

CHAPTER 2. EMBRYOPHYTES (CORMOPHYTES)

I. Definition

Embryophytes (or **Cormophytes**) are terrestrial plants that are **multicellular with true tissues**, unlike **Thallophytes** which are primitive and lack organized tissues.

Key features of Embryophytes:

- True vegetative structures (stem, leaf, root)
- Specialized tissues
- Reproduction via **haplodiplophasic life cycle** (alternation of generations)
- Presence of **reproductive structures** and **protective molecules**

II. Vegetative Apparatus

The vegetative body of embryophytes is called the **cornus**, composed of **stem, leaf, and root**.

1. Stem

- Indefinite growth due to a **terminal bud**
- Bears **leaves** and **axillary buds** at nodes separated by internodes
- **Axillary buds** allow branching
- **Phytomere**: Repeating unit of stem + leaf + axillary bud + internode
- Types:
 - **Herbaceous**: Green, flexible
 - **Woody**: Brown, rigid

2. Leaves

- Contain **chlorophyll** → main site of **photosynthesis**
- Responsible for **transpiration**

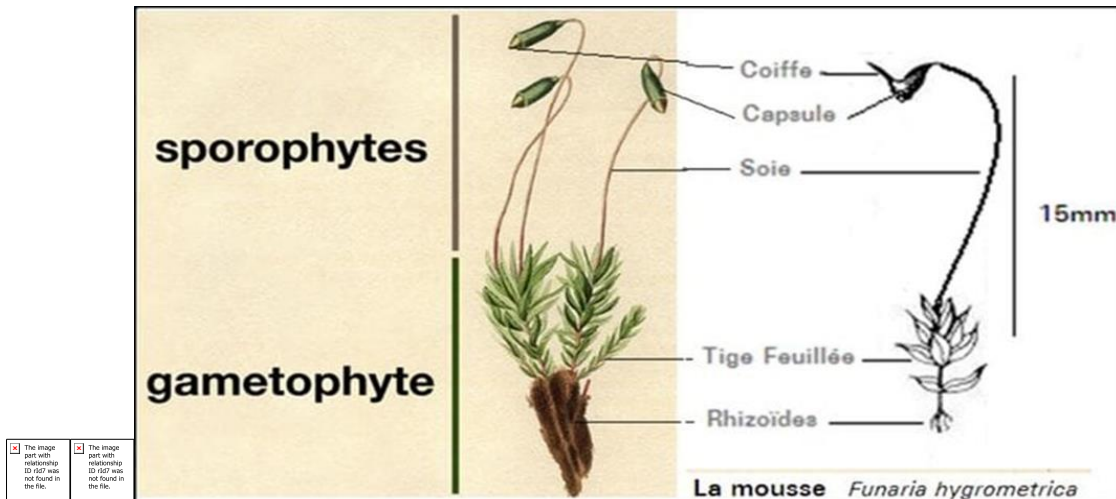
3. Buds

- **Growth zones** where new stems and leaves develop
- Types:

- **Apical cell:** in Bryophytes & Lycophytes
- **Meristems:** groups of dividing cells in Spermatophytes

4. Root System

- Connects plant to the soil
- Can be **rhizoids** (primitive) or **true roots** (vascular plants)

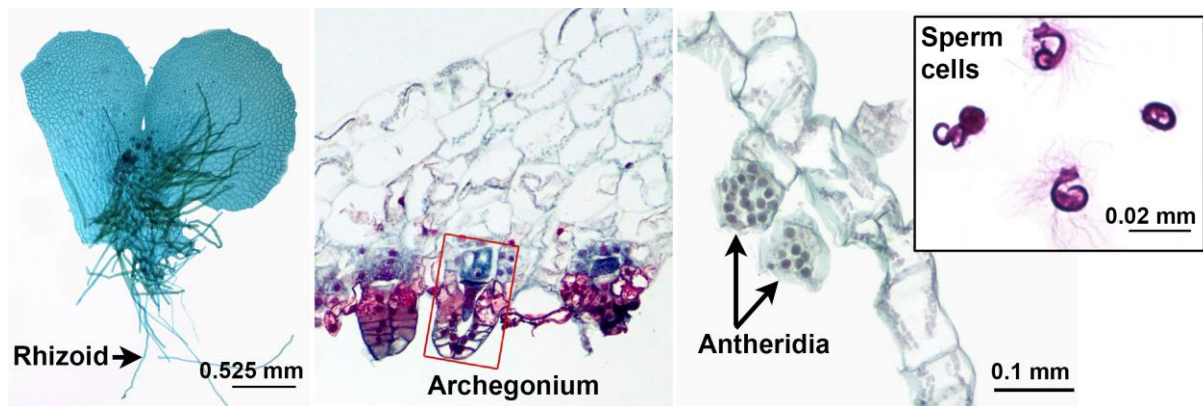


III. Reproductive Structures

- Structures are **sacs with multicellular walls** where gametes (**gametangia**) or spores (**sporangia**) form

1. Gametangia

- **Female gametangia: Archegonia** → contain **1 oosphere** (female gamete)
- **Male gametangia: Antheridia** → contain **multiple spermatozoa** (male gametes)



2. Fertilization & Embryo

- Male gamete (**spermatozoon**) fertilizes female gamete (**oosphere**) → **zygote (2n)**
- Zygote develops into an **embryo**, which grows **at the expense of maternal tissue**, giving the taxon its name (*Embryophytes*)

IV. Reproduction in Embryophytes – Haplodiplophasic Life Cycle

Alternation of Generations

Embryophytes reproduce through a **haplodiplophasic life cycle**, also called **alternation of generations**, which means the plant alternates between **two distinct phases**:

1. **Gametophyte (n) – haploid phase**
2. **Sporophyte (2n) – diploid phase**

1 Gametophyte (n)

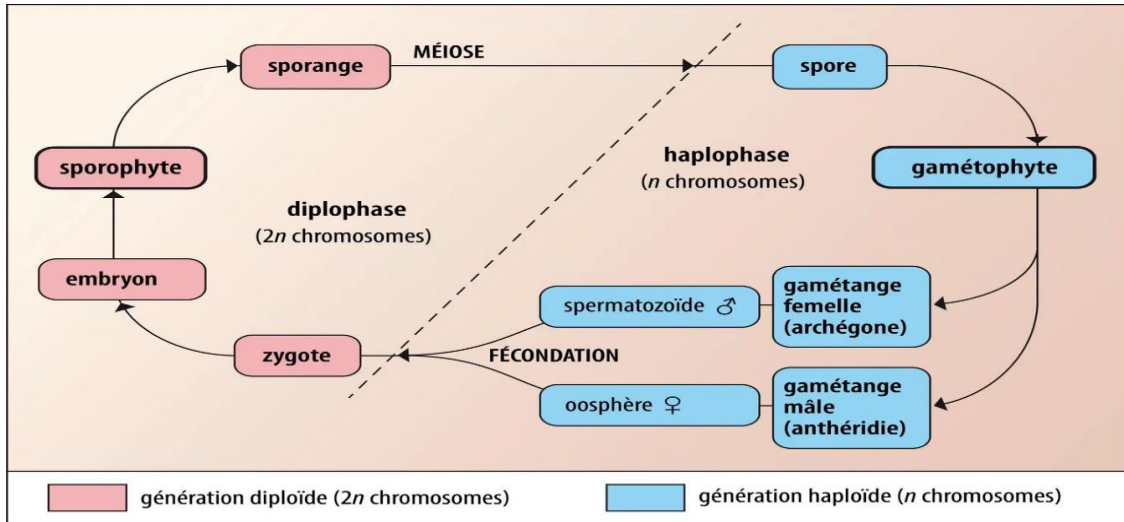
- Haploid (n) phase of the plant.
- Produces **gametes**:
 - Female → **egg (Oosphere)**
 - Male → **sperm (Spermatozoa)**
- In bryophytes, the **gametophyte is the dominant stage**.

2 Fertilization

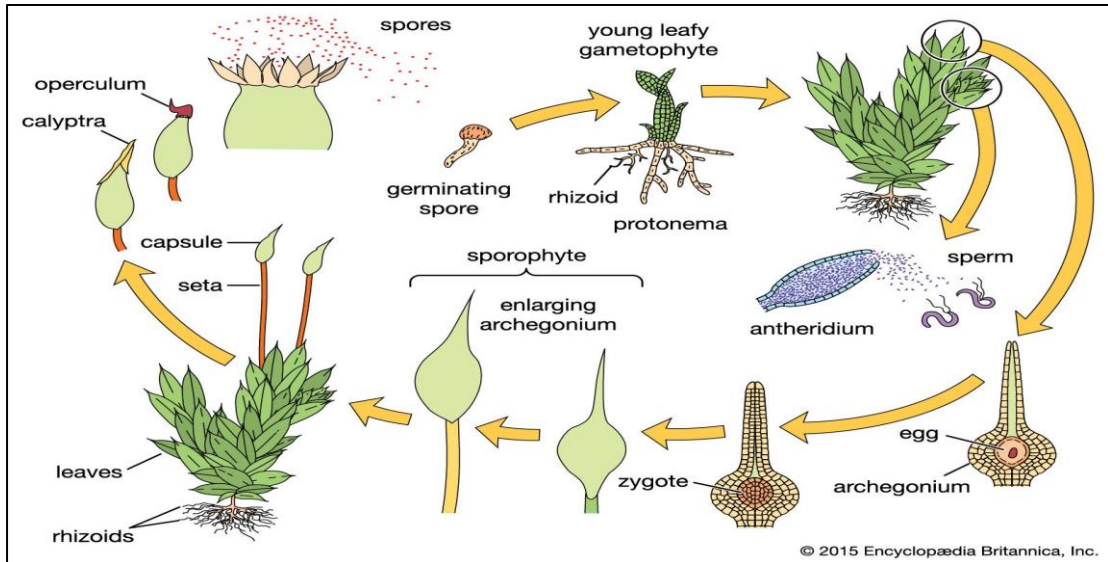
- Male gamete swims to the female gamete → forms **zygote (2n)**.
- Water is often required for fertilization in lower embryophytes (like mosses).

3 Sporophyte (2n)

- The zygote develops into the **sporophyte**.
- In most lower plants, the sporophyte **depends on the gametophyte for nutrition**.
- Produces **haploid spores (n) through meiosis**.
- Spores are released and grow into a new **gametophyte**, completing the cycle.



Example: The life cycle of the mosse



IV. Protective Molecules

Plants produce **molecules to protect against desiccation and UV rays**:

Molecule	Function
Cutins	Lipid polymer forming a cuticle on epidermis (except Bryophytes), prevents water loss
Sporopollenins	Resistant molecule in spore walls , protects against desiccation
Anthocyanins	Pigments in epidermis, absorb harmful UV rays