

LAB No. II:

MORPHOLOGICAL STUDY

(LICHENS AND FERNS)

Classification of Plant Kingdom

- **Bacteriophyta (Schizophyta)**
- **Cyanophyta**
- **Phycophyta**
- **Mycophyta**
- **Bryophyta**
- **Pteridophyta**
- **Spermatophyta**
 - **Gymnospermae**
 - **Angiospermae**
 - **Monocotyledones**
 - **Dicotyledones**
 - **Apetalae**
 - **Dialypetalae**
 - **Sympetalae**

TERMINOLOGY

Spore: is a unit of sexual or asexual reproduction that may be adapted for dispersal and for survival, often for extended periods of time, in unfavorable conditions.

Sporangium (pl., **sporangia**) is an enclosure in **which spores are** formed.

Sorus (pl., **sori**) : Sporangium community.

Indusium: membranous cover which surrounds the sori.

Ascus: Pouchlike structures that produce spores.

Hyphe (pl., **Hyphea**) Fibrous structures forming fungi

Mycelium: Community of hyphea.

Fructification: It is a system consisting of a set of hyphea. The vegetative part forms sporangiums. Among these, **infertile** hyphae form the hymenium layer.

Symbiosis (common life): Different organisms come together to form a common life form (shared nutrition and lifestyle (eg: lichens (Fungi-algae))

Thallus: Plant organs which does not consist of true roots, stems and leaves.

Apothecium: Reproduction units in the form of a small bowl on the thallus in various colors such as black, brown, orange, yellow. Sometimes they are embedded in thallus.

LICHENS

- **Lichens are composite organisms consisting of a symbiotic association of a fungus (the mycobiont) with a photosynthetic algae**
- **They look like a moss; do not have roots, stems and leaves.**

They can be grouped as follows according to their habitats:

1. Lichens living on the trunk, branches or leaves of living trees (*Usnea, Cladonia*)

2. Lichens living on logs, fences and similar places (*Cladonia*).

**3. Lichens living on the soil
(*Cladonia*).**

**4. Lichens living on calcereous, siliceous rocks (*Parmelia isidiotyla*, *P. consparsa*,
Rhizocarpon geographicum)**

Lichens can be grouped according to their shapes owing to their thalli having different forms:

1. Shrubby Lichens

a) Branch like lichens

b- Filiform lichens:

2- Leafy lichens: *Cetraria*, *Parmelia*, *Sticta*, *Petigera*, *Xanthoria*, *Lobaria*

3- Testaceous lichens

1. *Parmelia furfuracea*

Thalli are leaf-shaped (in the leafy lichen group).

-It lives on tree trunks or rocks.

-Thalli are shrubby and bifurcated, the upper surface is ash-colored, and the lower surface is gray-black (thallus is thicker compared to *Evernia prunastri*).

2. *Evernia prunastri*

Lichen Quercinus

Shrubby-branch like lichens.

It is common in the Aegean and Mediterranean, especially in the beech, hornbeam and maple trees.

The upper side of the thallus is green, the lower side is whitish.

Tallus is bifurcated.

3. *Lobaria pulmonaria* (lung lichen)

Since the lobes on the underside resemble the lobes of a lung, this species have been used in respiratory diseases.

It also has a mild antibacterial effect. Tea preparations werw also used as a laxative.

-It is found in the group of leafy lichens.

- The lower part is dark brown and the upper part is grayish-brown

4. *Usnea barbata* (beard lichen)

It is found in the shrubby-filiform lichen group.

- Saggy, thready and very branched thallus.**
- Small bowl-shaped yellowish-green apothecia are present on the thallus.**

5. *Cladonia pyxidata* (cup lichen)

Lichen Pyxidata

- Branch like lichen.
- Thalli are 1.5-2.5 cm in length, with a long stem. Colour is **whitish-green**

Division: PTERIDOPHYTA
(Vascular Cryptogams, Pteridophytes)

PTERIDOPHYTA

- **This division contains the most developed autotrophic land plants among the cryptogams . The plants have roots and stems and they have floem and xylem (vascular bundles)**
- **They prefer damp and shady places.**
- **They are mainly located in tropical and subtropical regions.**

3 classes are present:

Equisetatae

Lycopodiatae

Filicatae

Class: Filicatae (Ferns)

Ordo: Filicales

Autotrophic land plants that have developed the most among sporophyte plants.

1. P.N: *Phyllitis scolopendrium* (Harts tongue= Geyikdili)

- Fam: **Aspleniaceae**
- Leaves are simple, wide striped.
- The **sori (sorus, singular)** are located on the **lower face of the leaf**, on both sides of the midvein, linear and parallel to each other **with 45° angle**.
- **Indusium is present.**

2. P.N: *Polypodium vulgare* (Common Polypody = Kaya eğretilisi = Benekli eğretiliotu)

- **Fam: Polypodiaceae**
- Perennial, fleshy rhizome, grow between rocks or on trees. **The leaves are pinnatifid**, the lobes are long oblong, the edges are smooth or toothed. **The sori are rounded, distinctive, lined up along two sides of the midvein of the lobes.**
- **Indusium is not present.**
- **Rhizoma Polypodii (Polypodii rhizoma) contains saccharose and saponosides and used as expectorant, cholagogue and laxative.**

3. B.A: *Dryopteris filix-mas* (Male Fern = Erkek eğreltiotu)

- **Fam: Aspidiaceae**

- **Male Fern is** a perennial herbaceous plant. It has thick and dark brown rhizome.
- Vascular bundles are arranged like a **horseshoe on a rhizome.**
- **Rhizome is covered with yellowish brown scales.**
- The leaves are large, bipinnate, lobes are obtus, crenate. A part of the **stalk and rachis covered with yellowish brown scales.**
- Sori are lined up on both sides of the midvein (lined on two rows on the lower surface of the lobes) **up to 9 pairs and 1.5 mm in diameter.**
- **Indusiums are kidney-shaped.**

- **Sori** are found on opposite sides of the midvein of the **pinnula**.
Indusium is present, covers the sorus completely.
- Its shape is **kidney** like.
- **Indusiums** are a glabrous (rarely hairy), thinly membranous structures.
- **Sporangia** are stalked and have annulus. The annulus is not complete and it is thickened in the shape of a horseshoe.
- **Sporangiums** are ripped transversely from the annulus tip in maturity.

4.B.A: *Adiantum capillus veneris* ((Black maidenhair fern, Venus hair fern, baldırıkara, venüs saçı)

- **Fam: Adiantaceae**
- **Herba Adianti (Folia Adianti) T.K.** (the leaves of the plant). **Contains mucilage and bitter compounds.** Used especially in children as antitussive and expectorant.
Leaves have black petioles, they are flabelliform, lamina base is cuneate and leaves show dichotomic venation.
- **Leaf edges are curved to the lower surface at apex; Sorus is found within these folds**
- **Indusium is not present.**