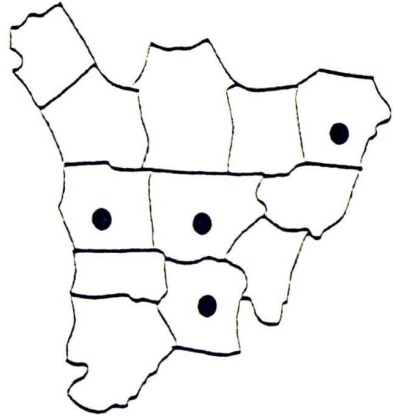
Equisetum arvense L.



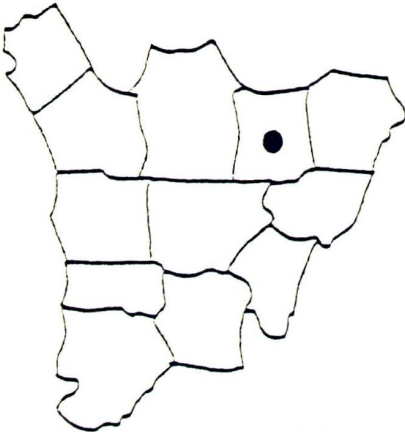
Equisetum hyemale L.



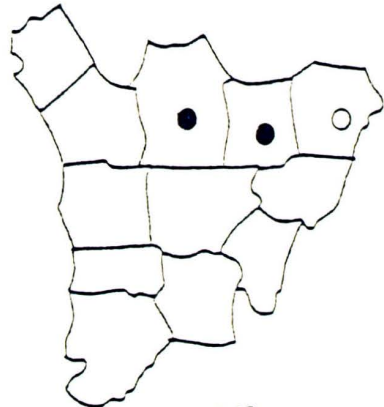
Isoetes engelmanni A. Braun



Lycopodium flabelliforme
(Fern) Blanch.

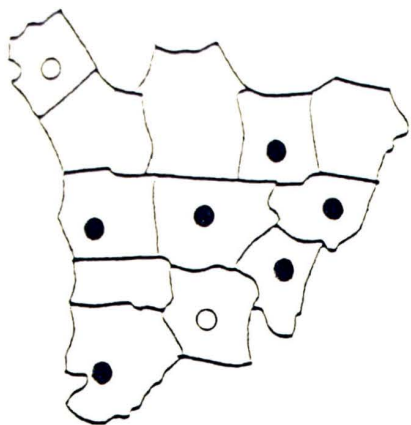


Lycopodium lucidulum Michx.

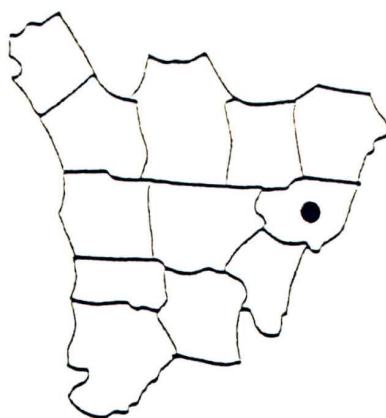


Lycopodium porophyllum
Lloyd and Underw.

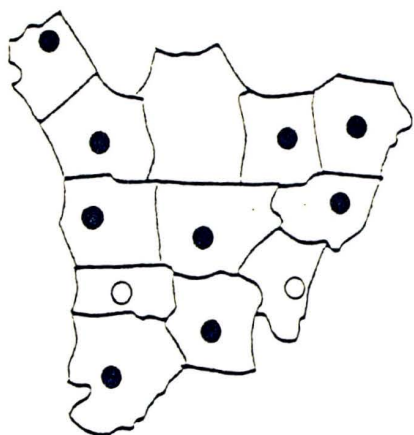
Figure 3. The distribution of Equisetaceae, Isoetaceae and Lycopodiaceae.



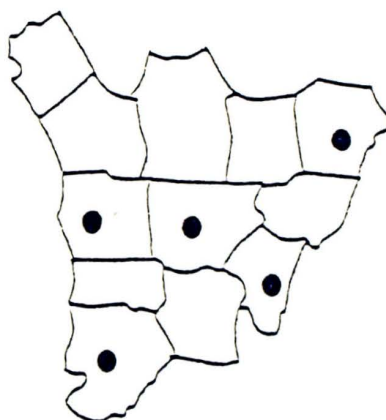
Selaginella apoda (L.)



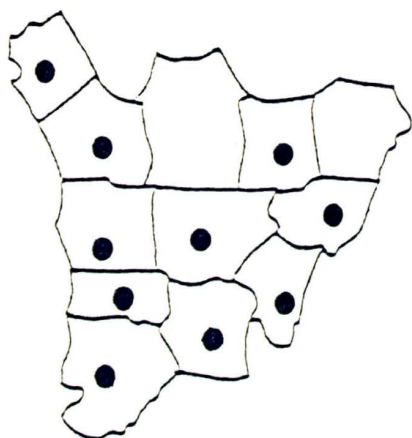
Adiantum capillus-veneris
L.



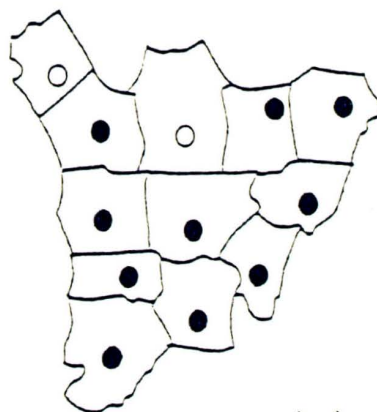
Adiantum pedatum L.



Cheilanthes alabamensis
(Buckl.) Kze.

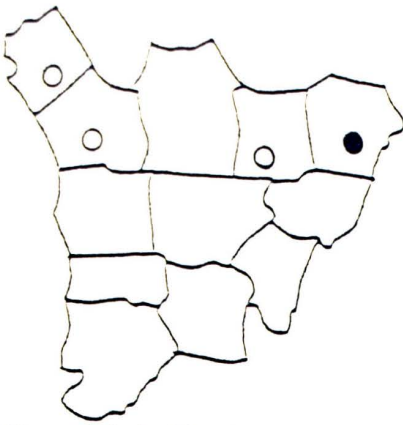


Cheilanthes lanosa (Michx.)

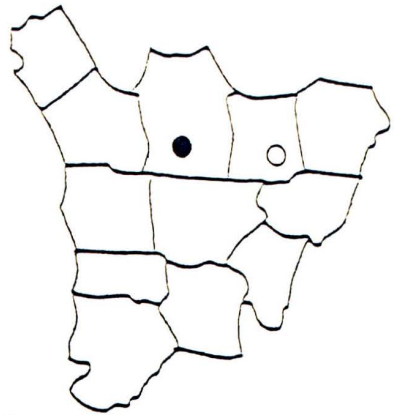


Pellaea atropurpurea (L.)
Link

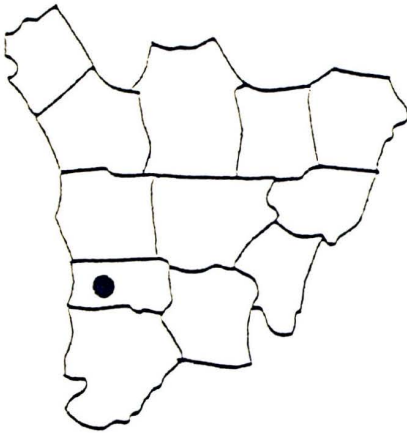
Figure 4. The distribution of Selaginellaceae and Adiantaceae Part I.



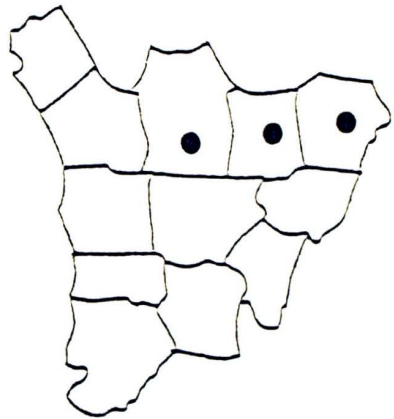
Pellaea glabella Mett.



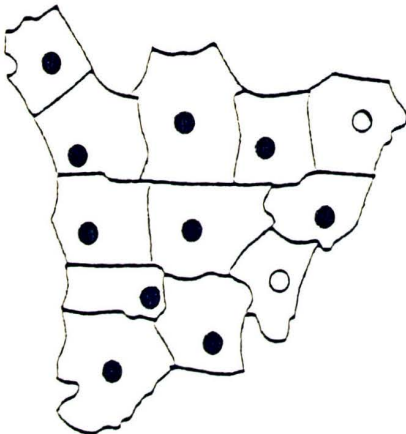
Asplenium bradleyi D. C.
Eaton



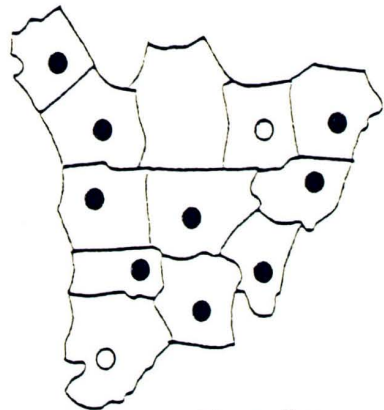
Asplenium ebenoides
R. R. Scott



Asplenium pinnatifidum Nutt.

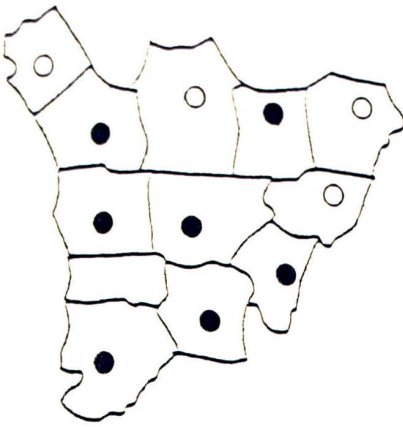


Asplenium platyneuron (L.)
Oakes

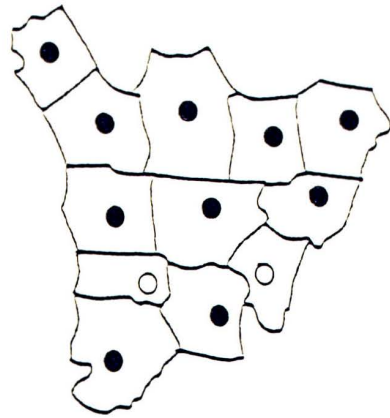


Asplenium resiliens Kze.

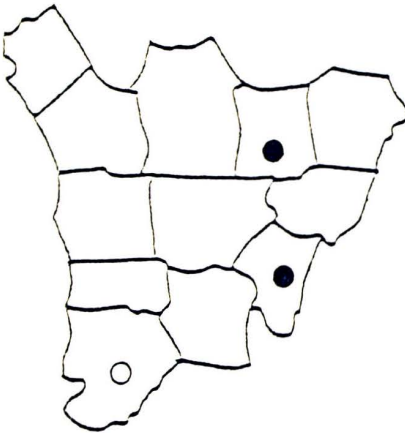
Figure 5. The distribution of Adiantaceae Part II and Aspleniaceae Part I.



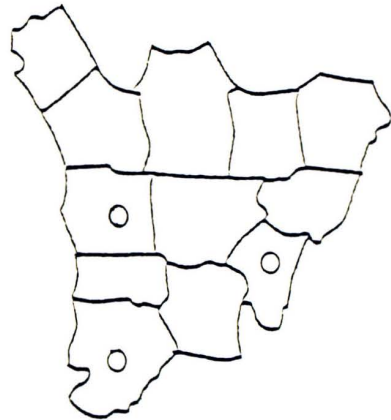
Polystichum acrostichoides
(Michx.) Schott



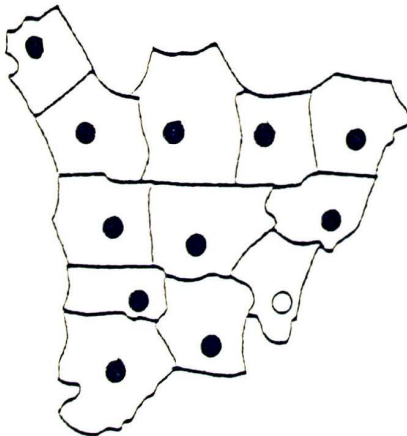
Thelypteris hexagonaptera
(Michx.) Weatherby



Thelypteris novaboracensis (L.)
Nieuw.



Thelypteris palustris
Schott

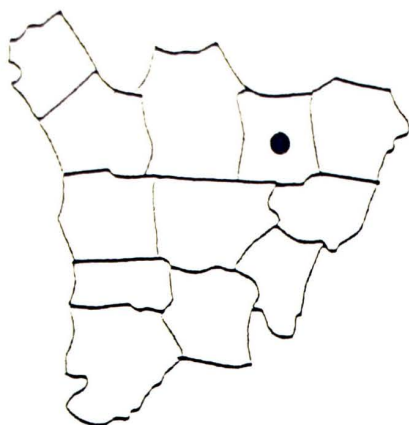


Woodsia obtusa (Spreng.)
Torr.

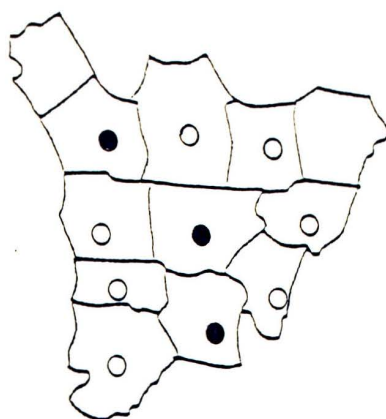


Woodwardia areolata (L.)
Moore

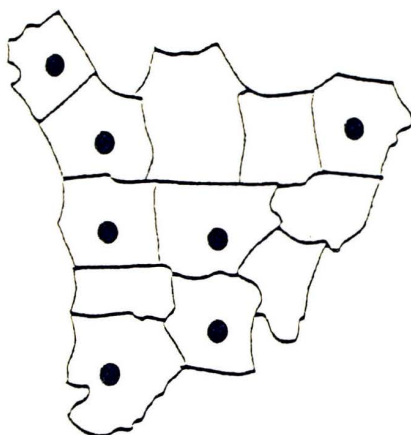
Figure 8. The distribution of Aspleniaceae Part IV and Blechnaceae.



Dennstaedtia punctilobula
(Michx.) Moore



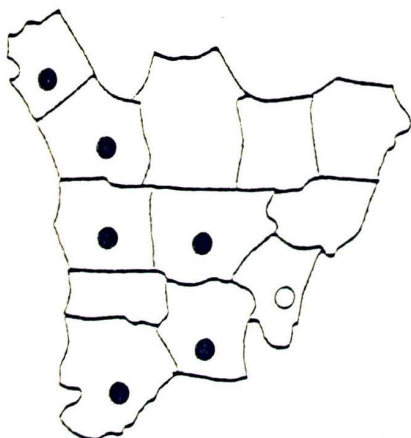
Pteridium aquilinum (L.)
var latisculum (Desv.) Underw.



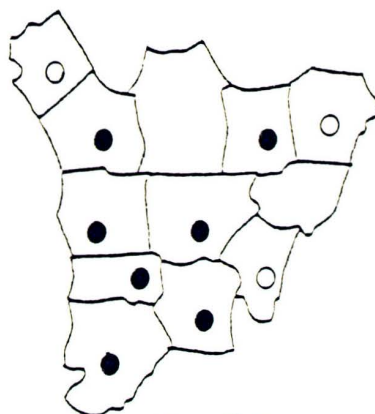
Pteridium aquilinum (L.) var
pseudocaudatum (Clute) Heller



Trichomanes boschianum
Swartz

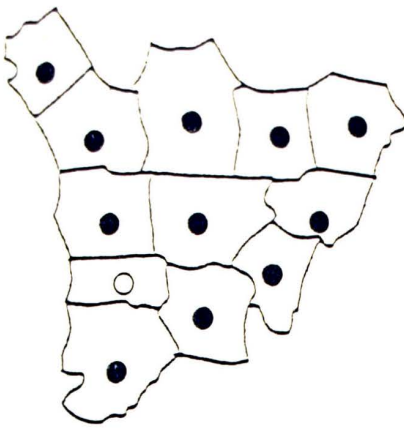


Botrychium biternatum (Sav.)
Underw.

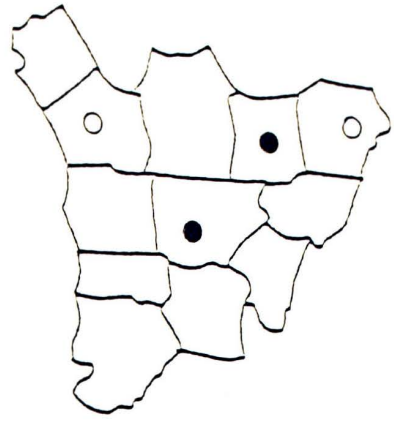


Botrychium dissectum
Spreng.

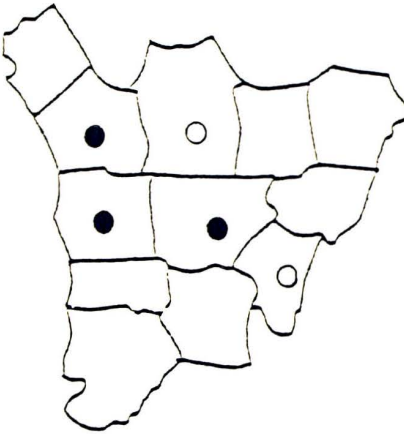
Figure 9. The distribution of Dennstaedtiaceae, Hymenophyllaceae,
and Ophioglossaceae Part I.



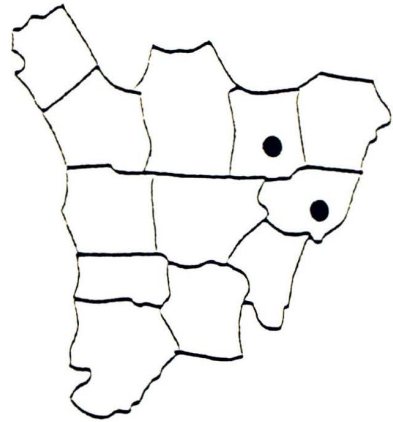
Botrychium virginianum (L.)
Sw.



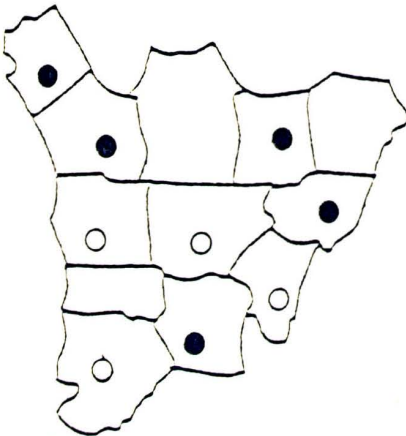
Ophioglossum engelmanni
Prantl.



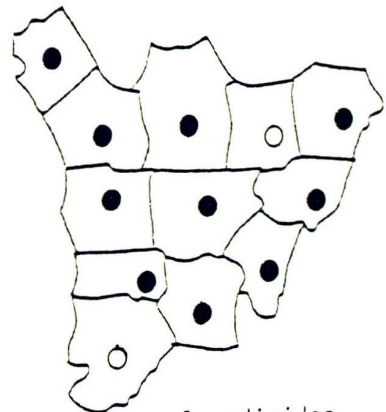
Ophioglossum vulgatum L. var
pycnostichum Fern.



Osmunda cinnamomea L.

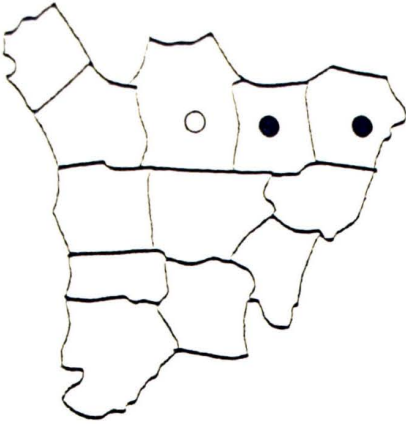


Osmunda regalis L.

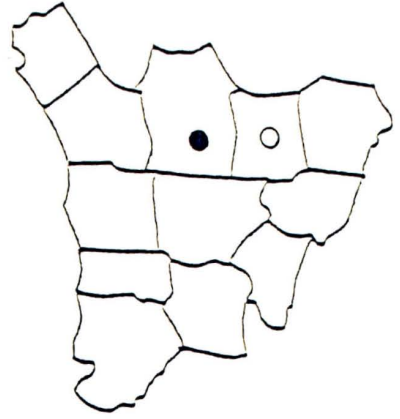


Polypodium polypodioides
(L.) Watt

Figure 10. The distribution of Ophioglossaceae Part II,
Osmundaceae and Polypodiaceae Part I.



Polypodium virginianum L.



Vittaria sp.

Figure 11. The distribution of Polypodiaceae Part II and Vittariaceae.

APPENDIX III

Table II. The Literature Citations of the Species of Pteridophytes from the Northwestern Highland Rim.¹

Counties	CHR.	LOG.	LYO.	TOD.	TRI.	CHE.	DIC.	HOU.	HUM.	MON.	ROB.	STE.
Species												
<i>Equisetum arvense</i>						1				1		1
<i>Equisetum hyemale</i>					9	1		1		1		
<i>Lycopodium flabelliforme</i>										1		1
<i>L. lucidulum</i>				7						1		
<i>L. porophilum</i>	9	9		9								
<i>Selaginella apoda</i>			3,9	3,9		1	1			1		1
<i>Adiantum pedatum</i>		9		3		1,2	1,2	2	1,2		1,2	
<i>Cheilanthes alabamensis</i>		10							1,2	1,2		
<i>C. lanosa</i>			3	3	7	1,2	1,2	2	1,2	1,2	1,2	1,2
<i>Pellaea atropurpurea</i>	9	6	3,7	3	6	1,2	1,2	1,2	1,2	1,2	1,2	1,2
<i>P. glabella</i>			3	3	9							
<i>Asplenium bradleyi</i>				3								
<i>A. pinnatifidum</i>	9	9		3,9								

Table II, (continued)

Counties	CHR.	LOG.	LYO.	TOD.	TRI.	CHE.	DIC.	HOU.	HUM.	MON.	ROB.	STE.
Species												
<i>Asplenium platyneuron</i>	3	9	3	3	4,5	1,2	1,2	1,2	1,2	1	1,2	1,2
<i>A. resiliens</i>		9,6		3,9		1,2	1,2	1,2	1,2	1	1,2	1,2
<i>A. rhizophyllum</i>			3	3		1,2	1,2	1,2	1,2	1,2	1,2	1,2
<i>A. ruta-muraria</i>						1,2	1,2		1,2	1		
<i>A. trichomanes</i>	9	9		3						1		
<i>Athyrium asplenioides</i>			9	9	9	1,2	1,2		1,2	1	1,2	1,2
<i>A. pycnocarpon</i>				3		1,2	1,2	1	1,2	1	1,2	1
<i>A. thelypteroides</i>				7,9		1,2	1,2		1,2			1,2
<i>Cystopteris bulbifera</i>		9				2	2	2	1,2	1,2	1,2	1,2
<i>C. protrusa</i>	3		3,9	3,7	9	1,2	1,2	1,2	1,2	1,2	2	1,2
<i>C. tennesseensis</i>		9		9		1		1	1	1		
<i>Dryopteris intermedia</i>	9	3,9										
<i>Onoclea sensibilis</i>	9			3,9		1,2	1,2		1,2	1,2	1,2	1,2
<i>Polystichum acrostichoides</i>	3	5,9	3,9	3,9	5,9	1,2	1,2	1,2	1,2	1,2	1,2	1,2

Table II, (continued)

Counties	CHR.	LOG.	LYO.	TOD.	TRI.	CHE.	DIC.	HOU.	HUM.	MON.	ROB.	STE.
Species												
<i>Thelypteris hexagonaptera</i>		9	3,9	4,5	3,9	1,2	1,2	1,2	1,2	1,2	1,2	1,2
<i>T. novaboracensis</i>									1,2			
<i>T. palustris</i>						1,2			1			1,2
<i>Woodsia obtusa</i>	3	5,9		3		1,2	1,2	1,2	1,2	1,2	1,2	1,2
<i>Dennstaedtia punctilobula</i>				3								
<i>Pteridium aquilinum</i> var. <i>latiusculum</i>	3			3	7,9		1,2	1,2	1	1,2	1,2	1,2
<i>Pteridium aquilinum</i> var. <i>pseudocaudatum</i>										1		1
<i>Trichomanes boschianum</i>				3								
<i>Botrychium biternatum</i>					9	2	1		2	1,2		
<i>B. dissectum</i>		5	3	3		1,2	2		1	1,2		
<i>B. virginianum</i>	3	5,9	3	3,9	9	1,2	1,2	1,2	1,2	1,2	1,2	1,2
<i>Ophioglossum engelmanni</i>		3,8		3,9	9					1,2		
<i>O. vulgatum</i> var. <i>pycnostichum</i>	7					1,2						

Table II, (continued)

Counties	CHR.	LOG.	LYO.	TOD.	TRI.	CHE.	DIC.	HOU.	HUM.	MON.	ROB.	STE.
Species												
<i>Osmunda cinnamomea</i>				3,9								
<i>O. regalis</i>					4,9	1,2	1,2		1,2	1,2	1,2	1,2
<i>Polypodium polypodioides</i>	3,9	9	3	3,9		1,2	1,2	1,2	1,2	1,2	1,2	1,2
<i>P. virginianum</i>	3			3,9								
<i>Vittaria</i>	9			9								

- ¹ 1. Wofford and Evans, 1979
 2. Shaver, 1954
 3. Reed, 1958, 1961

4. Smith, 1959
 5. Reed, 1962, 1965
 6. Browne, 1963

7. McCoy and Hunter, 1968
 8. Baskin and Baskin, 1978
 9. Cranfill, in press
 10. Cranfill and Lyle, 1979