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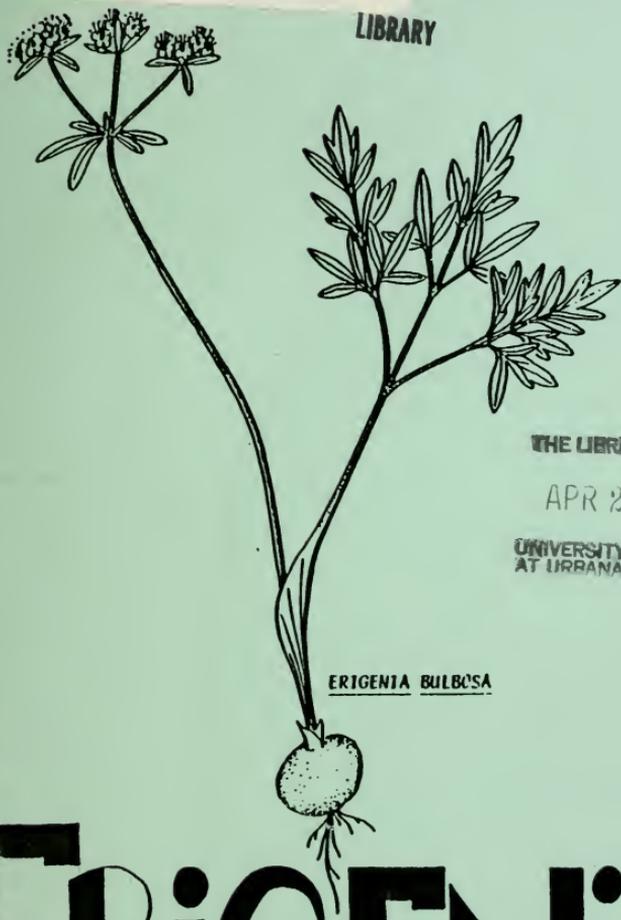
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ERIGENIA

JOURNAL OF THE
SOUTHERN ILLINOIS NATIVE PLANT SOCIETY

*Officers for 1982*

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The SINPS is dedicated to the preservation, conservation, and study of the native plants and vegetation of Southern Illinois.

Membership includes subscription to ERIGENIA as well as to the quarterly newsletter THE HARBINGER. ERIGENIA, the official journal of the Southern Illinois Native Plant Society, is published occasionally by the Society. Single copies of this issue may be purchased for \$2.50 (including postage). For current subscription rates or information concerning the Society write:

So. Ill. Native Plant Society
 Department of Botany
 Southern Illinois University
 Carbondale, IL 62901

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The SINPS annually publishes among its ERIGENIA issues an "UPDATE ON THE ILLINOIS FLORA". County and state record contributions are requested and should be sent to:
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 SINPS Flora Update Project
 Dept. of Botany, SIU
 Carbondale, IL 62901

ERIGENIA

JOURNAL OF THE
 SOUTHERN ILLINOIS NATIVE PLANT SOCIETY

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CONTENTS: PLANT COLLECTOR'S GUIDE

Editorial	1
Why Collect Plant Specimens?	2
Where to Collect Plants	5
The Ethics of Plant Collecting	7
Collecting Plant Specimens (An Outline with Appendices)	9
An Illustrated Glossary of Botanical Terms	22

TO CONTRIBUTE:

Manuscripts are accepted free of charge^A. Manuscripts should be typed single, spaced with 1½ inch side margins. Page numbers should be in pencil only. Black and white, glossy, 4x5" photos are also accepted (not too contrasty). Cost of each photo to author - \$5.00.

^AFloristic studies of Illinois and states bordering Illinois are accepted for publication but require a charge of \$5.00 per typed page with a maximum length of 20 pages. Floristic studies will be published in groups when sufficient copy is in hand. Contributions or inquiries concerning contribution should be sent to:

Mark W. Mohlenbrock
 Editor - ERIGENIA
 1865 E. Broadway, #233
 Tempe, Arizona 85282

EDITORIAL

- MARK W. MOHLENBROCK

Welcome to the fact-filled pages of ERIGENIA! I would like to take a few lines at this time to introduce you to ERIGENIA. The goal of this journal is to inform its readers in a topical manner of the many aspects pertaining to the native plants of the Southern Illinois region. Each issue will be centered around a particular theme thus making a handy set of references. A glance at the table of contents on the facing page indicates a "Plant Collector's Guide" theme for this issue.

Sooner or later most native plant enthusiasts find the need to collect one or more plant specimens. It is important that when one collects plants one does so in a proper way, thus making the collection useful. The following pages present guide lines for plant collecting and offer tools to assist in plant identification.

Looking at the months and ERIGENIA issues ahead, contributors are needed for every upcoming issue, save ERIGENIA 2: Southern Illinois Geology which is being prepared for press. Below is a list of potential ERIGENIA themes not necessarily printed here in their order of eventual publication:

Rare and Local Plants of Southern Illinois, The Natural Divisions of Southern Illinois, Wetlands Guide to Southern Illinois, Shrubby Plants of Southern Illinois, Illinois Native Edibles, Scenic Routes of Southern Illinois, Southern Illinois Prairies, Gardening with Southern Illinois Native Plants, Unique Natural areas of Southern Illinois, A Historic Summary of Southern Illinois Botany, Southern Illinois Fern Facts, Orchids of Southern Illinois, A Primer on Nature Photography, (ideas for additional themes are welcomed)

Each theme will require several contributions so start putting pen to paper. I should point out, if return of materials sent to me is requested, a self addressed stamped envelope is required. There is no specific order in which the potential themes will be dealt. When sufficient copy on a particular theme is obtained it will be placed on the "to be published next list". Manuscripts conforming to one of these themes are accepted at no cost to the author unless photos are included (see inside front cover). Illustrations and maps are welcomed and are printed at no cost to the author. Side margins must also be $1\frac{1}{2}$ inches. [Continued on page 44.]

Why Collect Plant Specimens? *

Illinois has, over the years, been blessed with many outstanding plant collectors. The eminent French botanist, Andre Michaux, was the first to collect Illinois plants during his visit in 1795. Many people have continued the botanical exploration begun by Michaux. They have come from the state's fine system of universities and from other institutions such as the Illinois Natural History Survey, Illinois State Museum, Morton Arboretum, Chicago Natural History Museum and many more. Tremendous contributions have also been made by people who were not professional botanists. Virginus Chase and Frederick Brendel collecting in Peoria County, Samuel Mead in Hancock County, Elihu Hall in Menard County, Jacob Schneck in Wabash County, Julian Neill in St. Clair County, and Paul Schildneck collecting in many central Illinois counties, are among many dedicated amateurs who have furthered our knowledge of Illinois plants.

With all this activity it would seem that the state would be thoroughly explored botanically, but such is not the case. Numerous areas exist in every county that have never been seen by a botanist much less thoroughly collected. Even areas that have been thoroughly collected produce new records. For example, Dr. Mohlenbrock of Southern Illinois University and his students have been collecting plants from Lake Murphysboro State Park for nearly thirty years, and new species continue to be found. Well explored areas like Lake Murphysboro are the exception rather than the rule even on public land.

Certain counties have been fairly well botanized including eleven counties in the Chicago area, Champaign, Jackson, Sangamon, St. Clair and Winnebago. Many of the other counties have been collected in only a cursory manner. Much is left to be discovered. The author documented well over 200 county records for Perry County in just one collecting season. Still, many more species need documenting for this county.

How does one know what has been collected before? Our knowledge of Illinois plant distributions down to the county level is available in a readily usable form. The book, entitled "Distribution of Illinois Vascular Plants" by Mohlenbrock and Ladd (1978), records the distribution of every species of vascular plant known from the state. Each species of plant found in Illinois is represented by a county outline map. A dot has been placed in each county from which the plant has been documented by the deposition of a dried, pressed specimen in an herbarium. By glancing through this

* *Contributed by Jay Raveill*

book, one quickly becomes aware that many species have counties that look as if they should be dotted, but are not. For example, one can theorize that if a species is dotted for all the counties in the south half of the state except one or two, the species must occur in those counties also. This, however, one does not know for sure. Plants often have unexplained gaps in their ranges. Many of these gaps are a result of inadequate collecting, but areas representing other gaps have been searched and the species just does not seem to be there. One can not always take ranges for granted until the herbarium specimens exists. This raises another point, the need for specimens instead of photographs or sight records.

Herbarium specimens are the only method by which plant identifications can be verified. When thousands of plants are identified, it is inevitable that a few errors will be made even by the best botanists. Another reason that botanists may disagree on the identity of a specimen is that some species are not well separated. Some botanists may lump together as one species what other botanists call several species. Photographs just do not show the very fine detail necessary to separate these very close "species". An exception is when one is dealing with rare plants such as orchids, bog plants and a few others. They should be well photographed and the photos sent to an herbarium where they will be treated like regular herbarium specimens. Sight records are of little value to science since they can not be corroborated without revisiting the reported location.

Collecting plants is one of the very few ways that the average person can make a significant contribution to the advancement of science. Plant collections aid the field of phytogeography which attempts to make some sense out of plant distributions. Many of us have made observations about where certain plants grow. One notes that some plants occur only in wet areas while others can be found only in rich wooded ravines. But why are some plants so common in one part of the state and yet absent from identical looking habitat in other parts of the state? Great progress has been made in explaining the distribution patterns of certain well collected species such as Giant Cane (Arundinaria gigantea), but most species' ranges are not well known enough at the county level to see any patterns.

Another reason to search for plants is that the discovery of certain rare plants in natural areas within the state

may prompt state or private officials to preserve such areas as is done frequently by the Illinois Nature Conservancy. The documentation of such species plays a role in bringing these plants and areas to the attention of agencies which can help preserve our natural heritage.

Most of the vegetation of Illinois bears little resemblance to what it was like in presettlement times. Our once expansive prairies have been converted into rich farm land. The magnificent trees of our bottomland forests have been replaced by rows of soybeans. The wet meadows of our lake shore are now beneath the towering buildings of a thriving metropolis. Plant species adapted to the intense interspecific competition of the prairie have been replaced by species adapted to the yearly plowing of a corn field.

These species that are adapted to disturbed areas, often called weeds, have plagued mankind from the beginning of recorded history. Some of the weeds around us now, were here when the first white settlers came and found the settler's fields to their liking. Many new weeds have invaded the state since. The Nodding Foxtail (Setaria faberi) was first found in the state in 1938. Now it is in every county and is one of our worst weeds. Weeds continue to invade the state every year. They are usually first found along docks, railroad tracks, highways or recently around airports. The exotic seeds usually inadvertently bought in and just happens to fall where conditions are right for germination and growth. Many of these new species will occur as just single individuals and will not persist. Other species may persist for several years at a single location but will not spread. Still other species are first found as isolated individuals only to spread to become ubiquitous weeds. One does not know into which category a new species will fit when the species is first encountered. All too often, weeds are ignored until they are too common and widespread to ever be eliminated from the state. But if we can keep watch on these invading plants, we may be able to identify the plants which could become serious weeds in time to control them.

The flora of the state is dynamic. Every year plants are found for the first time in the state and others are extirpated. At the county level the changes are even more pronounced. But we do not yet know many of the counties in which some species grow. Some of these species have always been common in certain counties but no one has ever collected them and so we still do not know that they are there. Once

all the counties are well collected, then we can track the spread of species and possibly explain why species grow where they do.

The distribution information collected is raw scientific data, the uses of which are limited only by the imagination of the investigator. Several professional botanists are actively gathering this data but field work is so time consuming and the state is so large and botanists so few. It is time to join the efforts of the enthusiastic amateur with the professional and finally, after nearly 200 years of botanical exploration, obtain an accurate knowledge of the distribution of the plants of our state.

Where to Collect Plants

Many previous collectors have concentrated their efforts on their home counties. This is a good idea since it will save both travel time and costly gasoline. To make a comprehensive collection of the plants of a county, one must collect from each of the habitats represented in that county. Wooded ravines, prairie remnants, barren bluffs, flood-plain forests, cultivated fields, swamps, lawns, and woodlots are a few of the habitats that should be covered. Each of these has unique species of woody and herbaceous plants. Areas retaining some natural quality should get special attention. Wetlands plants have tended to be ignored, especially those growing completely submerged in water, and so still need collecting. Another habitat whose plants are not always well documented are lawns. Some longstanding lawn weeds, for example the Red-seeded Dandelion (*Taraxacum laevigatum*), are still not well collected. Several aggressive lawn weeds are currently sweeping across the state and need to be tracked as they spread. It is something to think that county records can be documented without ever leaving ones own yard.

Topographic maps, besides just aiding in getting around in the field, can aid in the location of some habitats. Areas of sharp relief, like ravines and bluffs, can be quickly located from the comfort of ones own home. Topographic maps, except for the oldest ones, have the forested areas shaded with green. This locates forests, though it gives no indication of what the woods are like. When the green shading is combined with such things as steep topography or proximity to a river or stream, it may indicate

an area unsuited to human activities and therefore with some semblance of native conditions. Topographic maps also give place names, some of them obscure. When a name such as "Six Mile Prairie" is found, then one may be able to locate prairie remnants along nearby railroad tracks or roads.

The larger libraries will have every topographic map for the state (or even the country!). Smaller libraries may have maps for the local area. County road maps may also prove helpful in planning routes for collecting trips and can be found at many libraries. The addresses to order personal copies of topographic and county highway maps can be found below.

Comprehensive county collections are the most valuable, but take many years of hard work to assemble. However, every county record is valuable. If one's collecting time is limited one may wish to concentrate on just a single prairie remnant or woodland. One may prefer to collect in the lawns, gardens and parks of one's community. Where ever the collecting is done in the lesser botanized counties, new and much needed records will be discovered.

To send herbarium specimens:

Curator of the Herbarium
Department of Botany
Southern Illinois University
Carbondale, IL 62901

To order county highway maps:

Department of Transportation
2300 S. Dirksen Parkway
Springfield, IL 62706

To order topographic maps:

Branch of Distribution
U.S. Geological Survey
1200 South Fads Street
Arlington, VA 22202

To order aerial photographs:

Aerial Photography Field Office
ASCS-USDA
2222 West 2300 South, PO Box 30010
Salt Lake City, UT 84130

The Ethics of Plant Collecting

by

Lawrence R. Stritch

The pleasures that people derive from our native plants are numerous and varied. Many people enjoy the photographing of plants, the creation of a wildflower garden, the construction of a prairie restoration or small arboretum, and the collecting of plants for scientific purposes. Unfortunately, indiscriminate collecting of plants has led to their extirpation or total extinction. The best example of this occurred in New Jersey where 80% of the orchids once native to the state are now extirpated. Our natural heritage is a precious resource that can deliver great pleasure to our populace. However it is not a renewable or recyclable resource, therefore we must take great care to use it wisely so that future generations might derive those pleasures that we have partaken of.

The profession or hobby of plant collecting carries with it a few responsibilities. Plants belong, by law, to the landowner, whether that might be an individual, a corporation, or government agency. Animals on the other hand, have traditionally been owned by the government, with strong precedents passed on from British common law. It is necessary, therefore, to obtain permission from the landowner before removing any plants. In the case of federally or state owned land it is best to obtain a written permit from the agency responsible for the land's management. If you plan on collecting on privately owned land, oral permission will generally suffice.

Indiscriminate collecting of plants without the knowledge of whether they are threatened or endangered is highly unethical. It is your responsibility to know those plants that are federally or state listed as endangered or threatened in an area where you intend to collect plants. If you find a threatened or endangered plant species in the field, you are prohibited from collecting the plant unless you have the proper permits. It would be highly recommended that you report the finding of a threatened or endangered species to the appropriate governmental agency, so that they can confirm the siting and take appropriate action. If you are collecting plants for a wildflower garden or plant arrangement take only those that are common. If you are attempting to update a county flora or any other regional flora you should research the literature to determine what plants are already known from the area and therefore should not be recollected. In some cases professional as well as amateur plant enthusiasts have been responsible for the extirpation and in a few cases the extinction of some plant species. This problem has been created from two directions. First, there are those people who would collect endangered or threatened species. Some unscrupulous businessmen, even run ads offering payment for the reporting of locations of rare plants. In some cases that involve state lines, payment for the plant itself is offered. Each year

some florists in Vermont run newspaper ads in New York offering payment for bittersweet (*Celastrus scandens* and *C. Orbiculatus*). *Celastrus scandens* is an endangered species in New York and is protected. The second part of the problem involves the collecting of plants that are rare but have not as yet received protected status. If you know a plant to be exceedingly rare it is best left in its native habitat. Unfortunately the answer to whether to collect a specimen or not is not so easily decided. There will come the time when there will be the possible need to collect a rare plant, such as a state record. Hopefully if this dilemma presents itself to you there will be more than one plant present or only a portion of the plant will be needed to verify the identification of the plant. In a few cases even a photograph might do. Whatever the decision all that is asked of us is to remember:

"Many that live deserve death.
And some that die deserve life.
Can you give it to them?
Then be not to eager to
deal out death...
Even the wise can not see
all ends".

J.R.R. Tolkein

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COLLECTING PLANT SPECIMENS
(An Outline with Appendices)

by
Wanda Oskins

Introduction

The method of making herbarium specimens originated in Italy around the year 1530. Specimens dating from that century are still remarkably preserved! Properly prepared herbarium specimens are permanent records.

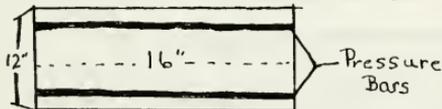
The following outline is designed to provide the basic information that will allow any person to properly collect and prepare lasting plant specimens.

I. The Necessary Equipment

A. Plant Presses

Standard plant presses measure 12 by 16 inches. This is the exact same size as standard herbarium paper. The usual press consists of two lattice-type frames bound together by two straps that fasten with alligator clips. Slightly larger (12"x18") or smaller plant presses can be constructed for special uses(eg. to carry in a backpack).

Plant presses may be purchased from biological and forestry suppliers. Ropes and cords are usually inefficient binders, so plant press straps are almost always purchased from the suppliers. It is however, rather easy and inexpensive to construct your own plant press frames. Use well seasoned and light plywood or masonite cut to the correct or desirable press size. Simply add two pressure bars on each frame by placing a 16"x1"x½" piece of wood 3 or 4 inches from the horizontal edges of the frame.



For construction of a lattice-type plant press, see the design given in Appendix E, part B.

B. Newspaper Folds, Blotters, and Corrugate Cardboard

Plants will be dried in the press in what a botanist describes as the plant press sandwich:

corrugate	
blotter	
newsprint(with	plant
blotter	inside)
corrugate	

Corrugates are pieces of cardboard cut down to the standard 12"x16" size. Blotting paper is usually purchased from biological suppliers. Both of these items are dried out and used again and again. None of these items need to be purchased. Alternatively, thick pads of newspapers(St. Louis Post-Dispatch, the Kansas City Star, or the Chicago Tribune) make suitable substitutes, and they can also be dried and used again and again.

- C. Digging and Cutting Implements
Some favorites are pocketknives, kitchen butcher knives, machetes, camp shovels, trowels, and pruning shears.
- D. The Field Notebook and Field Labels
These are for recording specific and detailed notes on the habitat, associated plants, location and date of collection, and the appearance of the specimen. Especially important is to note any characteristics which may become inapparent when the plant is pressed. For example, the color of flowers often changes or fades upon pressing.

All of the information in the field notebook is written next to a collection number that correlates to a tag or label on the plant specimen bearing the same number. Every plant collected during an entire career will be given a different collection number. (An easy way to label specimens is to write the number on the newspaper fold that contains the plant in the press.) The collection number plus the collector's last name will identify the specimen for all future reference to the plant.

Never rely upon memory for field notes. Record the vital information while in the field. Botanists write the date of collection by placing the day first, the month, and then the year (eg. 27 April 1982).

- E. Optional(but useful) Equipment
Camera
Magnifying Lens
Vials--for storing seeds and other plant parts
Coin envelopes--storing seeds, etc.
Folded Paper Packets--storing seeds, etc.
Plastic Trash Bag--transporting plants from the field
Vasculum--transporting plants from the field

- II. A Short Guide to Preparing A Herbarium Specimen
See the paper from Agric. Bull. 348 in the appendices.

III. Comments on What and How to Collect

- A. Collect Plants
Big, little, herbaceous, woody, aquatic,etc.

B. The Practice of Top-Snatching

For the most part, entire plants need to be collected to produce scientifically sound voucher specimens. Top-snatching, grabbing only the upper blooming portions of plants, has been regarded with disdain among botanists. The rule to follow is that whenever feasible, collect the complete plant. This is necessary to aid in the eventual identification of the specimen, to facilitate accurate and complete botanical descriptions, and to provide complete reference material for future studies on the species, genus, or family.

Today, many botanists are beginning to accept a more liberal point of view concerning top-snatching. The preservation of particularly rare plants is a good reason for not collecting a complete plant.

C. Collecting Unusual, Rare, or Endangered Plants

An ironic, perplexing situation exists because science demands that a voucher specimen be filed to verify the plant's correct taxonomic identification and existence in a locality. Unfortunately, collecting the specimen may further endanger the plant's existence.

Sound common sense and good judgement is important.

Follow these rules:

1. Become familiar with the rare plants of the region.
2. Never collect when only one specimen can be found.
3. If rarity is suspected, take photographs, make sketches, or if it can be done without harm, remove a tiny piece that will aid in identification. If the plant turns out to be common or if the population of a rare species is large enough, then the plant or only its verifying parts may be collected to make the necessary voucher specimen.

D. How Much to Collect

Try to collect enough to 3/4 of the standard herbarium sheet (3/4 of the newsprint fold). If the plants are tiny, collect several from the same population in order to fill the herbarium sheet. When specimens are large, selectively cut parts that represent the flower, upper and lower leaves, stems, roots, and fruit (if present). Grasses, sedges, and some other plants may be bent or folded (always in V's) so that they will fit into the newspaper fold.

E. Consider Plant Condition

ALWAYS CHOOSE TYPICAL SPECIMENS THAT REPRESENT THE POPULATION!

Frequently, it is helpful to know something about the plants being collected in order to get the necessary parts for identification. For beginning collectors, this is a hit and miss affair. Generally, it is wise to collect mature flowering and/or fruiting plants. If recognition of the plant family is possible, Table 24 from Smith's Vascular Plant Families is useful. (see appendix)

F. Putting Plants in the Press

All collected plants need to go into the press as soon as possible. Presses are often carried into the field by serious botanists and the plant is pressed as it is cut or dug from the ground. Other botanists may elect to transport the specimen from the field in a relatively humid atmosphere by using a plastic bag or vasculum. Pressing takes place that evening or the next day. By storing the specimens in a cool place (refrigerator), they will stay fairly fresh for about one day.

The "rip-and-cram" method of placing plants in the newspaper folds is deplorable. Poor specimens result. The specimens, in a way, represent the competence of the collector and some care should thus be taken to properly arrange the specimen. Arrange the plant so that some leaves are up and others are facing down. Leaves should be unrolled and without unnecessary folds. The whole specimen is pressed to show all parts in their natural arrangement, in so far as possible. Take special care that the flowers and fruits will be showing for observation. Excess and unneeded parts may be cut away and discarded.

G. Drying the Plants

Tighten the plant press straps and place the press in a warm dry spot with circulating air. Concrete blocks or other heavy weights can be set upon the plant press.

Within 24 hours, open the press and exchange the wet blotters (or paper pads) for dry ones. Make any final arrangement of the plant. Tighten the straps again and return the press to the drying area. Check the press every 24 hours, tightening the straps each time.

When plants are dry to the touch, test for incompletely dried specimens. They will feel slightly cool and the ends will droop when lifted from the newsprint fold. Most plants will dry within one week.

Plants receiving no attention, or those that do not dry completely, are often attacked by mold and eventually decay.

Many models of expensive metal encased, electric plant driers are available for purchase. If it is desired, small driers can be made inexpensively (see the plans in the appendix). Historically, warm spots such as the hood of a car and tops of radiators have been used. Electric fans have been used to circulate the air.

H. Storing and Mailing Specimens

Specimens are always given the greatest care. Protect specimens from insect damage by placing moth crystals in the storage area. When mailing, bind specimens together with thick corrugates (see the figure in the appendix) and add additional padding to the box in which the specimens are being shipped.

I. Special Techniques

Succulent (juicy) plants: cut strips of tissue out of the back of stems and leaves. This is invisible when plants are mounted and yet it aids in the drying process.

Thickened parts: cut in half.

Aquatics: float them in a pan of water and lift the specimen onto a piece of paper from beneath. Place the plant and the wet paper into the newsprint fold. Due to increased moisture, blotters will need to be changed more often.

Woody plants: Collect nuts or other fruits in coin envelopes and attach to herbarium sheet. Be sure the correct collection number correlating to the leafy specimen and field notes is included on the packet.

Slice open a section of the woody twig so that the pith may be easily examined.

IV. Plant Labels

A. Design

Examples of permanent labels are included in the appendix. They are variable in size and may include maps, emblems, or artistic illustrations. These permanent labels are placed in the lower right corner of the herbarium sheet when the plant is mounted.

B. Information on the Label

When plants are deposited at a herbarium, permanent labels will be provided if the collector does not provide one. However, the collector must include the necessary data from his field notebook.

The information on permanent labels includes:

1. Location where plant was collected
2. Scientific Name

3. Habitat description and notable ephemeral plant characteristics.
4. Family and common name.
5. Collector's name and collection number
6. Collection date.

V. Permanent Record

A final topic for the serious collector is the permanent record. It is a file of your endeavors and may prove significant in future inventories or when receiving requests about your plant collecting activities.

Keep the record so that it includes the final species determinations, where and when the plant was collected, and with what herbarium it was deposited.

Arrange headings in a record book as illustrated below:

<u>Coll.#</u>	<u>Scientific Name</u>	<u>Misc. info.</u>	<u>Loc./date</u>	<u>Herb. dep.</u>
---------------	------------------------	--------------------	------------------	-------------------

Leave a space between each entry to insert information that you may receive in the future about the plant specimen.

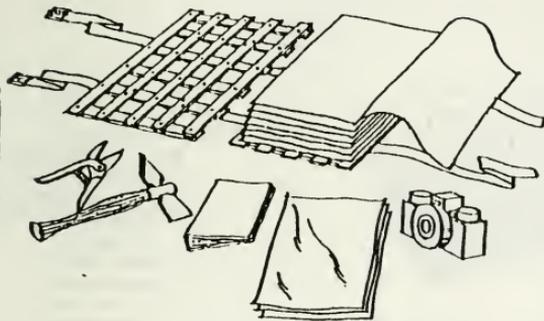
Literature Cited

Hale, A. 1976. A Portable Electric Herbarium Drier. Rhodora v.78. p.132.

Smith, C.E., Jr. 1971. Preparing Herbarium Specimens of Vascular Plants. Agric. Info. Bull. #348. USDA. Washington DC.

Smith, J.P., Jr. 1977. Vascular Plant Families. Mad River Press, Inc., Eureka, Calif.

APPENDICES
(following pages)



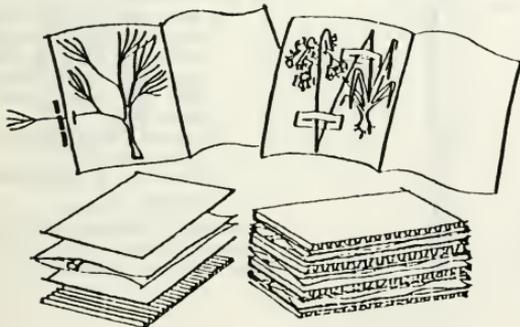
A. Assemble the equipment.

1. Prepare the press with folts of newspapers to receive the specimens.
2. Gather tools and supplies: cutting tools, digging tool, note book, plastic bags to hold unpressed specimens, and a camera to record difficult to describe plant parts.



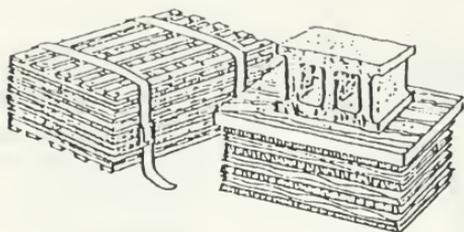
B. Collect the specimen and record the data.

1. Survey the plants to be collected to find the most representative specimens.
2. Cut or dig the selected plant parts.
3. Make detailed notes of observations that may be forgotten.
4. Place the specimens in a container for transport or in the press. If notes are made and separate parts collected, give the same identifying number to portions so they can be associated later.



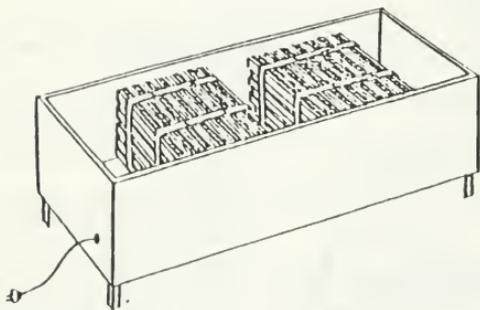
C. Prepare the specimen for pressing.

1. Place specimen in numbered newspaper fold.
2. Cut away excess parts, arrange leaves and flowers.
3. Write notes beside number in notebook; describe area, habit of plant, colors that may change, odors, and any special details.
4. Place fold between driers (adsorbent blotting paper) and corrugates (corrugated cardboard with channels running the width of the 12- by 17-inch piece) or heavy pairs of newspaper.



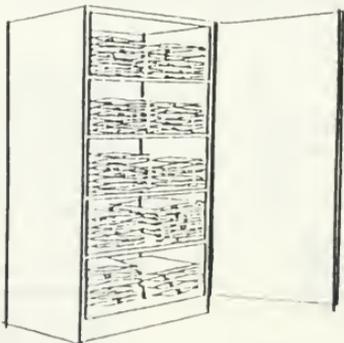
D. Press the specimen.

1. Press the specimen with its driers and corrugates tightly between press frames or weight heavily beneath board or books.



E. Dry the specimen.

1. Change driers or newspaper pads in 24 hours and thereafter as they become moist. Do not disturb the specimens in the newspaper folds.
2. When dry to the touch, test for incompletely dried specimens (incompletely dried specimens will feel cooler and ends will droop when lifted from the fold).



F. Store the specimen.

1. Store dried specimens in their folds tied between corrugates or mount on stiff 12- by 16-inch paper with bookbinder's Holland tape strips, casein, or plastic glue.
2. Label all specimens before storage or mounting.
3. Store only in insect-resistant furniture.

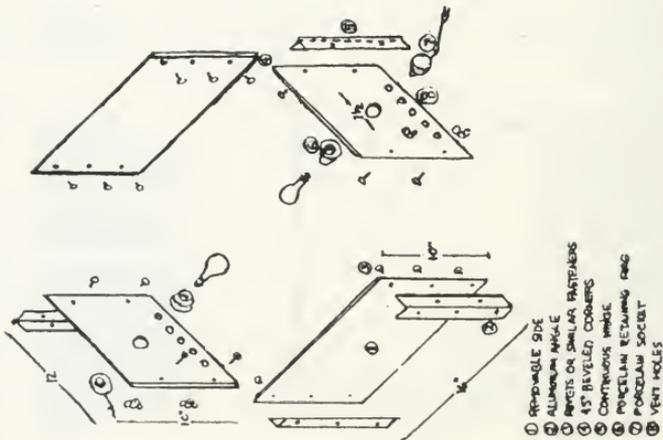
Additional, detailed information on preparing herbarium specimens can be found in the rest of this bulletin.

Table 24. Features emphasized in the identification of common flowering plant families

Families	Underground Parts	Leaves	Flowers	Fruits	Take Note Of
Amaranthaceae				X	Monococious or dioecious
Araceae	X	X		X	
Araliaceae	X		X	X	
Asclepiadaceae			X	X	Position fitting pedicel
Betulaceae				X	
Boraginaceae	X		X	X	
Cactaceae			X		Spines and glochids
Campanulaceae			X		Corolla shape
Caprifoliaceae				X	
Caryophyllaceae			X	X	Style number
Chenopodiaceae					
Commelinaceae			X		Very delicate flowers
Compositae	X	X	X	X	Ray flower color
Cornaceae				X	Branchlet color
Crassulaceae		X	X		Basal rosette
Cruciferae		X	X	X	
Cucurbitaceae				X	Monococious or dioecious
Cyperaceae	X			X	
Ericaceae			X	X	Flower surface
Euphorbiaceae			X	X	Watery or milky sap
Fagaceae		X		X	Growth form
Geraniaceae			X	X	
Gramineae	X	X		X	Mature Spikelets
Hydrophyllaceae	X		X	X	
Iridaceae	X		X	X	Flws. very delicate
Juglandaceae		X		X	Nature of pith
Juncaceae			X	X	Flat or terete leaves
Labiatae	X		X	X	Flw. color & markings
Leguminosae	X	X	X	X	
Liliaceae	X		X	X	Bulb morphology
Loranthaceae			X	X	Host plant
Malvaceae			X	X	Flower color
Nyctaginaceae	X			X	
Oleaceae		X		X	
Orchidaceae			X		Flw. color & markings
Plantaginaceae		X	X		
Polemoniaceae	X		X	X	Flower color
Polygonaceae	X			X	
Portulacaceae				X	
Potamogetonaceae		X		X	Stipule morphology
Primulaceae	X	X	X	X	
Rhamnaceae			X	X	
Rosaceae	X	X	X	X	Flying & sterile stems
Rubiaceae				X	
Salicaceae		X		X	
Scrophulariaceae			X	X	Flw. color & markings
Solanaceae			X	X	
Ulmaceae		X		X	
Umbelliferae	X	X		X	
Violaceae		X	X		Flw. color & markings

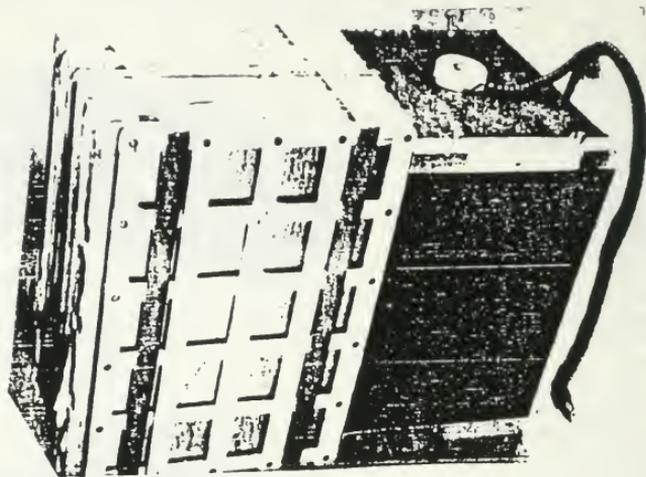
Appendix C. Designs for a Portable Plant Drier
(copied by permission from Hale, A. 1976.)

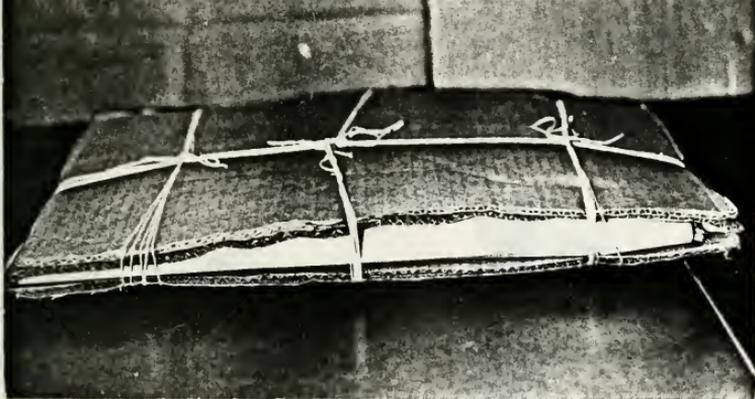
A PORTABLE ELECTRIC HERBARIUM DRIER .



1. Dimensions and materials needed for drier construction.

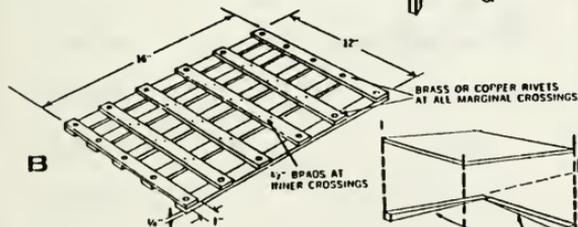
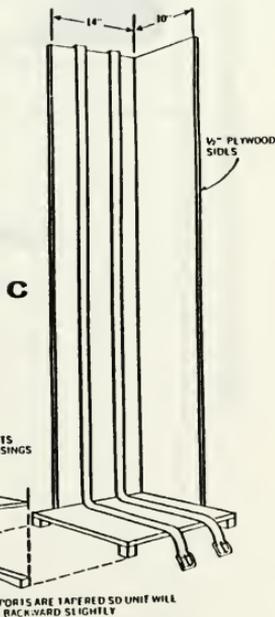
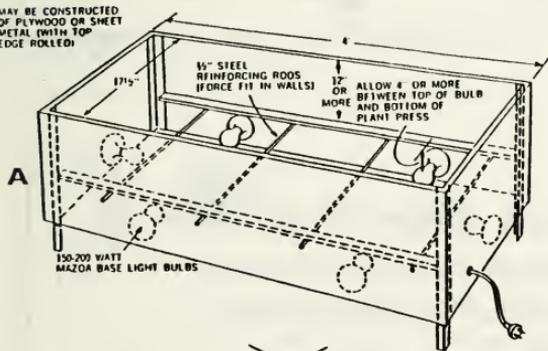
2. Completed and assembled plant drier in use.





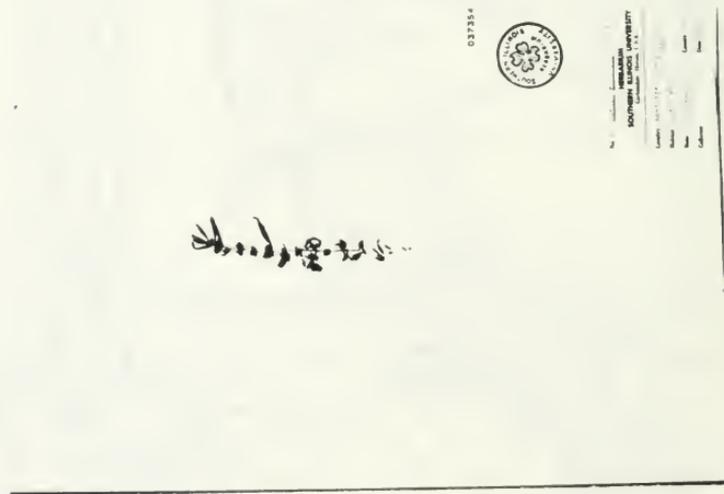
Appendix D. Herbarium Specimens Bundled and Tied Between Sturdy Corrugates for Storage or Mailing.

MAY BE CONSTRUCTED OF PLYWOOD OR SHEET METAL (WITH TOP EDGE ROLLED)



Appendix E. Designs for constructing: A. Heated Drying Rack B. Lattice-type Plant Press C. Stacking Corner

Appendix F. Prepared and Mounted Herbarium Specimens



Poorly Prepared Specimen

Properly Prepared Specimen

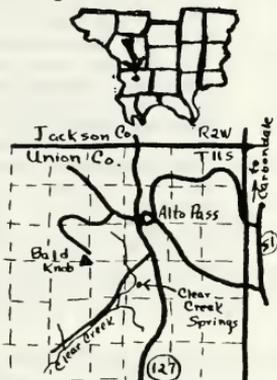
FLORA OF SOUTHERN ILLINOIS

Vegetation of fresh-water springs

UNION COUNTY

Clear Creek Springs
T11S R2W Sec. 22 N1/2

Christine Ott No.



No.

HEPATICAE OF NORTH AMERICA

Southern Illinois University Herbarium

Carbondale, Illinois 62901, U.S.A.

Locality

Habitat

State

County

Collector

Det.

Date

written and illustrated by Mark W. Mohlenbrock

Having read the preceding articles, one should now possess the whys, wheres, whats, and hows of plant collecting. Hopefully, this new or renewed information will spur the reader to make plant collections for the advancement of science or for the enjoyment of searching for that specimen which represents an additional dot for the species range map. However, as an ever increasing stack of specimens begins to occupy a corner of one's office, desk, or (more than likely) long since used ping-pong table, the need to begin the task of identification becomes apparent. Unless you are a botanical whiz kid, or are a well-seasoned professional who can identify a specimen without the use of a botanical key, it will be necessary to open a plant manual covering your area. Technical, botanical terms are often among the keys and may hinder the interpretation of the keys. Most plant manuals contain a glossary of these botanical terms, but often the English definitions are equally confusing. Presented on the following pages is "An Illustrated Glossary of Botanical Terms" which I hope will be helpful in the identification of one's plant collections.

TO USE THIS GLOSSARY:

An alphabetical listing of the terms follows this paragraph. With each entry is a reference number which corresponds to the illustration of the term. To locate the illustration, large index numbers found on each plate are provided. A brief definition also accompanies each entry.

- ABAXIAL. 156. Away from the stem (as with leaf petioles and branches); also, the lower surface of a leaf.
- ACCESSORY FRUIT. 251. Comprised of a fleshy receptacle in which carpels are attached to the outside (as in *Fragaria*).
- ACHENE. 261. Dry, indehiscent, single-seeded fruit, having the seed coat not attached to the mature ovary wall.
- ACORN. 280. Dry, woody, drupe-like fruit of *Quercus*.
- ACUMINATE. 67. Tapering gradually to a point with the sides concave.
- ACUTE. 52. Coming to a point (especially with leaves and perianth).
- ADAXIAL. 153. Toward the stem (as with leaf petioles and branches); also, the upper surface of a leaf.
- AGGREGATE FRUIT. 255. Fruit where several separate carpels form a cluster from a single flower.
- ALTERNATE. 14. Singly produced at a node (as with leaves).
- AMENT. 213. Catkin; a spike comprised of unisexual flowers (as in *Salix*).
- ANTHER. 228, 244. Part of a stamen which bears the pollen.
- ANTHORSE. 96. Pointing toward the top (especially with hairs).
- APICULATE. 44. Abrupt, short-pointed tip (as with leaves).
- ARCHING. 173. Pointing upward but bending like a bow.
- AREOLE. 84. Structure bearing spines and flowers (as in cacti); also, area between small veins in leaves.
- ARIL. 270. An appendage (often fleshy) attached to a seed coat at or near the hilum of the seed, partially or totally covering the seed (as in *Taxus*, *Juniperus*, *Celastrus*).
- ASCENDING. 174. Pointing upward in a somewhat concave manner.
- ASYMMETRICAL. 29. Not symmetrical; halves not alike (as in leaf bases and flower parts).

- ATTENUATE. 89. Gradually tapering to a point (as with leaf tips and bases).
- AURICULATE. 62. With ear-like lobes (especially leaf bases).
- AWN. 124. A sharp appendage (bristle) near or at the tip of a structure (as with glumes and lemmas of grasses).
- AXILLARY. 194. At the axil; i.e., at the angle formed by leaf and stem.
- BEARD. 137. A tuft of bristles.
- BERRY. 269. Fruit in which seeds are surrounded only by fleshy pulp (as a tomato).
- BIDENTATE. 95. Having two teeth (as leaf of *Ambrosia bidentata*).
- BIFID. 190. Two-cleft (as petal of *Phlox bifida*).
- BILABATE. 200. Having two lips (as in many Lamiaceae flowers).
- BLADE. 108. The broad portion of a leaf.
- BRACT. 191. A modified (often reduced) leaf associated with flowers and inflorescences.
- BRISTLE. 114. A stiff hair.
- BUD SCALE. 150. Structure subtending and often partially surrounding a bud.
- BULB. 148. Swollen bud with fleshy scales and leaf bases (as with *Allium*).
- BUNDLE TRACES. 159. Scars left from attachment of a leaf petiole's vascular tissue.
- CALLUS. 138. Hard, thickened area at the base of some lemmas (in grasses).
- CALYX. 250. Collective term for the sepals.
- CAMPANULATE. 183. Bell-shaped (as with flowers of Campanulaceae).
- CANESCENT. 105. Covered with a dense layer of short, fine, grayish hairs.
- CAPILLARY. 13. Elongated, threadlike (as with some leaves and hairs).
- CAPITULAUM. 214. Head; a dense cluster of sessile or subsessile flowers from the same point of the peduncle (as in Asteraceae).
- CAPSULE. 259. Fruit with many seeds composed of a number of carpels which dehisces at maturity.
- CARUNCLE. 281. A wartlike appendage near the hilum (point of attachment) of a seed (as with castor bean seeds).
- CATKIN. 213. Ament; spike comprised of unisexual flowers (as with *Salix*).
- CAUDATE. 119. Having a tail-like tip.
- CAULINE. 85. Pertaining to structures attached to a stem (esp. leaves).
- CILIATE. 71. Having cilia (marginal hairs) around the edge of a structure.
- CIRCINATE. 8. Spiraled (as fern fiddleheads).
- CIRCUMSCISSILE. 265. Dehiscing horizontally like a cap.
- CLASPING. 61. Having the base of a leaf partially surrounding the stem.
- CLAWED. 180. Having a narrowed base of the petal (as with *Cleome*, *Silene*).
- CLEISTOGAMOUS. 167. Flower which self-fertilizes without opening, usually not showy (as in *Violaceae*).
- CLIMBING. 175. Scandent; twining stem supported by clinging.
- COLUMN. 219. A tubular structure surrounding the pistil which is composed of fused stamen filaments (as in *Malvaceae*); the fusion of style and filament(s) (as in *Orchidaceae*).
- COMA. 278. A tuft of hairs at the end of a seed (as in *Asclepias*).
- COMPOUND. 20, 27, 31. Composed of two or more similar parts (as with leaves, inflorescences, and pistils).
- CONE. 1. Strobilus; reproductive structure composed of a branch bearing a cluster of sporophylls.
- CONNECTIVE. 241. Extension of the stamen filament which occurs between and often above the anther.
- CONVOLUTE. 201. Rolled up lengthwise (often twisted) (as in *Phlox* flower buds).

- CORDATE. 36. Heart-shaped (as leaf-base of *Cercis canadensis*).
- CORM. 164. Underground, bulblike stem which has papery scale leaves.
- COROLLA. 249. Collective term for the petals; often used when petals are fused at least part way.
- CORONA. 192. Modified appendages derived from the corolla.
- CORYMB. 198. Flat-topped inflorescence whose branches arise from different locations on the peduncle, thus having the outermost flowers blooming first.
- CRATERIFORM. 17. Swollen, conc-shaped structure, with a depressed apex (as with nectariferous glands in Fabaceae).
- CREeping. 171. Having a horizontal stem which grows along the ground, sometimes rooting at the nodes.
- CRENATE. 60. Having rounded teeth (especially margins of leaves).
- CRISPED. 86. Ruffled, curled.
- CUCULLATE. 195. Hood-shaped (as with flowers).
- CULM. 136. Hollow stem of grasses.
- CUNEATE. 79. Wedge-shaped (as with leaf bases).
- CUPULAR. 224. Cuplike.
- CUSPIDATE. 112. Having a sharply pointed tip which is firmer than the remaining portion of the blade.
- CYME. 208. Alternate-branching inflorescence which is generally flat-topped, the central flowers blooming first.
- SCORPIOID CYME. 207. Specialized cyme which is coiled and the flowers are borne on one side of the axis, resembles a coiled raceme or spike.
- DECLINED. 173. Bending, similar to arching.
- DECUMBENT. 170. Parallel to substrate except at apex which is erect or suberect.
- DECURRENT. 59. Gradually tapering base often resulting in a winged petiole (as with leaves).
- DEHISCENT. 267. Splitting open at maturity (as with fruits and anthers).
- DELTOID. 33. Triangular, with attachment at the middle of one of the sides.
- DICHOTOMOUS. 168. Forking, usually into two equal branches.
- DIFFUSE. 176. Spreading in all directions.
- DIGITATE. 212. Arranged in a fingerlike manner.
- DISC. 243. Fleshy appendage of the receptacle which surrounds the ovary.
- DISC FLOWER. 216. Flower of Asteraceae which has a tubular corolla with no showy, elongated lobes; usually found interior to the edge of a head.
- DRUPE. 253. Fruit with a fleshy exocarp and stony endocarp inside which is found the seed.
- ECHINATE. 276. Covered with spines or prickles.
- ELLIPTIC. 56. Broadest at the middle, tapering at both ends (as with leaves).
- EMARGINATE. 57. Having a shallow, broadly notched tip.
- ENTIRE. 34, 70. Without lobes, divisions, or teeth (as with leaves).
- ERECT. 169. Upright.
- FALCATE. 256. Sickle-shaped.
- FIBROUS. 143. Having several major roots of similar size, i.e., no tap root.
- FIDDLEHEAD. 9. Juvenile, curled leaf of a fern.
- FILAMENT. 233, 246. Stalk of a stamen which supports the anther.
- FILIFORM. 100. Long, narrow, almost threadlike.
- FIMBRIATE. 184. Fringed.

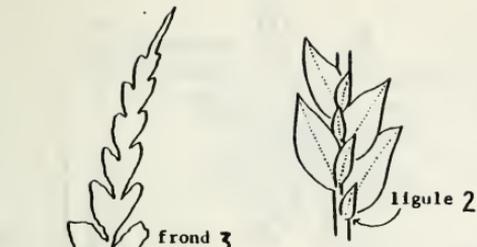
- FLABELLATE 75. Fan-shaped (as with leaves of Ginkgo).
- FLXUOUS. 16. Zig-zagged (as with stems).
- FLORET. 139. In grasses, the small flowers including palea and lemma.
- FOLLICLE. 268. Dry fruit which splits at maturity only on one side.
- FROND. 3. Leaf blade of a fern.
- FUNNELFORM. 186. Funnel-shaped (as with flowers).
- FUSIFORM. 145. Widest in middle, tapering to both ends, 3-dimensional (as with swollen roots of Panax).
- GALEA. 203. A hood formed from fused or modified petals or sepals.
- GENICULATE. 90. Bent backwards.
- GIBBOUS. 92. Swollen on one side (as with Utricularia bladders).
- GLAND. 17, 222. A swollen secretory structure.
- GLOCHID. 83. Sharp minute bristle with a barbed tip (as with Opuntia).
- GLUME. 134. Empty (sterile) scale subtending a grass spikelet, usually two per spikelet.
- GRAIN. 126. Fruit of a grass, dry, one-seeded.
- HASTATE. 64. Arrowhead-shaped with basal lobes spreading perpendicular to the tip of the leaf.
- HEAD. 214. A dense cluster of sessile or subsessile flowers from the same point of the peduncle (as in Asteraceae).
- HIRSUTE. 106. Covered with coarse stiff hairs.
- HISPID. 107. Covered with rigid spinelike hairs.
- HOOD. 188. A modified, generally concave petal or sepal.
- HORN. 187. An elongated floral appendage especially with Asclepias.
- HYPANTHIUM. 245. Cup-shaped receptacle in which the carpels are situated (as in Rosa).
- IMBRICATE. 88, 205. With one edge overlapping like shingles.
- INDEHISCENT. 262. Not splitting open at maturity (as with fruits).
- INDUSIUM. 6. Flaplike covering of a sorus (as with ferns).
- INFERIOR. 238. Having the ovary surrounded by the attached floral tube or embedded in the receptacle.
- INFLEXED. 96. Pointing downward.
- INTERNODE. 152. Area between two nodes.
- INVOLUCRE. 215, 277. Cluster of bracts subtending the flower cluster.
- INVOLUTE. 77, 125. Rolled inward.
- LACINIATE. 91. Composed of narrow, pointed lobes or segments, thus appearing lacerated.
- LANCEOLATE. 50. Widest below the middle of the leaf, tapering in both directions, longer than broad.
- LATERAL BUD. 154. Bud not found at the tip of the stem, but rather along the stem.
- LEAFLET. 24. Segment of a compound leaf attached to rachis at one point, i.e., not a lobe.
- LEGUME. 255A. Dry fruit which splits on both margins (pertaining to most fruits of Fabaceae).
- LEMMA. 129, 141. Lower of the two bracts which immediately subtend the grass floret.
- LENTICEL. 151. Corky spots found on stems and branches.
- LENTICULAR. 161. Lens-shaped; convex on both sides.
- LIGULE. 2, 121. Collarlike appendage found at juncture of blade and sheath (as with grass leaves).
- LINEAR. 22. Having a long, narrow shape in which the side margins are parallel for much of their length (as in Salix).
- LIP. 202. Modified petals which oppose each other, forming a lip-like structure.
- LOBE. 25, 32. Having indentations only partially to the midrib of a leaf.

- LOCULE. 247. Cavity of the pistil or stamen.
- LODICULE. 133. Rudimentary scales at the base of a grass flower which represent the perianth.
- LOMENT. 254. A legume which is divided into one-seeded segments.
- LONG TAPERING. 19. Gradually coming to a point.
- LYRATE. 38. Pinnately lobed with large, rounded terminal lobe.
- MONILIFORM. 260. Resembling a string of beads (as with some Fabaceae fruits).
- MUCRONATE. 37. With an abrupt, short-pointed apex (as with leaf tips).
- NEEDLE. 26. Modified, narrow, virtually cylindrical leaf which is acutely tipped (associated with conifers).
- NODE. 155. Area of stem which bears leaves, flowers, and branches.
- NUT. 272. Woody, indehiscent, single-seeded fruit.
- OBLANCEOLATE. 51. Broadest near the apex, tapering to the base.
- OBLIQUE. 29. Having unequal sides; asymmetrical.
- OBOVATE. 49. Egg-shaped except having the point of attachment at the smaller end.
- OBTUSE. 46. Rounded, blunt, not pointed.
- OCREA. 117. Membranaceous, tubular, stipular sheath (as in Polygonaceae).
- OPPOSITE. 87. Two structures which are attached to an axis at the same level but on either side.
- ORBICULAR. 39. Circular.
- OVARY. 231, 238, 242. Swollen, basal, ovule-bearing portion of the pistil (as with flowers).
- OVATE. 55. Round base with tapering tip, length not a great deal longer than width.
- OVULE. 248. Female reproductive product which, upon fertilization, develops into a seed.
- PALEA. 131, 140. Upper of the two bracts which immediately subtend the grass floret.
- PALMATE. 20, 32. Arranged like fingers on a hand.
- PANDURIFORM. 15. Fiddle-shaped.
- PANICLE. 218. Inflorescence in which several axes lined with pedicelate flowers are grouped together.
- PAPPUS. 209. Modified bristly calyx (as in Asteraceae).
- PARALLEL. 69. Having veins or leaf margins arranged such that they could not bisect.
- PECTINATE. 94. Resembling a comb.
- PEDICEL. 206, 230, 239. Stalk subtending a flower.
- PEDUNCLE. 210. Stalk of an inflorescence.
- PELTATE. 41. Having the leaf stalk (petiole) attached to the blade inward from the margin (like an umbrella and its handle).
- PERFOLIATE. 58. Having the leaf encircling the stem as if the stem pierces the leaf.
- PETAL. 223, 232. Membranaceous often showy structure, a number of which are arranged around the pistil and stamens and inside of the calyx.
- PETALIFEROUS. 163. Flower which has petals.
- PETIOLE. 42. Leaf stalk.
- PETIOLULE. 28. Stalk which attaches leaflet blade to the rachis (in compound leaves).
- PILOSE. 109. Surface covered with long, fine, soft hairs.
- PINNA. 45. Primary division of a compound leaf.
- PINNATE. 25, 27. Arranged along the axis like a feather.
- PINNULE. 43. Smallest segment of a compound leaf.

- PISTIL. 226. Female (ovule-producing) structure of a flower composed of ovary, style, and stigma.
- PLANO-CONVEX. 80. Having a flat upper surface and a convex lower surface.
- PLICATE. 74, 130. Folded, forming a "v" in cross-section.
- PLUMOSE. 252. Having fine hairs arranged like a plume of a feather.
- POME. 263. Fruit composed mainly of a fleshy receptacle which surrounds the inferior ovary (as with apples).
- PRICKLE. 160. A sharp outgrowth of the epidermis of stem or leaf (as in Rosa).
- PROCUMBENT. 172. Lying flat (on the ground) (as in Chamaesyce).
- PROSTRATE. 172. Lying flat on the ground (as in Chamaesyce).
- PUBESCENT. 104. Surface covered with fine, short, soft hairs; also, used as a general term for hairiness.
- PUNCTATE. 197. Having spots or dots on the surface (as with Hypericum punctatum).
- PYRIFORM. 275. Pear-shaped.
- QUADRATE. 120. Four-sided in cross-section.
- RACEME. 199. Inflorescence in which pedicelate flowers are arranged along an axis.
- RACHILLA. 135. Secondary axis (such as a grass spikelet axis).
- RACHIS. 11, 47. Primary axis of a leaf or inflorescence.
- RAY FLOWER. 217. Outer flower of a head which bears one large, often showy corolla lobe (as in Asteraceae).
- RECEPTACLE. 229. Common point of attachment in flower of calyx, corolla, stamens, and pistil.
- RENIFORM. 53. Kidney bean-shaped.
- REPENT. 171. Creeping along the ground, rooting at the nodes.
- REPLUM. 271. False partition found between the two valves of Brassicaceae fruits.
- RESUPINATE. 204. Positioned upside down (as with flowers of Orchidaceae).
- RETICULATE. 68. Netlike, interlocking (as with vein pattern of most dicot leaves).
- RETROSE. 99. Pointed downward.
- RETUSE. 72. Having a shallow, narrow notch at the apex.
- REVOLUTE. 76. Having the margins rolled backward.
- RHIZOME. 142. A horizontal underground stem which produces both shoots and roots.
- RHOMBIC. 97. Diamond-shaped.
- ROSETTE. 166. Having the leaves clustered around the base of the stem at ground level.
- ROTATE. 189. Open widely, wheellike (as with flowers of Physalis).
- ROUNDED. 54. Curved such that there are no angles.
- RUGOSE. 110. Having a wrinkled surface.
- SACCATE. 182. Sac or slipper-shaped (as with lady's-slipper orchid).
- SAGITTATE. 63. Arrowhead-shaped.
- SALVERFORM. 181. Tubular corolla with lobes abruptly spreading.
- SAMARA. 266. Fruit which is dry, indehiscent, and winged (as with Acer and Ulmus).
- SCABROUS. 103. Rough, with the texture of sandpaper.
- SCALE. 10. Thin, membranaceous, or succulent bract which generally represents a rudimentary leaf; flat, thin, membranaceous outgrowth on the surface of a leaf.
- SCANDENT. 175. Climbing; twining stem supported by clinging.
- SCAPE. 165. Leafless flower stalk.
- SCAR. 158. Mark left on a stem where a leaf petiole was once attached.

- SCURFY. 102. Having a scaly surface.
- SECUND. 132. Borne on one side (as with inflorescences of Bouteloua).
- SEPAL. 227, 236. Outer flower part, often green, which subtend the petals.
- SERRATE. 78. Having upward pointing, sawtoothlike teeth.
- SERRULATE. 81. Having miniature serrate teeth.
- SESSILE. 115. Having a structure attached directly; lacking a stalk.
- SHEATH. Tubular part of a grass leaf which encircles the stem;
 OPEN SHEATH. 122. With edges not overlapping.
 CLOSED SHEATH. 123. With edges overlapping.
- SILICLE. 273. A silique which is nearly as broad as tall (as with Brassicaceae fruits).
- SILIQUE. 274. An elongated capsule which has a replum separating the two valves (as with Brassicaceae fruits).
- SINUATE. 21. Wavy.
- SINUS. 40. The recessed portion of a lobed structure.
- SOLITARY. 193. Occurring singly.
- SORUS(I). 5. A cluster of sporangia found on the fronds of ferns.
- SPADIX. 179. A flower spike which has a succulent axis and is generally enclosed by a spathe (as with Arisaema).
- SPATHE. 177. Bract which encloses (or subtends) an inflorescence (as with Arisaema).
- SPATULATE. 185. Spatula to spoon-shaped.
- SPIKE. 196. Inflorescence with sessile flowers positioned along the rachis.
- SPINE. 18, 82. Sharp, hard outgrowth of a leaf or replacing the leaves and stipules entirely.
- SPORANGIUM(A). 7. Case or saclike structure which produces spores.
- SPUR. 178. A slender, saclike, modified petal or sepal.
- STAMEN. 127, 225, 234. Male reproductive component of a flower composed of filament, and anther in which pollen is produced.
- STANDARD. 220. A large, modified petal, often called a banner (as in Fabaceae).
- STELLATE. 101. Star-shaped (especially with surface hairs or scales).
- STIGMA. 128, 237. Area terminating the pistil which is receptive to the pollen grain.
- STIPE. 12. Stalk (often associated with leaf stalk of ferns).
- STIPULE. 18, 48. One of a pair of appendages (often leaflike) which arise from the base of the petiole of a leaf.
- STOLON. 147. Horizontal, thin stem which runs along the surface of the ground.
- STRIATE. 4. Having longitudinal grooves.
- STROBILUS(I). 1. Cone; reproductive structure composed of a branch bearing a cluster of sporophylls.
- STYLE. 240. Tubular portion of the pistil which lies between the stigma at the tip and the swollen ovary below.
- SUBULATE. 93. Coming to a narrow, drawn out point.
- SUPERIOR. 231. Pertaining to an ovary in which the pistil is elevated above the receptacle.
- TAP ROOT. 144. Primary root which is larger than the other roots.
- TAPERING. 23. Gradually coming together.
- TENDRIL. 98. Twining extension of leaf or stem which is used to help support the plant (especially vines as with Vitis).
- TERETE. 116. Circular in cross-section (as with stems and petioles).
- TERMINAL BUD. 149. Bud which is located at the apex of shoot or stem.
- THORN. 162. Short, modified, sharp-tipped branch.
- TOMENTOSE. 111. Woolly; matted hairs.
- TOOTHED. 30. Dentate; having angular teeth on the margin (as with leaves).

cone = strobilus 1



striate 4



frond 3

ligule 2



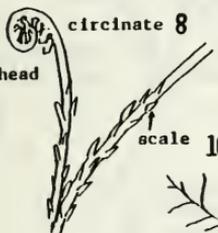
sorus(1) 5

6 indusium

7 sporangia

8 circinate

9 fiddlehead



10 scale

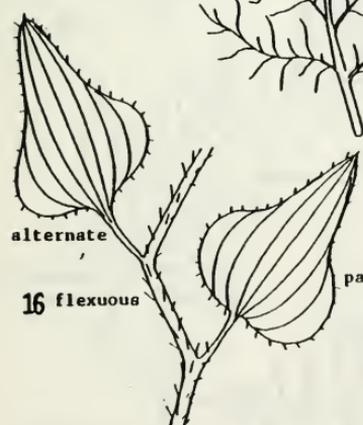


11 rachis

12 stipe



13 capillary segments



14

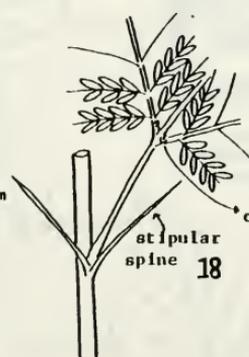
alternate

15

panduriform

16

flexuous



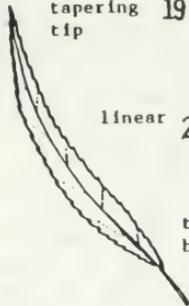
17 crateriform gland

18 stipular spine

17

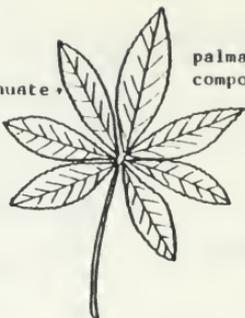
19-36

long tapering tip 19



linear 22

21 sinuate



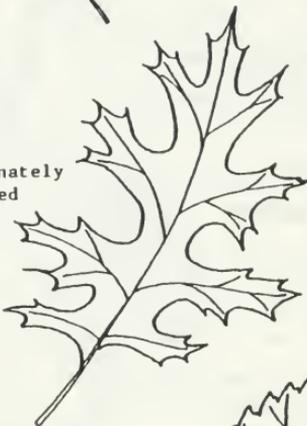
palmately compound 20

tapering base 23

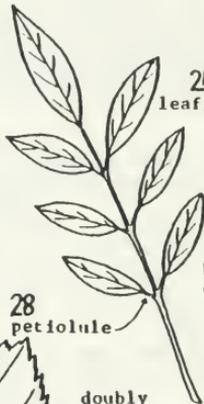


needles 26

25 pinnately lobed



24 leaflet



pinnately compound 27

28 petiole

29 base = oblique



31 doubly pinnately compound

doubly toothed margin 30

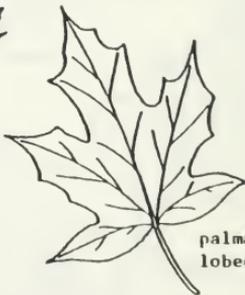


deltoid 33



truncate base 35

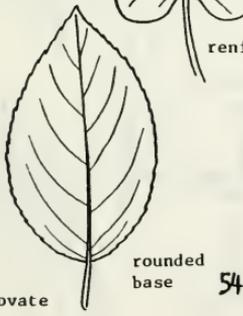
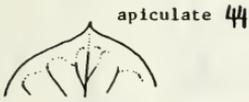
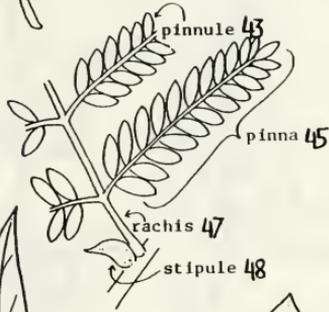
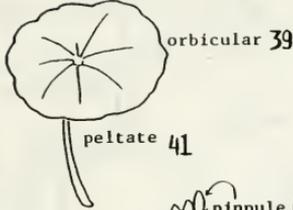
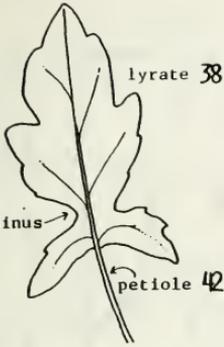
palmately lobed 32



entire 34

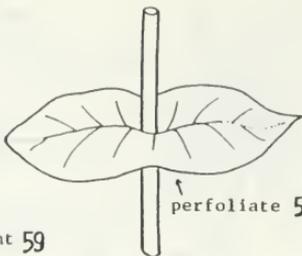


cordate base 36





decurrent 59

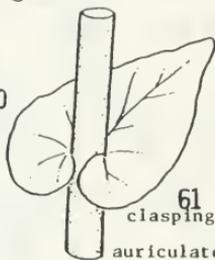


perfoliate 58

emarginate 57



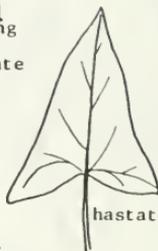
crenate 60



61
clasping
auriculate

63 sagittate

62



hastate 64

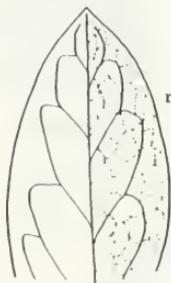


trifoliate 66



whorled 65
=verticillate

acuminate 67



reticulate
veined

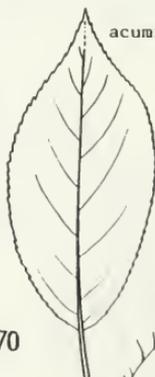
68



parallel
veined

69

entire
margin 70



ciliate 71



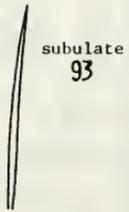
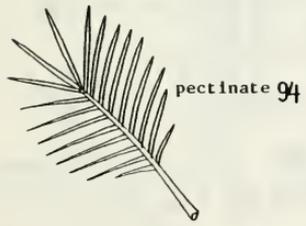
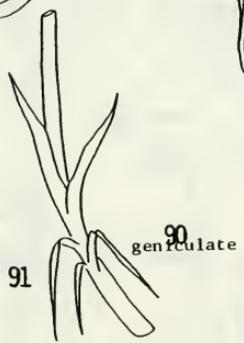
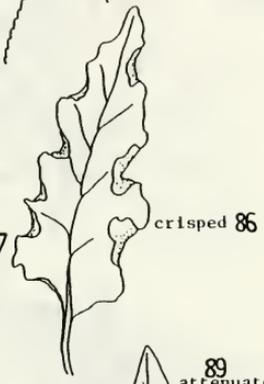
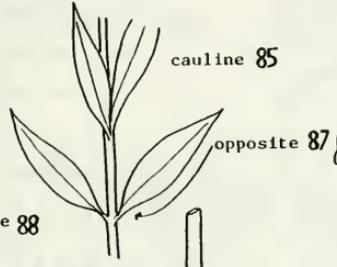
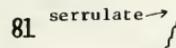
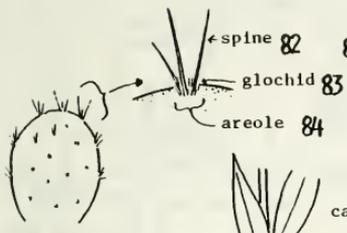
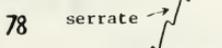
undulate

73

retuse 72



some leaves in cross section



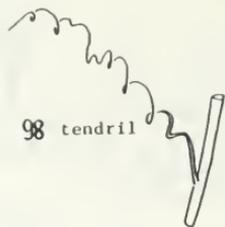
96-120



antrorse 96
=inflexed



retrorse 99



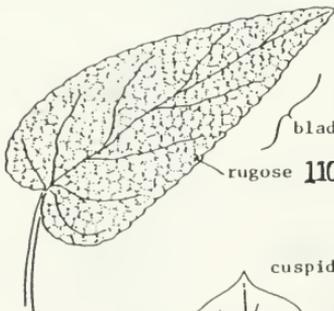
98 tendril



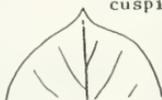
rhombic 97



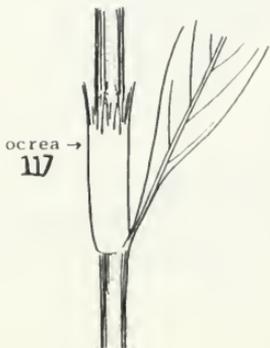
filiform 100



blade 108
rugose 110



cuspidate 112



ocrea →
117



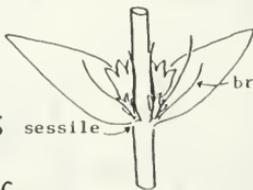
terete 116



triangular 118



quadrate 120



115 sessile

bristle 114



caudate
119

SURFACE TYPES



stellate 101



scurfy 102



scabrous 103



pubescent 104



canescent 105



hirsute 106



hispid 107



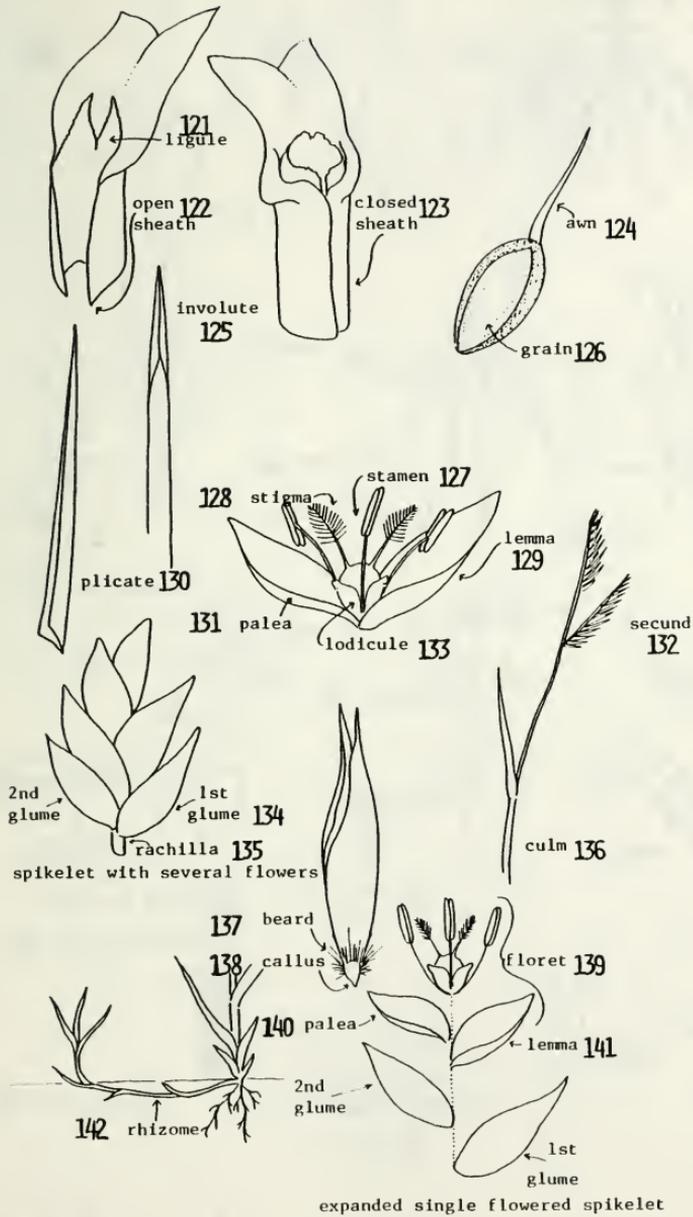
pilose 108

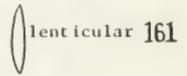
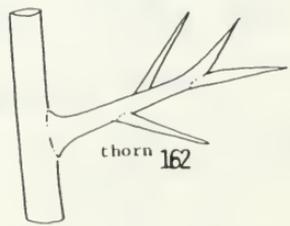
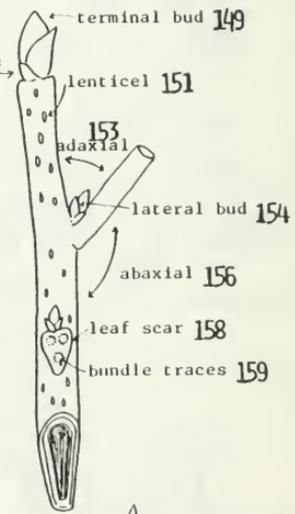
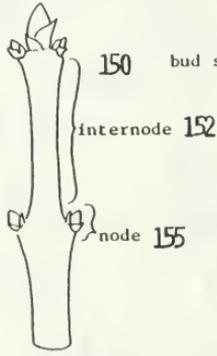
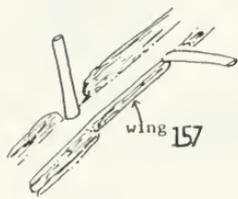
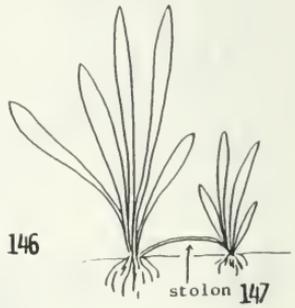
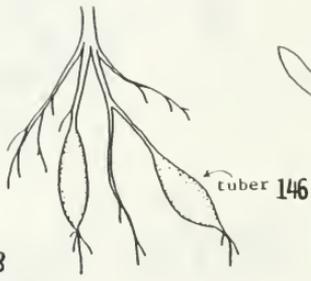
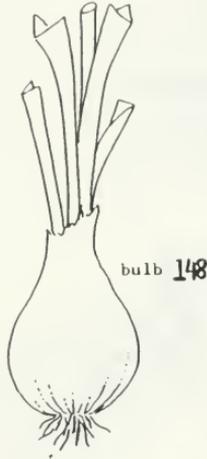
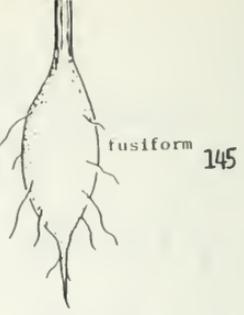
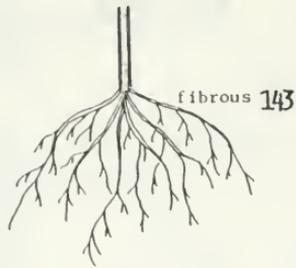


tomentose 111

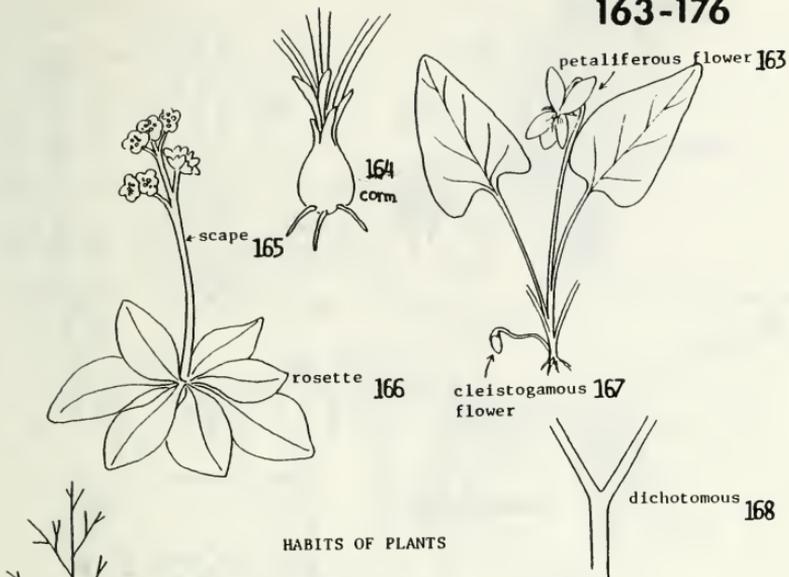


velutinous 113

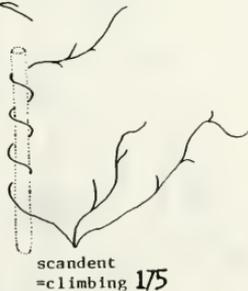
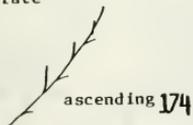
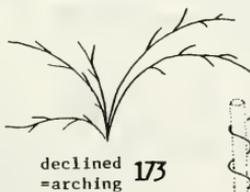
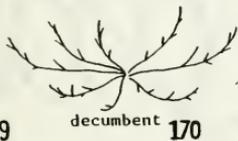


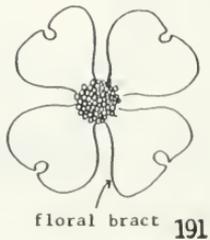
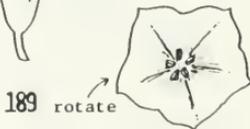
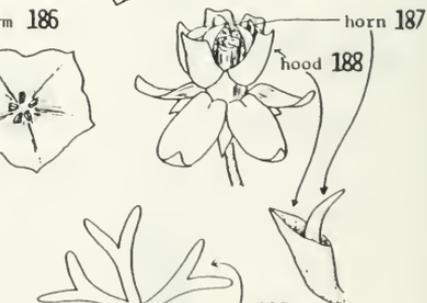
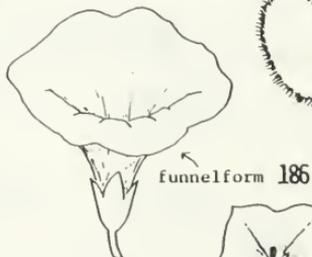
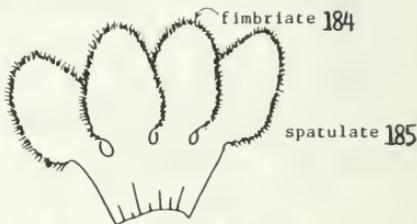
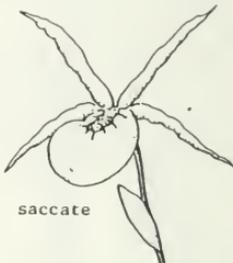
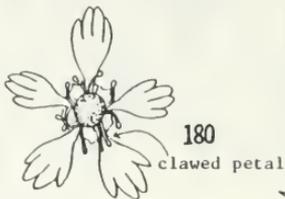
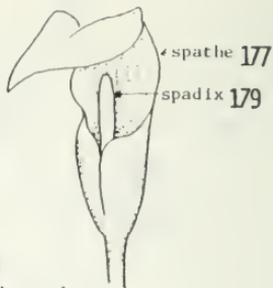
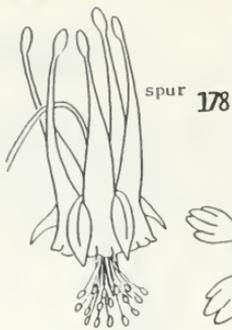


163-176

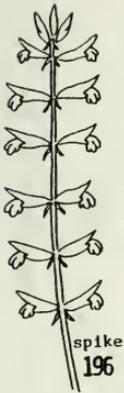


HABITS OF PLANTS

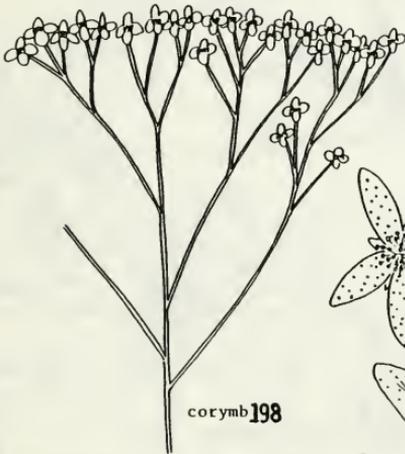
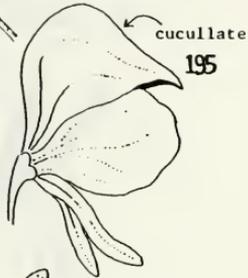
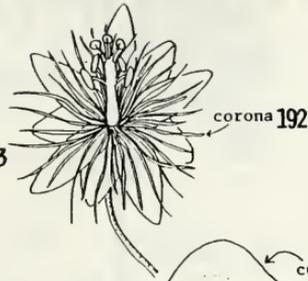
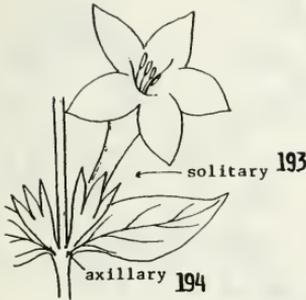




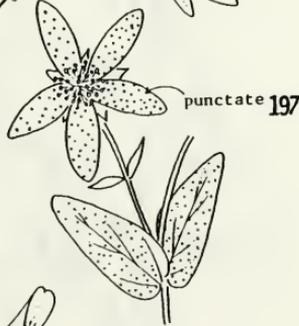
192-205



spike
196



raceme 199

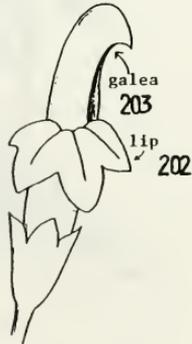


bilabiate 200



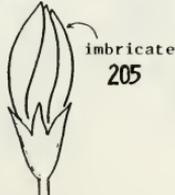
201
convolute

lip 202

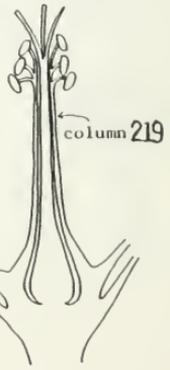
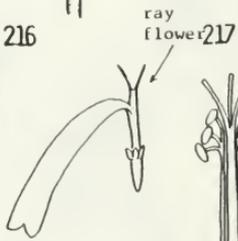
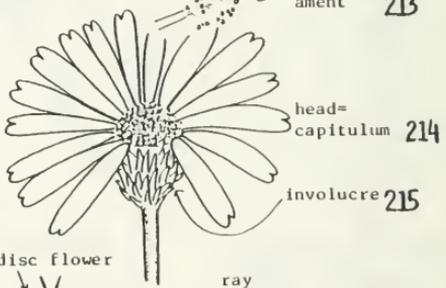
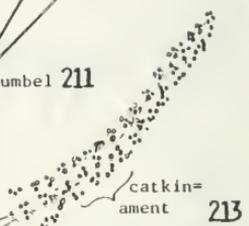
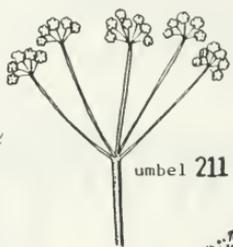
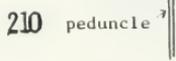
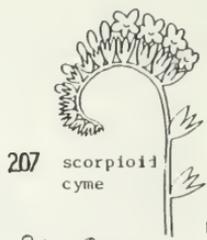
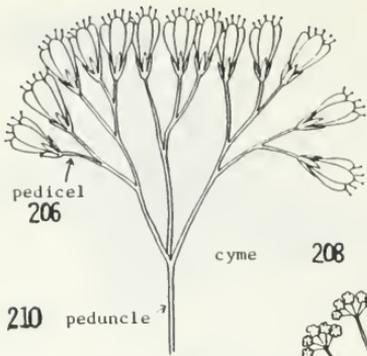


galea
203

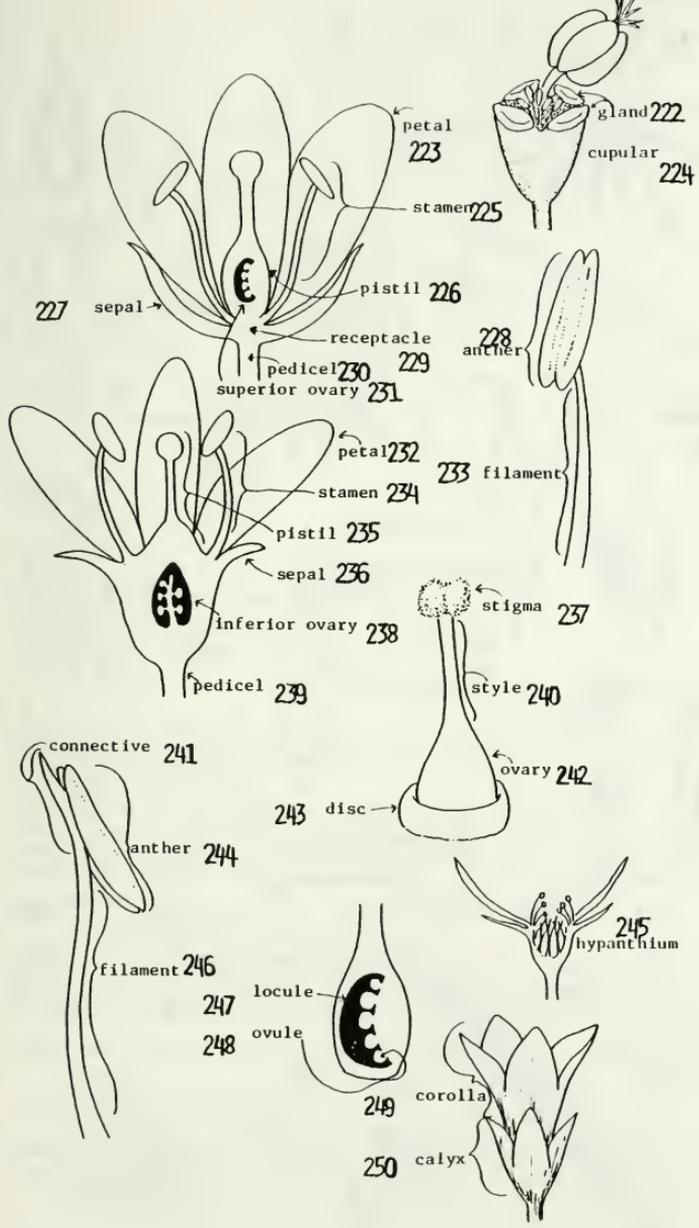
lip
202



imbricate
205



222-250



251-269



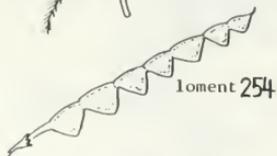
plumose 252



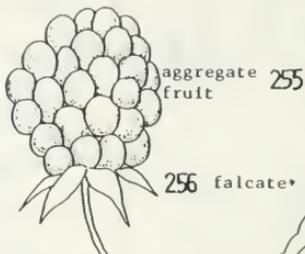
251
accessory
fruit



drupe 253

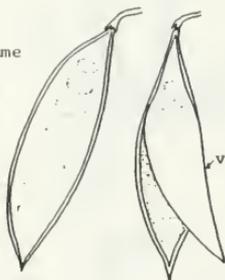


loment 254

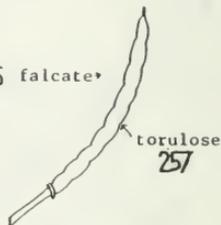


aggregate
fruit 255

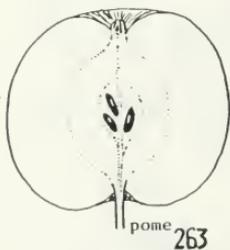
legume
255A



valve 258



torulose
257



pome 263

260 moniliform



259
capsule

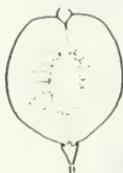


achene 261

indehiscent 262



utricle 264



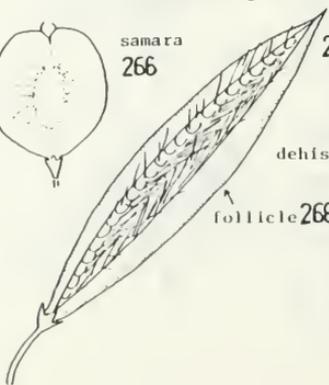
samara
266

265 circumscissile

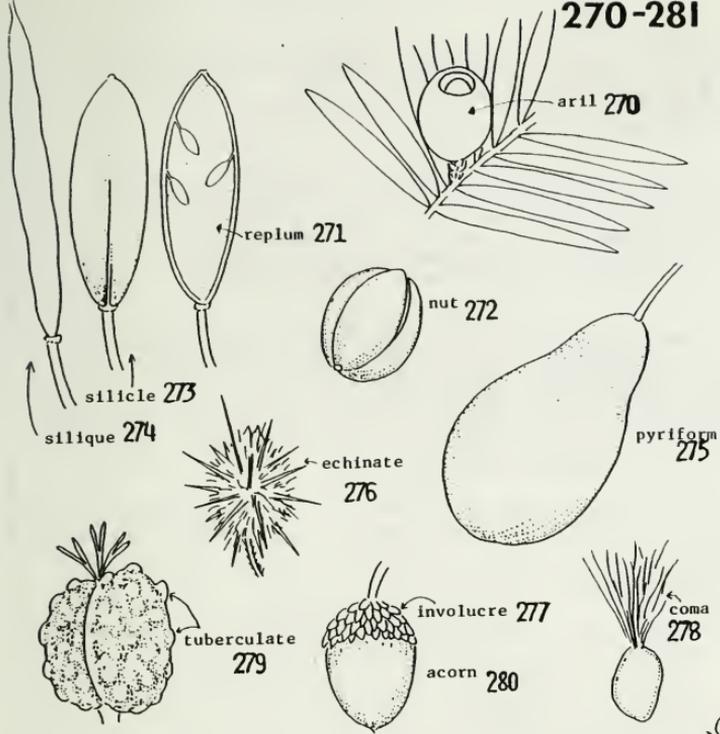


dehiscent 267

follicle 268



berry
269



[Continued from page 28.]

- TORULOSE. 257. Slightly constricted between seeds (as with some Brassicaceae fruits).
- TRIANGULAR. 118. 3-sided.
- TRIFOLIOLATE. 66. Having three leaflets (as with Trifolium).
- TRUNCATE. 35. Ending abruptly as if chopped off.
- TUBER. 146. Thickened, underground stem which serves as a storage organ.
- TUBERCULATE. 279. Having a warty surface.
- UMBEL. 211. Inflorescence type in which the pedicels are attached at the same point (as in Apiaceae).
- UNDULATE. 73. Having a wavy margin (as with leaves).
- URCEOLATE. 221. Urn-shaped (as with flowers of many Ericaceae).
- UTRICLE. 264. Small, single-seeded, thin walled fruit which is indehiscent or splits horizontally (circumscissile).
- VALVE. 258. Segment of a dehiscent fruit (especially associated with legumes).
- VELUTINOUS. 113. Hairs arranged like velvet.
- VERTICILLATE. 65. In a whorl.
- WHORL. 65. Arrangement of 3 or more like parts from the same point.
- WING. 157. A thin, woody, corky, or membranaceous extension (as with stems in Ulmus and fruits in Dioscorea).

EDITORIAL
(Continued from page 1)

As a special service, floristic studies of areas in Illinois and the states which border Illinois will be accepted for publication. Since membership dues cannot possibly be stretched far enough to cover these additional issues, the author of the study shall be required to cover this expense by remitting \$5.00 per page of the manuscript. The membership shall receive these issues at no additional cost.

Beginning with ERIGENIA 3, the SINPS will publish annually among its issues an "Update on the Illinois Flora". The first update will cover 1978-1980. Data published here may be used to keep your copy of DISTRIBUTION OF ILLINOIS VASCULAR PLANTS - Mohlenbrock and Ladd (1978) up to date. [For those who do not own this book it is offered by the SINPS. Details may be obtained from the inside back cover of this issue.] If you would like to contribute to this annual state-wide issue please read the note on the inside front cover.

Finally, I hope you enjoy these pages. Your comments and contributions are welcomed. Help YOUR society grow by showing ERIGENIA to your friends!

OUR CONTRIBUTORS:

- JAY PAVEILL - is a native of Independence, Missouri. He received his bachelor's degree at Northwest Missouri State University. He is currently completing his master's program at Southern Illinois University - Carbondale. Jay has done much herbarium work for the Missouri Department of Conservation and has been a teaching assistant at SIU. His main interests lie in surveying the colonization of drastically disturbed land.
- LAWRENCE STRITCH - is a native of upstate New York. He received his bachelor's degree from Illinois Benedictine College and master's from Southern Illinois University - Carbondale. Lawrence is presently working on his doctorate. His main interest is in plant taxonomy.
- WANDA OSKINS - is a graduate student in plant taxonomy at Southern Illinois University - Carbondale. She is originally from Independence, Missouri, and holds a bachelor's degree in biology from Central Missouri State University. Since 1978, Wanda has worked as a research intern and seasonal naturalist with the Missouri Department of Natural Resources. While in Missouri, she has collected plants on floristic projects at Knob Noster State Park, Schell-Osage Wildlife Refuge, and Mark Twain State Park. Her current master's thesis work includes a floristic survey of Big Oak Tree State Park in Missouri. Wanda helped organize the Southern Illinois Native Plant Society and was elected as the Society's first president.
- MARK MOHLENBROCK - is a graduate student in plant taxonomy and systematics at Arizona State University. He received his bachelor's degree in botany at Southern Illinois University - Carbondale. Mark is editor of ERIGENIA and is also American Representative for the Mammillaria Society, a cactus society based in England. His main interest is with the cactus family and is also fond of the western U.S. flora. He is a professional botanical illustrator.

SOUTHERN ILLINOIS NATIVE PLANT SOCIETY

department of botany, southern illinois university
carbondale, illinois 62901

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