

Biogeography. Lecture 6

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Outline

Most important geological periods

Carboniferous and Permian: first biogeography

Mesozoic era: from Triassic to Cretaceous



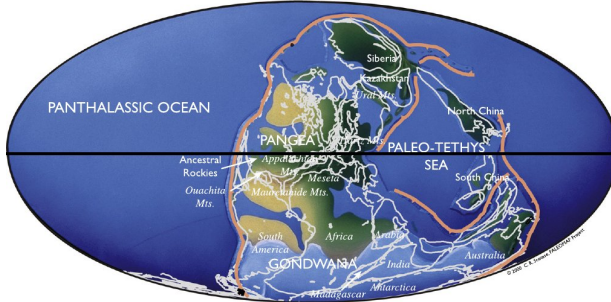
Most important geological periods

Carboniferous and Permian: first biogeography



Carboniferous period

306 Ma Carboniferous

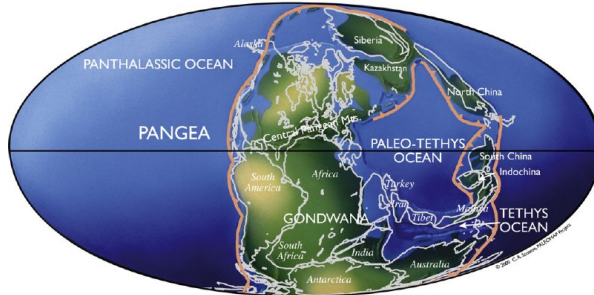


- ▶ Hot, wet tropical climate in Europe and North America (Laurasia), dry arctic forests in Siberia (Angarida)
- ▶ Pteridophyte and primitive seed plants forests dominated tropics, insects started to fly
- ▶ Reptiles appeared



Permian period

255 Ma Permian



- ▶ Last period of Paleozoic era, ended with a mass extinction in the sea and also on land
- ▶ Pangea formed, with a giant central desert
- ▶ Primitive synapsid reptiles dominated the land

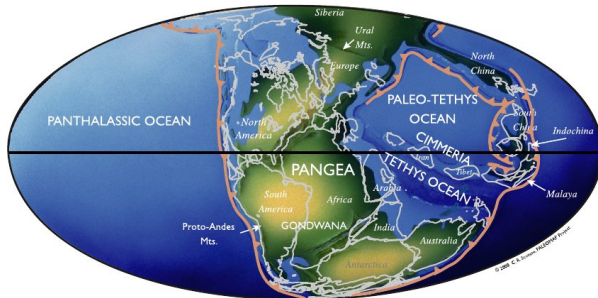
Most important geological periods

Mesozoic era: from Triassic to Cretaceous



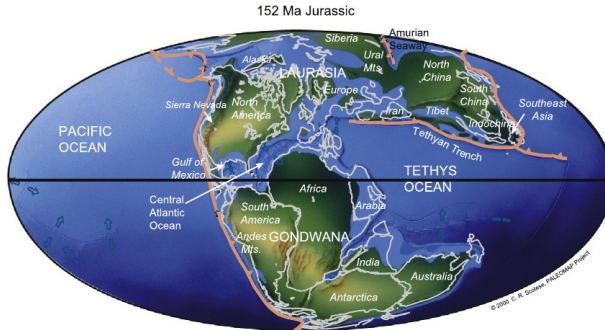
Triassic period

237 Ma Triassic



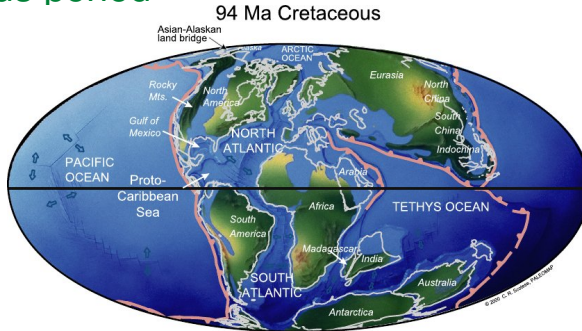
- ▶ Pangea broke (part of Africa adhered to North America)
- ▶ Climate becoming wetter
- ▶ Grasshopper-like insects radiated
- ▶ Synapsid reptiles declined, dinosaurs and pterosaurs appeared

Jurassic period



- ▶ Atlantic ocean and Rocky mountains appeared
- ▶ Peak of dinosaur diversity
- ▶ Birds appeared as a lineage of small flying dinosaurs
- ▶ In the sea, ammonites and primitive fish dominated

Cretaceous period



- ▶ High level of water (second high after Devonian), warm climate even on North and South poles, sea in North Dakota
- ▶ Flowering plants appeared and rapidly colonized all land
- ▶ Butterflies and flies appeared
- ▶ Terrestrial dinosaurs slowly declined and finally disappeared in the very end of period



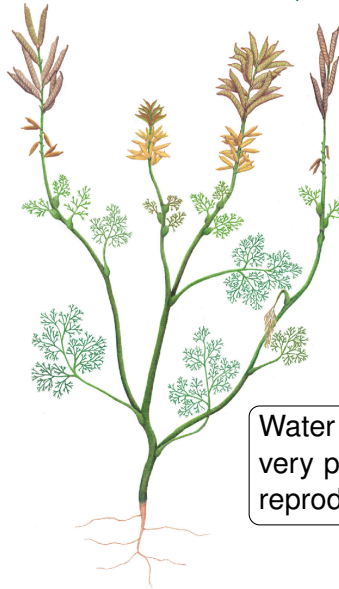
Subdivisions of Cretaceous

System	Series	Stage
Paleogene	Paleocene	Danian
Cretaceous	Upper	Maastrichtian
		Campanian
		Santonian
		Coniacian
		Turonian
		Cenomanian
	Lower	Albian
		Aptian
		Barremian
		Hauterivian
		Valanginian
		Berriasian
Jurassic	Upper	Tithonian

- ▶ Hauterivian: first flowering plants (pollen)
- ▶ Barremian/Aptian: Famous Yixian formation (China)
- ▶ Maastrichtian: end of dinosaur age



Archaeofructus (discovered in 2002, Yixian)



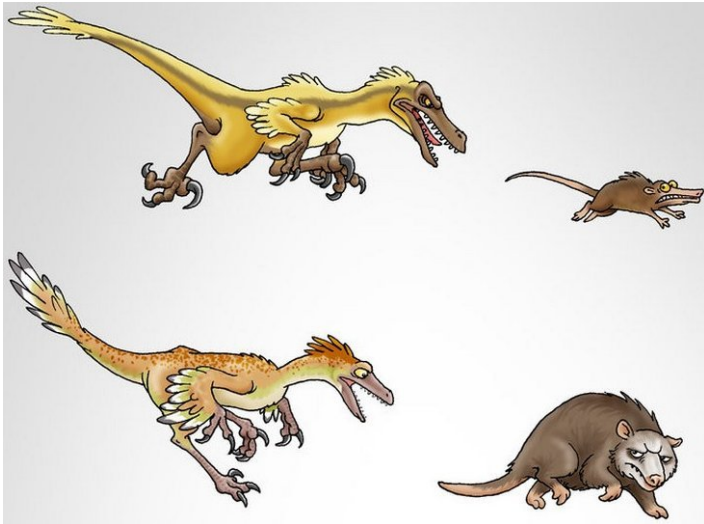
Water plant with
very primitive
reproductive organs

Yutyrannus from China, newest reconstruction



feathered, warm-blood, social

From Jurassic...



... to Paleogene



The hero: *Repenomamus robustus* (reconstruction)



In 2005, Chinese paleontologists found the tricodont mammal skeleton with young dinosaur in the stomach



Summary

- ▶ At the end of Permian, all continents formed equatorial super-continent Pangea
- ▶ Jurassic period was a peak of dinosaur diversity
- ▶ Impact theories are mentally attractive but do not explain slow and “blurred” extinction as well as existence of “untouchable” groups like plants and insects.



For Further Reading



A. Shipunov.

Biogeography [Electronic resource].

2014—onwards.

Mode of access:

http://ashipunov.info/shipunov/school/biol_330



Dinosaurs.

<http://en.wikipedia.org/wiki/Dinosaur>

