F · E · R · N · S

Introduction to Ferns of West Virginia

By Norma Jean Venable

Cooperative Extension Service Center for Extension and Continuing Education West Virginia University

Foreword

The purpose of this publication is to provide the reader with an introduction to basic fern biology and to describe some of the most common and interesting ferns and fern allies that can be found in West Virginia.

This fern booklet has been designed for use in the field. It is suggested that the reader take it along on field trips, and for each species of common fern or fern ally which is seen that is described, write in more identifying characteristics of that particular plant, including habitat in which it grew, leaf type, shape and condition of sori, and other information which will aid in identifying and remembering the fern. Space on each page has been provided to write in more information.

A checklist of ferns and fern allies with Latin names has been included for the use of those who wish to keep a record of the ferns and fern-related plants that they might see in West Virginia. A list of references providing more technical information about ferns is appended.

Familiarity with the ferns and fern terminology used in this booklet should enable the reader to use more technical fern identification manuals to identify the less common ferns, hybrid ferns, and other fern allies beyond the scope of this booklet.

Thanks are expressed to ***Ginny Baer, Mike Breiding*** and ***Bill Grafton*** for editing, technical review and the help and encouragement that made this publication possible.

Designed by Meredith Pearce

Illustrated by Diane Stirrat

Contents

Introduction to Ferns

We tend to think of ferns as having lacy green leaves and as growing deep in the forest. Actually, ferns have many different growth forms and thrive in a variety of habitats. Tree ferns, for instance, grow to a height of 40 feet and can be found in tropical rain forests. At the other end of the scale, the diminutive water ferns, which are found in Florida, are under an inch long and grow right on the water's surface.

West Virginia has a remarkable variety of ferns growing within its borders, some of which resemble what we usually think of as ferns, and some of which don't, such as the following:

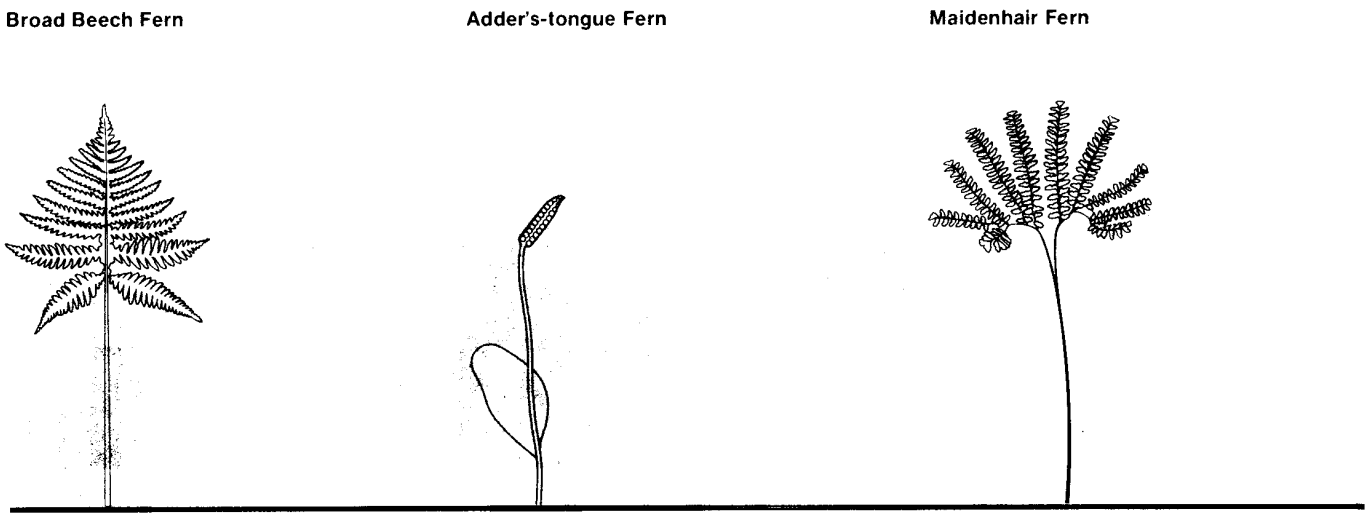


Fig. 1. Examples of Ferns Found in West Virginia.

In order to begin to identify some of our more common West Virginia ferns, we need to be familiar with the terms used to describe the features of these interesting and attractive plants. This terminology is often found in fern manuals, so it is important to be familiar with it.

Fern Leaves

Parts of a Fern Leaf

Figure 2 shows the names of the various parts of a fern leaf for two shapes of leaves. Note that for both leaves the whole leaf is called a ***leaf,*** or ***frond,*** or ***blade,*** which is then, as in the case of the leaf shown in Fig. 2b, composed of a ***leaflet,*** or ***pinna,*** which is again composed of individual ***subleaflets,*** or ***pinnules.***

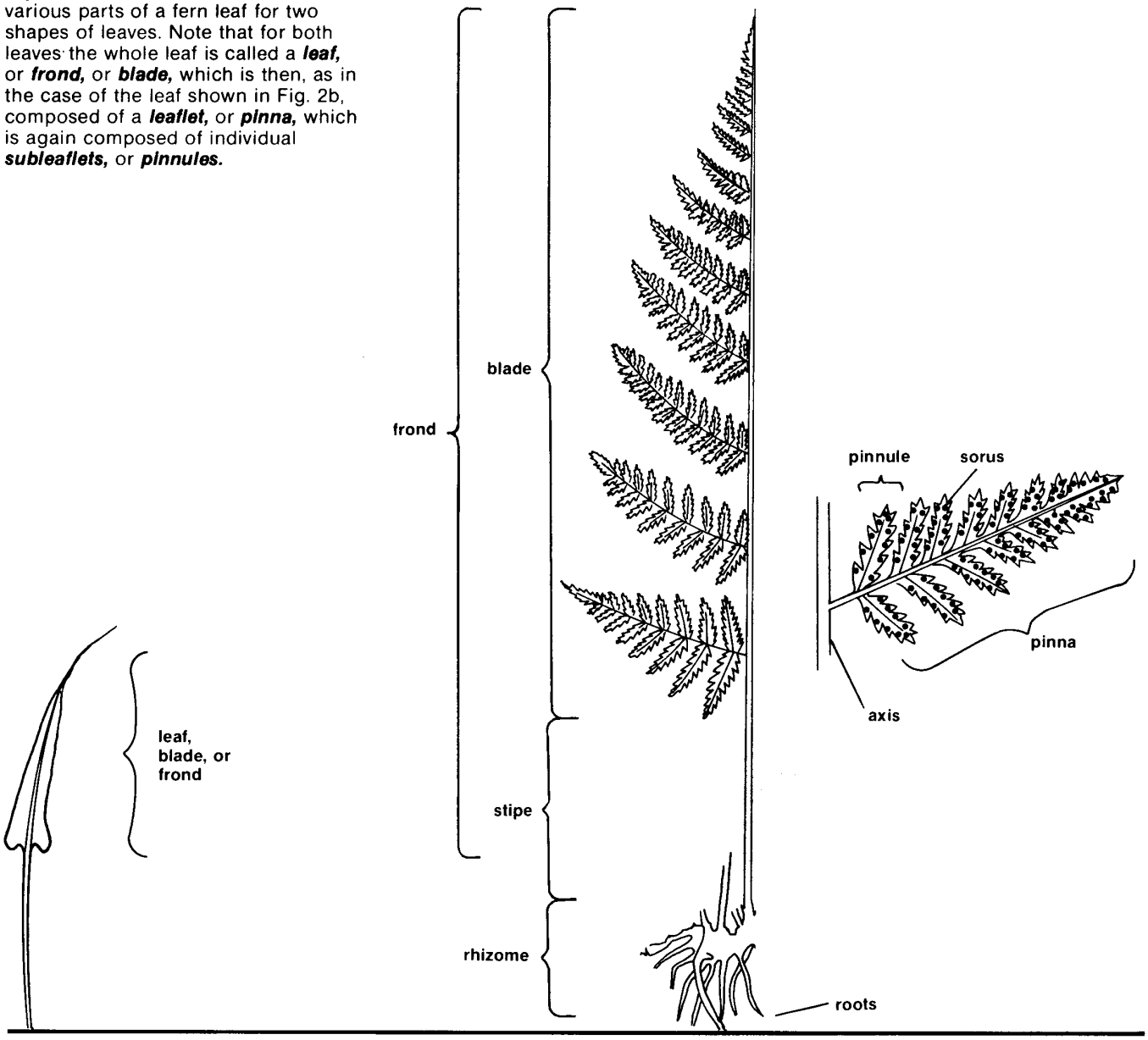


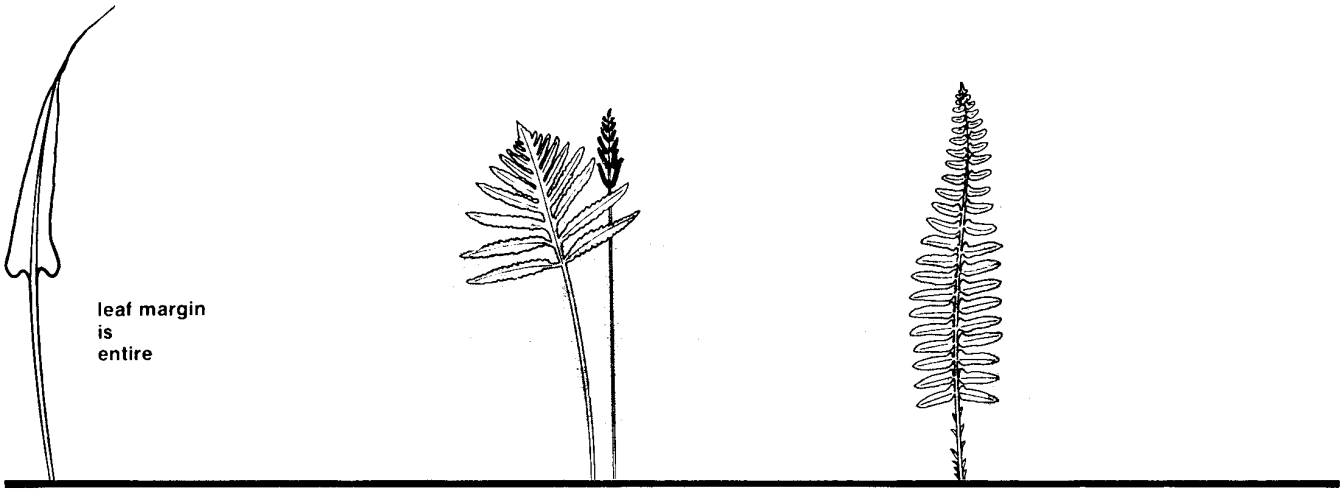
Fig. 2. Parts of a Fern Leaf.

Leaf Types

As the pictures in Fig. 2 indicate, fern leaves basically are of two types, ***simple,*** or ***compound.*** This classification is further illustrated in Fig. 3. A ***simple leaf,*** as shown in Fig. 3a, is undivided; the leaf is all in one piece. In addition, the outer edge of the leaf, or ***leaf margin,*** as it is called, does not have any lobes, cuts, or teeth, and is therefore called ***entire.*** The leaf shown in Fig. 3b is also a simple leaf; it does have cuts or lobes in the margin, but since these cuts do *not* extend all the way to the stem, this leaf shape is still considered to be simple.

If the cuts or lobes *do* extend all the way to the stem, then the leaf is considered to be ***compound.*** Fig. 3, c to e, shows compound leaves, which are described as being divided into two or more parts or leaflets. Fig. 3c shows a pinnately compound leaf. The word ***pinnate*** simply means feather-shaped, and means that the leaf generally resembles a feather in its outline. Note that the leaflets arise from a central stem. Fig. 3d shows a ***bipinnate leaf,*** which means that the primary leaflets are again pinnate, and Fig. 3e shows a ***tripinnate leaf,*** which means that the leaf has been divided three times.

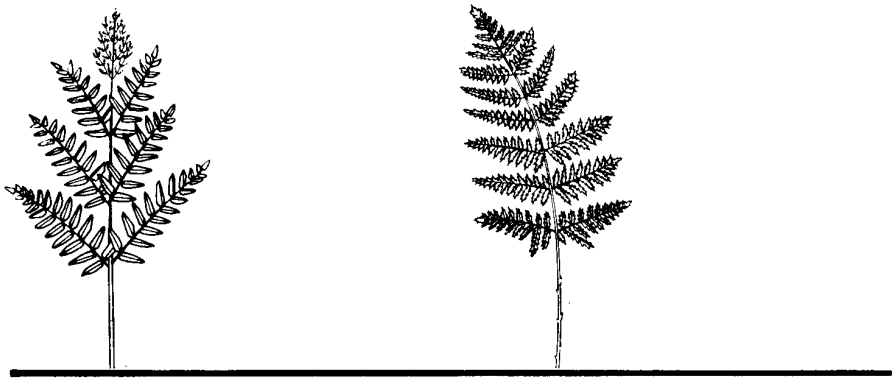
Ferns are often described by the type of leaf they have, for instance:



3a. Simple Leaf of Walking Fern

3b. Pinnatifid Leaf of Sensitive Fern

3c. Pinnate Leaf of Christmas Fern



3d. Bipinnate Leaf of Royal Fern

3e. Tripinnate Leaf of Woodfern

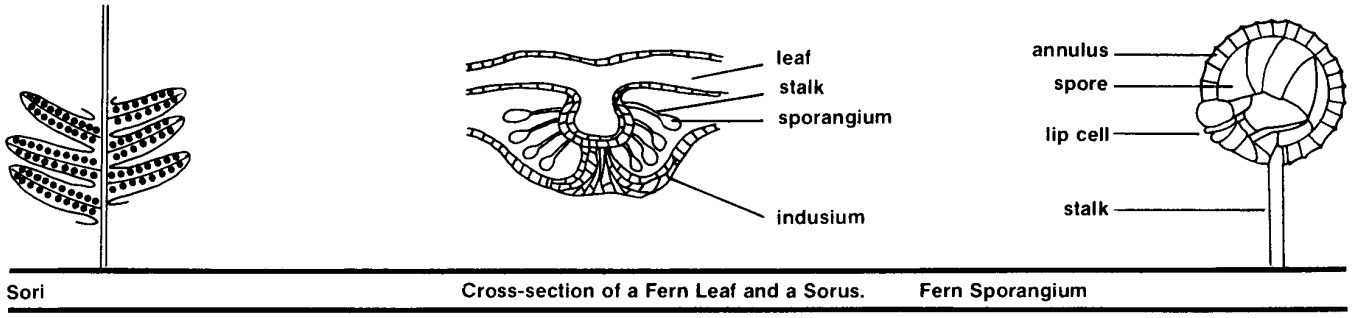
Fig. 3. Leaf Types.

Sori, or Fruitdots

Sori

As with higher plants, ferns can reproduce vegetatively by runners, but ferns do not have seeds as do more advanced plants. Instead, they reproduce by means of tiny spores. Spores are contained in capsules called ***sporangium*** which are located in the fruitdots, or to use the technical term, ***sori*** (singular, ***sorus***). Sori are usually located on the *underside* of special sporebearing, or fertile fern leaves, as seen in Fig. 4.

Some sori are covered by a thin membrane called the fruitcover, or ***indusium.*** The indusium is present on certain groups of ferns and is used to help identify the fern. For example, in the woodferns, the indusium is very conspicuous and is kidney-shaped, as seen in the illustration in Fig. 5.
The indusium can be seen most clearly with the use of a hand lens.
The individual spores, sporangia, and ***annulus,*** a ring-like structure around the sporangium, shown in Fig. 4, are microscopic.



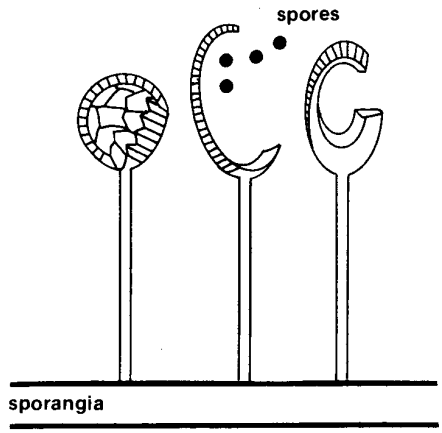


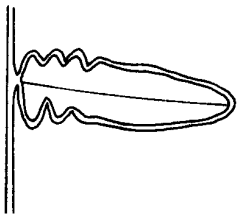
Fig. 4. Fern Sori and Related Parts.

Location of Sori

The shape and location of sori on the underside of the fern leaf is different for various groups of ferns, and as is seen in Fig. 5, is used to identify fern groups. Sori will be in various stages of development, depending on the time of the year.

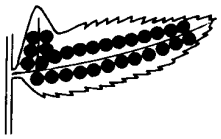
Bladder Ferns

The fruitdots are scattered away from the leaf margins. The indusium is hood-shaped.



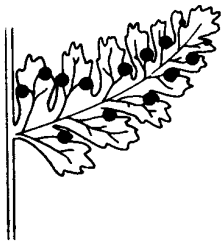
Bracken Fern

This fern has a continuous indusium on the margin of the pinnule.



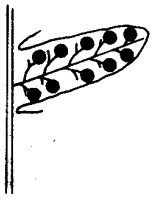
Christmas Fern

The fruitdots are round, and usually close together. The indusium is round, with a center stem.



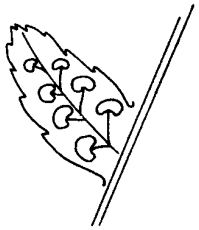
Hayscented Fern

Fruitdots are small and on teeth of leaflets. The indusium is nest-shaped holding spore cases like eggs.



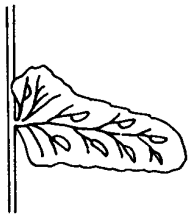
Polypody Ferns

The fruitdots are round, and quite prominent. There is no indusium.



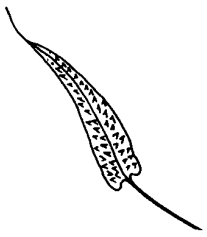
Shield Ferns

The fruitdots are in scattered rows. The indusium is conspicuous; it is kidney-shaped and whitish.



Spleenworts

Fruitdots are short, straight, usually oblique to the midrib.



Walking Ferns

The fruitdots are elongated, scattered, and irregular in size and placing.

Fig. 5. Location of Sori for Different Fern Groups.

Sori on Separate Stalks

Not all sori are located on the underside of the fern leaf. In some fern groups, such as the Royal Ferns, which are pictured, the sori are located on special spore-bearing or fertile stalks. Because of the distinctive location of their sori, the various species of the Royal Fern group are easy to identify. Other ferns which have sori located on separate stalks are the Ostrich Fern, the Grape Fern, and the Sensitive Fern, which are shown.

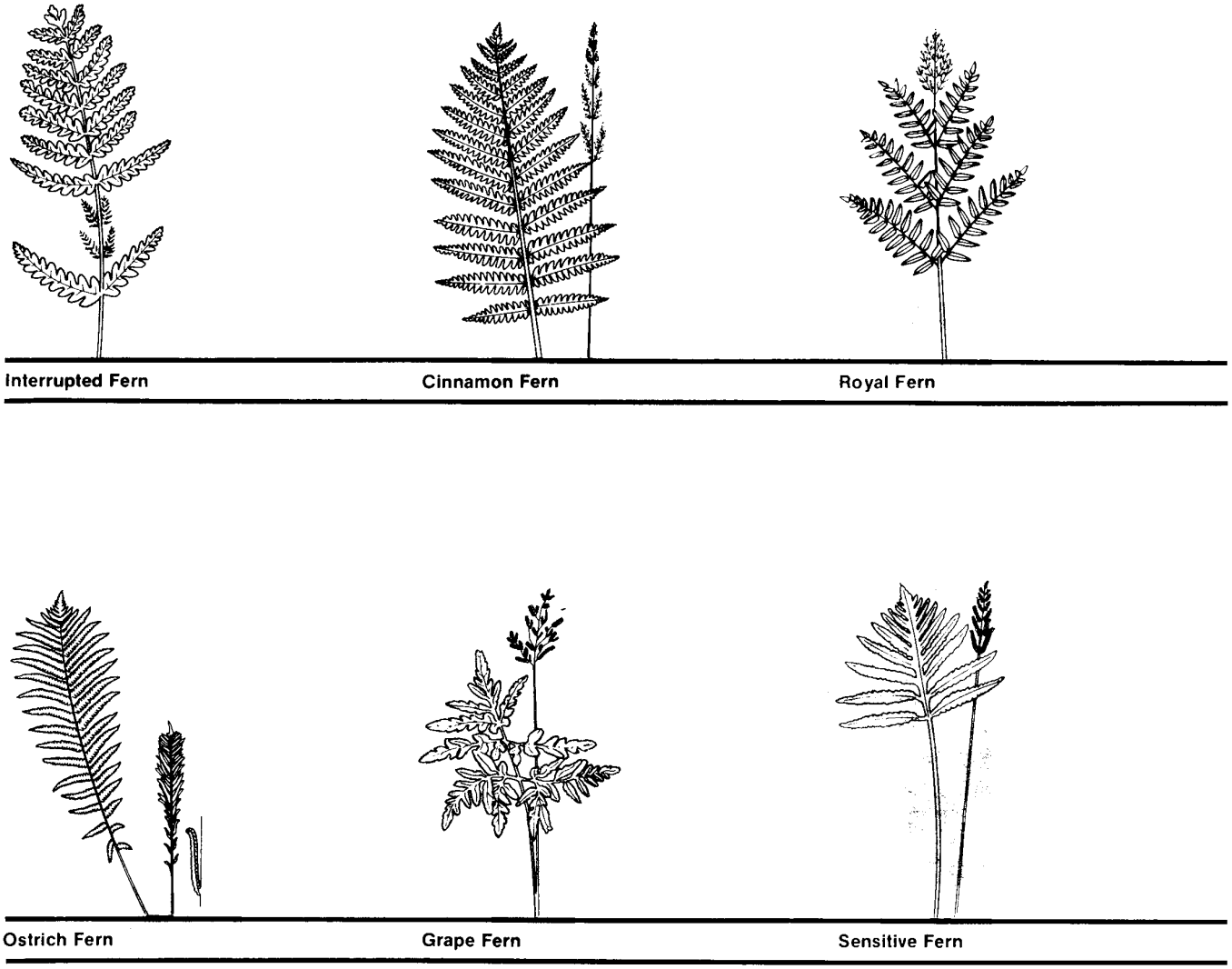


Fig. 6. Ferns With Sori Located on Fertile Stalks.

Life Cycle of Ferns

The life cycle of ferns, shown in Fig. 7, is interesting to know about. When a spore in the sorus or fruitdot is released, and is deposited in the soil under favorable moisture and temperature conditions, it develops into what is called a ***prothallus.*** This little plant, which looks more like a leaf than a plant, is usually heart-shaped, and is about one-quarter inch in size. On this tiny leaf-like structure, microscopic reproductive structures (the female structure is termed the ***archegonium,*** and the male is termed the ***antheridium***) are produced. After fertilization occurs, a root from the developing embryo grows down into the soil and a stem grows upward. Eventually, small leaves appear, and the plant develops into the fern which we commonly recognize as a fern plant.

The prothallus with female and male reproductive structures is referred to as a ***gametophyte,*** while the fern plant which we are most familiar with is termed the ***sporophyte.***

The fern prothallus, shown in Fig. 8, is very small and not often seen. If you do see a cluster of them, you will realize that they are part of the fern, and not some other type of plant.

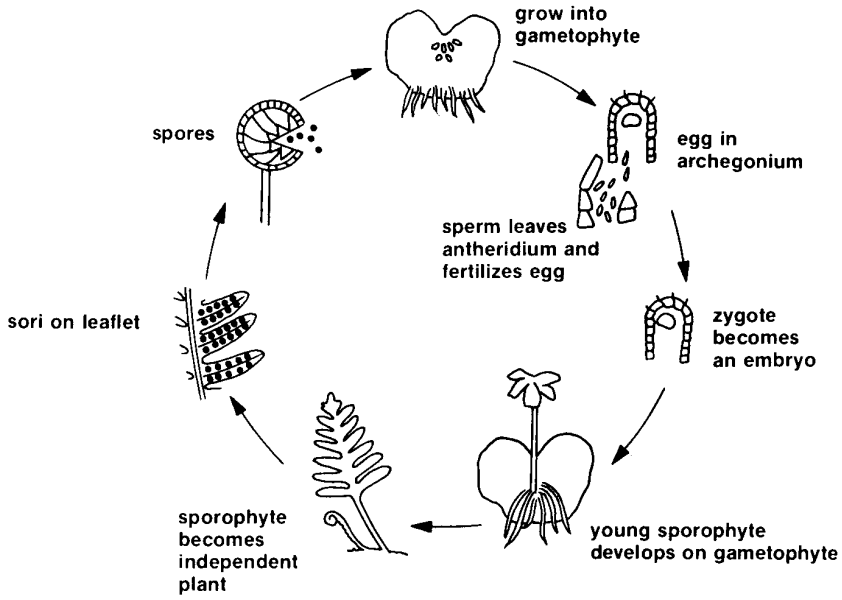


Fig. 7. Life Cycle of a Fern.

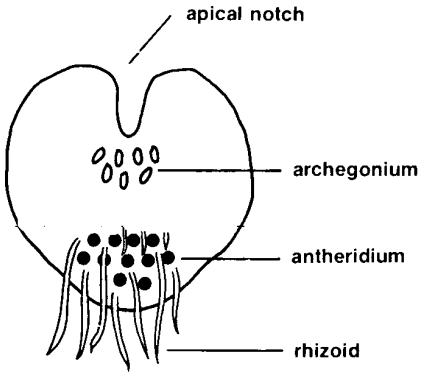
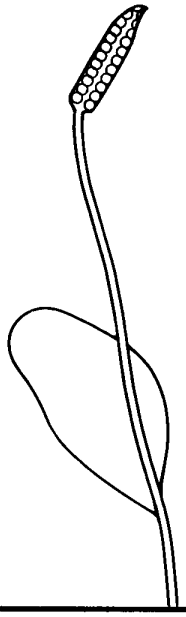


Fig. 8. Fern Prothallus.

West Virginia Ferns

Adder's Tongue Fern
Ophioglossum

This fern is easily overlooked because of typically small size and resemblance to leaves of some flowering plants. Note that the spike has 2 rows of sporangia. The entire plant grows up to 15 inches long. It is found in moist meadows and thickets in Cabell, Calhoun, Gilmer, Kanawha, Mercer, Monongalia, Pocahontas, Upshur, Wood, and Wirt counties.



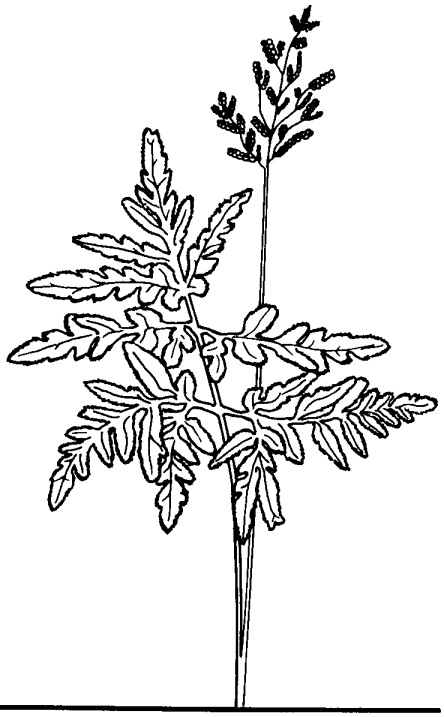
Adder's Tongue Fern
Ophioglossum vulgatum

Grape Ferns
Botrychium

There are several species of grape ferns in West Virginia. All have pinnate or compound leaves. They are found in every county on well-drained soil in woods and meadows.

Cutleaf Grapefern

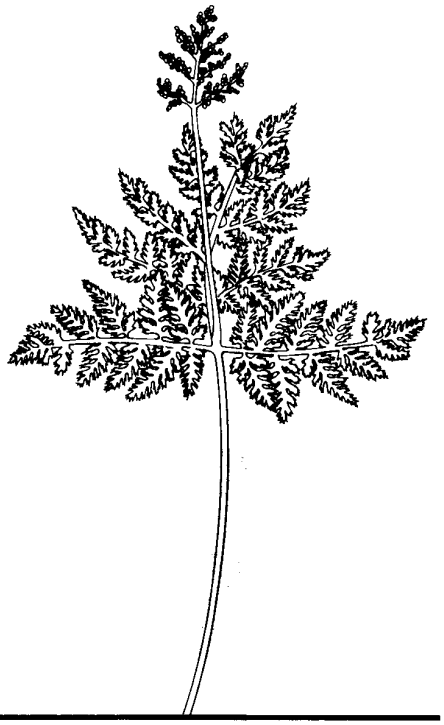
The leaves are noticeably leathery in texture and the leaf margins are finely cut. In winter the leaves turn a bronze color. The leaves are around 6 to 8 inches tall. This fern can be found in fields, woods, pastures, and thickets, probably in every county. A good time to look for it is in the fall when other foliage has died back.



Cutleaf Grapefern
Botrychium dissectum

Rattlesnake Fern

This grape fern is named because the fertile stalks supposedly resemble the rattles of a rattlesnake. The sterile blade is 10 to 24 inches long and the blade has a thin, paper-like structure. It is found in rich woods, probably in every county.



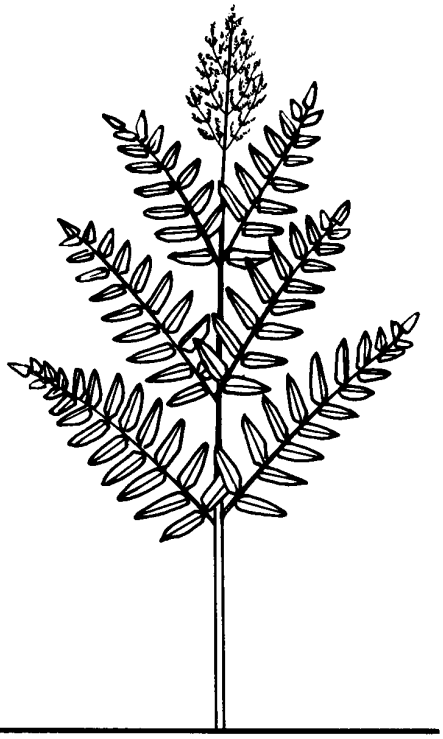
Rattlesnake Fern
Botrychium virginianum

Royal Ferns
Osmundas

The Royal Ferns are large, leafy plants with creeping rootstocks. Because of their large size and location of their sori, this group of ferns is very distinctive in appearance.

Royal Fern

These ferns have their sori on the upper pinnae. The fronds are 2 to 6 feet tall, and grow in clumps, often in shallow water. The leaves are bipinnate. This fern usually occurs in wet areas and occurs in most counties.



Royal Fern
Osmunda regalis

Cinnamon Fern

The fronds often grow to 6 feet in height, growing in a circle and spreading out in a vase-like form. This fern can be recognized by the tufts of cinnamon-colored "wool" on its stem. These tufts can sometimes be seen on the leaves even in the fall, after the fertile stalk has disappeared. In fall, the leaves turn a light brown. This fern occurs in many habitats, including wet areas, and probably occurs in every county.

Cinnamon Fern
Osmunda cinnamomea

Interrupted Fern

The sori are located in the middle of the stem thus giving this fern its name. The fertile fronds are usually taller than the sterile, 2 to 4 feet high. In the fall its leaves turn a light brown. It occurs in a wide range of habitats and is quite common on road banks and is probably found in every county.

Interrupted Fern
Osmunda claytoniana

Filmy Fern
Trichomanes

Most members of this fern family are found in the tropics. The one shown does occur, although rarely, in West Virginia. The leaves are thin and have bristle-like receptacles at the end. Fronds are 3 to 6 inches long and grow in rows from a hairy, creeping rootstock. This fern has been found on wet rocks in Kanawha, Webster, and Wayne counties.

Filmy Fern
Trichomanes boschianum

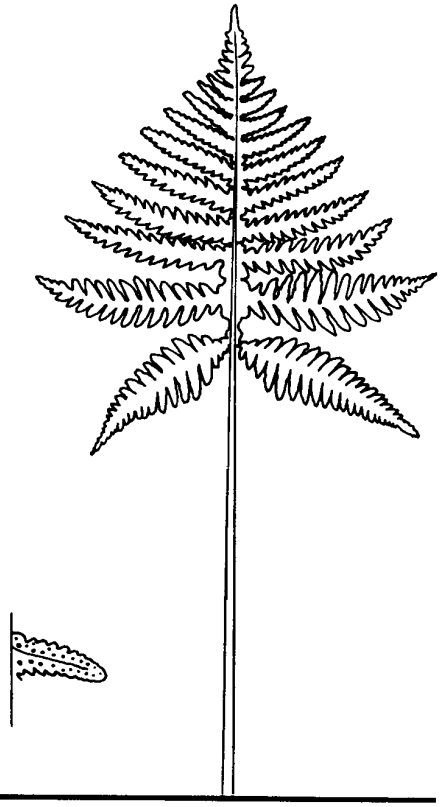
Oak Fern
Gymnocarpium

Note the overall triangular appearance of this fern. Its leaves are tripinnate and about 1 foot long. This fern has circular sori and no indusium. It is a northern species found in moist spruce woods and cold mountain swamps.

Oak Fern
Gymnocarpium dryopteris

Beech Ferns
Phegopteris

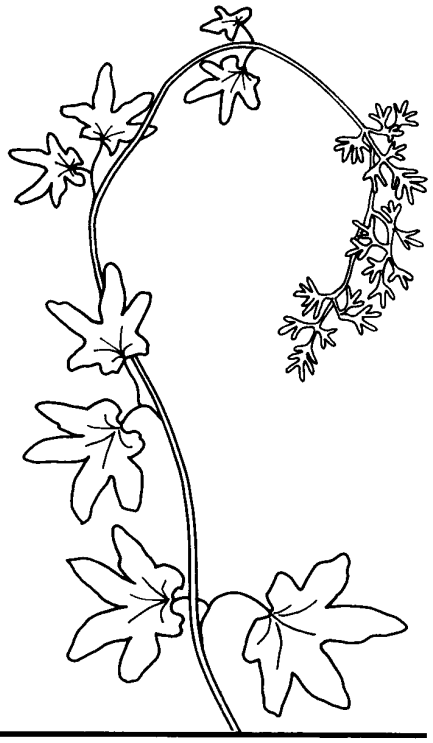
Two species of Beech Ferns occur in West Virginia. They have triangular leaves, like the Oak Fern. The species shown here, Broad Beech Fern, has a winged stem and grows in dry woods and moist thickets, probably in every county.



Broad Beech Fern
Phegopteris hexagonoptera

Climbing Fern
Lygodium

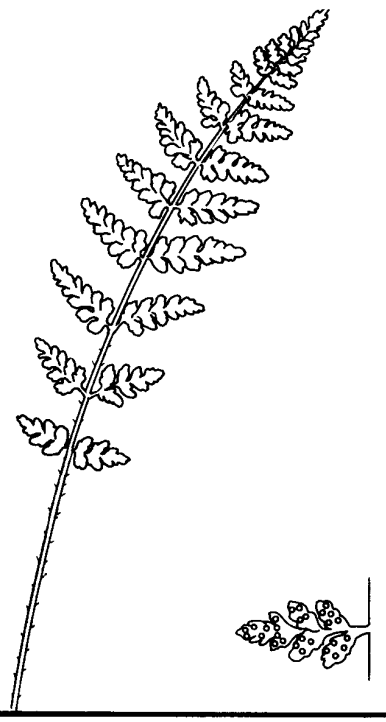
This unusual looking fern, which occurs in very acid soil, is not too common and prefers moist thickets and open woods. Fronds are 3 to 4 feet long. It is found in Fayette, Greenbrier, Nicholas, Preston, Raleigh, Upshur, and Webster counties.



Climbing Fern
Lygodium palmatum

Woodsia
Woodsia

These are small or medium-sized ferns growing in rocky places. Fronds are 8 to 20 inches long. The sori are circular. The one pictured, Blunt-Lobed Woodsia, has a straw-colored chaffy stipe and grows on cliffs, rocky banks, in mortar joints of stone walls, in dry and moist places, probably in every county.



Blunt-Lobed Woodsia
Woodsia obtusa

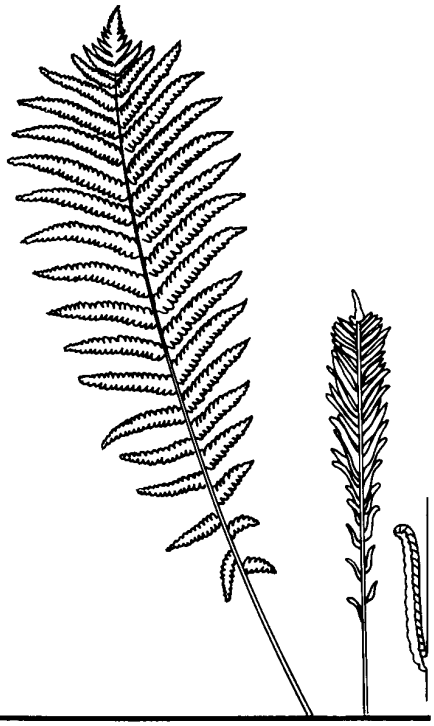
Bladder Ferns
Cystopteris

These are delicate ferns with rounded sori, each borne on the back of a vein. The indusium is hood-like. Fronds are seldom more than 15 inches long. The one shown is Brittle Fern, which is found on cool rock crevices throughout the state.

Brittle Fern
Cystopteris fragilis

Ostrich Fern
Matteuccia

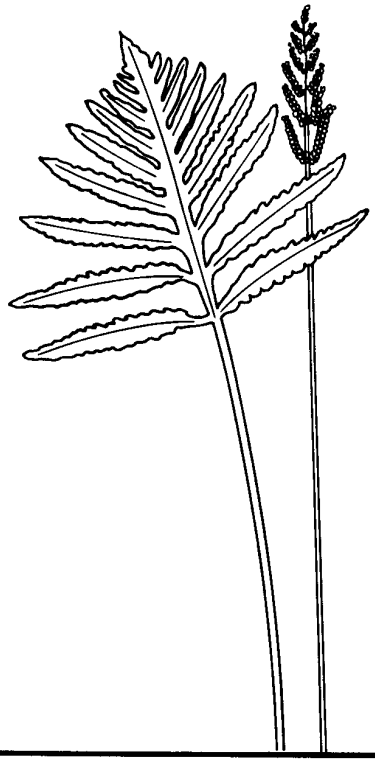
This is a northern fern that is not too common in West Virginia. Note separate fertile and sterile stalks, and the overall resemblance to an ostrich feather. This fern prefers moist thickets in neutral soils. It is found in higher elevations.



Ostrich Fern
Matteuccia pensylvanica

Sensitive Fern
Onoclea

Note the deeply pinnatifid leaf. This is a very common fern and occurs in every county. Fronds 1 to 3 feet high. Occasionally you will see the fertile stalks standing in the winter after the leaves have died back.



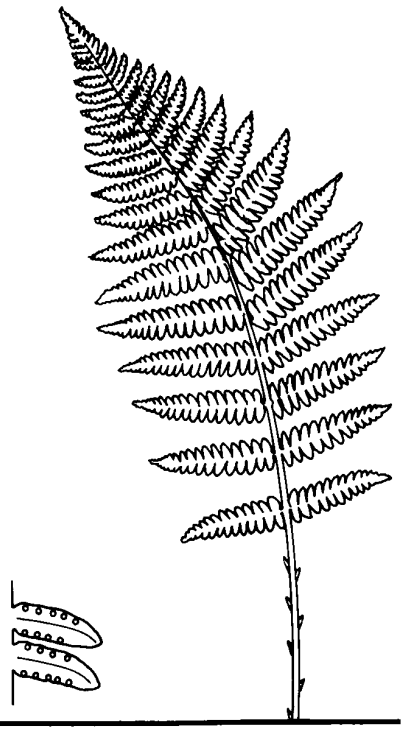
Sensitive Fern
Onoclea sensibilis

Wood or Shield Ferns
Dryopteris

There are several species of wood ferns. Hybridization occurs among them and identification of exact species is not always easy. The sori are circular, located on the back of an unmodified leaf. The indusium is kidney-shaped. Some of these ferns are evergreen. Fronds are about 1 to 4 feet long.

Marginal Shield Fern

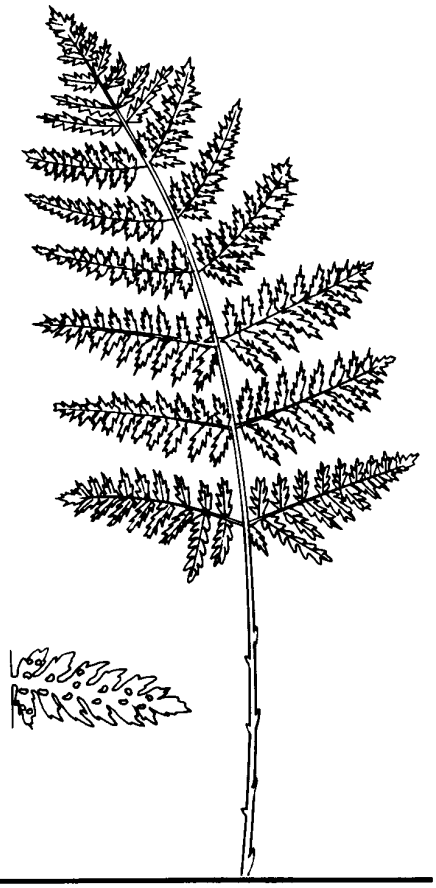
The twice-pinnate leaves are evergreen. The feature that distinguishes this fern from other wood ferns is that the sori are located on or near the leaf margins. This fern is very common in woods throughout the state.



Marginal Shield Fern
Dryopteris marginalis

Intermediate Wood Fern

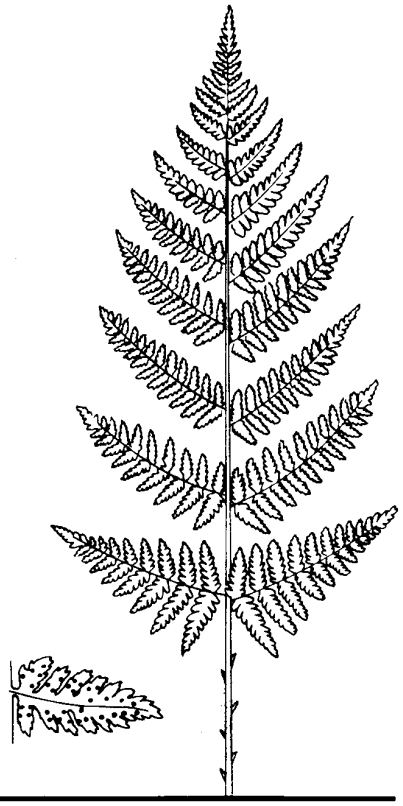
The leaves are evergreen. Inner pinnules of the basal row are usually shorter than the next outer ones. Note the illustration. The sori are located midway between the midvein and the leaf margin. The stem, stipe, and indusium are covered with tiny stalked glands. This fern is common in most wooded areas in the state.



Intermediate Wood Fern
Dryopteris intermedia

Spinulose Shield Fern

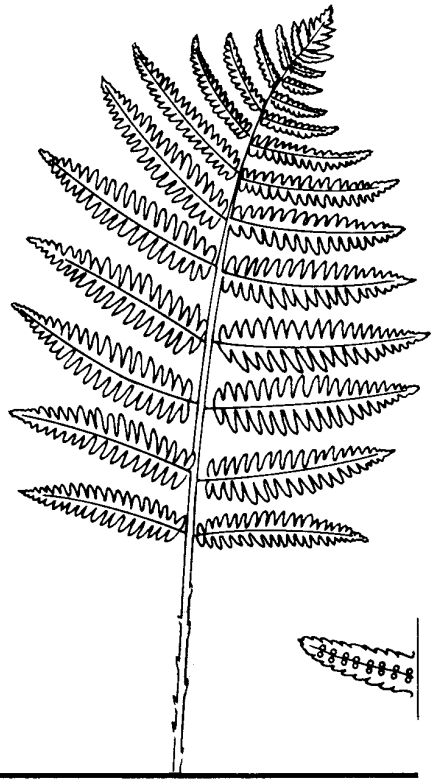
The leaves are tripinnate. The lower pinnules are noticeably ***unequal*** in length, with those on the lower side longer. The stem is scaly. This fern is found in rich woods and on rocky banks, and is common in both mountain and hilly counties. (This fern is easily confused with the Intermediate Wood Fern. A way to tell them apart is the length of the pinnules on the bottom row of the pinnae; the pinnules are longer in the Spinulose, shorter in the Intermediate. Compare the two pictures. Also, there are no glands on this fern, as there are on the Intermediate Fern.)



Spinulose Shield Fern
Dryopteris spinulosa

Goldie's Shield Fern

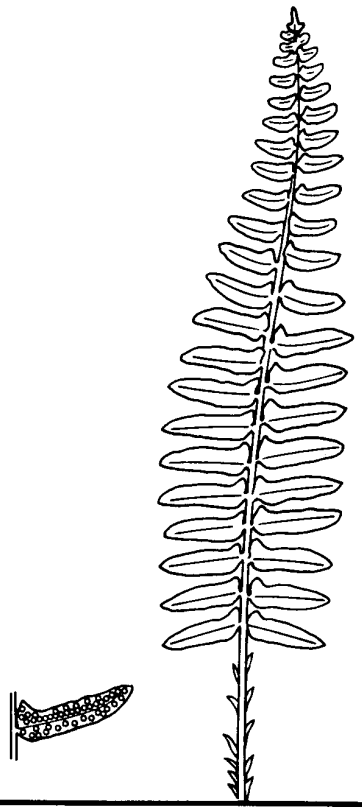
This is a large fern. The leaves are ovate (egg-shaped, with the bottom part of the leaf broader than the top) which helps distinguish this from other shield ferns. The leaves are dark green. Sori are located near the midvein. It is found in rich woods throughout the state.



Goldie's Shield Fern
Dryopteris goldiana

Christmas Fern
Polystichum

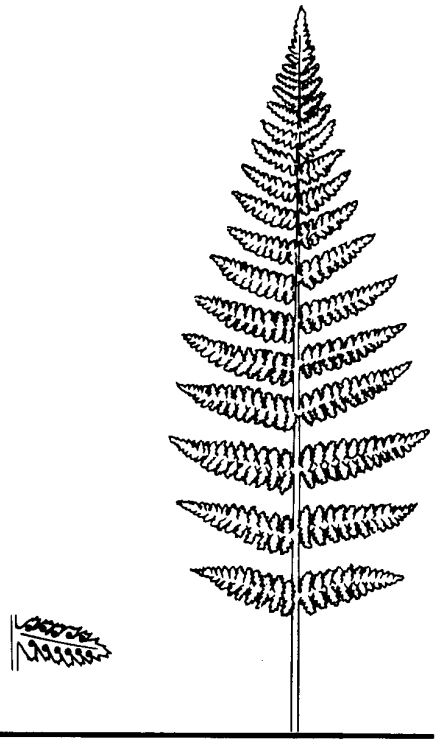
This fern is evergreen and is widely used for Christmas decoration. The spore-bearing leaves are at the top of the plant and are smaller than the other leaves. Note the ear-like projection on the upper side of each leaf. Fronds are 12 to 18 inches high. This is found in woods and on rocky slopes, and is the most common fern in the state.



Christmas Fern
Polystichum acrostichoides

Hay-scented Fern
Dennstaedtia

Unlike many of our ferns which grow in shady areas, this fern grows in open fields. When crushed, it has a pleasant scent similar to that of drying hay. It is lacy and delicate in appearance and the fronds are 12 to 24 inches high. Towards the end of summer, a patch of Hay-scented ferns tends to have a matted, tangled appearance. It occurs throughout the state and is more common at higher altitudes.



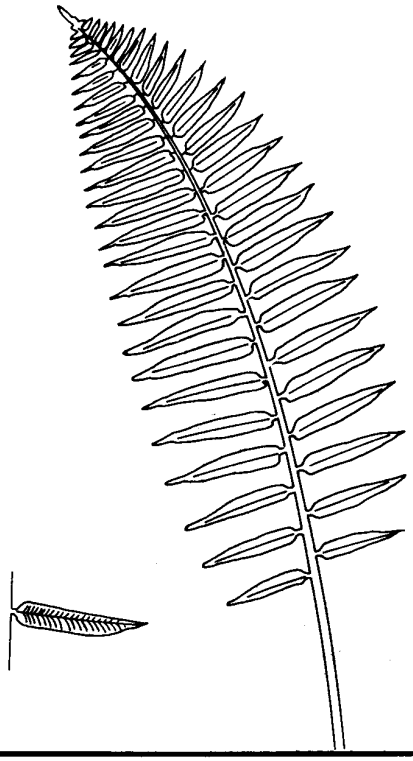
Hay-scented Fern
Dennstaedtia punctilobula

Lady Ferns
Athyrium

There are several species of Lady Ferns. A distinguishing feature is their oblong, linear sori.

Glade Fern

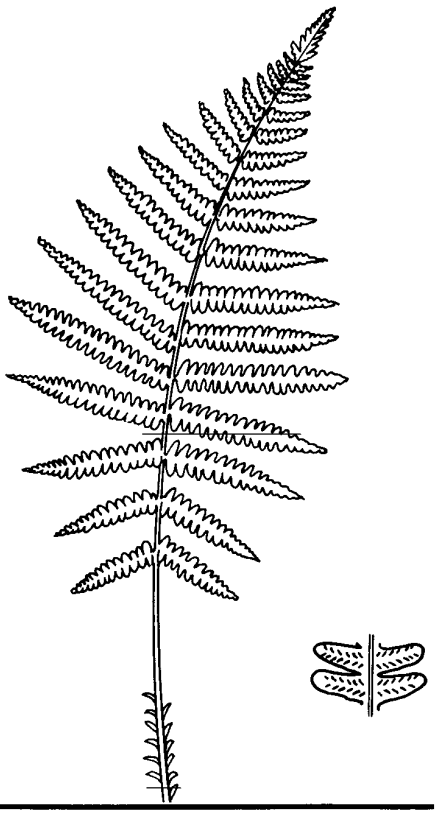
The leaves are once pinnate, rather long, and the margins are entire. The stem is green, and the fronds, 2 to 4 feet high, grow in clumps. This fern is common in rich, moist, shady woods throughout the state.



Glade Fern
Athyrium pycnocarpon

Silvery Athyrium

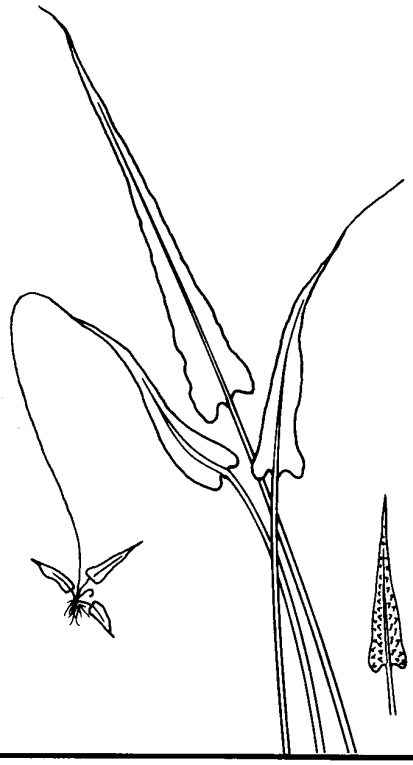
The pinnae are linear, and the stipes are straw-colored. The indusia have a silvery shine when young, which accounts for the name. Fronds are 2 to 3 feet high, and grow in clumps. This is found in rich woods throughout the state.



Silvery Athyrium
Athyrium thelypterioides

Walking Fern
Camptosorus

This distinctive fern has evergreen, somewhat leathery leaves, which are 4 to 12 inches long. The leaves sometimes root at the tips. Sori are scattered on the back of the leaves and are linear. Walking Ferns are common throughout the state and prefer limestone rocks and moist ravines.



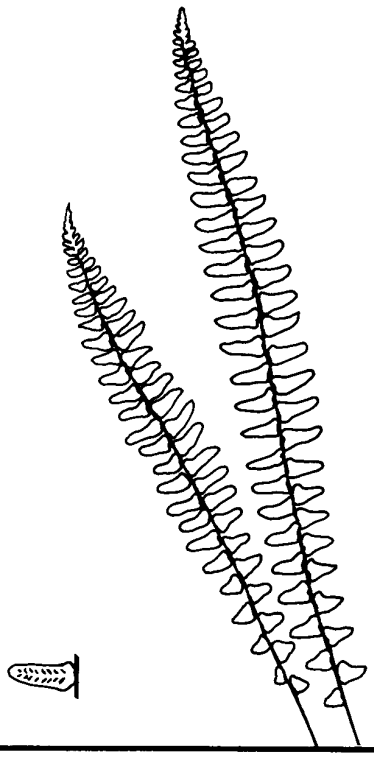
Walking Fern
Camptosorus rhizophyllus

Spleenworts
Asplenium

There are several kinds of Spleenworts. Shape of the leaves shows considerable variation as the 3 species shown here indicate.

Ebony Spleenwort

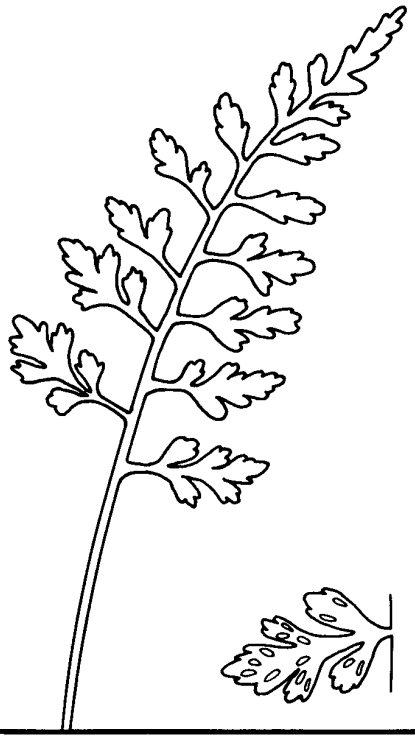
There are 20 to 40 pairs of pinnae, and the leaves have an auricle or projection at their base. Fronds are 8 to 20 inches high; fertile fronds are higher than the sterile. The stem is a dark, shining black-brown. This is a common fern throughout the state, and is found on acid rocky soils, often with Christmas and Wood Ferns.



Ebony Spleenwort
Asplenium platyneuron

Mountain Spleenwort

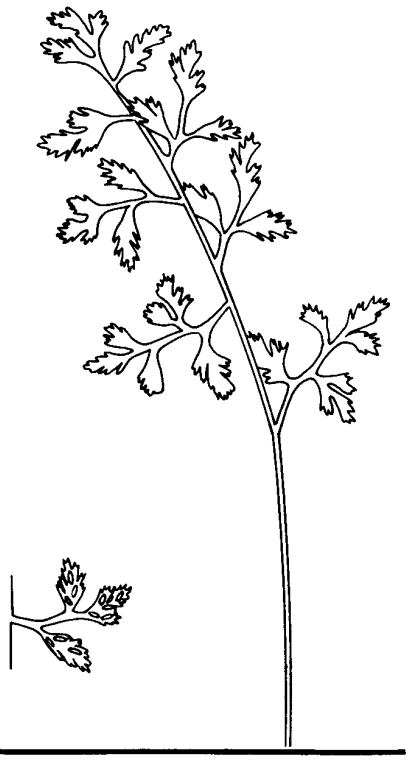
The fronds are evergreen, 2 to 6 inches long, and broadest at the base. This fern prefers acid soil pockets in sandstone boulders and outcrops and occurs in most mountain counties.



Mountain Spleenwort
Asplenium montanum

Wall-Rue

The leaves are evergreen; pinnules are usually wedge-shaped. Fronds are seldom more than 5 inches high. It is found on limestone rocks in Grant, Greenbrier, Hampshire, Hardy, Jefferson, Logan, Mineral, Monroe, Pendleton, and Pocahontas counties.

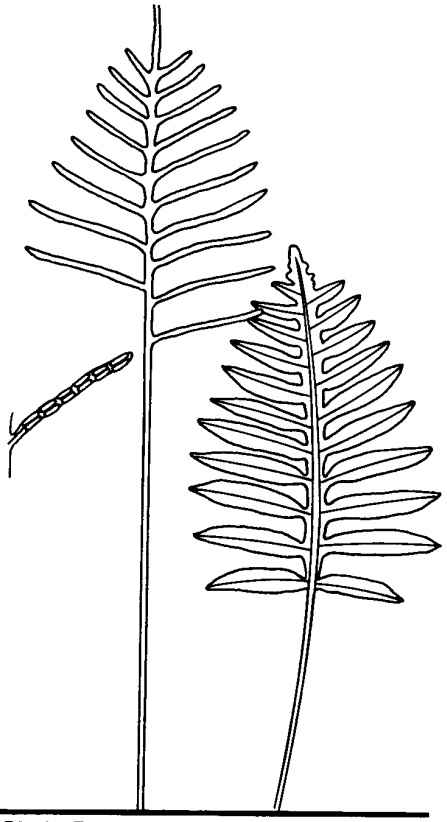


Wall-Rue
Asplenium ruta-muraria

Chain Fern

Lorinseria

This is a large fern with pinnatifid leaves, 12 to 20 inches long. Sterile and fertile leaves are different. The sori are arrayed in chain-like rows. It prefers swamps and wet woods in acid soil. It is found in Pocahontas, Greenbrier, Upshur, Clay, Nicholas, and Mineral counties.

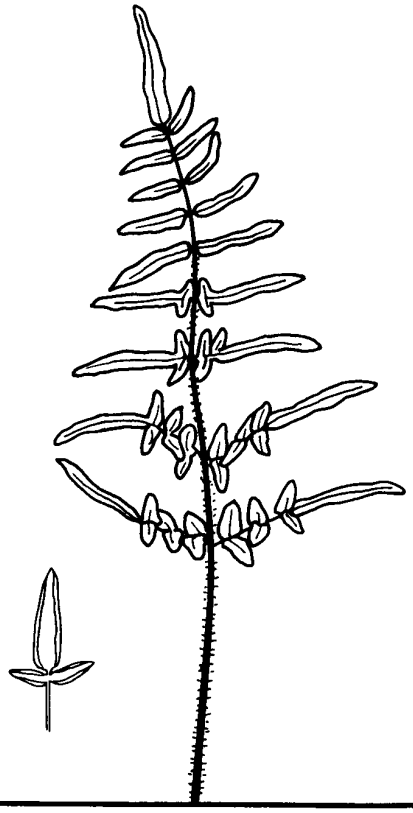


Chain Fern
Lorinseria areolata

Cliffbrakes

Pellaea

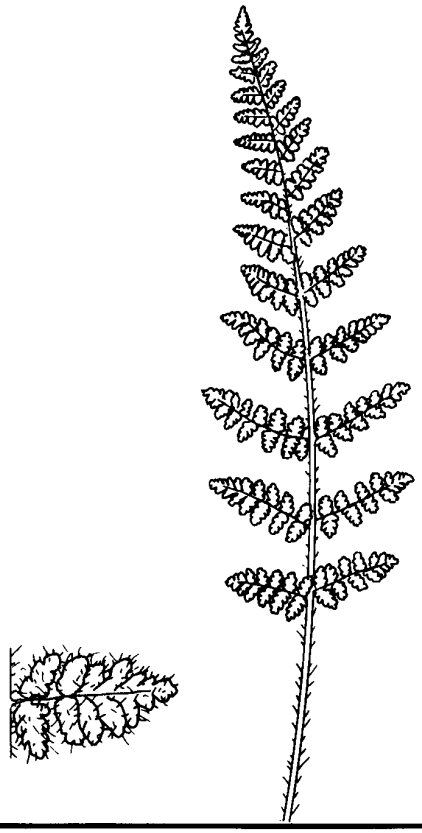
These are small ferns with 1 to 3 pinnate pinnae; stems are dark and shiny. The one shown, Purple Cliffbrake, has fronds 4 to 24 inches high, and the leaves have a peculiar bluish-green color. Sori are on leaf margins of fertile leaflets. The stem is hairy. It is usually found on dry limestone rocks in most parts of the state.



Purple Cliffbrake
Pellaea atropurpurea

Lipferns
Cheilanthes

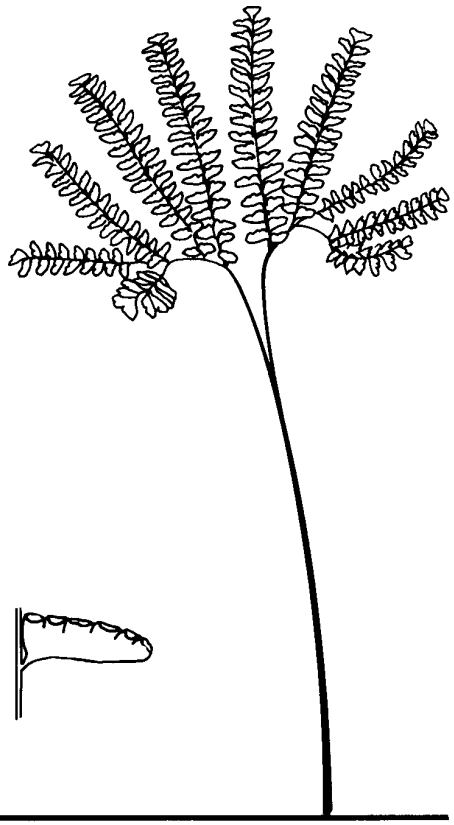
These are small ferns of rocky habitats, with wooly or scaly leaves. Sori are rounded and on the leaf margin. The one shown, Hairy Lip Fern, has fronds 6 to 15 inches long, narrowly lance-shaped in outline, and is found in shales in the eastern part of the state.



Hairy Lip Fern
Cheilanthes lanosa

Maidenhair Fern
Adiantum

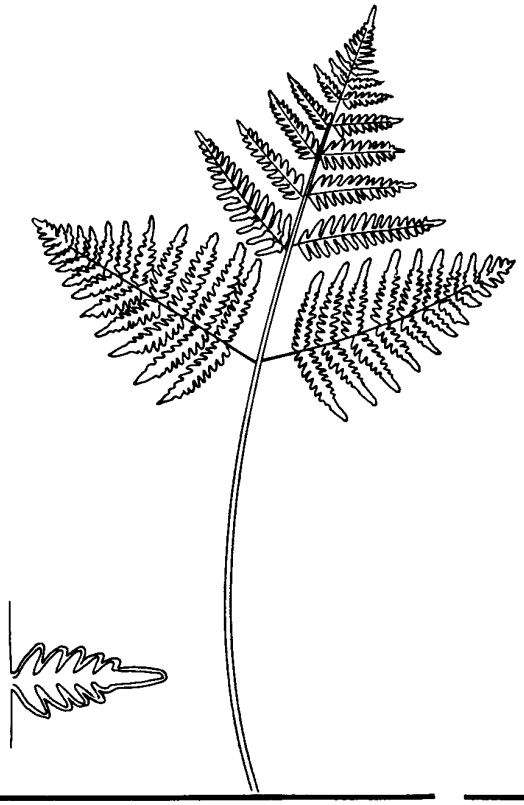
This fern, with its fan shape, is easy to identify. It has black glossy stems and is very delicate and graceful. Usually under a foot high, it prefers shaded places and is found throughout the state.



Maidenhair Fern
Adiantum pedatum

Bracken
Pteridium

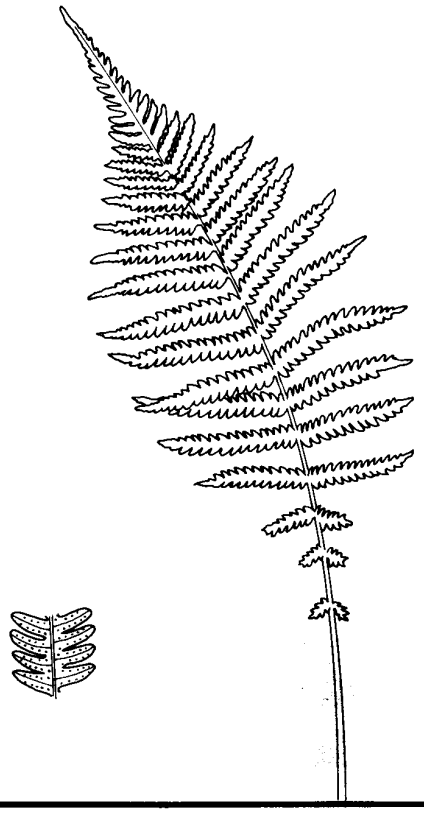
This is the largest of the West Virginia ferns. Fronds are spreading in habit and reach 1 to 3 feet high. Bracken may grow in stands covering acres of land. The sporangia are in a continuous line around the leaf margin. In fall, the leaves turn dark brown. This is found throughout the state.



Bracken
Pteridium aquilinum

New York Fern
Thelypteris

This is an easy fern to identify. Notice how the leaves taper each way, at each end of the leaf. Fronds are 8 to 24 inches long. It is found in every county, usually in woods and thickets.



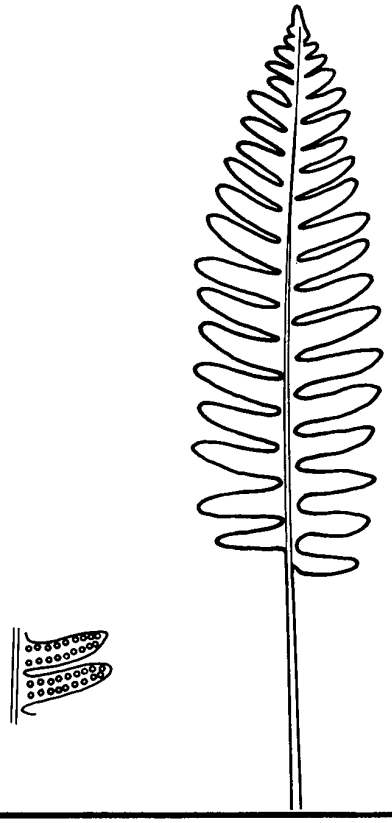
New York Fern
Thelypteris noveboracensis

Polypody Ferns

There are two species of polypodiums in West Virginia.

Common Polypody

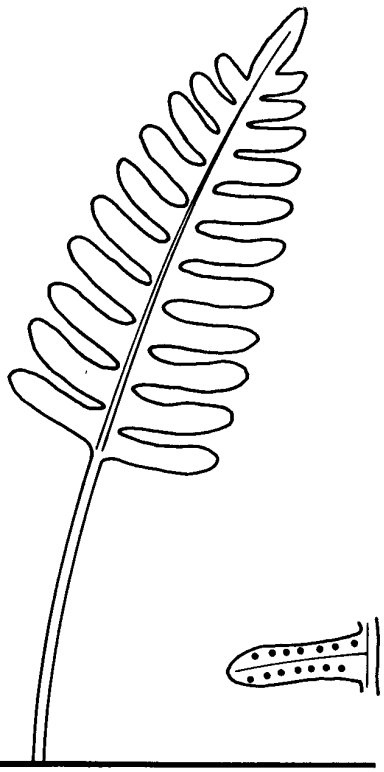
This is an evergreen fern with smooth pinnatifid leaves, which grow 4 to 10 inches high. Sori are large and circular. This fern grows on rocks and (rarely) tree trunks, probably in every county; it does prefer higher elevations.



Common Polypody
Polypodium virginianum

Gray Polypody or Resurrection Fern

This fern has gray-green leaves, 2 to 7 inches long, which are scaly underneath. This fern grows on rocks in West Virginia. In the South it is an epiphyte (air plant) and can grow on tree bark, shingles and rooftops. It is termed the Resurrection Fern because the leaves turn brown when dry, green again when moist. It is found in Pendleton, Pocahontas, Calhoun, Gilmer, Grant, Wayne, Wirt, and Wyoming counties.



Little Gray Polypody
Polypodium polypodioides

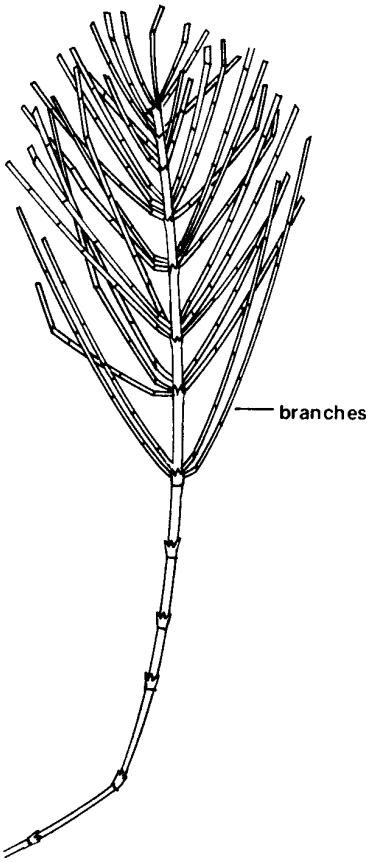
Fern Allies

Fern allies are related to ferns in that they are also non-flowering plants which reproduce by means of spores. Spore-bearing organs may be located on a separate fertile stalk, or on a modified leaf.

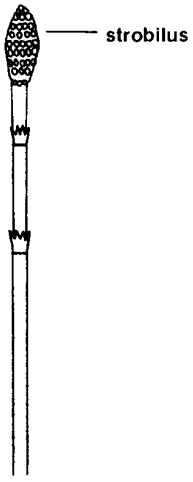
Horsetails
Equisetum

Horsetails are considered to be the most primitive of the fern allies. The upright stems are green and photosynthetic. The small, triangular leaves are united into a collar at each ***node.***[1] ***Whorled***[2] branches arise from the stem. Spores are in a cone-like strobilus that may or may not be located on a separate stalk. Some stems and branches have ridges that contain silica particles, which gives these plants a rough surface, and accounts for the name given to one species, scouring rush. Fig. 9 shows the location of the stem, leaves, branches and fertile stalk of a typical horsetail.

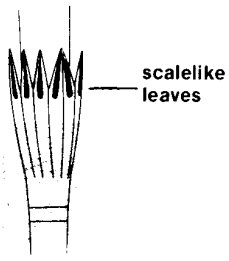
[1]Node: the portion of the stem which bears leaves.
[2]Whorled: arranged in a circle around the stem.



Vegetative Shoot With Branches



Fertile Spike With Strobilus

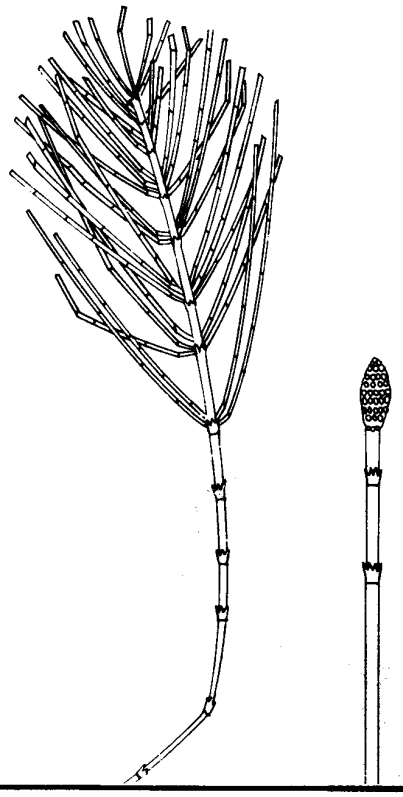


Enlarged Diagram of Node With Scalelike Leaves

Fig. 9. Parts of a Typical Horsetail.

Common Horsetail

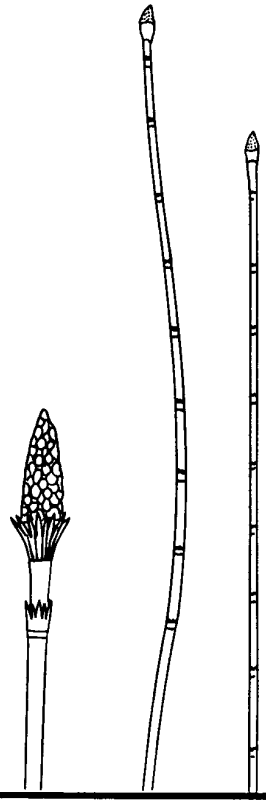
This is the most common horsetail found in the state. It is found in sandy soils and waste places, especially along railroad tracks. Fertile stalks can be seen in the spring. The plant is about 6 to 10 inches high.



Common Horsetail
Equisetum arvense

Scouring Rush

This horsetail grows along streambanks and seeps most commonly in the Eastern Panhandle, where it is locally abundant. The slender, evergreen stems have a rough surface because of the presence of silica particles. Stems grow up to 3½ feet tall and usually grow in clusters. Fertile and sterile stems look alike.



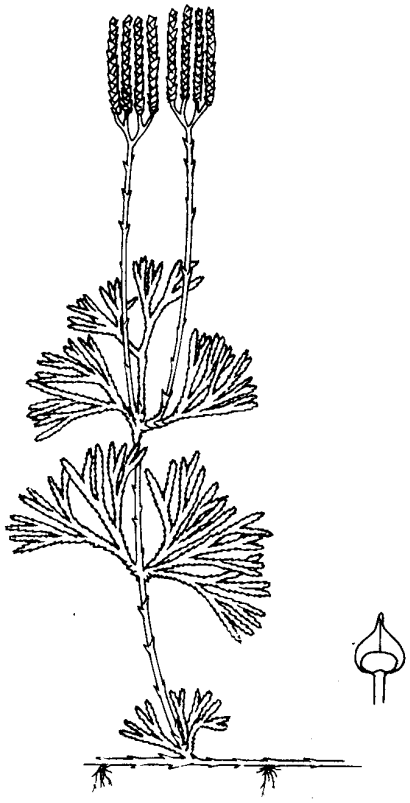
Scouring Rush
Equisetum hyemale

Clubmosses
Lycopodium

These plants are small and grow close to the ground and have a moss-like appearance. Spores are contained in cones, or stroboli, or on modified leaves.

Groundpine

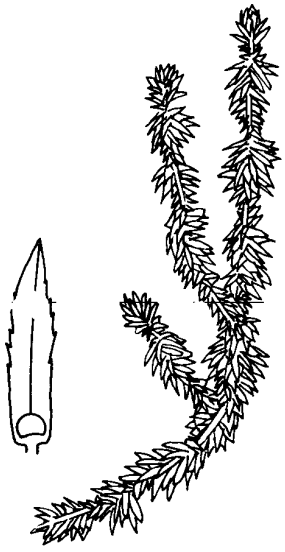
This is common in woods and on hillsides throughout the state. Note the location of the stroboli, on long stalks. Branchlets are flattened. This plant is evergreen.



Groundpine
Lycopodium digitatum

Shining Clubmoss

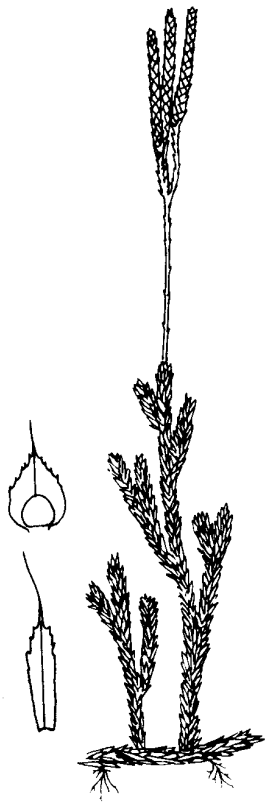
This can be found throughout the state, but is most common in mountain areas. The spore-producing organs are located on the leaves, as shown in the illustration. The leaves are toothed, and are evergreen.



Shining Clubmoss
Lycopodium lucidulum

Common Clubmoss

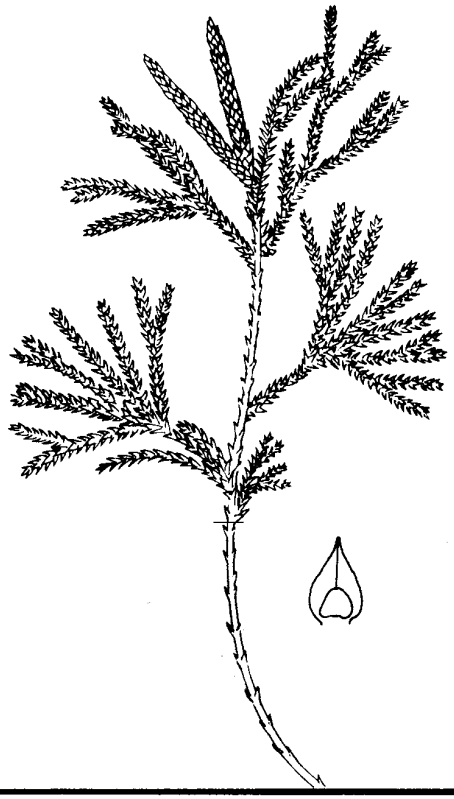
This is common in mountain counties, in dry or wet woods, sphagnum moss bogs, and spruce forests. The linear leaves are tipped with a bristle. It is sometimes called Wolf's Claw Clubmoss, and is evergreen.



Common Clubmoss
Lycopodium clavatum

Tree Clubmoss

This is found in rich woods in mountain counties. The stems are tree-like. Spikes are unstalked, or sessile. It is evergreen.



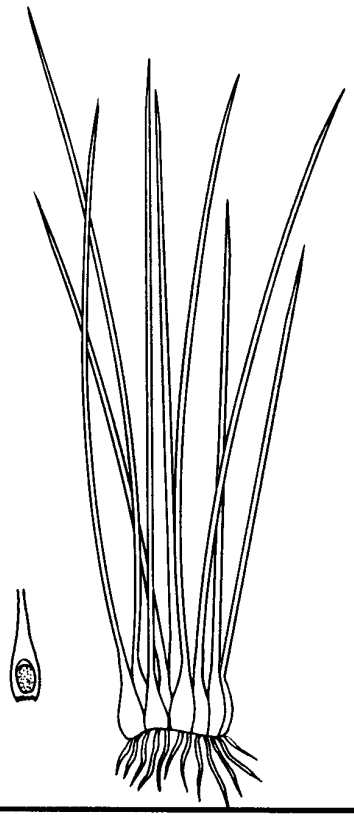
Tree Clubmoss
Lycopodium obscurum

Quillwort
Isoetes

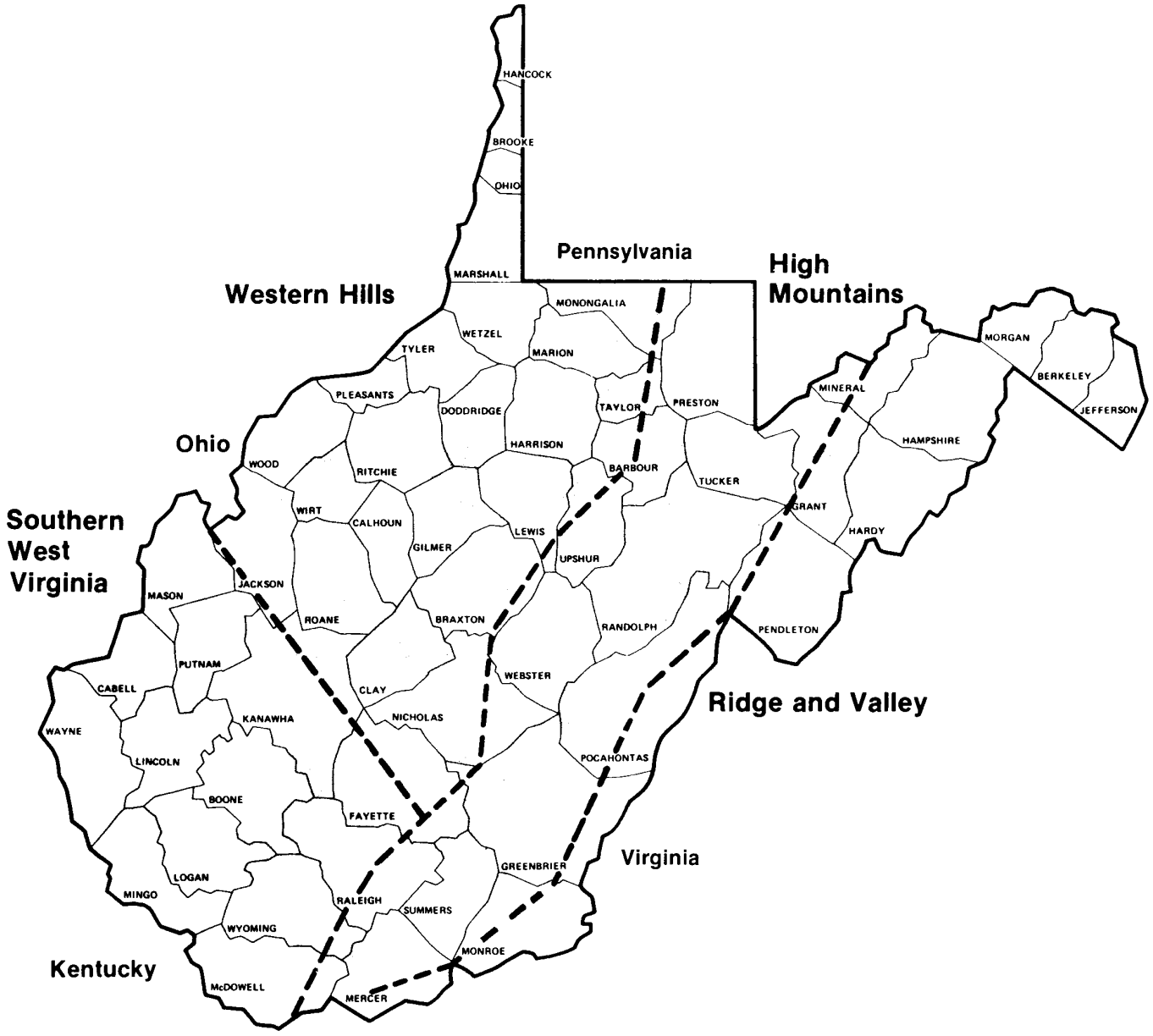
These are small, aquatic plants with a grass-like appearance. The spore-bearing organs are located at the bottom of the long, awl-shaped leaves.

Quillwort

This plant often, but not always grows submerged in water, and can also be found on wet shores and muddy ditches. It most often occurs in the mountain counties.



Quillwort
Isoetes engelmanni



Approximate Geographical Locations Where Fern Species May Be Found.

Checklist of West Virginia Ferns and Fern Allies

Key

C is common throughout the state.

RV is Ridge and Valley.

HM is High Mountain counties.

WH is Western Hills.

SWV is Southern West Virginia.

It should be kept in mind that the above geographical locations where ferns can be found are approximate and that it is possible and likely that some ferns and fern allies can be found outside the areas specified in the key. These geographic designations represent specimens where they are known to occur in the state.

Horsetail *(Equisetaceae)*

- ___ Wood Horsetail *(Equisetum sylvaticum)* **HM,** Rare
- ___ Common Horsetail *(E. arvense)* **C**
- ___ Water Horsetail *(E. fluviate)* Jefferson County, Rare
- ___ Scouring Rush *(E. hyemale)* **RV** Local

Clubmoss *(Lycopodiaceae)*

- ___ Rock Clubmoss *(Lycopodium porophilum)* **HM,** Rare
- ___ Shining Clubmoss *(L. lucidulum)* **C** more often in mountain areas
- ___ Bog Clubmoss *(L. inundatum)* **WH** Local
- ___ Stiff Clubmoss *(L. annotinum)* **HM**
- ___ Groundpine *(L. obscurum)* **HM**
- ___ Var. *dendroideum*
- ___ Common Clubmoss *(L. clavatum)* **HM**
- ___ Slender Groundpine *(L. tristachyum)* **HM**
- ___ Groundpine *(L. flabelliforme)* **C**
- ___ *L. × haberi*

Spikemoss *(Selaginellaceae)*

- ___ Rock Spikemoss *(Selaginell rupestris)* **RV**
- ___ Meadow Spikemoss *(S. apoda)* **C**

Quillwort *(Isoetaceae)*

- ___ Quillwort *(Isoetes engelmanni)* **HM**

Adder's Tongue Fern *(Ophioglossaceae)*

- ___ Grapefern *(Botrychium matricariaefolium)* **HM** Scattered
- ___ Little Grapefern *(B. simplex)* **HM,** Rare
- ___ Cutleaf Grapefern *(B. dissectum)* **C**
- ___ Bluntnose Grapefern *(B. oneidense)* Pendleton County, Rare
- ___ Lance-leaved Grapefern *(B. lanceolatum)* **HM**
- ___ Rattlesnake Fern *(B. virginianum)* **C**
- ___ Adder's Tongue *(Ophioglossum vulgatum)* **SWV** and **WH**
- ___ Var. *pseudopodum*

Royal Fern *(Osmundaceae)*

- ___ Royal Fern *(Osmunda regalis)* **C**
- ___ Cinnamon Fern *(O. cinnamomea)* **C**
- ___ Interrupted Fern *(O. claytoniana)* **C**

Curly Grass *(Schizaeaceae)*

- ___ Climbing Fern *(Lygodium palmatum)* Scattered throughout the state

Filmy Fern *(Hymenophyllaceae)*

- ___ Filmy Fern *(Trichomanes boschianum)* Kanawha, Wayne, Webster

Ferns *(Polypodiaceae)*

- ___ Rusty Woodsia *(Woodsia ilvensis)* **RV**
- ___ Allegheny Cliff Fern *(W. scopulina)* **RV**
- ___ Blunt-lobed Woodsia *(W. obtusa)* **C**
- ___ Brittle Fern *(Cystopteris fragilis)* **C**
- ___ Lowland Brittle Fern *(C. protrusa)* **C**
- ___ Bulbiferous Bladder Fern *(C. bulbifera)* **C**
- ___ Ostrich Fern *(Matteuccia pensylvanica)* **HM,** Rare
- ___ Sensitive Fern *(Onoclea sensibilis)* **C**
- ___ Oak Fern *(Gymnocarpium dryopteris)* **RV, WH, HM**
- ___ Long Beech Fern *(Phegopteris connectilis)* **HM**
- ___ Broad Beech Fern *(P. hexagonoptera)* **C**
- ___ New York Fern *(Thelypteris noveboracensis)* **C**
- ___ Marsh Fern *(T. palustris)* **C**
- ___ Bog Fern *(T. simulata)* Tucker, Preston, Rare
- ___ Crested Shield Fern *(Dryopteris cristata)* **HM** Scattered

___ Log Fern *(D. celsa)* Preston County, Rare

___ Goldie's Shield Fern *(D. goldiana)* **C**

___ Marginal Shield Fern *(D. marginalis)* **C**

___ *D. × pittsfordensis*

___ Mountain Wood Fern *(D. campyloptera)* **HM, RV**

___ Susquehanna Wood Fern *(× D. neo-wherryi)*

___ *× D. triploidea*

___ Braun's Wood Fern *(× D. uliginosa)*

___ Spinulose Shield Fern *(D. spinulosa)* **C**

___ Intermediate Shield Fern *(D. intermedia)* **C**

___ Boott's Wood Fern *(D. × Boottii)* **HM**

___ Christmas Fern *(Polystichum acrostichoides)* **C**

___ Var. *lonchitoides*

___ Hay-scented Fern *(Dennstaedita punctilobula)* **C**

___ Glade Fern *(Athyrium pycnocarpon)* **C,** Local

___ Silvery Athyrium *(A. thelypterioides)* **C**

___ Northeastern Lady Fern *(A. angustum)* **HM**

___ Var. *rubellum*

___ Southern Lady Fern *(A. asplenioides)* **C**

___ Walking Fern *(Camptosorus rhizophyllus)* **C**

___ Graves' Spleenwort *(Asplenium × gravesii)* Jefferson, Upshur, Rare

___ Pinnatifid Spleenwort *(A. pinnatifidum)* **WH**

___ Trudell's Spleenwort *(× A. trudellii)* **HM, RV**

___ Black-stem Spleenwort *(A. resiliens)* **HM, RV**

___ Ebony Spleenwort *(A. platyneuron)* **C**

___ Var. *incisum*

___ Bradley's Spleenwort *(A. bradleyi)* **SWV, HM**

___ Forked Spleenwort *(A. septentrionale)* Rare

___ Walking Spleenwort *(A. × ebenoides)* **HM, RV**

___ Maidenhair Spleenwort *(A. trichomanes)* **C**

___ Rue Spleenwort *(A. ruta-muraria)* **SWV, HM, RV**

___ Mountain Spleenwort *(A. montanum)* **HM**

___ Chain Fern *(Lorinseria areolata)* **HM, WH**

___ Purple Cliffbrake *(Pellaea atropurpurea)* **HN, RV, WH**

___ Smooth Cliffbrake *(P. glabella)* Jefferson, Tyler, Wirt, Rare

___ Hairy Lip Fern *(Cheilanthes lanosa)* **WH, RV**

___ Chestnut Lip Fern *(C. castanea)* **RV,** Rare

___ Fragile Rockbrake *(Cryptogramma stelleri)* Randolph, Rare

___ Maidenhair Fern *(Adiantum pedatum)* **C**

___ Brake, or Bracken *(Pteridium aquilinum)* **C**

___ Var. *pseudocaudatum*

___ Common Polypody *(Polypodium virginianum)* **C**

___ Little Gray Polypody *(P. polypodioides)* **WH, RV, HM**

References

How to Know the Ferns and Fern Allies, by John T. Mickel, Pictured Key Nature Series, Wm. Brown Company Publishers, Dubuque, Iowa, 1979.

Field Guide to Northeastern Ferns, by Eugene C. Ogden, Bulletin Number 444, New York State Museum, The University of the State of New York, State Education Department, Albany, New York, 1981.

Flora of West Virginia, by P. D. Strausbaugh and Earl Core, Seneca Books, Inc., 1977.

A Field Guide to the Ferns, by Broughton Cobb, Houghton Mifflin Company, 1963.