

# Introduction to Botany. Lecture 18

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October 10, 2012

# Outline

- 1 Questions and answers
- 2 Leaf
  - Anatomy of leaf
  - Ecological adaptations of leaves

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## Previous final question: the answer

Please invent a multiple choice test question for the second exam  
(**subject**: root, stem or leaf).  
There should be at least **three** exclusive choices.

# Results of Exam 2: statistic summary

Summary:

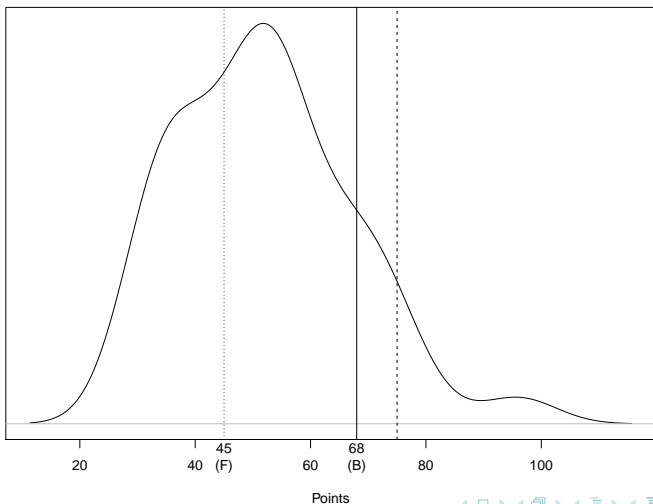
Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
31.00	40.00	52.00	52.05	61.00	96.00	5

Grades:

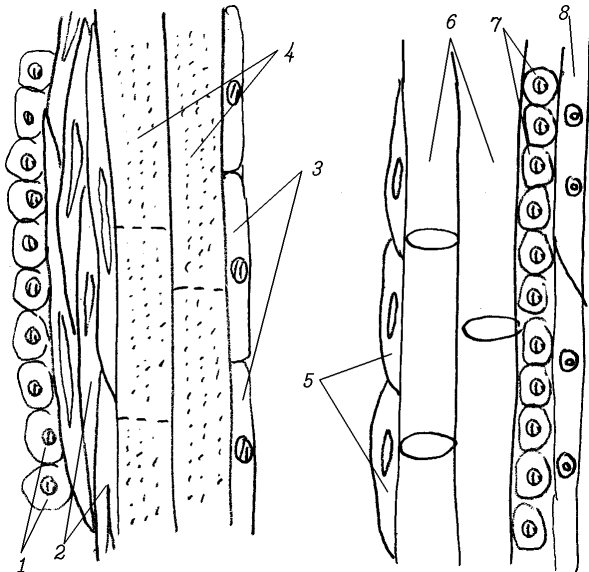
F	D	C	B	max
45	52	60	68	75

# Results of Exam 2: the curve

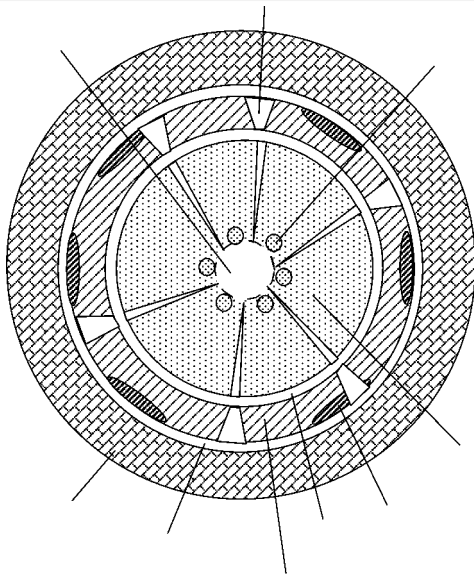
Density estimation for Exam 2 (Biol 154)



# Results of Exam 2: some questions

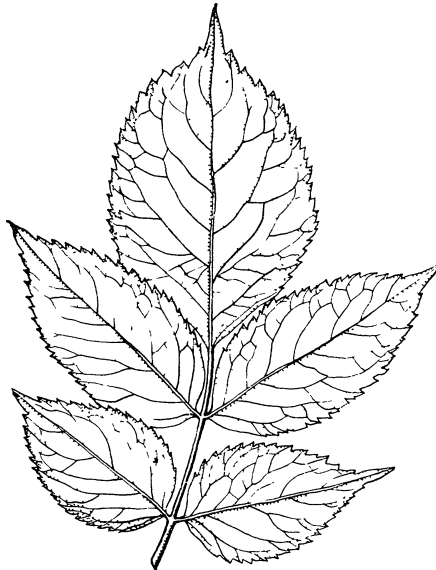


# Results of Exam 2: some questions





# Results of Exam 2: some questions



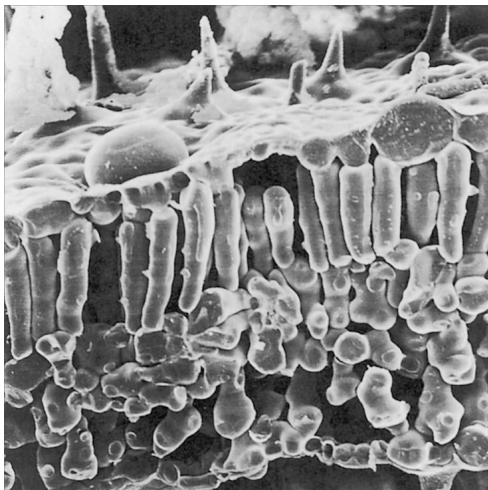
# Leaf

## Anatomy of leaf

# Mesophyll

- Palisade mesophyll consists of tightly arranged elongated cells with less chloroplasts
- Spongy mesophyll consists of loosely attached cells rich of chloroplasts

# Palisade and spongy cells



palisade  
mesophyll

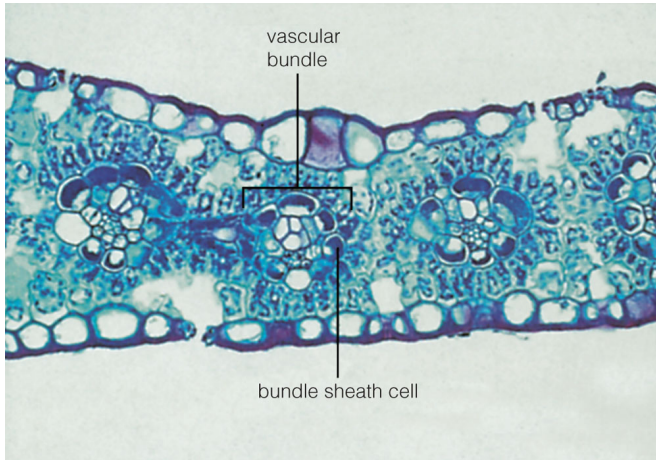
spongy  
mesophyll

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# Veins/vascular bundles

- Phloem typically faces downwards, xylem—upwards
- Bundles of C<sub>4</sub>-plants have additional bundle sheath cells

# Bundle sheath cells



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# Leaf

## Ecological adaptations of leaves

# Plants and water

- Xerophytes: sclerophytes and succulents (stem and leaf)
- Mesophytes
- Hygrophytes
- Hydrophytes



# Leaf succulent (*Crassula argentea*)



mesophyll  
cells

# Xerophyte leaf—needle of pine (*Pinus contorta*)



# Final question (2 points)

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Why plants are dying in the flood?

# Summary

- Internally, leaves are segregated into epidermis, mesophyll (parenchyma) and vascular bundles
- Water deficit results in either sclerophyte or succulent adaptations
- Water excess results in hygrophyte or even hydrophyte adaptations

## For Further Reading



J. E. Bidlack, Sh. H. Jansky.  
*Stern's introductory plant biology*. 12th edition.  
McGraw-Hill, 2011.  
*Chapter 7.*



Th. L. Rost, M. G. Barbour, C. R. Stocking, T. M. Murphy.  
*Plant Biology*. 2nd edition.  
Thomson Brooks/Cole, 2006.  
*Chapter 6.*