

Introduction to Botany. Lecture 40

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Outline

- 1 Short excursion
 - Greenhouse
- 2 Questions and answers
- 3 Liliidae, or monocots
 - Main features
 - Gramineae, or Poaceae—grass family

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Short excursion Greenhouse

Previous final question: the answer

Why Compositae is often considered as most advanced family among angiosperms?

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Why Compositae is often considered as most advanced family among angiosperms?

- Many advanced characters: fused petals, small number of parts, inferior ovary
- Inflorescences which imitate flowers: “next level” of flowers
- Number of species could indicate the success of group

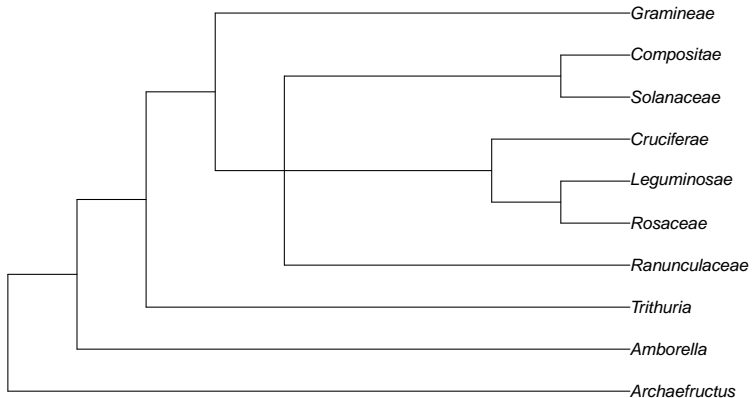
Liliidae, or monocots

Main features

Main features of monocots

- One cotyledon
- Linear leaves with acrodromous venation
- Root system without main root
- No cambium
- Trimerous flower with non-differentiated perianth

Phylogeny of angiosperms so far



Liliidae, or monocots

Gramineae, or Poaceae—grass family

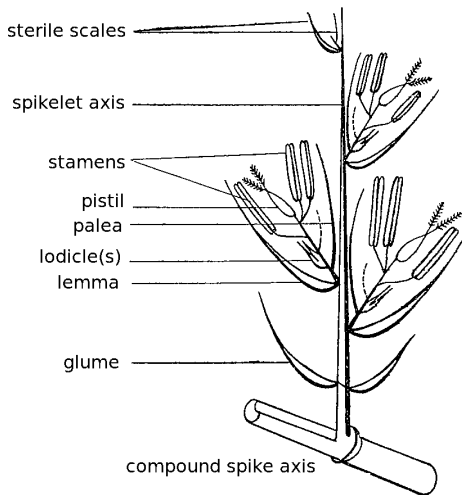
Main features of grasses

- $\approx 8,000$ species distributed thorough all the world, but most genera concentrate in tropics
- Prefer dry, sunny places
- Ofren form tussocks—compact structures where old grass stems, rhizomes and roots are intermixed
- Grasses form grasslands—specific ecological communities widely represented on Earth. North Dakota prairies are grasslands.

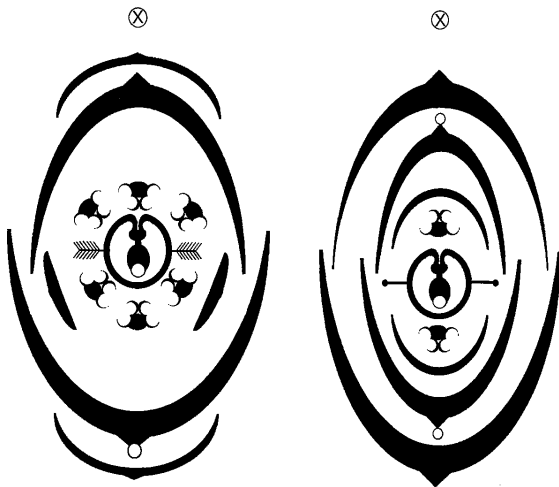
Morphology of grasses

- Stems usually hollow and round
- Leaves flat, in two ranks
- Flowers reduced, wind-pollinates, usually bisexual, form complicated spikelets*
- Each spikelet bear two glumes; each flower has lemma and palea scales
- Perianth is reduced to lodicules
- Stamens from 6 to 1 (most often 3), with large anthers
- Fruit is a caryopsis, it includes flower scales
- Seed has a specific structure—embryo with coleoptile, coleorhiza and scutellum

Scheme of grass spikelet



Grasses: *Oryza* and *Anthoxanthum* diagrams



$\uparrow P_{0-3} A_{0-3+2-3} \underline{G_{(2)}}$

Representatives of grass family

- Most primitive grasses are bamboos (Bambusoideae subfamily)
- Pooid grasses usually are C_3 plants, wheat (*Triticum*), rice (*Oryza*), barley (*Hordeum*) and rye (*Secale*) belong to this group
- Panicoid grasses are mostly C_4 plants, corn (*Zea*) and sugarcane (*Saccharum*) belong here

Rare event: bamboo (*Schizostachyum* sp.) is flowering!



Festuca sp.



Rice (*Oryza sativa*), the most important world crop



Corn (*Zea mays*), the most productive world crop (up to 10 MT/ha)



Summary

- Grasses (Gramineae) have general monocot characters but their flower structure deviated from “typical” monocot due to the adaptation for wind pollination.
- BOTANY IS COOL!

Final questions

Final questions

Short anonymous voluntary survey:

- 1 What do you like most in botany course?
- 2 What do you dislike most in botany course?
- 3 Which lab do you remember most of all?
- 4 Please grade (1—bad, 5—excellent):
 - 1 Lectures
 - 2 Labs
 - 3 Final questions
 - 4 Exams
- 5 Are you interesting in doing directed research in botany?

For Further Reading



J. E. Bidlack, Sh. H. Jansky.
Stern's introductory plant biology. 12th edition.
McGraw-Hill, 2011.
Chapter 23.



Th. L. Rost, M. G. Barbour, C. R. Stocking, T. M. Murphy.
Plant Biology. 2nd edition.
Thomson Brooks/Cole, 2006.
Chapter 25.