

Pteridophytes (chapter 17)

Pteridophyte characteristics

They are vascular (they have roots, stems, and leaves)

The cells are cylindrical or elongated, and network throughout the plant

Xylem moves water and ions (positive and negative) around the plant

Phloem moves organic molecules, like sugars, around the plants

The sporophyte is the dominant phase in the life cycle

Pteridophytes (chapter 17)

Club mosses - the Lycophytes	<i>Selaginella</i> is the only genus of the family Selaginellaceae	Most are found in tropical areas, and a few (seven genera) are found in the US and Canada	The club mosses are homosporous
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<i>Selaginella</i> has an herbaceous sporophyte that bears microphylls. Its sporophylls are arranged in strobili	<i>Selaginella</i> has a ligule (small, scalelike outgrowth) with unisexual gametophytes	The club mosses have sporangia, which are modified leaves (or leaf-like organs) that bear the spore-producing sporangia	Each sporophyte of <i>Selaginella</i> has a single sporangium
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Pteridophytes (chapter 17) (cont)

In the US and Canada, nonphotosynthetic sporophylls are grouped into strobili (cones) at the ends of the aerial branches	Megaspores produce megasporangia	Spores of club mosses bring bisexual gametophytes about during germination	Microsporophylls produce microsporangia
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Megaspores and microsporangia occur in the same strobilus	The sperm of <i>Selaginella</i> require water to swim to the archegonia and fertilize the eggs. Fertilization occurs after the gametophytes have been shed from the strobilus	<i>Isoetes</i> , the quillworts, is the only genus of the family Isoetaceae	<i>Isoetes</i> is heterosporous
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Pteridophytes (chapter 17)

Ferns - the Monilophytes	The phylum Monilophyta is made up of the ferns and horsetails	There are four major lineages of the Monilophytes: the Psilotopsida, the Marattiopsida, the Polypodiopsida, and the Equisetopsida	Ferns either eusporangiate or leptosporangiate terms the structure and method of development of their sporangia
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In a eusporangium, the parent cells are located at the surface of the tissue from which the sporangium is produced	Leptosporangia come from a single superficial parent cell, which divides transversely or obliquely	Sporangia are stalked, and each has a special layer of unevenly thick-walled cells called an annulus	The leaves of the Polypodiopsida are called fronds. The fronds are megaphylls, and they're most conspicuous of the sporophyte
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Pteridophytes (chapter 17) (cont)

The ferns are the only seedless vascular plants to have well-developed megaphylls

The fronds are compound; the lamina is divided into **pinnae** (leaflets), which are attached to the **rachis** (extension of the leaf stalk)

In many genera of ferns, young sori are covered by specialized outgrowths of the leaf called the **indusia** (singular: indusium)

The sporangia occur in clusters called sori (singular: sorus)

Gametophytes typically develop rapidly into a flat, heart-shaped structure called the **prothallus**

Pteridophytes (chapter 17) (cont)

Circinate venationThe rhizomes of the water ferns grow in the mud, in damp soil, or often with the leaves floating on the surface of the water

The leaves of *Marsilea* resemble the leaves of a four-leaf clover

Azolla and *Salvinia* are small ferns that float on top of the water

Gymnosperms: chapter 18

Coniferophyta (the conifers)	Cycadophyta (the cycads)	Ginkgoophyta (ginkgo, or maidenhair tree)	Gnetophyta (the gnetophytes)

Gymnosperms

Characteristics of gymnosperms

Seeded, vascular plants

There are extinct and living gymnosperms

The extinct gymnosperms are the seed ferns and the cordaites

There are four phyla of living gymnosperms. They are: Coniferophyta (the conifers), Cycadophyta (the cycads), Ginkgoophyta (the ginkgo, or maidenhair, tree), and Gnetophyta (the gnetophytes)

Their seeds and ovules are exposed on sporophylls (modified leaves)

Microgametophytes (male gametophytes) develop as pollen grain. Water isn't required as a medium for transporting the sperm to the egg

Gymnosperms (cont)

Pollination is when the pollen grain (partly developed microgametophyte) is transferred bodily to the vicinity of a megagametophyte (female gametophyte) within an ovule

Angiosperms

Angiosperms



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