Introduction to Botany. Lecture 23

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Outline

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Previous final question: the answer

Please draw the **entire** (*whole*, not dissected), **ovate** leaf with **acute** apex, **cordate** base, **smooth** margin and **hyphodromous** venation.

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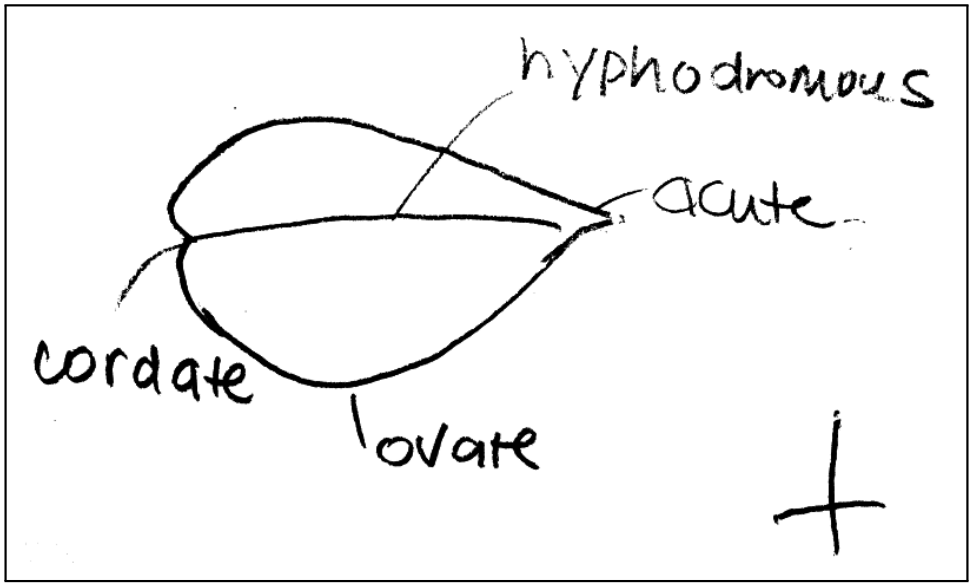
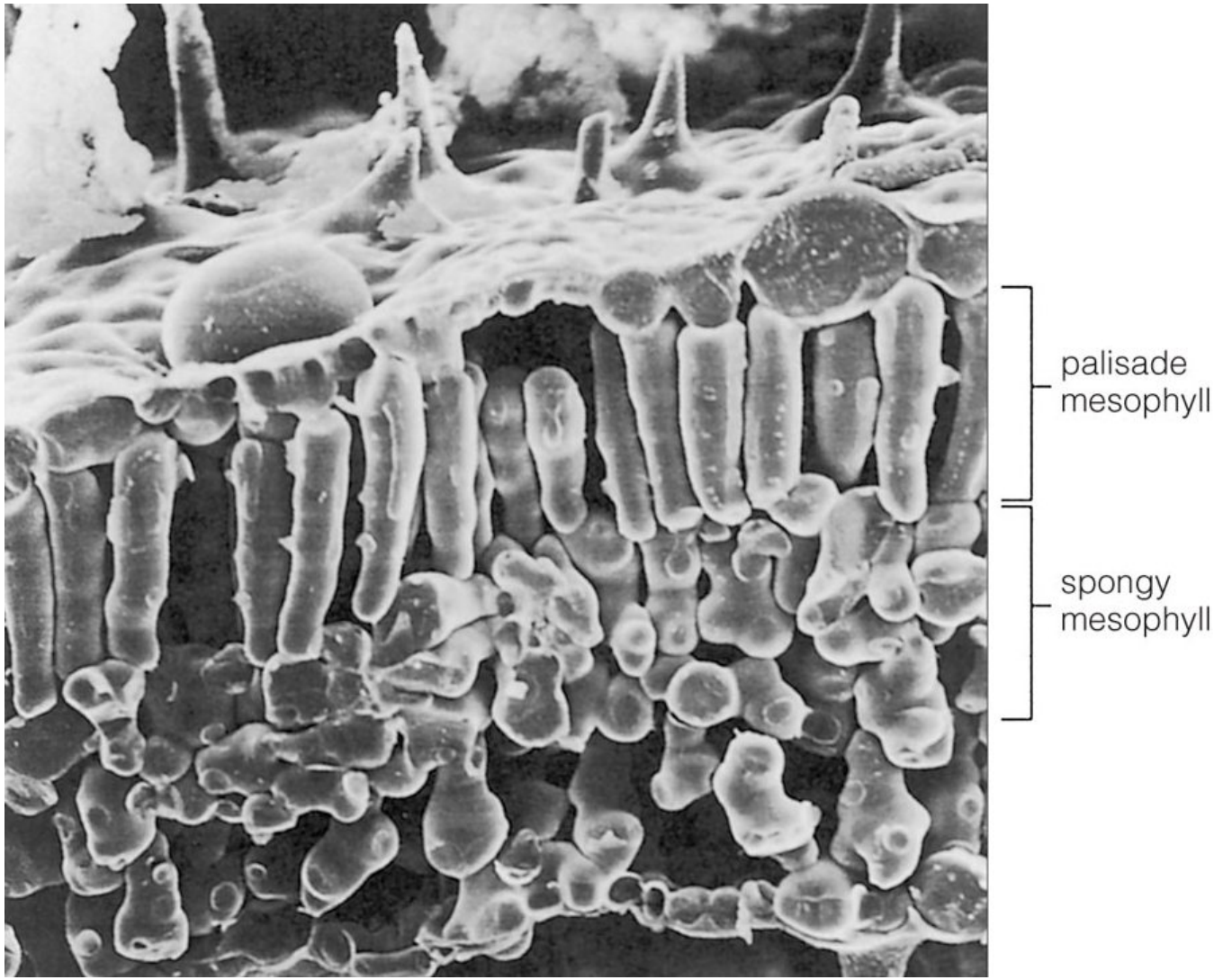


Leaf
Anatomy of leaf

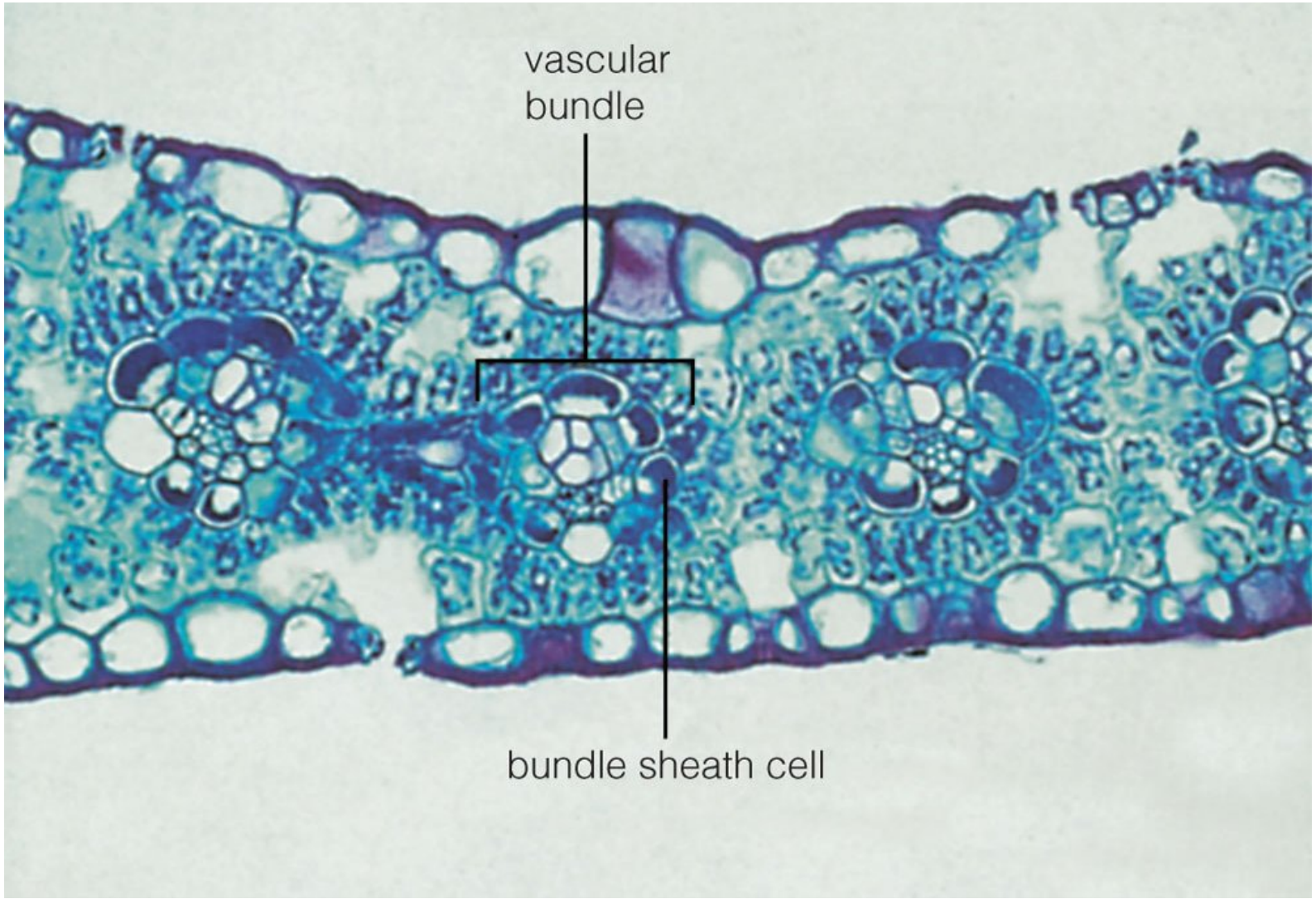
Palisade and spongy cells



Veins/vascular bundles

- Phloem typically faces downwards, xylem—upwards
- Bundles of C_4-plants have additional bundle sheath cells

Bundle sheath cells

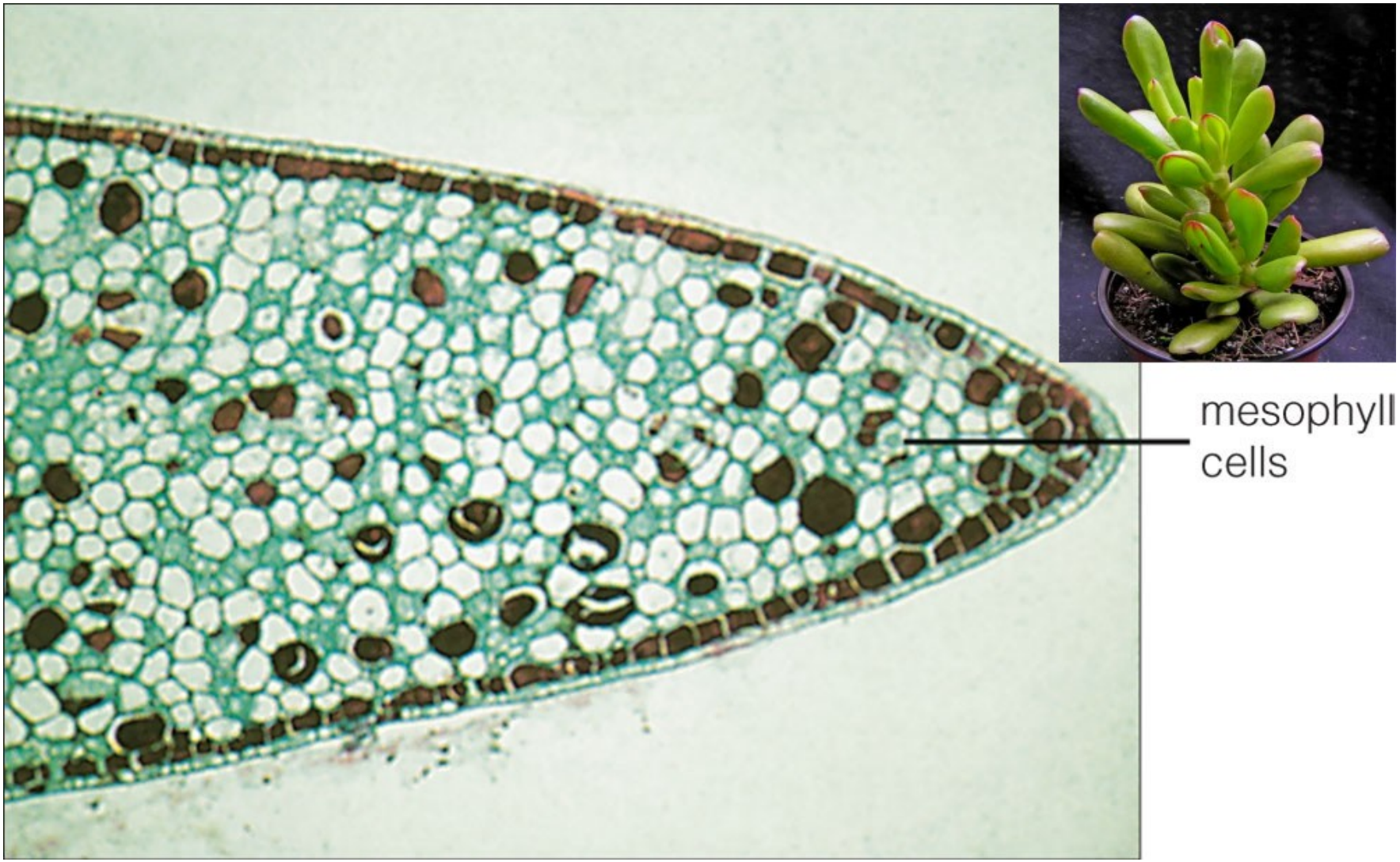


Leaf
Ecological adaptations of leaves

Plants and water

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

Leaf succulent (*Crassula argentea*)

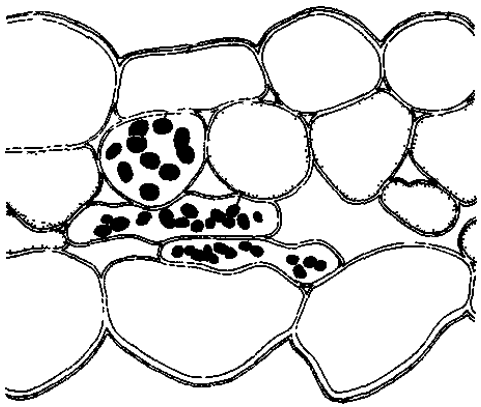


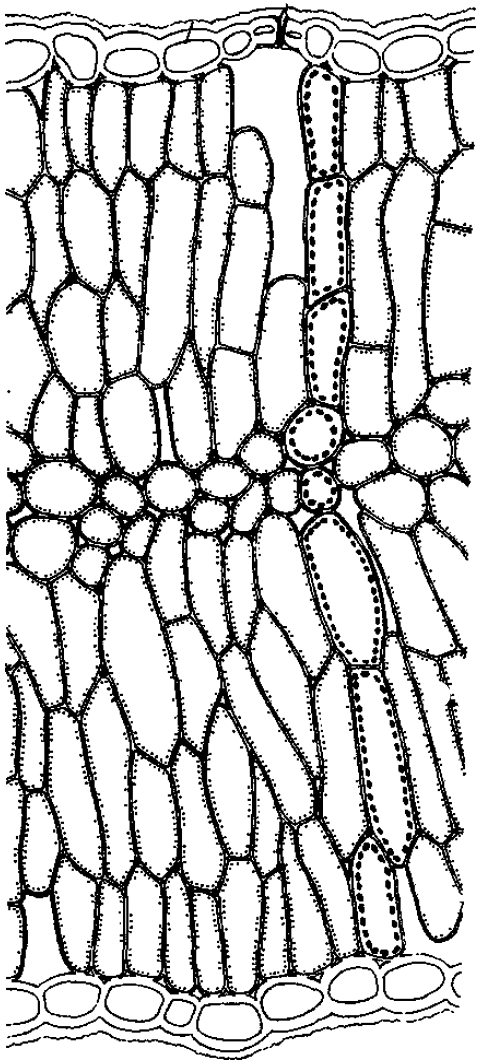
Xerophyte leaf—needle of pine (*Pinus contorta*)

Plants and light

- Sciophytes
- Heliophytes

Sciophyte and heliophyte





Oxalis acetosella and *Sylphium laciniatum*

Plants and soil

- Halophytes (accumulate, excrete or avoid NaCl)
- Nitrate halophytes (grow on soils rich of $NaNO_3$)
- Oxylophytes (grow on acidic soils)
- Calciphytes (grow on chalk soils rich of $CaCO_3$)

Leaf of salt-accumulating halophyte

Atriplex prostrata

Plants and substrate

- Psammophytes (grow on sand)
- Petrophytes (grow on rocks)
- Rheophytes (grow in fast springs)

Rheophyte

Macarenia clavigera from Venezuela

River with rheophytes

They are flowering, too

Podostemum ceratophyllum (may be found even in ND!)

Plants and metabolism

- Mycoparasites
- Hemiparasites
- Phytoparasites (root and stem)

Mycoparasite

Triuris hyalina from South America

Hemiparasite

Krameria parvifolia from southern Texas

Root parasite

Hydnora africana from South Africa

Stem parasite

Cuscuta europaea from Germany

Final question (2 points)

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Which plants have more palisade mesophyll—heliophytes or sciophytes?

Summary

- Water deficit results in either sclerophyte or succulent adaptations
- Water excess results in hygrophyte or even hydrophyte adaptations

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.
Chapter 6.