

Introduction to Botany. Lecture 25

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Outline

1 Questions and answers

2 Life cycles

- From general life cycle to heterospory
- Origin of seed

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- 1 Questions and answers
- 2 Life cycles
 - From general life cycle to heterospory
 - Origin of seed

Previous final question: the answer

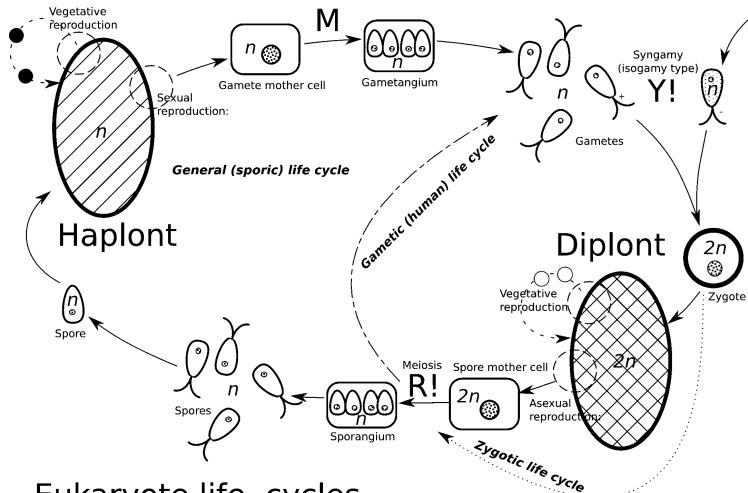
Why diplont is better than haplont?

Previous final question: the answer

Why diplont is better than haplont?

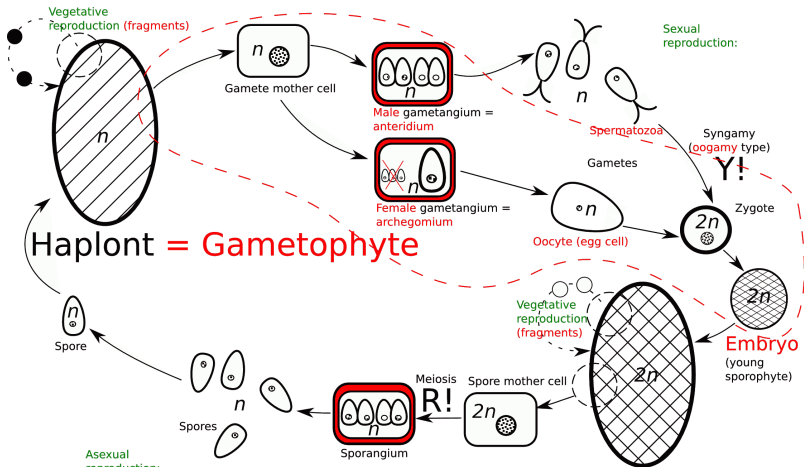
- More genes
- Recessive mutations are suppressed

General life cycle



Eukaryote life cycles

Life cycle of land plants: differences



Diplont = Sporophyte

Life cycles

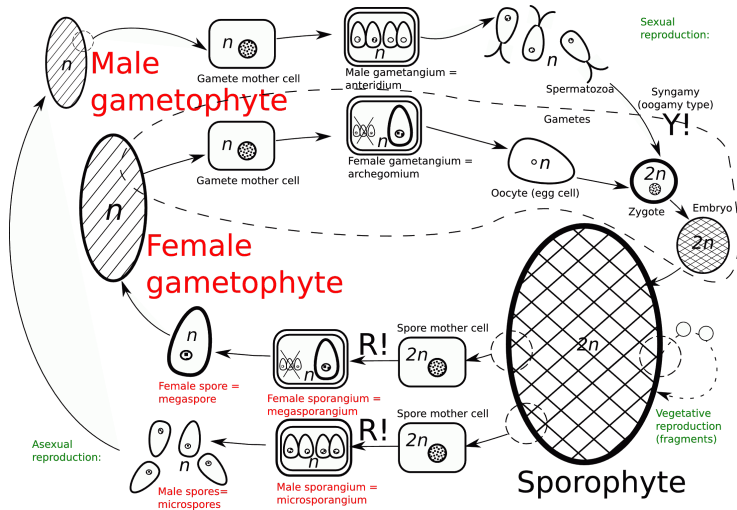
From general life cycle to heterospory

Heterospory

Terms covered:

- Male gametophyte, female gametophyte
- Microspores and microsporangium
- Megaspores and megasporangium

Heterosporic cycle: differences



Life cycles

Origin of seed

Origin of seed

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

Seed plant life cycle

Terms covered:

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

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

Summary

- Heterosporic plants have two kinds of spores: female (megaspores) and male (microspores)
- Seed plants have compact life cycle where almost all stages happen on mother sporophyte

Final question (3 points)

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If reproduction via seeds is better than reproduction via spores, why there are 10,000 species of ferns and only 600 species of gymnosperms?

For Further Reading



J. E. Bidlack, Sh. H. Jansky.
Stern's introductory plant biology. 12th edition.
McGraw-Hill, 2011.
Chapter 12.



Th. L. Rost, M. G. Barbour, C. R. Stocking, T. M. Murphy.
Plant Biology. 2nd edition.
Thomson Brooks/Cole, 2006.
Chapter 12.