

Phylum: PTERIDOPHYTA – PTERIDOPHYTES

Pteridophytes are the first group of plants with **true vascular tissues** – hence the name “vascular plants”. The so-called sporophyte generation of pteridophytes is characterized by true roots, stems and leaves. Haploid reproductive structures, termed **spores**, are formed by meiosis on the sporophyte (spore-bearing) plant in sac-like structures called **sporangia** (Singular: sporangium). The spores fall from the sporophyte, and when conditions are optimal, the spore starts to germinate, and a small green plate, termed **prothallium** (prothallus) will develop. The prothallus bears the sex organs, which produce gametes – thus the prothallium means the **gametophyte** (gamete-bearing) generation of the plant. Following fertilization (the fusion of the gametes), the zygote will develop – through a series of mitosis – into the diploid sporophyte plant (with root, stem and leaves).

The phylum Pteridophyta can be broken down into three classes: Lycopsidea (club mosses), Sphenopsida (horsetails) and Pteropsida (ferns).

Classis: LYCOPSIDA

Ordo: Lycopodiales

Familia: Lycopodiaceae – Club mosses

As indicated by their name “club mosses”, some family members may in fact resemble a large moss, but they are true vascular plants. **Sporangia** (the spore-holding plant structures) develop on specialized leaves termed **sporophylls**. In some species the sporophylls are similar to the vegetative leaves. In other family members, e.g. in *Lycopodium* species, the sporophylls differ in size or shape from vegetative leaves and are grouped at the tip of the shoot, forming the so-called cone or strobilus (Plural: strobili). *L. clavatum* (wolf’s-foot clubmoss, foxtail clubmoss or groundpine) is the most widespread species in the genus *Lycopodium*. Being confined to undisturbed sites with acidic soils, it is endangered and protected in many areas, including Hungary. The shoots grow mainly prostrate along the ground, the stems are branched and densely covered with small, spirally arranged leaves. The branches bearing the yellow-green spore cones turn erect, reaching 5-15 cm above ground. The spores of this clubmoss, “Lycopodium powder”, were used as flash powder in early photography. The drug “Lycopodium” has been used as a dispersant and homogenizing agent, as well as talcum powder. The plant parts of some club mosses contain toxic alkaloids like lycopodin.

Classis: SPHENOPSIDA (EQUISETOPSIDA)

Ordo: Equisetales

Familia: Equisetaceae – Horsetail family

Members of the horsetail family are characterized by ribbed **stems**, these often associated with internal hollow canals; reduced, whorled **leaves** that are usually marginally fused; **sporangiophores**, each of which consists of a peltate axis bearing sac-like structures called sporangia (holding the spores); and photosynthetic **spores with elaters**.

The field horsetail or common horsetail (*Equisetum arvense*) is native to the northern hemisphere. We can distinguish two types of stems in this species. The fertile, spore-bearing stem appears from the rhizome in early spring; its yellowish-brown color indicates that it is not able to photosynthesize, but utilizes the stored nutrients of the rhizome. The sterile (lacking spores), green stem starts to grow after the fertile stem has wilted, its main task being photosynthesis. The sterile shoots (*Equiseti herba*) are collected for medical purposes, due to their excellent diuretic (promotes the formation of urine by the kidney) and antiphlogistic (inflammation reducing) effect.

Care must be taken to avoid contamination of the above drug with the superficially similar marsh horsetail (*E. palustre*), which is rich in the toxic alkaloid palustrin. In the latter species the fertile shoots are green and shaped like the sterile shoots.

Classis: PTEROPSIDA

Most ferns have a horizontal, modified stem, the **rhizome**, which is usually underground. Some ferns have erect aerial stems, while others are vines. The immature leaves are often coiled and are known as **fiddleheads** or croziers. The mature leaves, called **fronds**, come in a great variety of forms, but are in most cases divided or compound leaves. The sporangia are usually aggregated into clusters, known as **sori** (Singular: **sorus**), which may or may not be covered by a flap of tissue, the **indusium**.

Ordo: Aspidiales

Familia: Aspidiaceae

The (common) male fern (*Dryopteris filix-mas*) is one of the most common ferns of the temperate northern hemisphere. The half-evergreen, bipinnate leaves are upright and reach a maximum length of 1.5 m. On the abaxial (lower) side of the leaf blade, sori – covered by indusium – develop in two rows. The rhizome was used until recently as an **anthelmintic** (a drug that expels parasitic worms, called helminths, from the body) to get rid of tapeworms.

Ordo: Polypodiales

Familia: Polypodiaceae

Common polypody (*Polypodium vulgare*) develops from a horizontal rhizome. The 10 to 50 cm long fronds are divided all the way back to the central stem (rachis). The sori are found on the lower side of the leaf blade. The rhizome has traditionally been used in some confectionery, due to its bittersweet taste, attributed to the presence of a triterpene saponin, called osladin, which is 500 times sweeter than sucrose. The dried rhizome has been used in traditional medicine as a purgative and anthelmintic, due to it containing phytoecdysteroids.