

# Introduction to Botany. Lecture 32

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# Questions and answers

## Quiz



# Final question (2 points)

What is a heartwood?



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What is a heartwood?

- Non-functional xylem in the center of stem.

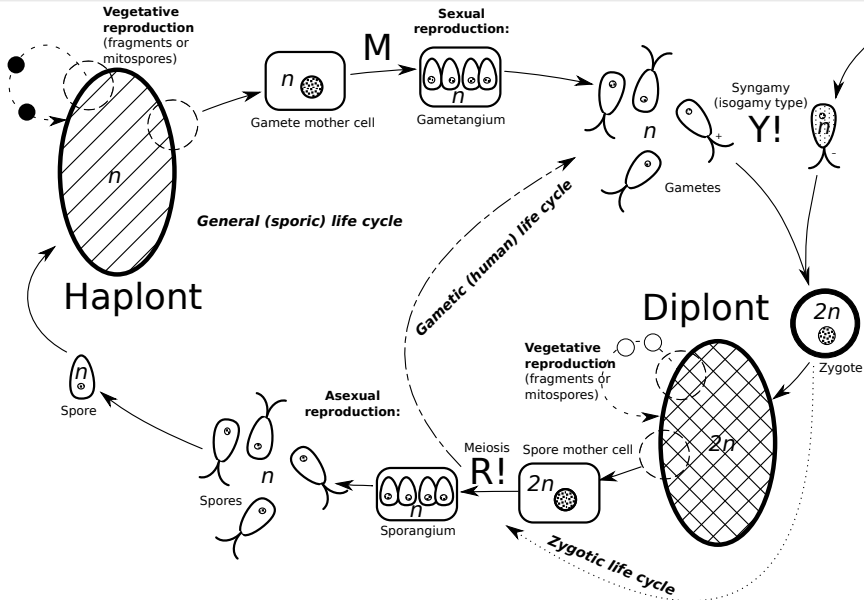


# Branching, thickening and seed

## Origin of seed

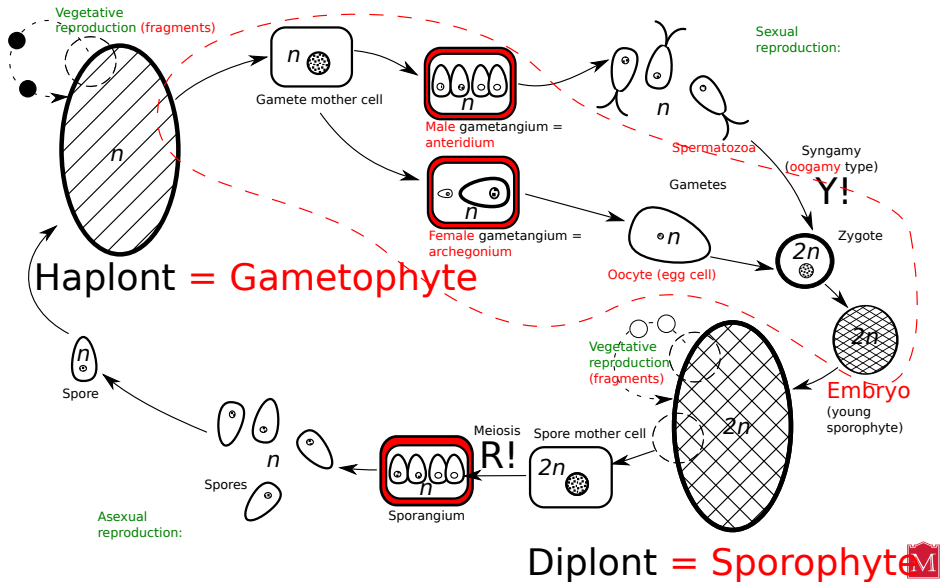


# General life cycle

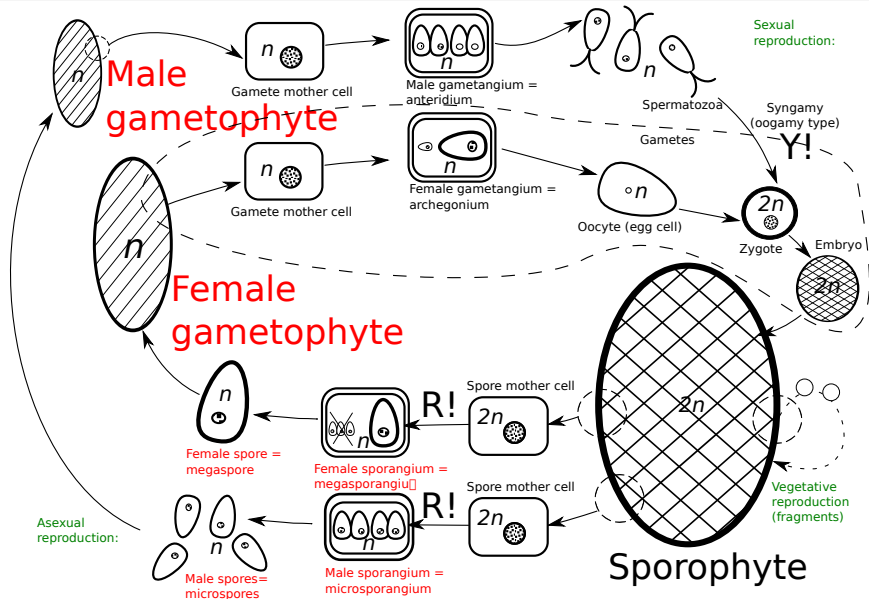




# Life cycle of land plants: differences



# Heterosporic cycle: differences

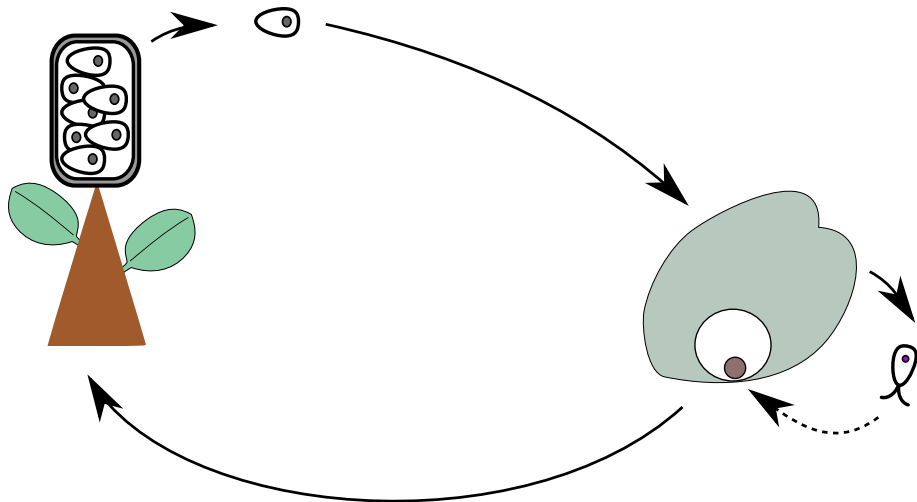


# Origin of seed

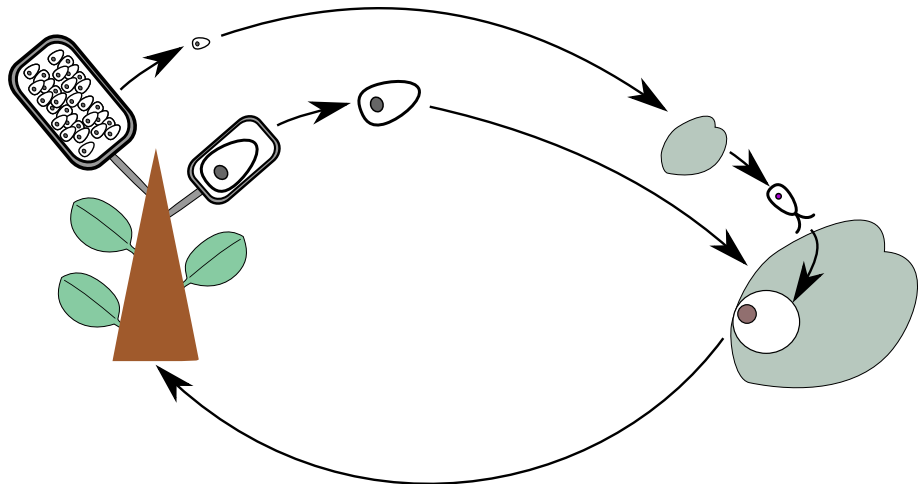
- “**Dinosaur problem**”: without control on the *r*-strategic gametophyte, *K*-strategic tree sporophyte cannot guarantee its reproduction
- **Seed is the result of enforced control of sporophyte over gametophyte**
- Growing of gametophytes, syngamy (fertilization) and growing of daughter sporophyte—everything happens **directly on mother sporophyte**



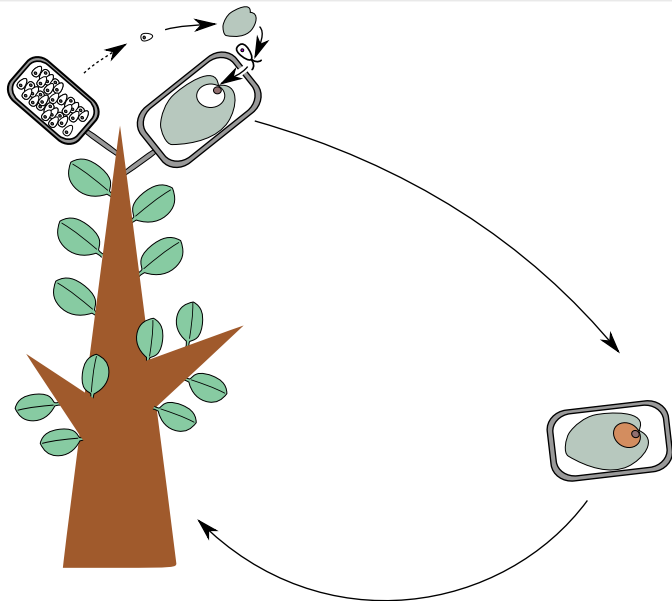
# Seed origin: step I, homosporous



# Seed origin: step II, heterospory



# Seed origin: step III, seed



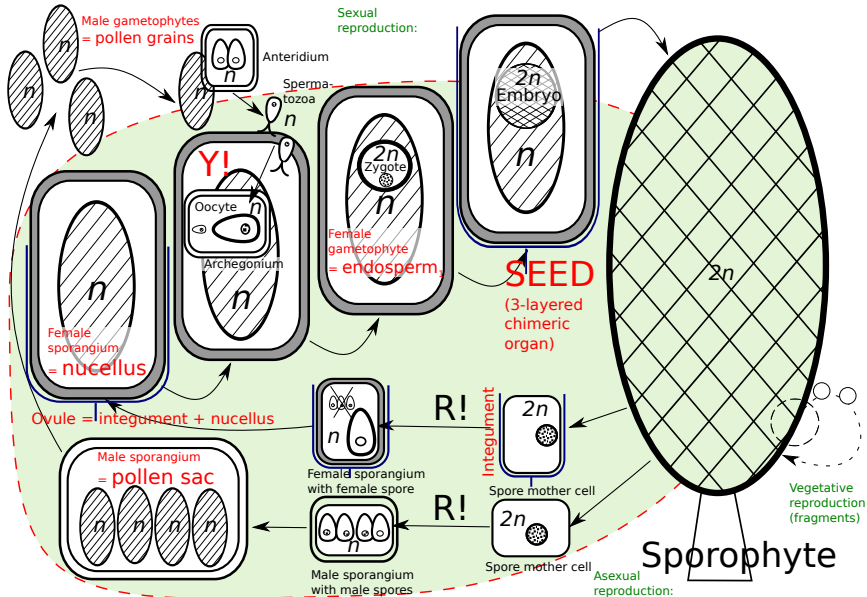
# Seed plants have life cycle where almost all stages happen on mother sporophyte

## Terms covered:

- Ovule and integument
- Nucellus and pollen sac
- Pollen grains and endosperm
- Seed



# Seed plant cycle: differences





# Summary: the seed

- Seed is a **chimeric organ** with three layers: (1) mother sporophyte tissue (integument + nucellus), (2) female gametophyte tissue (endosperm) and (3) daughter sporophyte (embryo)
- Biggest disadvantages of having seed are: (a) low probability of fertilization (pollination needed) and (b) overall slowness of cycle
- “Hot spots” of seed life cycle: (1) pollination with wind, insects or anything, (2) fertilization with **pollen tube** and (3) reduction of gametophytes



# Final question (2 points)



# Final question (2 points)

TBA



# For Further Reading



A. Shipunov.

*Introduction to Botany* [Electronic resource].

Mode of access:

[http://ashipunov.info/shipunov/school/biol\\_154](http://ashipunov.info/shipunov/school/biol_154)

