Introduction to Botany. Lecture 28

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Outline

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Previous final question: the answer

What are adventitious roots?

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What are adventitious roots?

- Roots growing from the stem

Plant diversity

Systematics

Basics of systematics

Terms covered:

- Systematics = taxonomy
- Species, taxonomic hierarchy
- Taxon, rank = category, classification
- Kingdom, phylum, class, order, family, genus, species
- Subclass, subfamily and other intermediate ranks
- Subspecies and cultivars

Biological nomenclature

Terms covered:

- Binomial name, species epithet, reference = citation
- Priority, starting dates, synonyms
- Shortcuts: “sp.”, “spp.”, “s. l.” (wide sense), “s. str.” (strict sense), “i. s.” (position unknown)

Examples

		Example 1	Example 2
Kingdom	Regnum	Vegetabilia	Animalia
Phylum	Phylum	Spermatophyta	Chordata
Class	Classis	Angiospermae (Magnoliopsida)	Mammalia
Order	Ordo	Liliales	Primates
Family	Familia	Asparagaceae	Hominidae
Genus	Genus	*Chlorophytum*	*Homo*
Species	Species	*Chlorophytum comosum* (Thunb.) Jacq. 1862	*Homo sapiens* L.

Species name

Chlorophytum	comosum	(Thunb.)	Jacq.	1862
Genus name	*Species epithet*	*First author*	*Second author*	*Year of description*

Plant diversity

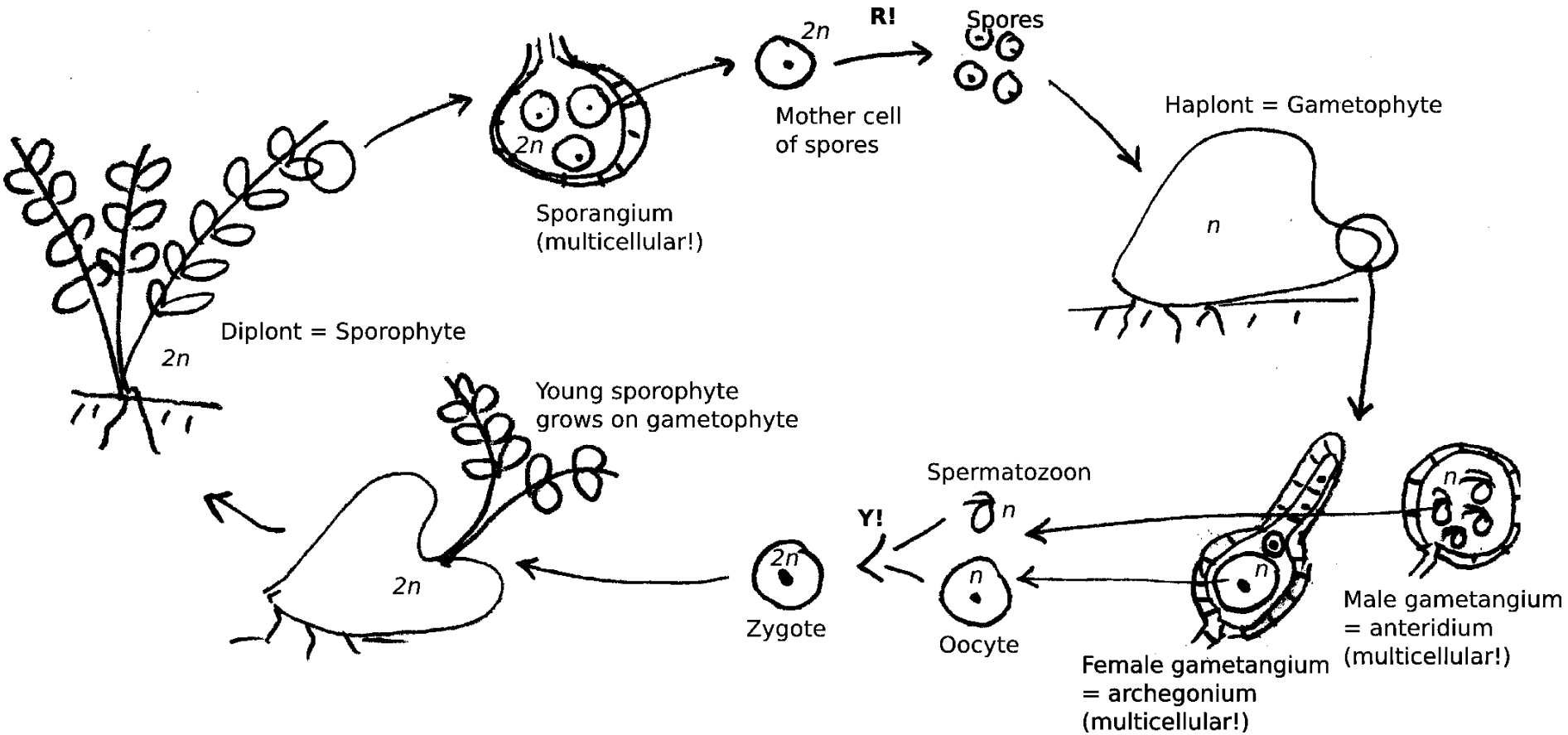
Kingdom Vegetabilia, land plants

Life cycle of land plants

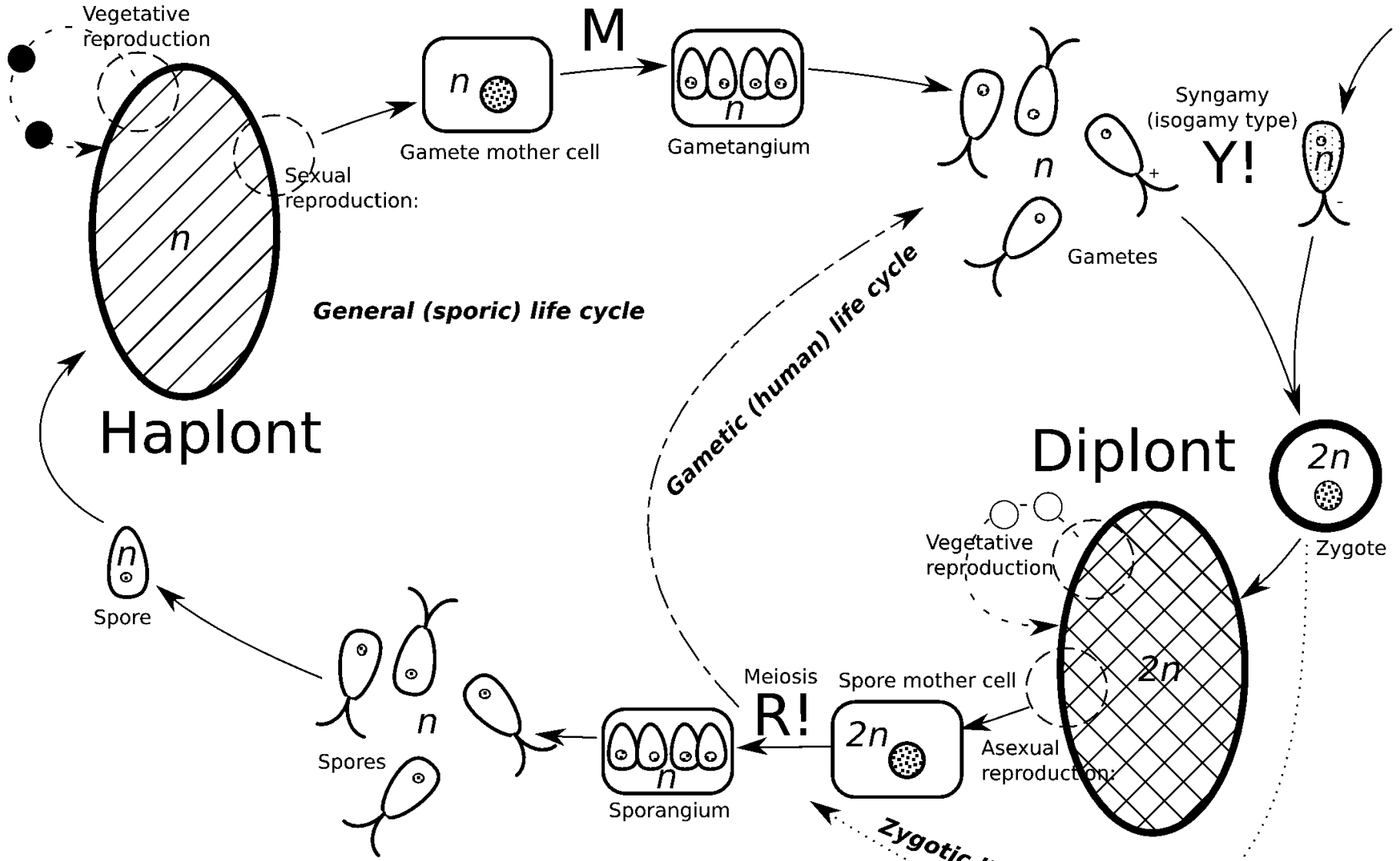
Terms covered:

- Sporophyte and gametophyte
- Archegonium and antheridium
- Spermatozoa and oocyte (egg cell)
- Embryo and parasitic sporophyte
- Predominance of sporophyte and/or gametophyte

Life cycle of land plants

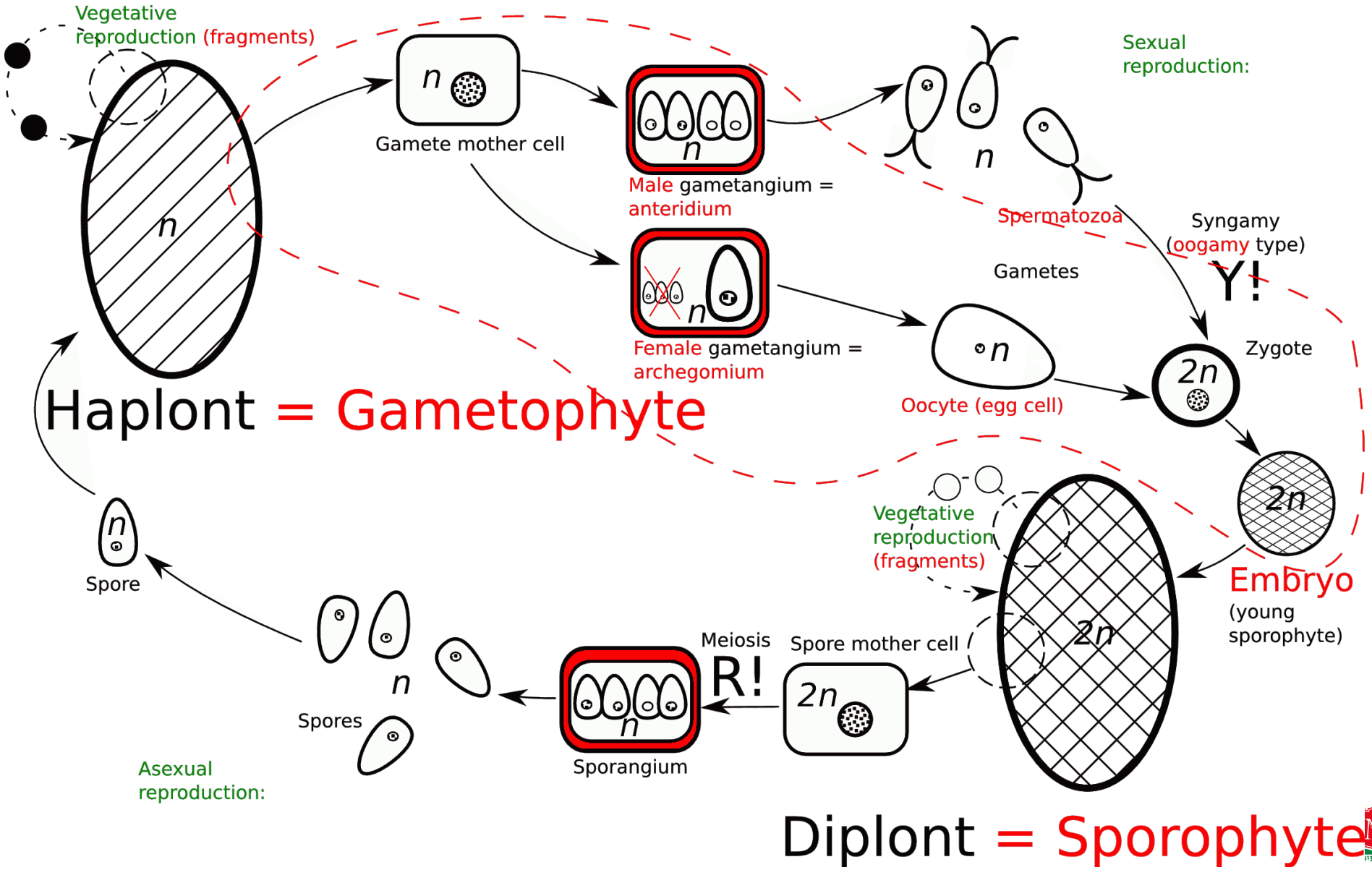


General life cycle



Eukaryote life cycles

Life cycle of land plants: differences



Three main phyla

- **Bryophyta**: gametophyte predominance
- **Pteridophyta**: sporophyte predominance, no seed
- **Spermatophyta**: sporophyte predominance, seed

Plant diversity

Phylum Bryophyta: mosses

Bryophyta

- $\approx 20,000$ species
- Sporic life cycle with gametophyte predominance*
- Sporophyte reduced to sporogon (sporangium with seta), usually achlorophyllous, parasitic
- No roots, only rhizoid cells (long hairy dead cells capable for apoplastic transport)
- Poikilohydric plants
- Gametophyte starts development from protonema

Protonema

Final question (2 points)

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Phylum, ..., order?

Summary

- Taxonomy studies the diversity of living things
- Seven main categories (ranks) are used to make the hierarchy in the classification
- Land plants have a sporic life cycle with multicellular gametangia and sporangia, oogamy and embryo.
- **Bryophyta**, **Pteridophyta** and **Spermatophyta** are three main phyla of plants$_2$.
- **Bryophyta** are only plants$_2$ with gametophyte predominance.

For Further Reading

A. Shipunov.
Introduction to Botany [Electronic resource].
2010—onwards.
Mode of access:
http://ashipunov.info/shipunov/school/biol_154

Th. L. Rost, M. G. Barbour, C. R. Stocking, T. M. Murphy.
Plant Biology. 2nd edition.
Thomson Brooks/Cole, 2006.
Chapters 18, 22.