

Introduction to Botany. Lecture 8

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Outline

- 1 Questions and answers
- 2 Tissues
 - Periderm
 - Poikilo- and homoiohydricity
 - Absorption tissues
 - Secretory tissues
 - Additional meristems

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- 2 Tissues
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Previous final question: the answer

What is common between xylem and phloem?

Previous final question: the answer

What is common between xylem and phloem?

- Complex tissues
- Transport
- Fibers and parenchyma



Results of Exam 1: statistic summary

Summary:

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
21.00	51.00	60.00	58.78	72.00	80.00	2

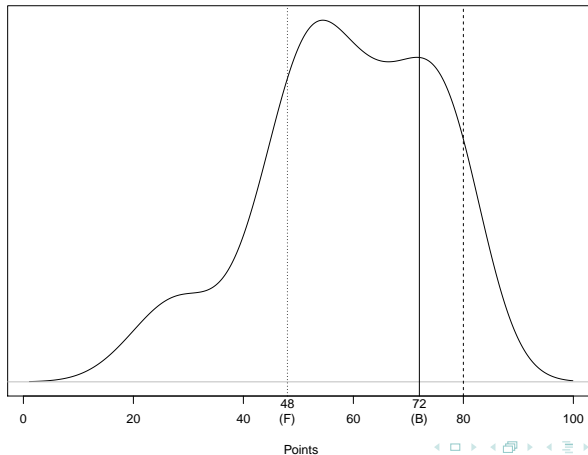
Grades:

F	D	C	B	max
48	56	64	72	80

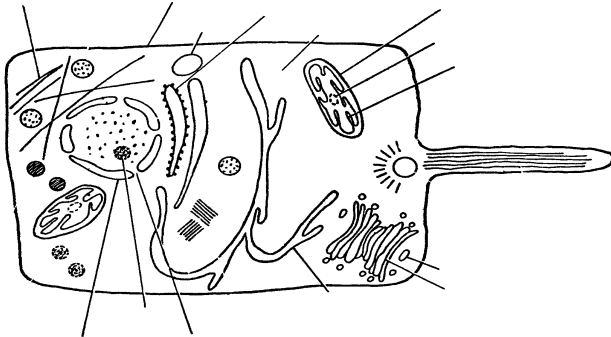


Results of Exam 1: the curve

Density estimation for Exam 1 (Biol 154)



Results of Exam 1: some questions



More about plants₂ classification

- Mosses (Bryophyta)
- Ferns and allies (Pteridophyta)
- Seed plants (Spermatophyta)
 - Conifers (Pinopsida)
 - Other classes of seed plants
 - Angiosperms (Magnoliopsida)
 - Monocots (Liliidae)
 - Other subclasses of angiosperms (“dicots”)



Tissues

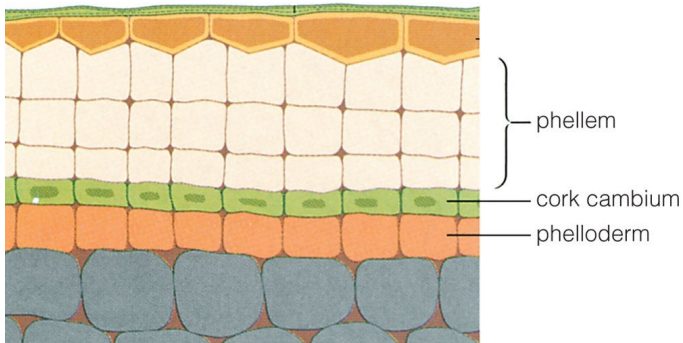
Periderm

Secondary dermal tissue: Periderm

- Secondary dermal tissue
- Arises inside the stem ground tissue, closer to surface (cortex)
- Complex tissue: includes phellem, cork cambium, and phelloderm
- Old periderm includes some other tissues and becomes a cork
- Cells of phellem are dead cells rich of suberin
- Main function is defense



Three cell types of periderm



Cork cambium is another lateral meristem; *phellem* and *phelloderm* are main components of periderm

Tissues

Poikilo- and homoiohydricity

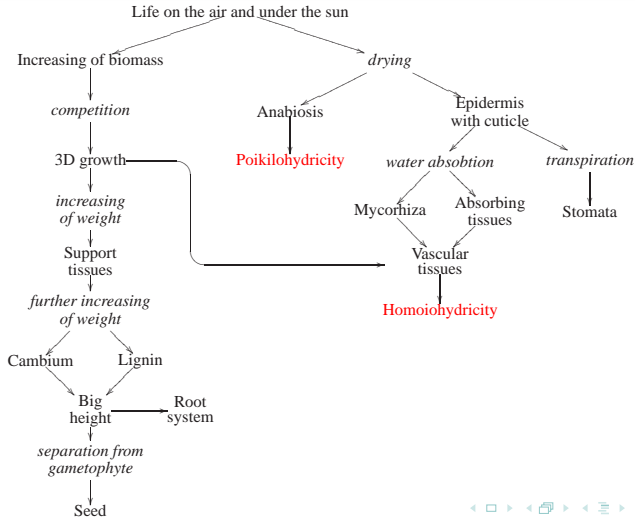


Poikilo- and homoiohydricity

- **Poikilohydric** plants do not save water, they survive even complete desiccation
- **Homoiohydric** plants save water, they always have similar water content and do not survive after desiccation
- Compare with poikilo- and homoiothermic animals (reptiles vs. mammals)



Origins of poikilo- and homoiohydricity



Tissues

Absorption tissues



Absorption tissues

- Always primary, simple tissues
- **Rhizoderm**, or root hairs, originates from protoderm, but life span is much shorter than of epidermis
- **Velamen**, originates from root cortex



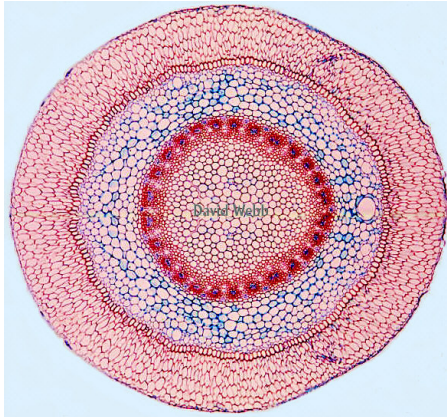
Rhizoderm



Root hairs of grass seedlings (LM)



Velamen



Outer cylinder is a velamen tissue of orchid root (LM, © D. Webb)

Tissues

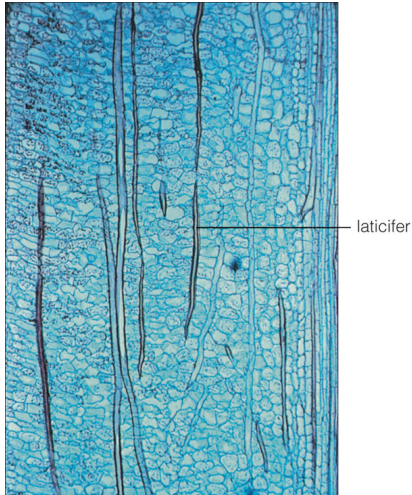
Secretory tissues

Secretory tissues

- Primary, simple or complex tissues
- Spreading across plant body, concentrating in leaves and young stems
- May secrete latex, volatile oils, mucus and other chemicals
- Functions vary: attraction or dis-attraction, communication, defense etc.



Laticifers



© 2005 Brooks/Cole - Thomson

Tissues

Additional meristems



Additional meristems

- **Intercalary** meristems: locate in stems, regulates stem elongation
- **Marginal** meristems are leaf-specific, they regulate leaf shape
- **Repair** meristems help to cure wounds, they form buds and roots in unusual places



Final question (1 point)



Final question (1 point)

Give an example of secondary complex tissue.



Summary

- **Periderm** covers stems
- **Homoiohydric** plants have **absorption** tissues which take water from soil
- **Secretory** tissues extract different chemicals outside



For Further Reading



J. E. Bidlack, Sh. H. Jansky.
Stern's introductory plant biology. 12th edition.
McGraw-Hill, 2011.
Chapter 4.



Th. L. Rost, M. G. Barbour, C. R. Stocking, T. M. Murphy.
Plant Biology. 2nd edition.
Thomson Brooks/Cole, 2006.
Chapter 4.

