

Systematic Botany. Lecture 14

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Outline

Questions and answers

Diversity of Gramineae

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Diversity of Gramineae

Previous final question: the answer

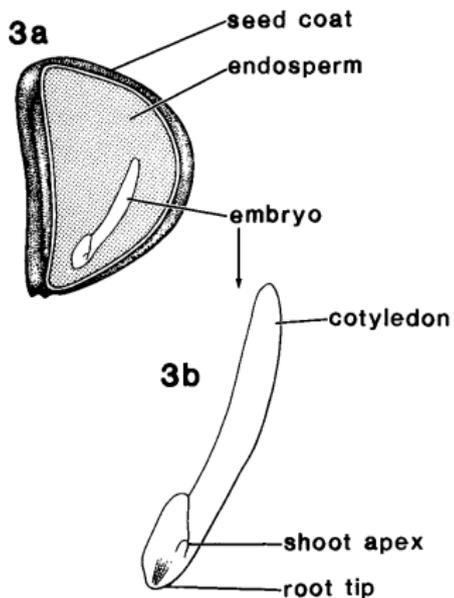
Why the grass embryo is unique?

Previous final question: the answer

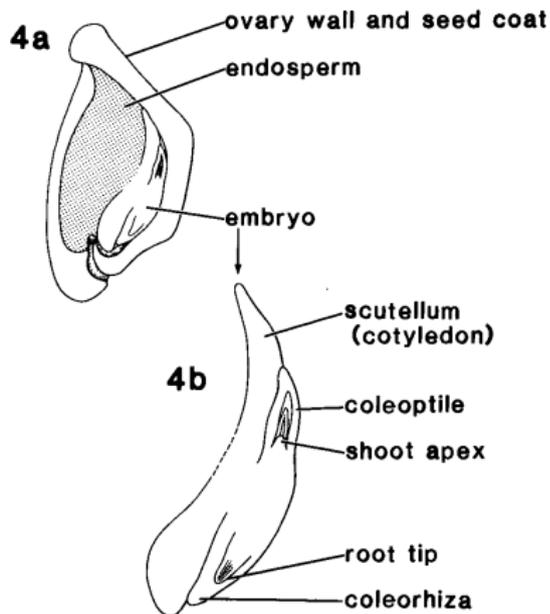
Why the grass embryo is unique?

- ▶ Lateral location
- ▶ Has coleoptile, coleorhiza and scutellum

Typical Monocot Embryo (*Zephyranthes treatiae*, Amaryllidaceae)



Grass Embryo (*Zea diploperennis*)



Subfamily Anomochlooideae

- ▶ Broad leaves, no spikelets, no lodicules, 4–6 stamens.
Tropical South America.
 - ▶ *Anomochloa*—anomochloa
 - ▶ *Streptochaeta*—streptochaeta

Anomochloa



Subfamily Pharoideae

- ▶ Broad leaves with pinnate venation, spikelets one-flowered, unisexual, in panicles, 6 stamens, 3 stigmas.
 - ▶ *Pharus*—pharus, South America
 - ▶ *Leptaspis*—leptaspis, tropics of Old World

Leptaspis



Subfamily Puelioideae

- ▶ Broad leaves with parallelodromous venation, spikelets with multiple unisexual florets, 3 lodicules, 6 stamens, 3 stigmas
 - ▶ *Puelia*—puelia (Tropical Africa, poorly studied)

Puelia



Subfamily Bambusoideae

“BEP clade” starts here.

- ▶ Mostly woody plants, leaves broad or narrow, spikelets bisexual or unisexual, number of flower parts vary. $\approx 1,200$ species.
 - ▶ *Phyllostachys*—golden bamboo, often cultivated in southern U.S.
 - ▶ *Arundinaria*—hill cane, native to eastern U.S.
 - ▶ *Bambusa*—bamboo, reaches 35 m in height
 - ▶ *Melocanna*—has large berry-like caryopses

Arundinaria appalachiana



Subfamily Ehrhartoideae

- ▶ Herbaceous plants, ligules mostly not fringed, sometimes annuals, inflorescences are mostly panicles, 2 lodicules, 2 styles, stamens 3–6. ≈ 120 species.
 - ▶ *Oryza*—rice
 - ▶ *Zizania*—wild rice
 - ▶ *Leersia*—cut grass

Subfamily Pooideae

Annuals or perennials, inflorescences are compound spikes, racemes or panicles, spikelets bisexual, lodicules 2, stamens 3, styles 2, embryo small (like in previous subfamilies). $\approx 3,300$ species.

Tribes:

Bromeae *Bromus*—bromegrass

Meliceae *Melica*—melic, *Glyceria*—mannagrass

Poeae *Poa*—bluegrass, *Festuca*—fescue, *Avena*—oats, *Phleum*—timothy grass and many others

Stipeae *Stipa*—needle-and-thread, *Oryzopsis*—ricegrass

Triticeae *Triticum*—wheat, *Secale*—rye, *Hordeum*—barley, *Agropyron*—wheatgrass and many others

Subfamily Aristidoideae

“PACCAD clade” starts here.

- ▶ Xerophytic grasses, mostly tropical and subtropical, ligules fringed, panicles, lemma with three awns, palea short, stamens 1–3, embryo small or large, C_4 (*Aristida*). ≈ 350 species.
 - ▶ *Aristida*—threeawn

Aristida purpurea



Subfamily Arundinoideae

- ▶ Large perennials, sometimes almost woody, have panicles, palea not reduced, stamens 1–3, embryo mostly large, C₃-plants. ≈35 species.
 - ▶ *Arundo*—giant reed
 - ▶ *Phragmites*—reed

Arundo



Subfamily Danthonioideae

- ▶ Large xerophytic grasses with narrow leaves, ligule hairy, lemma with single awn, C₃-plants. ≈250 species.
 - ▶ *Danthonia*—oatgrass from outside of prairies
 - ▶ *Cortaderia*—pampas grass

Cortaderia



Subfamily Panicoideae

Primarily tropical grasses, ligule often consists of hairs or absent, spikelets frequently paired, embryo large, leaves with Kranz anatomy, mostly C₄-plants. ≈3,270 species.

Tribes:

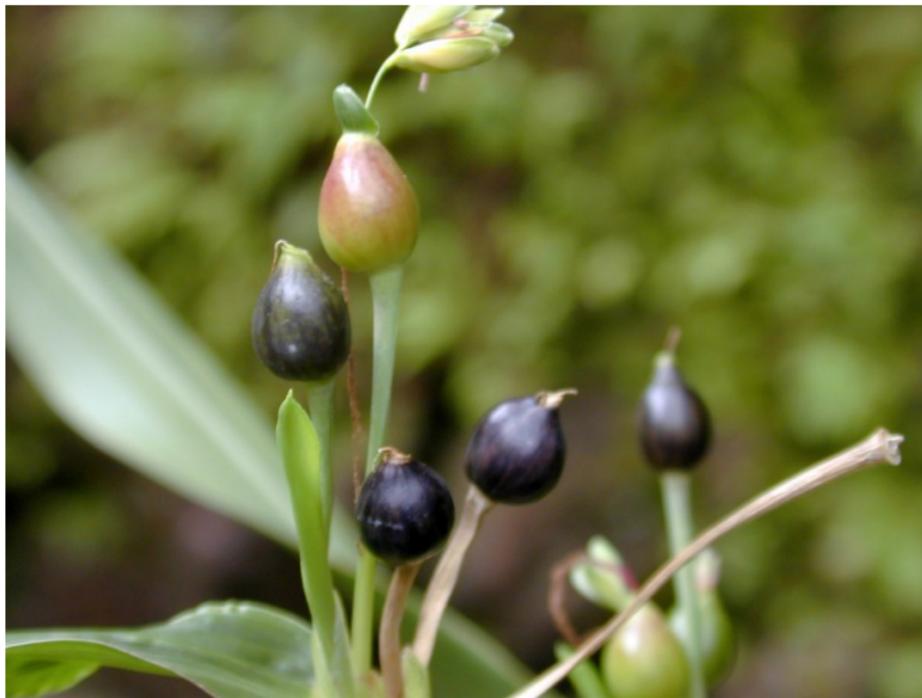
Paniceae *Panicum*—millet, *Setaria*—pigeongrass,
Cenchrus—sandbur

Andropogoneae *Saccharum*—sugarcane,
Sorghum—sorghum, *Zea*—corn, *Coix*—Job's
tears, *Andropogon* (*Schizachyrium*)—bluestem

Cenchrus



Coix



Subfamily Chloridoideae

Grasses of dry climates, ligule fringed, leaves have specific bicellular microhairs, spikelets compressed, sometimes one-sided, embryo large, C₄-plants, Kranz anatomy. ≈1,400 species

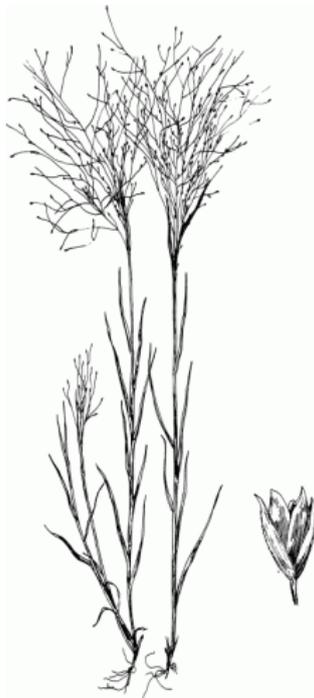
Tribes:

Eragrostideae *Eragrostis*—lovegrass

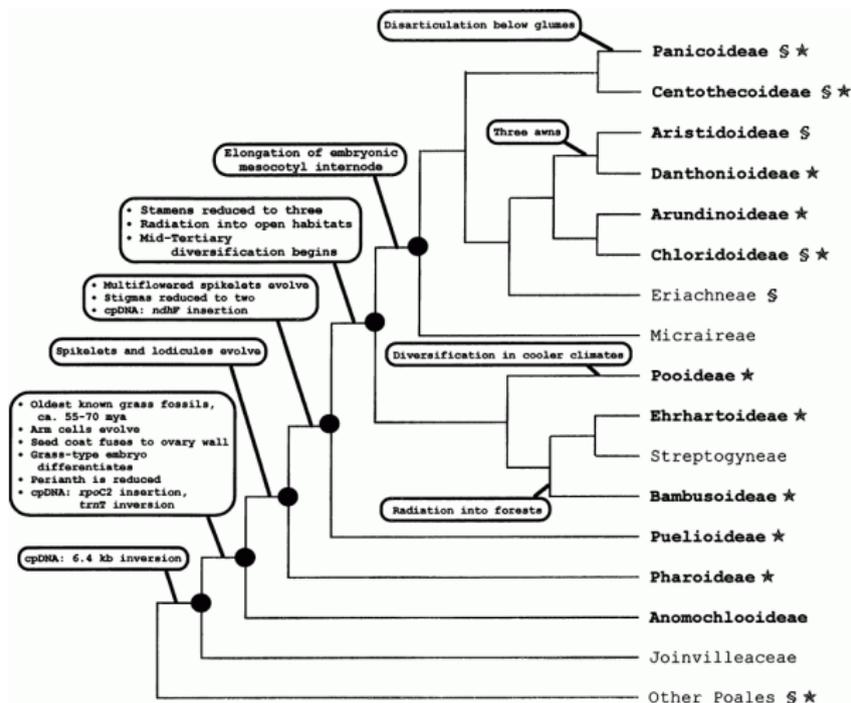
Zoysieae *Sporobolus*—dropseed, *Spartina*—cordgrass,
Calamovilfa—sandseed

Cynodonteae *Muhlenbergia*—muhly, *Bouteloua*—grama

Muhlenbergia



Phylogeny of grasses



Final question (2 points)

Final question (2 points)

Which subfamily includes corn?

For Further Reading



O. A. Stevens.

Handbook of North Dakota plants. 3rd edition.

NDSU, 1963.