

Introduction to Biology. Lecture 24

Alexey Shipunov

Minot State University

March 29, 2017



1 Questions and answers

- Exam 3

2 Where we are

- Animals

3 Everyone is going terrestrial

- Ordovician, Silurian and Devonian: three ages of fishes
- Plants are going terrestrial



Outline

1 Questions and answers

- Exam 3

2 Where we are

- Animals

3 Everyone is going terrestrial

- Ordovician, Silurian and Devonian: three ages of fishes
- Plants are going terrestrial



- 1 Questions and answers
 - Exam 3
- 2 Where we are
 - Animals
- 3 Everyone is going terrestrial
 - Ordovician, Silurian and Devonian: three ages of fishes
 - Plants are going terrestrial



Questions and answers

Exam 3



Results of Exam 3: statistic summary

Summary:

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
38.00	56.00	65.00	65.69	75.50	100.00	12

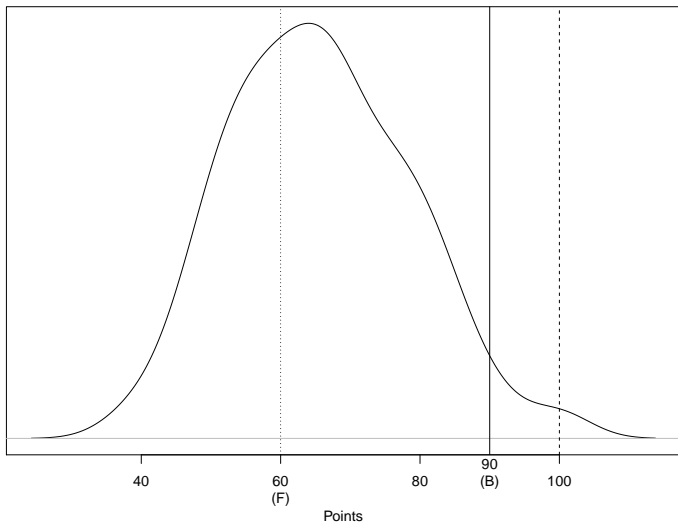
Grades:

F	D	C	B	max
< 60	< 70	< 80	< 90	100



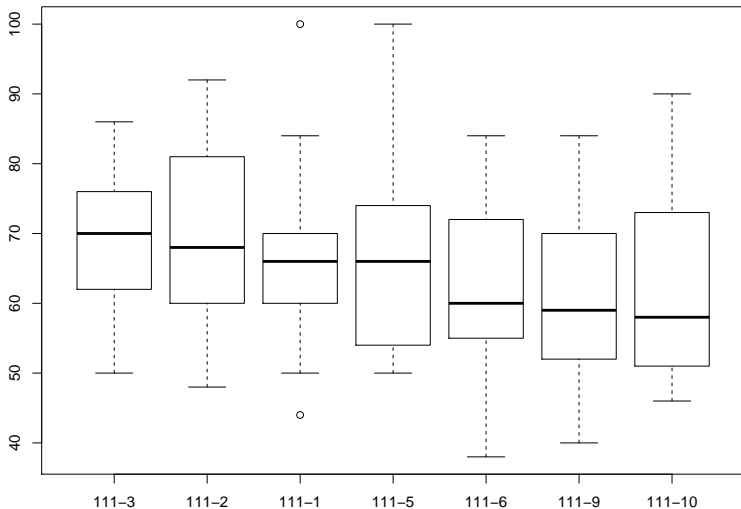
Results of Exam 3: the curve

Density estimation for Exam 3 (Biol 111)

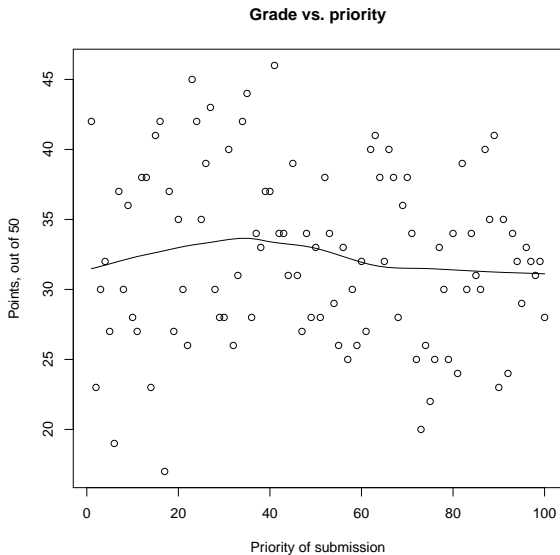


Results of Exam 3: sections

Competition between Biol 111 sections (Exam 3)



Results of Exam 3: priority vs. points



Results of Exam 3: three questions

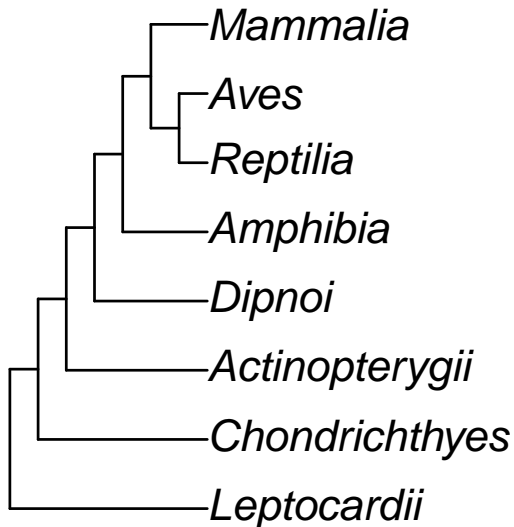
14. In Cambrian, Orsten and Burgess faunas were located:
- A On Siberian continent
 - B On Gondwana continent
 - C **In the ocean**
19. Cambrian echinoderms:
- A Sea cucumbers
 - B Sea horses
 - C **Sea lilies**
22. Jet motion is characteristic for:
- A Some arthropods
 - B Some chordates
 - C **Some mollusks**



Where we are Animals



Phylogeny of eight classes



Timescale of Phanerozoic eon, Paleozoic era

- Phanerozoic eon
 - Paleozoic era
 - Cambrian period: 541 Mya
 - Ordovician period: 485 Mya
 - Silurian period: 443 Mya
 - Devonian period: 419 Mya
 - Carboniferous period: 358 Mya
 - Permian period: 299–252 Mya



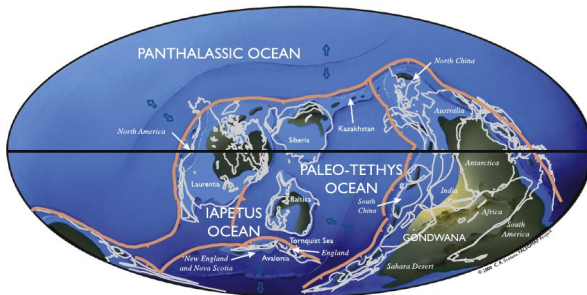
Everyone is going terrestrial

Ordovician, Silurian and Devonian: three ages of fishes



Ordovician period

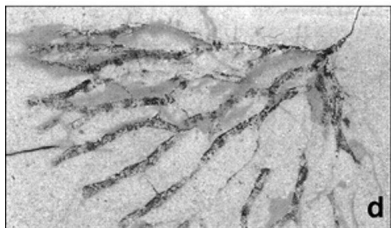
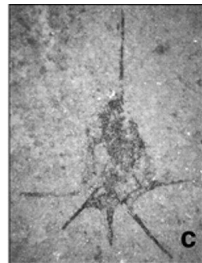
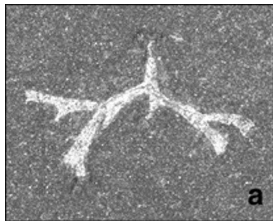
458 Ma Ordovician



- Climate changed from hot to glaciated (Gondwana hits the South Pole)
- Marine fauna spread out, especially cephalopods, conodonts and graptolites
- In the end, the first great extinction: 85% of marine species extinct



Graptolites

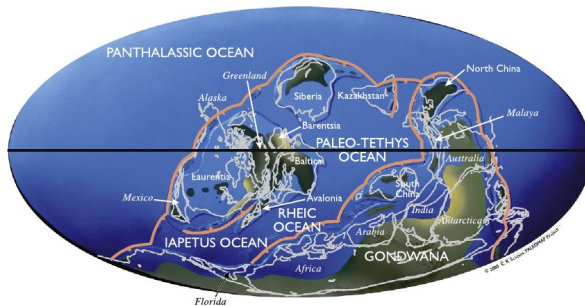


They were plankton colonial animals close to echinoderms and chordates



Silurian period

425 Ma Silurian



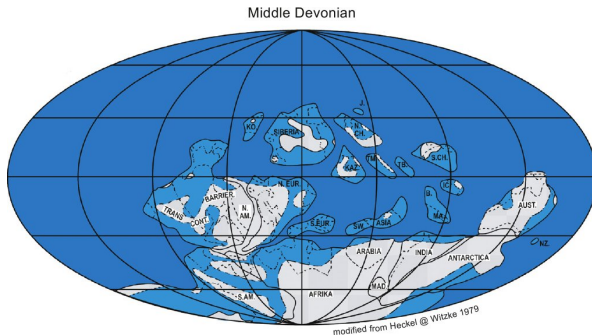
- Fluctuating climate
- Prospering of marine fauna again
- Land colonization started from plants and arthropods!
- South Pole still in the Gondwana



Silurian sea



Devonian period



- Moderate climate becoming warmer
- Exceptionally high sea level
- Greatest diversity of marine fauna in Paleozoic (especially fishes)
- Terrestrial vertebrates: tetrapods appeared!



Everyone is going terrestrial

Plants are going terrestrial



Protists, algae and plants

- Photosynthetic protists are algae
- Plants are descendants of green algae, they developed tissues in the process of land colonization



*Primordial plant cell: cell wall, chloroplasts, vacuole and turgor,
plasmodesmata*



Origin of tissues and organs of plants: first steps



Summary

- Plants are photosynthetic multi-tissued eukaryotes
- Plants developed tissues independently from animals, in the process of land colonization



For Further Reading



Plant cell.

http://en.wikipedia.org/wiki/Plant_cell



Plant tissues.

http://en.wikipedia.org/wiki/Tissue_%28biology%29#Plant_tissues

