A CHECKLIST OF THE VASCULAR PLANTS OF TANGLEWOOD BIOLOGICAL STATION, HALE COUNTY, ALABAMA

by

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A THESIS

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INTRODUCTION

This study was begun as a survey of the vascular flora of the Tanglewood Biological Station of the University of Alabama. The project was not intended to be an ecological study of the area, but was planned primarily to be a checklist. The major portion of this work was done between June, 1965 and September, 1966.

Since little work has been done on the flora of the upper coastal plain of Alabama, this work serves as a basis for long-term, comprehensive studies of the area. The present study should also serve as a basis for preliminary comparisons of this flora with that of the black belt, which is in close proximity.

Tanglewood Biological Station consists of 480 acres in Township Twenty-two of Range Four East, Hale County, Alabama. This land was deeded to the University of Alabama on May 18, 1949, by Mrs. Alma Bishop Williams, of nearby Akron, as a memorial to her aunt, Miss J. Nicholene Bishop. The property is to be preserved as a plant and wildlife sanctuary and biological station, as well as to be used for educational purposes by the University of Alabama.

I would like to express my gratitude to my advisor, Dr. Joab L. Thomas, for his aid and advice on this project. I would like to thank Mrs. Alma Bishop Williams, whose gift provided the land on which this survey was made. Also, I would like to thank the National Science Foundation for a Graduate Teaching Assistant Summer Fellowship which supported this work during the summer of 1966.

DESCRIPTION OF THE AREA

The area included in this study lies on soils of the Upper Cretaceous at the approximate boundary of the Eutaw and Tuscaloosa formations. Soils in this area may be classified as clay, sandy clay, sandy loam, loam, and vary from very dry to muddy depending upon the location and season. The land is fairly hilly in most places and is drained by numerous small creeks which often form swamps in the lowlands. These drain into Five Mile Creek which is medium sized and slow flowing (Adams, 1926).

Tanglewood lies in the central pine belt at the approximate boundary of the Eutaw belt and the short leaf pine belt (Harper, 1943). This area lies approximately twenty-five miles south of the fall line, the boundary between Paleozoic rocks and Cretaceous deposits. The hill country north of the fall line is fairly rocky, while the coastal plain deposits below the fall line are more sandy (Harper, 1913). The flora of the Tanglewood area may represent a transition zone between the coastal plain flora to the south and the hill country flora to the north. The land included in this survey may be divided into four rather arbitrary regions: old field and lawn areas, pine-sweetgum associations, deciduous hardwoods, and lowland swamps. The boundaries between these regions are usually vague and one habitat tends to grade into another.

Several areas occur which may be classified as old field associations. These areas vary from fields which are cultivated

every year, to fields cultivated every other year, to cleared areas in which pine and sweetgum seedlings may be found. A small amount of lawn area is included in the group. Soils in these areas are mainly sandy clay with a small amount of loam in scattered areas. These old fields are exposed to full sunlight and as a result the soil is usually dry. The most common plant families in these open areas are the Compositae, Gramineae, Leguminosae, and Cruciferae.

Large areas of land are covered with pine and sweetgum. These pine-sweetgum associations are of varying ages, depending upon how recently the area was cultivated or timbered. In some areas the association grades into old fields, whereas in other areas it grades into hardwood forests. The soil in these pine-sweetgum sites is usually sandy clay or sandy loam covered with varying amounts of pine litter. Although the soil is usually fairly dry, it is more moist than the soil of the old fields. The dominant members of this association are several species of pine, sweetgum, and to a lesser degree, sourwood and several scrubby oaks. Although undergrowth is usually rather sparse, there is some diversity in the species found. The families most common in terms of species are the Compositae and Leguminosae; those most common in terms of individuals are the Pinaceae, Hamamelidaceae, Compositae, Leguminosae, Ericaceae, Caprifoliaceae, and Liliaceae. Stands of Vaccinium are quite abundant in the more open areas. The last two families are represented by Lonicera and several species of Smilax which cover extremely large areas.

Deciduous hardwoods may be found in several higher areas where they may grade into old fields or pine-sweetgum woods. On lower, wetter slopes the hardwoods often grade into lowland swamps or "bottoms". The soil throughout the hardwood forest ranges from moist to very wet, and is composed of sandy loam or loam. The dominant large trees include several species of oaks and hickories, and the monotypic beech and sweetgum. Magnolias, red maple, and mulberry are often found on the wetter slopes, while the dryer slopes often contain abundant dogwood, sourwood, rhododendron, and holly. Several ferns as well as members of the Liliaceae and Violaceae are quite common on the forest floor.

Along the edges of numerous small streams a lowland swamp type of vegetation may be found. The soil in this area varies from sandy loam to sandy clay, often becoming sandy mud with small pebbles. During wet weather, much of the land is covered by several inches of water, and even in very dry weather the land is somewhat spongy. Extremely large areas of swamp are covered with dense tangles of Illicium, Lonicera, and Smilax to the virtual exclusion of other plants. In other lowland areas the above mentioned plants may be found with several species of oaks, rushes, sedges, grasses, magnolia, alder, and willow.

CATALOGUE OF THE VASCULAR PLANTS OF TANGLEWOOD

The following is an alphabetical catalogue by family of the vascular plants of the Tanglewood Biological Station of the University of Alabama. A count of the plants showed that there were 289 species in 208 genera in 87 families.

The accompanying chart indicates whether a plant is common (c), rare (r), or absent (no symbol) in a particular habitat. In some cases it is difficult to assign a plant to a particular habitat because of the numerous intergradations of habitats.

The classification followed in this work is as recent as possible, and for the most part follows Fernald (1950), Gleason (1958), or Small (1933). With the exception of approximately fifteen species, all of the plants were collected and identified by the author. All of the specimens have been deposited in the herbarium of the University of Alabama.

A check was made of the standard references on the flora of Alabama (Mohr, 1901; Harper, 1928, 1944). A brief list of the new records for Alabama is given following the checklist for Tanglewood.

CATALOGUE OF SPECIES OF TANGLEWOOD

	A	B	C	D *
ACANTHACEAE				
Ruellia ciliosa Pursh.			c	r
ACERACEAE				
Acer rubrum L.		r	c	c
AMARANTHACEAE				
Amaranthus hybridus L.	c			
AMARYLLIDACEAE				
Hypoxis hirsuta (L.) Coville	c	r		
ANACARDIACEAE				
Rhus copallina L.		c		
Rhus glabra L.		c		
Rhus radicans L.	r	c	c	c
ANNONACEAE				
Asimina parviflora (Michx.) Dunal			c	
APOCYNACEAE				
Amsonia tabernaemontana Walt.			c	
Vinca major L.	r			

* A, Fields and Lawns; B, Pine-Sweetgum Woods; C, Deciduous Hardwoods; D, Lowland Swamp.

	A	B	C	D
AQUIFOLIACEAE				
Ilex decidua Walt.		c		
Ilex opaca Ait.			c	
ARACEAE				
Arisaema triphyllum (L.) Schott.			c	c
ARISTOLOCHIACEAE				
Hexastylis arifolia (Michx.) Small			c	
ASCLEPIADACEAE				
Asclepias tuberosa L.		c		
Asclepias variegata L.			r	
BERBERIDACEAE				
Podophyllum peltatum L.			c	
BETULACEAE				
Alnus serrulata (Ait.) Willd.				c
BIGNONIACEAE				
Campsis radicans (L.) Seem.		c		
CALYCANTHACEAE				
Calycanthus floridus L.		c	r	
CAMPANULACEAE				
Campanula aparinoides L.	c	r		
Lobelia cardinalis L.				r

	A	B	C	D
CAMPANULACEAE (ctd.)				
Lobelia puberula Michx.		c	c	
Specularia biflora (R. & P.) Fisch and Mev.	c			
CAPRIFOLIACEAE				
Lonicera japonica Thunb.		c		c
Lonicera sempervirens L.	r			
Sambucus canadensis L.				r
CARYOPHYLLACEAE				
Cerastium viscosum L.	c			
Sagina decumbens (Ell.) Torr. and Gray	c			
Stellaria media (L.) Cyrill.	c			
CELASTRACEAE				
Euonymus americanus L.			c	
CISTACEAE				
Lechea villosa Ell.	c			
COMPOSITAE				
Ambrosia artemisiifolia L.		c		
Aster dumosus L.		c		
Aster pilosus Willd.		c		
Carduus spinosissimus Walt.		c		
Coreopsis auriculata L.	c			
Coreopsis major Walt.		c		
Elephantopus tomentosus L.		c		

	A	B	C	D
COMPOSITAE (ctd.)				
Erigeron canadensis L.	c	r		
Erigeron ramosus (Walt.) BSP.	c	c		
Erigeron strigosus Muhl.	c	c		
Eupatorium aromaticum L.	c	c		
Eupatorium capillifolium (Lam.) Small	c			
Eupatorium coelestinum L.		c		
Eupatorium rotundifolium L.	c	c		
Gnaphalium obtusifolium L.	c	c		
Gnaphalium purpureum L.	c			
Haplopappus divaricatus (Nutt.) Gray		c		
Helenium tenuifolium Nutt.	c	c		
Helianthus hirsutus Raf.	c	c		
Heterotheca mariana (L.) Shinners		c		
Hieracium gronovii L.		c		
Krigia virginica (L.) Willd.	c	r		
Polymnia uvedalia L.			r	
Pyrrhopappus carolinianus (Walt.) DC.	c			
Rudbeckia hirta L.	c	c		
Senecio obovatus Muhl.			c	
Senecio smallii Britton		c		
Silphium asteriscus L.		c		
Solidago juncea Ait.		c		
Solidago odorata Ait.	c	c		
Vernonia glauca (L.) Willd.		c		
Xanthium strumarium L.	c			

	A	B	C	D
CONVOLVULACEAE				
Bonamia humistrata (Walt.) Gray		c		
Dichondra repens Forst.	c			
Ipomoea lacunosa L.	c			
Ipomoea pandurata (L.) G.F.W. Meyer	c			
CORNACEAE				
Cornus florida L.		c	c	
CORYLACEAE				
Carpinus caroliniana Walt.				r
CRASSULACEAE				
Penthorum sedoides L.				r
CRUCIFERAE				
Arabidopsis thaliana (L.) Heynh.	c			
Arabis virginica (L.) Poir.	c			
Brassica rapa L.	r			
Capsella bursa-pastoris (L.) Medic.	c			
Draba brachycarpa Nutt.	c			
Draba verna L.	c			
Lepidium virginicum L.	c			
CYPERACEAE				
Carex leptales Wahl.				c
Carex lurida Wahl.				c
Cyperus retrorsus Chapm.				c

	A	B	C	D
CYPERACEAE (ctd.)				
Rhynchospora cephalantha Gray				c
DIOSCOREACEAE				
Dioscorea quaternata (Walt.) J.F. Gmel.			c	
EBENACEAE				
Diospyros virginiana L.		c		
ERICACEAE				
Kalmia latifolia L.			c	
Monotropa uniflora L.		r		
Monotropsis odorata Ell.			r	
Oxydendrum arboreum (L.) DC.		c		
Rhododendron canescens (Michx.) Sweet			c	
Rhododendron nudiflorum (L.) Torr.			c	
Vaccinium arboreum Marsh.		c		
Vaccinium corymbosum L.		c		
EUPHORBIACEAE				
Acalypha gracilens Gray		c		
Cnidoscolus stimulosus (Michx.) Gray	c	c		
Euphorbia corollata L.		c		
Euphorbia maculata L.		c		
Sebastiana ligustrina (Michx.) Muell. Arg.		c	c	
Tragia urticifolia Michx.		c		

	A	B	C	D
FAGACEAE				
Fagus grandifolia Ehrh.			c	
Quercus alba L.			c	
Quercus bicolor Willd.				r
Quercus falcata Michx.		c	c	
Quercus laurifolia Michx.			c	
Quercus marilandica Muenchh.		c		
Quercus nigra L.		r		
Quercus phellos L.			c	c
Quercus stellata Wang.		r		
GERANIACEAE				
Geranium carolinianum L.	c			
GRAMINEAE				
Agrostis hyemalis (Walt.) BSP.	c			
Andropogon gerardi Vitm.	c			
Axonopus affinis Chase	c			
Danthonia sericea Nutt.	c	c		
Echinochloa colonum (L.) Link.	c			
Hordeum pusillum Nutt.	c			
Panicum anceps Michx.	c	c		
Panicum commutatum Schult.				c
Panicum dichotomum L.				c
Panicum lancearium Trin.	c	c		
Panicum lanuginosum Ell.	c			

	A	B	C	D
GRAMINEAE (ctd.)				
Panicum laxiflorum Lam.				c
Panicum sphaerocarpon Ell.	c			
Paspalum laeve Michx.	c			
Paspalum urvillei Steud.		c		
Sorghum halepense (L.) Pers.	c			
Uniola sessiliflora Poir.	c			
GUTTIFERAE				
Hypericum hypericoides (L.) Crantz.	c	c		
Hypericum mutilum L.		c		c
Hypericum stragalum Adams & Robson.		c		
Hypericum walteri Gmel.				c
HAMAMELIDACEAE				
Hamamelis virginiana L.			c	
Liquidambar styraciflua L.		c	r	c
HIPPOCASTANACEAE				
Aesculus pavia L.		c		
ILLICIACEAE				
Illicium floridanum Ellis				c
IRIDACEAE				
Belamcanda chinensis (L.) DC.		r		

	A	B	C	D
JUGLANDACEAE				
Carya ovalis (Wang.) Sarg.			c	
Carya tomentosa Nutt.			c	
JUNCACEAE				
Juncus biflorus Ell.	r			
Juncus coriaceus Mackenzie				c
Juncus effusus L.				c
LABIATAE				
Dracocephalum virginianum L.		r		
Lamium amplexicaule L.	c			
Lycopus rubellus Moench.				r
Pycnanthemum incanum (L.) Michx.		c		
Scutellaria elliptica Muhl.		c		
Scutellaria incana Biehler		c		
Scutellaria serrata Andr.				r
LAURACEAE				
Sassafras albidum (Nutt.) Nees.	c	r	r	
LEGUMINOSAE				
Cassia nictitans L.		c		
Cassia tora L.	c			
Cercis canadensis L.			c	
Clitoria mariana L.	c	c		
Crotalaria sagittalis L.		c		

	A	B	C	D
LEGUMINOSAE (ctd.)				
Crotalaria spectabilis Roth.	c			
Desmodium nudiflorum (L.) DC.			r	
Desmodium nuttallii (Schindl.) Schub.		c		
Desmodium paniculatum (L.) DC.		c		
Galactia volubilis (L.) Britt.		c		
Lespedeza cuneata (Dumont.) G. Don.	c			
Lespedeza intermedia (Wats.) Britt.		c		
Lespedeza repens (L.) Bart.		c		
Medicago arabica (L.) Huds.	c			
Pueraria lobata (Willd.) Ohwi	r	r	r	
Rhynchosia tomentosa (L.) H. & A.		c		
Robinia pseudo-acacia L.	r			
Schrankia microphylla (Dryand.) Macbr.		c		
Strophostyles umbellata (Willd.) Britt.	c	r		
Stylosanthes biflora (L.) BSP.	r	c		
Tephrosia spicata (Walt.) T. & G.		c		
Trifolium incarnatum L.	c			
Trifolium procumbens L.	c			
Trifolium repens L.	c			
Trifolium resupinatum L.	c			
Vicia angustifolia Reichard	c			
Wisteria sinensis Sweet		r		

	A	B	C	D
LILIACEAE				
Amianthium muscaetoxicum (Walt.) Gray			r	
Chamaelirium luteum (L.) Gray			r	
Lilium michauxii Poir.			r	
Muscari racemosum (L.) Mill.		r		
Smilacina racemosa (L.) Desf.			r	r
Smilax bona-nox L.		c	c	c
Smilax glauca Walt.	c	c	c	c
Smilax pumila Walt.			r	
Smilax rotundifolia L.			r	
Trillium cuneatum Raf.			c	
Trillium ludovicianum Harbison				c
Trillium sessile L.				c
LOGANIACEAE				
Gelsemium sempervirens (L.) Ait. f.		c		c
Polypremum procumbens L.	c	c		
Spigelia marilandica L.		r	r	
LYTHRACEAE				
Lagerstroemia indica L.	r			
MAGNOLIACEAE				
Liriodendron tulipifera L.			r	c
Magnolia fraseri Walt.			r	
Magnolia macrophylla Michx.			c	c
Magnolia virginiana L.			r	c

	A	B	C	D
MELASTOMATACEAE				
Rhexia mariana L.		c		
Rhexia virginica L.				r
MELIACEAE				
Melia azedarach L.	c			
MENISPERMACEAE				
Cocculus carolinus (L.) DC.	c	r		
MORACEAE				
Morus rubra L.			c	c
MYRICACEAE				
Myrica cerifera L.		c		r
OLEACEAE				
Chionanthus virginicus L.				r
Ligustrum sinense Lour.		r		
ONAGRACEAE				
Jussiaea decurrens (Walt.) DC.				c
Ludwigia alternifolia L.				c
Oenothera laciniata Hill.	c			
Oenothera speciosa Nutt.	c			
OPHIOGLOSSACEAE				
Botrychium dissectum Spreng.		r		

	A	B	C	D
ORCHIDACEAE				
Corallorrhiza wisteriana Conrad			r	
Habenaria clavellata (Michx.) Spreng.				r
Malaxis unifolia Michx.			c	
Spiranthes cernua (L.) Rich.			r	
Spiranthes tuberosa Raf.		r		
Tipularia discolor (Pursh.) Nutt.			c	
OROBANCHACEAE				
Epifagus virginiana (L.) Bart.			c	
OSMUNDACEAE				
Osmunda cinnamomea L.				r
OXALIDACEAE				
Oxalis corniculata L.	c			
Oxalis florida Salisb.	c			
Oxalis stricta L.		c		
Oxalis violacea L.			c	
PAPAVERACEAE				
Sanguinaria canadensis L.			c	
PASSIFLORACEAE				
Passiflora incarnata L.	c			
PHRYMACEAE				
Phryma leptostachya L.			r	

	A	B	C	D
PINACEAE				
Juniperus virginiana L.		c		
Pinus echinata Mill.		c		
Pinus elliottii Engelm.		c		
Pinus palustris Mill.		c		
Pinus taeda L.		c		
PLANTAGINACEAE				
Plantago aristata Michx.	c			
PLATANACEAE				
Platanus occidentalis L.				c
POLEMONIACEAE				
Phlox carolina L.			r	
Phlox glaberrima L.				r
POLYGONACEAE				
Polygonum setaceum Baldw. ex Ell.				c
Rumex hastatulus Baldw.	c	r		
POLYPODIACEAE				
Asplenium platyneuron (L.) Oakes			c	c
Athyrium Felix-femina (L.) Roth.				c
Onoclea sensibilis L.				c
Polypodium polypodioides (L.) Watt.			c	
Polystichum acrostichoides (Michx.) Schott.			c	c

	A	B	C	D
RANUNCULACEAE				
Delphinium ajacis L.	r			
Hepatica americana (DC.) Ker.			c	
ROSACEAE				
Duchesnea indica (Andr.) Focke	c			
Potentilla canadensis L.		c		
Prunus angustifolia Marsh.	c			
Prunus munsoniana Wight and Hedr.	r			
Prunus serotina Ehrh.	c	c		
Rosa carolina L.		c		
Rubus trivialis Michx.	c			
RUBIACEAE				
Cephalanthus occidentalis L.				c
Diodia teres Walt.		c		
Diodia virginiana L.				r
Galium circaezans Michx.		c	r	
Galium pilosum Ait.		c	r	
Galium uniflorum Michx.		c	r	
Houstonia patens Ell.	c			
Houstonia purpurea L.		c		
Mitchella repens L.		c	c	
Richardia scabra L.	c			
SALICACEAE				
Salix nigra L.				c

	A	B	C	D
SAURURACEAE				
Saururus cernuus L.				c
SAXIFRAGACEAE				
Decumaria barbara L.			c	
Hydrangea arborescens L.			r	
Itea virginica L.				r
Philadelphus inodorus L.		r		
SCROPHYLARIACEAE				
Aureolaria flava (L.) Farw.	c			
Gerardia tenuifolia Vahl.		c		
Gratiola virginiana L.				c
Linaria canadensis (L.) Dum.	c			
Veronica arvensis L.	c			
Veronica peregrina L.	c			
SOLANACEAE				
Solanum carolinense L.	c			
STYRACACEAE				
Halesia carolina L.			c	
SYMPLOCACEAE				
Symplocos tinctoria (L.) L'Her.			r	
ULMACEAE				
Celtis occidentalis L.		c		
Ulmus alata Michx.		c	r	

	A	B	C	D
UMBELLIFERAE				
Chaerophyllum tainturieri Hook.	c			
Daucus pusillus Michx.	c			
Sanicula smallii Bickn.		c	c	
URTICACEAE				
Pilea pumila (L.) Gray				r
VALERIANACEAE				
Valerianella radiata (L.) Dufr.	c			
VERBENACEAE				
Callicarpa americana L.		c	r	
Verbena brasiliensis Vell.	c			
VIOLACEAE				
Viola affinis LeConte			c	
Viola cucullata Ait.			c	
Viola hastata Michx.			c	
Viola papilionacea Pursh.			c	
Viola primulifolia L.			c	c
Viola rafinesquii Greene	c			
VITACEAE				
Parthenocissus quinquefolia (L.) Planch.				c
Vitis aestivalis Michx.		c		

PLANTS PREVIOUSLY UNREPORTED FROM ALABAMA

NATIVE	INTRODUCED
Campanula aparinoides	*Axonopus affinis*
Carya ovalis	*Crotalaria spectabilis*
Hypericum stragalum	*Ligustrum sinense*
Monotropsis odorata	*Prunus munsoniana*
Quercus bicolor	*Verbena brasiliensis*
Vernonia glauca	

SUMMARY

An attempt has been made to catalogue the vascular plants of the Tanglewood Biological Station of the University of Alabama. The 289 species have been listed to indicate relative distributions according to habitat. Although there is a considerable diversity of species of plants at Tanglewood, numerous species were found to be represented by only one or a very few individuals. Judging from the number of species which were represented by only one individual, one might conclude that there are probably several more species which inhabit the area but were not found. Several species were found that previously had not been reported from Alabama, and a list of them is included.

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