

# Introduction to Botany. Lecture 23

Alexey Shipunov

Minot State University

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# Outline

- 1 Monday test
- 2 Life cycles
  - From general life cycle to the life cycle of angiosperms
- 3 Flower

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# Monday test (5 points)

1 Which of the terms is mismatched?

- ① male – sperm
- ② meiosis –  $1n$
- ③ mitosis –  $1n$
- ④ gamete –  $2n$
- ⑤ sporophyte –  $2n$

# Monday test (5 points)

2 The most recently evolved plant groups have:

- ① sporic life cycles
- ② gametic life cycles
- ③ zygotic life cycles

## Monday test (5 points)

3 In *Fucus*, which has a gametic life cycle, the only haploid phase is:

- ① a single-celled gamete
- ② a multicellular gametophyte
- ③ a single-celled sporophyte
- ④ a multicelled sporophyte
- ⑤ a multicelled egg

## Monday test (5 points)

4 Which choice does NOT belong to the pistil?

- ① microsporangium
- ② ovary
- ③ ovule
- ④ egg
- ⑤ 7-celled gametophyte

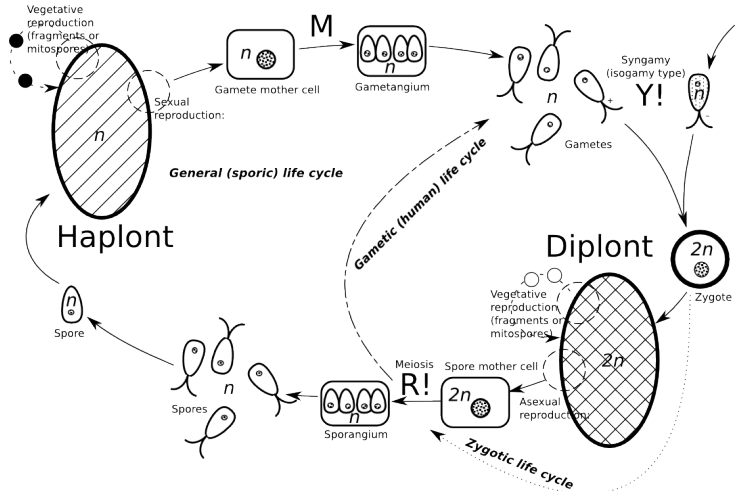


## Monday test (5 points)

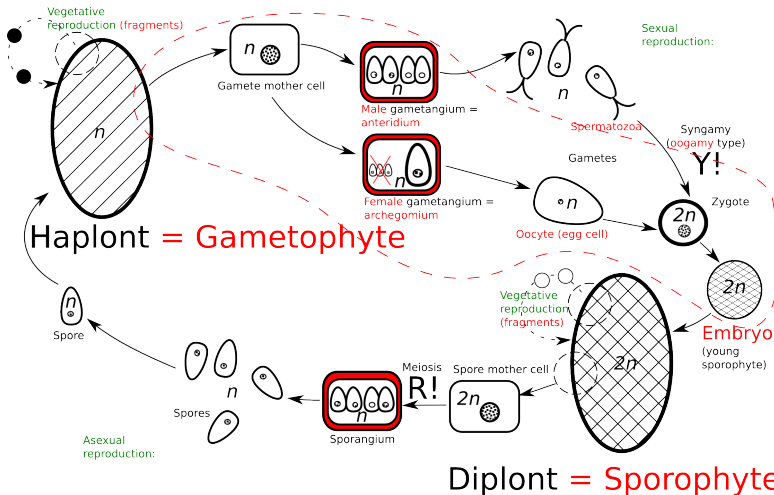
5 If meiosis takes place in an organism with a  $2n$  number of 48, how many pairs of homologous chromosomes at the end of meiosis in each daughter cell?

- 1 48
- 2 24
- 3 0
- 4 96
- 5 12

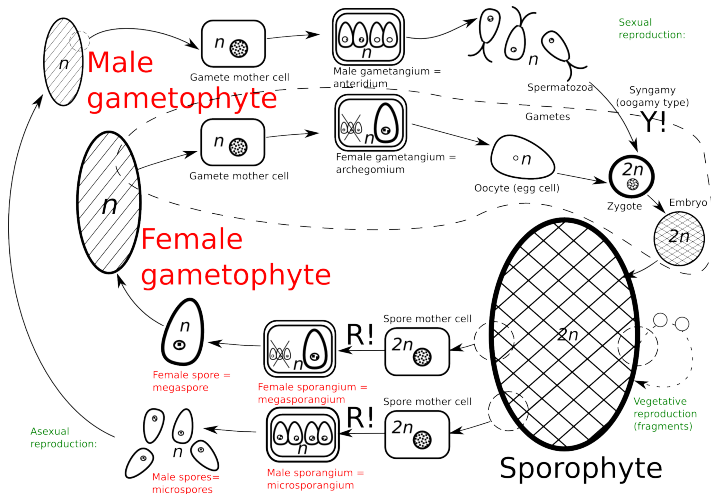
# General life cycle



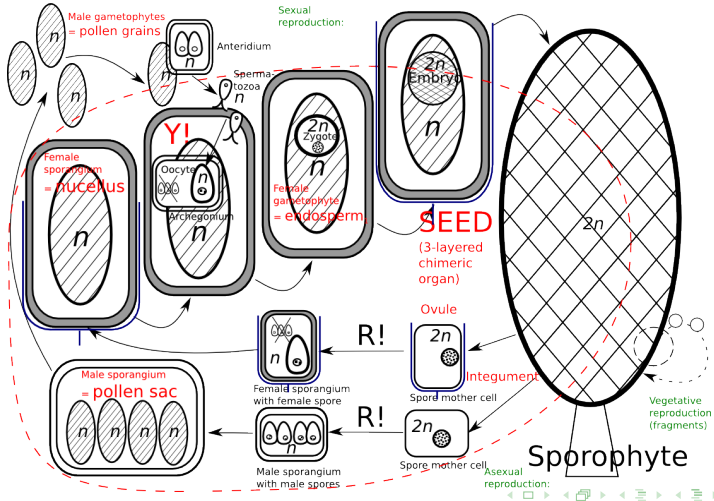
# Life cycle of land plants: differences



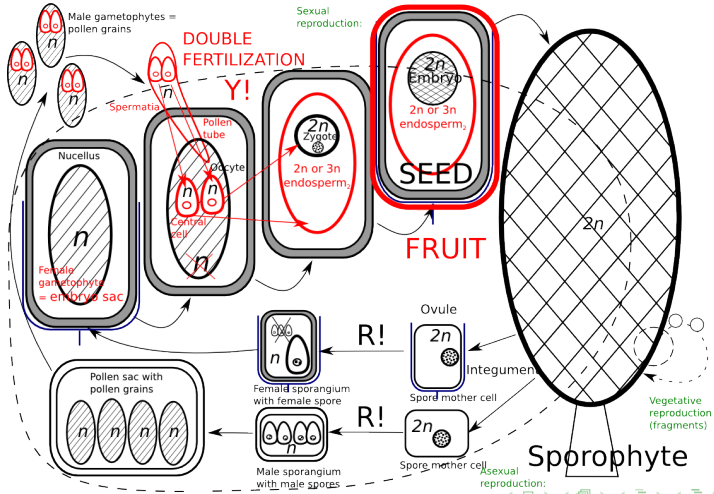
# Heterosporic cycle: differences



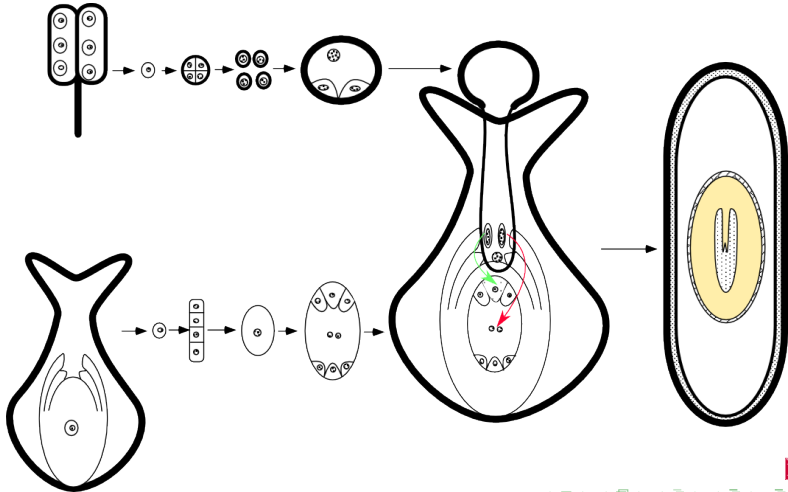
# Life cycle of seed plants: differences from heterosporic ferns



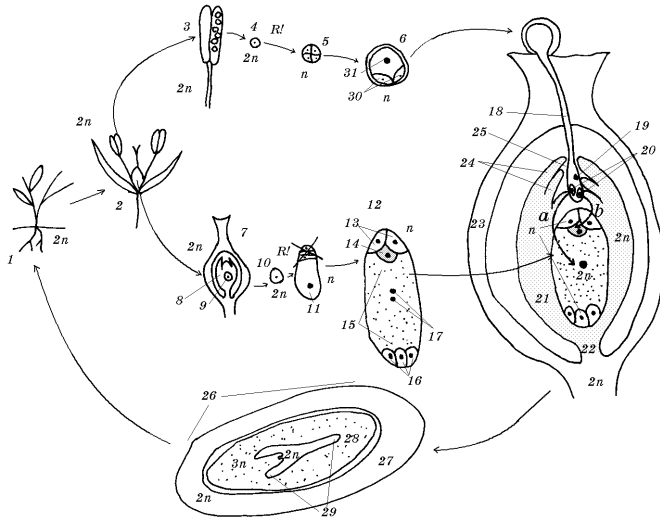
# Life cycle of angiosperms: differences from primitive seed plants



# Life cycle of angiosperms: relations between structures



# Life cycle of angiosperms: another view





# Life cycle of angiosperms: sources of optimization

- Reduction of everything, especially of haploid stages
- Signal role of second embryo (source of endosperm<sub>2</sub>)
- Well-developed pollination

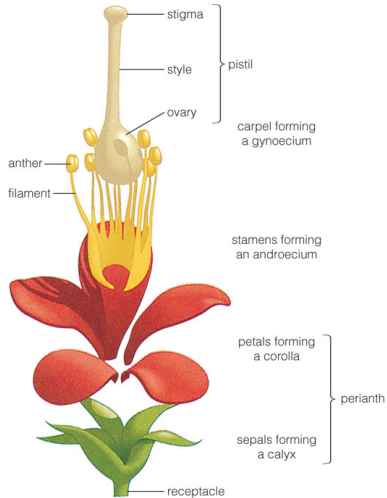
# Definition of flower

- Compact tree-zoned generative shoot
- Three main zones: sterile (perianth), male (androecium) and female (gynoecium)
- General characters: sex, merosity, symmetry, position of gynoecium

# Structure of flower

- Perianth
  - Simple perianth (consists of tepals)
  - Double perianth
    - Calyx (consists of sepals)
    - Corolla (consists of petals)
- Androecium (consists of stamens)
  - Filament
  - Anther (consists of pollen sacs)
- Gynoecium (consists of pistils)
  - Ovary (consists of carpels)
  - Style
  - Stigma

# Structure of flower



# Structure of ovary

- Locules and placentas
- Placentation: axile, central, parietal

# Summary

- Angiosperms accelerated their life cycle using (a) reduction, (b) signaling second embryo and (c) sophisticated pollination
- **Flower** is a compact three-zoned generative shoot
- Three main zones of flower: sterile (**perianth**), male (**androecium**) and female (**gynoecium**)

# For Further Reading



Th. L. Rost, M. G. Barbour, C. R. Stocking, T. M. Murphy.  
*Plant Biology*. 2nd edition.  
Thomson Brooks/Cole, 2006.  
**Chapters 12, 13.1–2.**