

Introduction to Botany. Lecture 14

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September 27, 2017



Outline

1 Questions and answers

- Quiz

2 Mitosis and meiosis

- Syngamy (Y!)
- Meiosis (R!)



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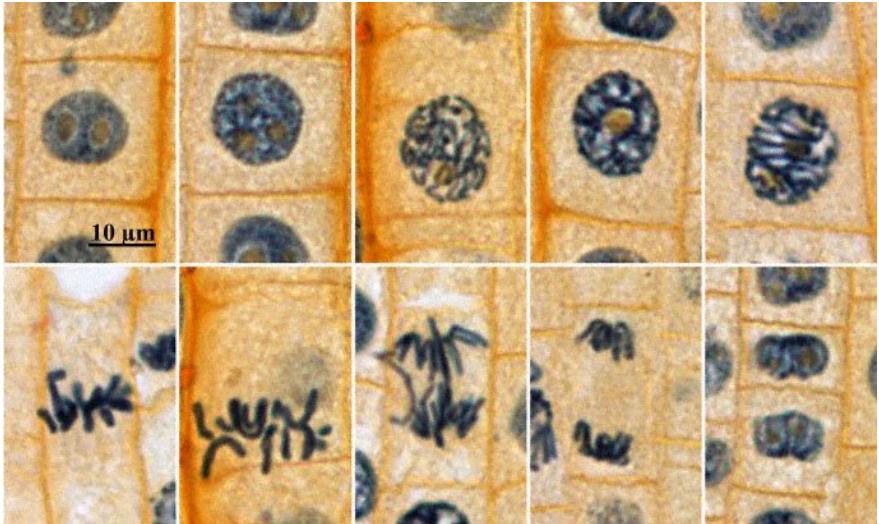
Questions and answers

Quiz



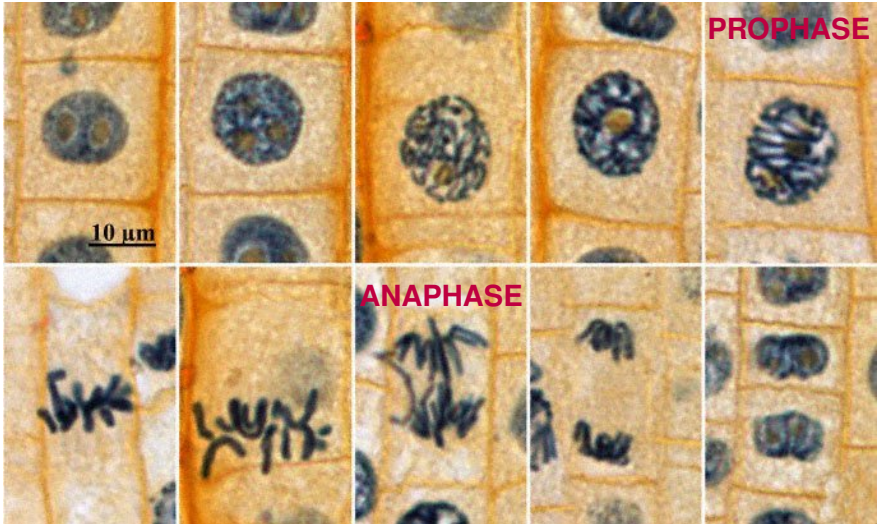
Final question (2 points)

Which stage?



Final question (2 points)

Which stage?



Mitosis and meiosis

Syngamy (Y!)



Why do living things support diversity

- Individual level: diverse genes increase adaptation
- Population level: diverse individuals make population survive



Exchange and renovation of DNA

- To sustain with the ever-changed environment, organisms must evolve (“Red Queen Law”)
- To evolve, they need a genetic diversity: different genotypes in different organisms
- To be genetically diverse, they need a process of genetic exchange
- One of ways of exchange is a sexual process in a form of **syngamy**
- However, constant syngamy will result in constant increase of DNA amount
- Meiosis is a counterbalance to syngamy



Definition of syngamy

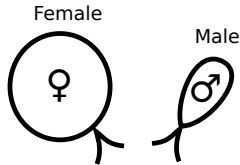
- *Fusion of two cells, where resulted cell will have two times more chromosomes*
- Initial cells are **gametes**, resulted cell is a **zygote**
- Chromosome formula: $X + X \longrightarrow XX$
- **The goal of syngamy** is the renovation of genetic material
- Syngamy changes genotype of cells



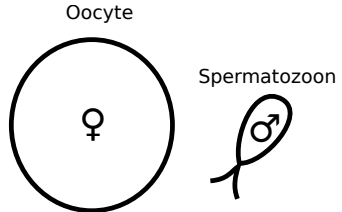
Types of syngamy



Isogamy:
different
genotypes



Heterogamy:
different
size



Oogamy:
different
motility

Mitosis and meiosis

Meiosis (R!)



Some useful terms: checklist

- Gene
- Protein
- Enzyme
- Genotype
- Phenotype
- Genome
- Population
- Mutation
- Syngamy



Final question (2 points)



Final question (2 points)

How do male and female gametes split their job?



Summary

- **Mitosis** is a equal division of DNA, **ploidy does not change**, **genotype does not change**
- **Syngamy** is a sexual process of cell fusion, **ploidy doubles**, **genotype changes**
- **Meiosis** is a process of reduction of DNA amount, **ploidy halves**, **genotype changes**



For Further Reading



A. Shipunov.

Introduction to Botany [Electronic resource].

Mode of access:

http://ashipunov.info/shipunov/school/biol_154

