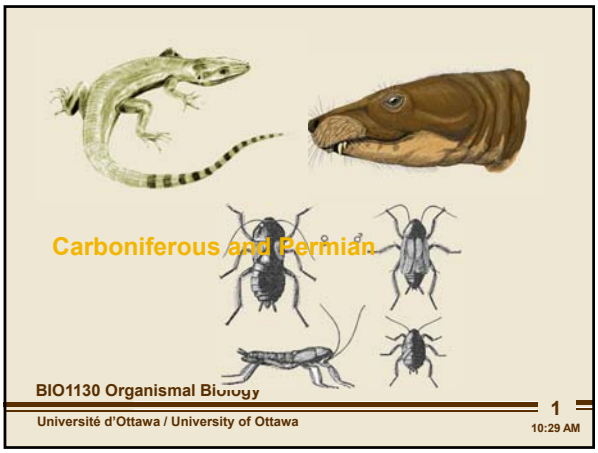
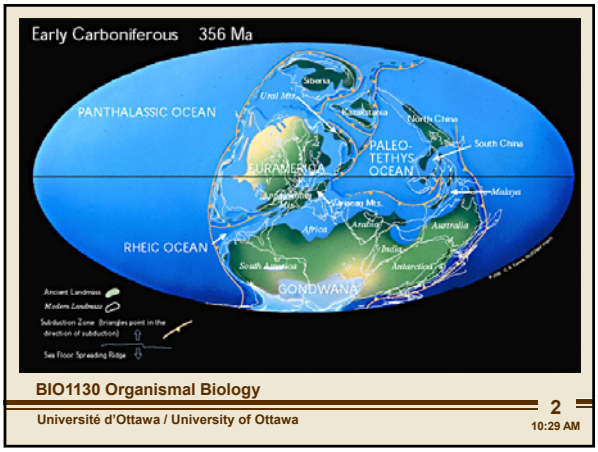
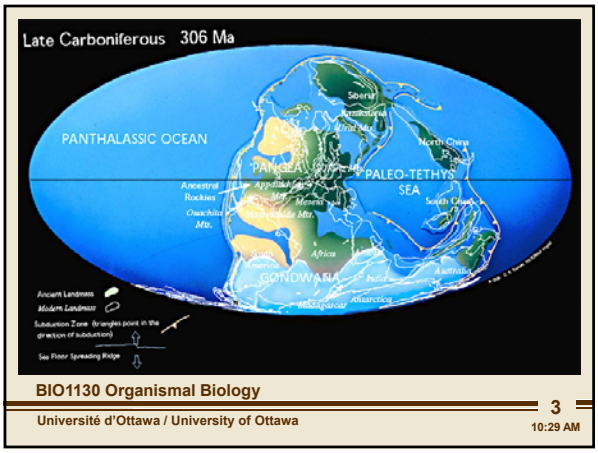
Carboniferous and Permian periods

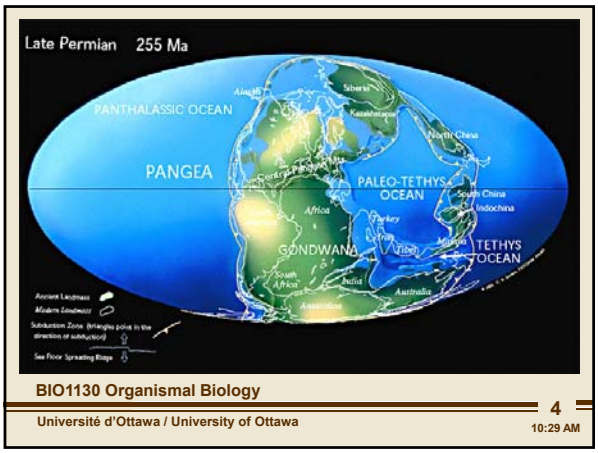




end of devonian, we had a large amount of or
accumulate on the continents. It leaked in the
dropped.
On lands the plants dont get affected. The
animals in the oceans were affected. The con
will start to pangea. Its going to have oceanic



Carboniferous and Permian periods



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Becasue the land mass is one extreme to the other, the plants are going to start to take off. We get rainforests. We are going to see plants

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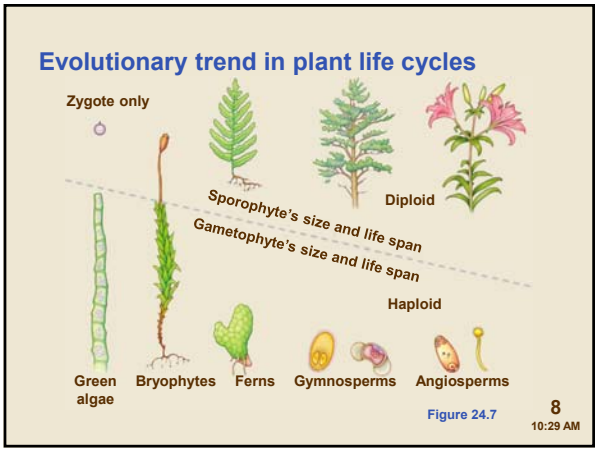
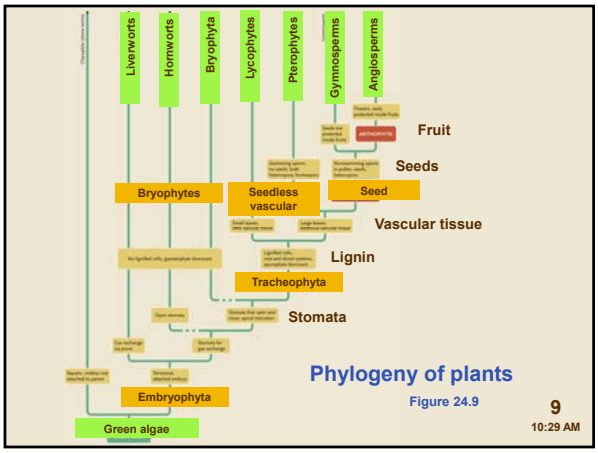
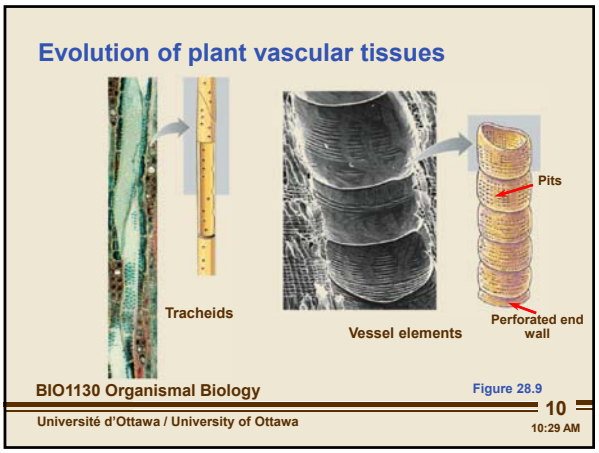
What is going to happen is these ~~are going to the be the dominant plants. they will be fern type trees. they are~~ going to have the fern life cycle but are going to woody enou ~~to be taller.~~



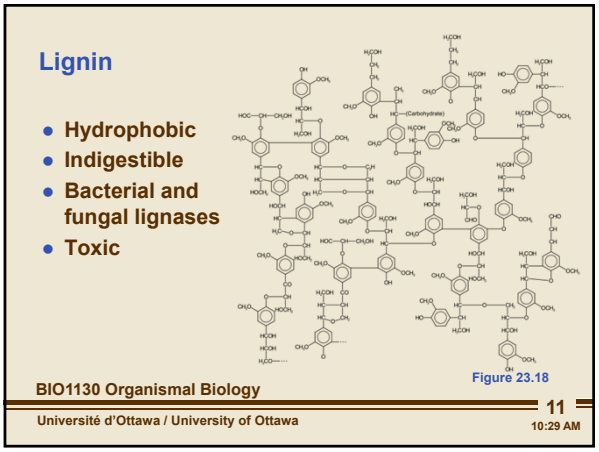
in the aquatic envioronments the sperma dn the egg were sperate they made two seperate plants. they made the gametophyte plant that was haploid and ~~made eggs and sperm. moss life cycle~~ a gametophyte plant that made archegonia or the antheridia and the rain carried the ~~sperm to the archegonia and fertilized~~ it. The egg developed as a new sporophyte out of the existing plant. we are seeing a gradual change from 2 plants to one plant. ~~We saw it happen in the ferns. The~~ gametophyte are going to be embedded in the spotophyte part of the plant.



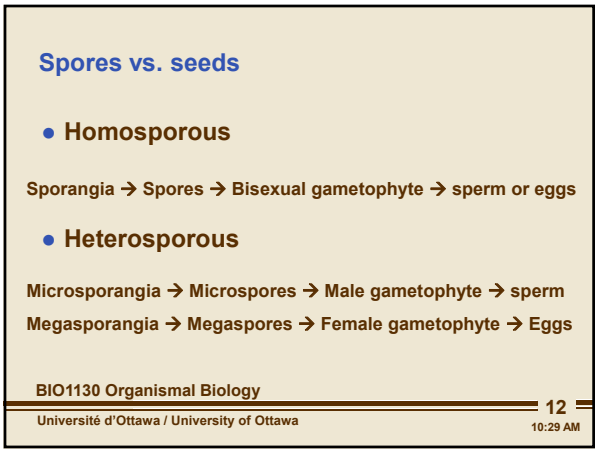
what we have seen are the somata, the beggin of the lignin to support the plant, vascular tiss ~~what we are going to see if they have~~ seeds or not. the seedless plants are the ferns. now we are going to see seeds appear. we are ~~to move the male sperm into a water proof cor called pollen.~~



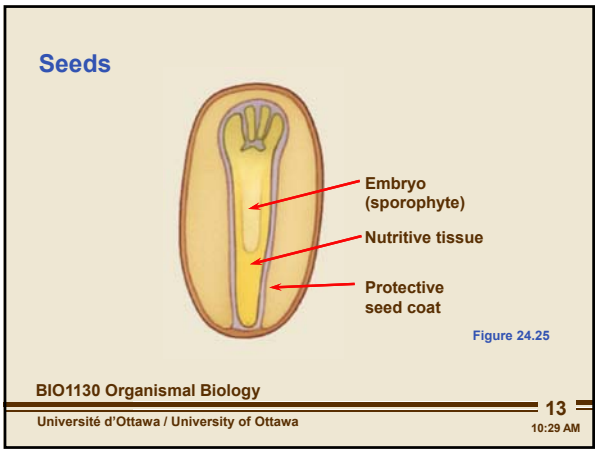
the secondary plant cell wall. the lignin is impo
the lignin created the carboniferous cause of a
~~life structure that wasnt broken down~~.



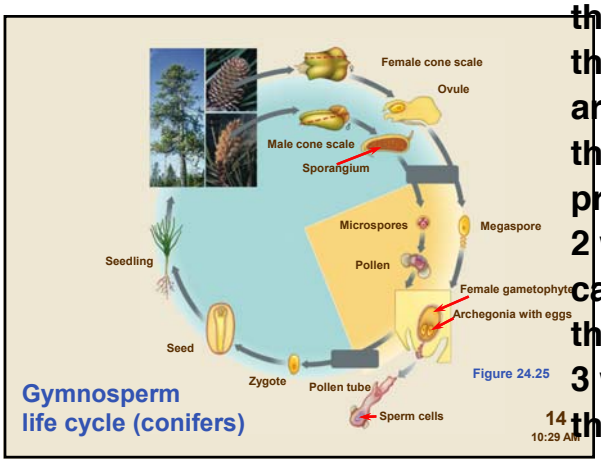
this chemical structure, is very hard to breado
its like teflon. otherwise that the water that wa
~~the cellulse is wetable, then that would block~~
water movement in the plant. its indigestible w
deposits.
~~bacteria and fungi can breakdown~~ lignin. Fun
role is to breakdown plant material. its very to
all of the fluids moving in the tracheal system
are not going to be contaminated. The fluid in



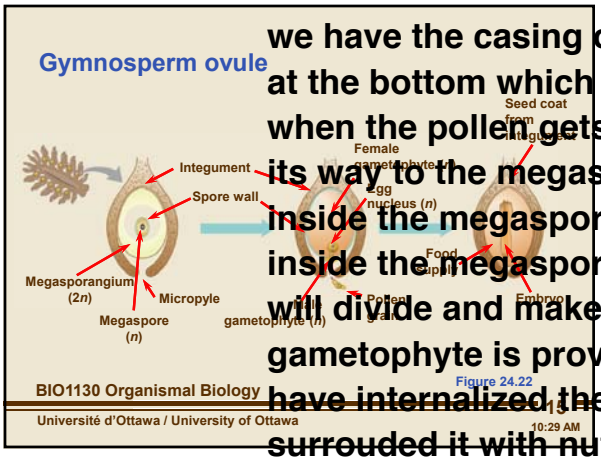
up until now they was no physical spore that p
sperm or eggs which is called Homosporous.
~~the 2 spores are going to take on~~ different role
one spore will be large and have nutrients whi
a megaspore which makes the megasporangia
make the archegonia the female gametophyte.
~~time we are going to get a microspore~~ which is
which will become waterproof, and be able to t
in the wind.



from the megaspore we get the seed, in which the embryo is encased in a protective case. in a seed we have produced that has its nucleus feritlized by a sperm and cell division. this a basically a sporophyte stage that is sitting in the megaspore that is providing it nutrients. we still have the megaspore and the fertilization but the devolping sporopjhyte is protected in a seed.

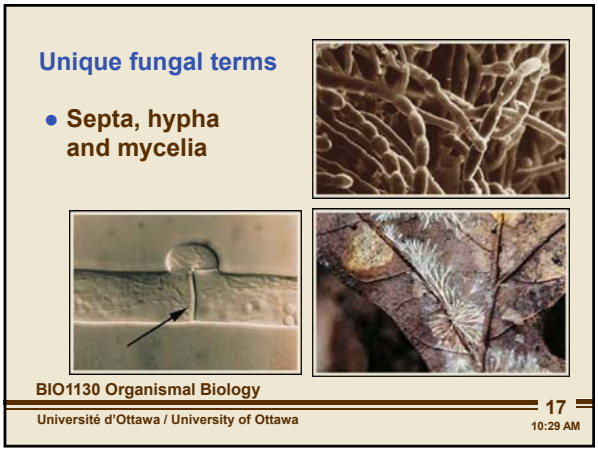


the biggest cones are at the top of the seed these are the female cones. the male cones are filled with pollen. what is happening is that inside that male cone, is a sporangia that is producing microspore. each one is miotic division 2 will be nuclei for fertilization, and 2 will make the casing.
the female will have a megaspore, when the miotic 3 will be lost and 1 will always be used for fertilization. the wind will carry the powder on the big cones and the rain will wash the microspores into the femal

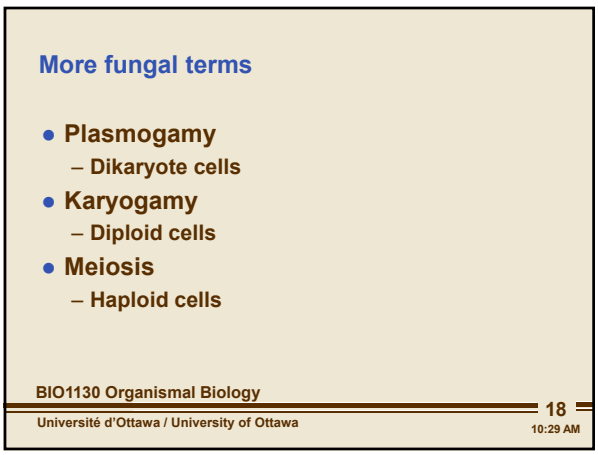


we have the casing on the outside, a small opening at the bottom which is the place for the pollen to get in. when the pollen gets to the opening, it starts to mine its way to the megaspore and fertilize. so we end up with a zygote inside the megaspore. the nuclei which were haploid, migrate inside the megaspore they then fertilize the haploid inside. then it will divide and make the embryo, the tissue is all haploid. the gametophyte is providing its initial nutrients to start its life. we have internalized the whole gametocyte cycle in the plant, and surrouded it with nuttrients to start life. no more water to sperm to swim through, we have stomata, we have tracheal system, we have solved the sperm movement.

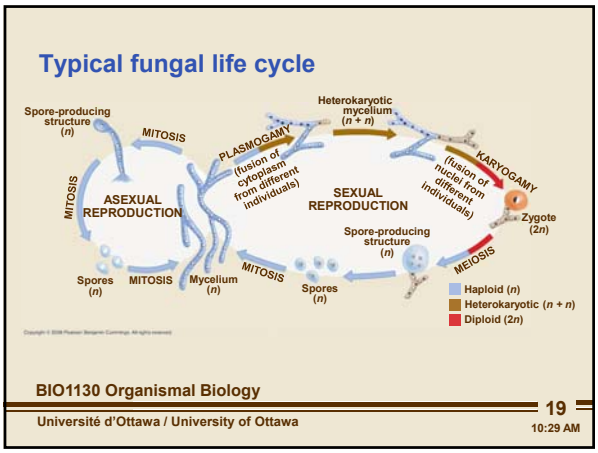
3rd major multicellular kingdom. they are haplo organisms. the diplonitc were animals, the alernation of generation were plants



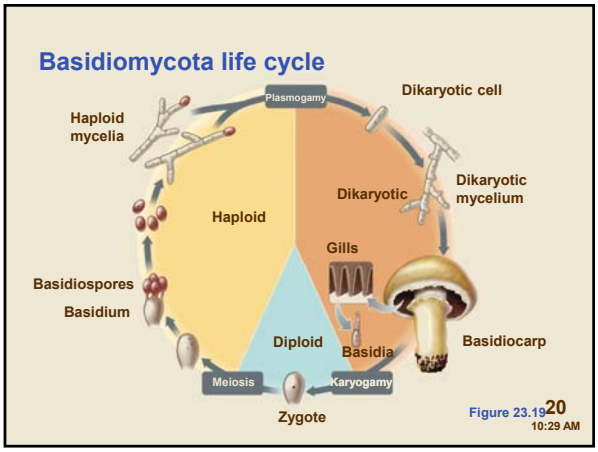
their cells are lined up end to end to make threads called hypha and when they are together its called mycelia. these branch and continure to grow. they are cytoplasmically connected to each other. thye digest their food externally. absorb the nutrients into the cytoplasm, and the cytoplasm is connected through the whole organism so its available for the whole organism. they recycle all the dead shit into the soil.



they spend most of their life in the haploid sta when they mate, they will fuse. they will fuse t they fuse their cytoplasm and is called plasmo the fusion of the nucleus is called karyogamy. when have karyogamy we have the diploid sta

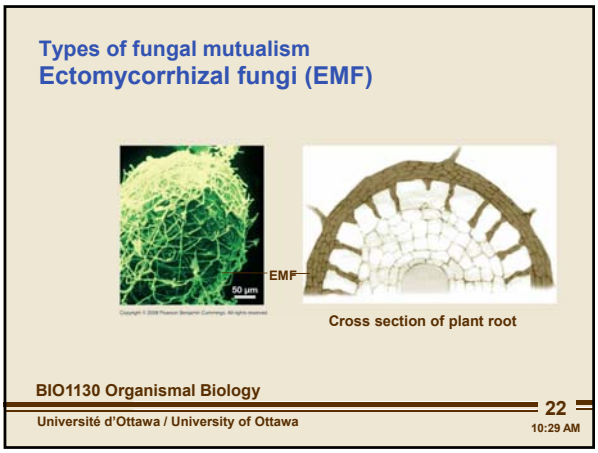


will consist of haploid cells, and become big cl
end to end, they are absorbing the nutrients ex
~~and shring them with the cytoplasm~~ and makin
it available for the whole organism. two diffeen
mate
~~then the plasma will fuse called plasmology, th~~
the cell will have 2 nuclei, its called a heteroka
or a dikaryont to signal there are 2 haploid nuc
in the cell. they nuclei will fuse and we get dipl
~~and will go under miosis and have 4~~ spores, ar

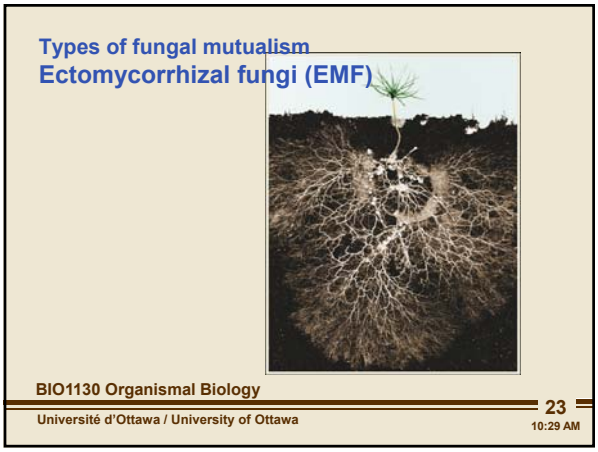


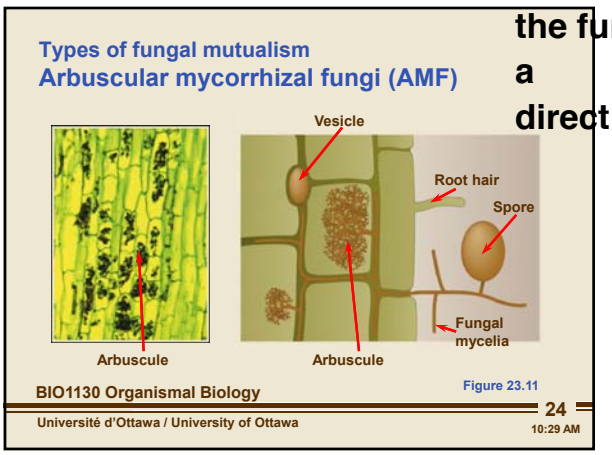
so we got haploid mycelia, they will meet up with
another thing and make a dikaryont cell. in addition
these mycelia spreading, they will wrap
themselvels into compatec structures and what you
basically have is a mushroom in a collapesed and
folded stage. what happes is when we get a rainfall
they absorb the water, the water is used to infalte
the mushroom. on the under sruface will be little
cells that have 2 seperated dikaryote cells. they
have to be in moist enviornments.

the fungi and the plant roots have a
mutualism

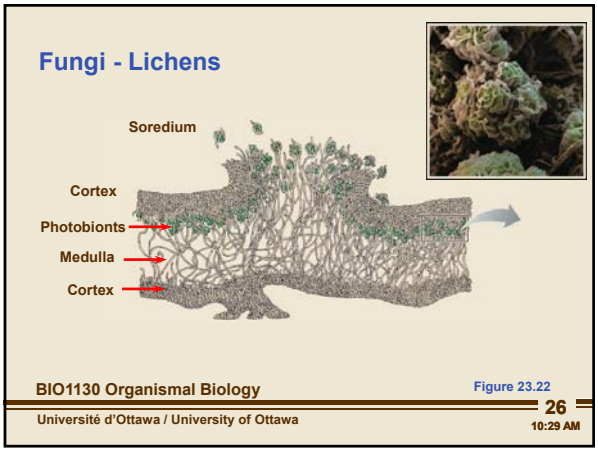


ectomycorrizhal means the fungus is on the outside. it can liquify rock, it can extract miner ~~which the plants need. it is solubulizing the mi~~ and providing it to the plants and the plants ar giving sugars to the fungi.

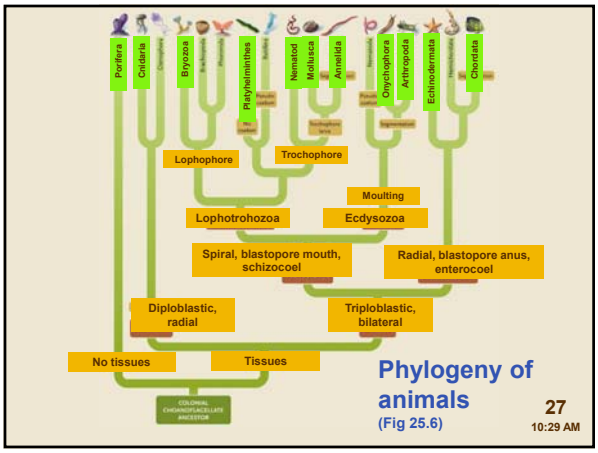




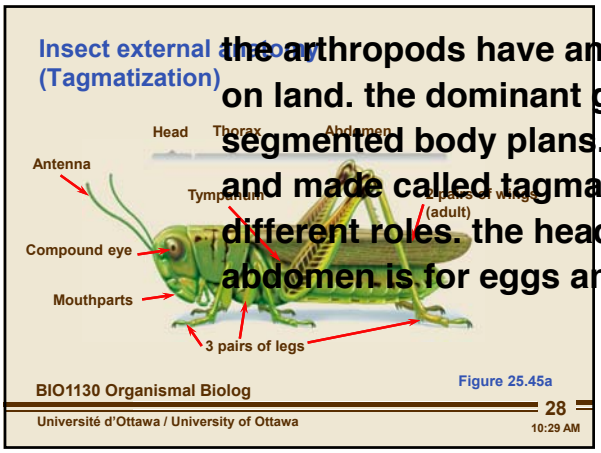
the fungus sets up shop inside plant cells. now we have a direct transport route into the cytoplasm of the plant.



a symbiosis, that takes the mycelia and wraps the green algal cells, which are carrying out pl the fungus is sitting on the rock which is being down to provide minerals to the plant. the fung being very important. they provide nutrients a the dead material back into the soil.

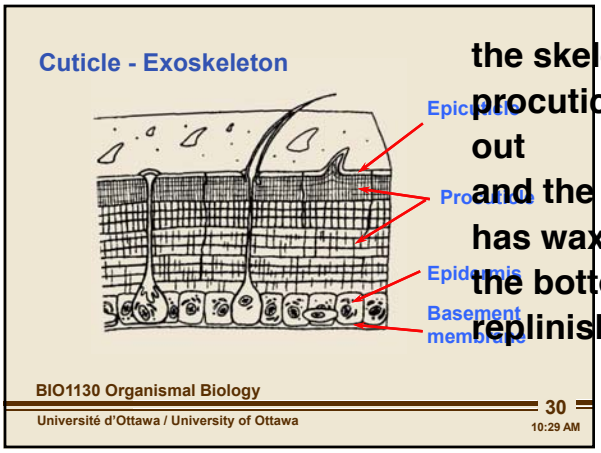


we also have animals that are moving up in the terrestrial enviornment

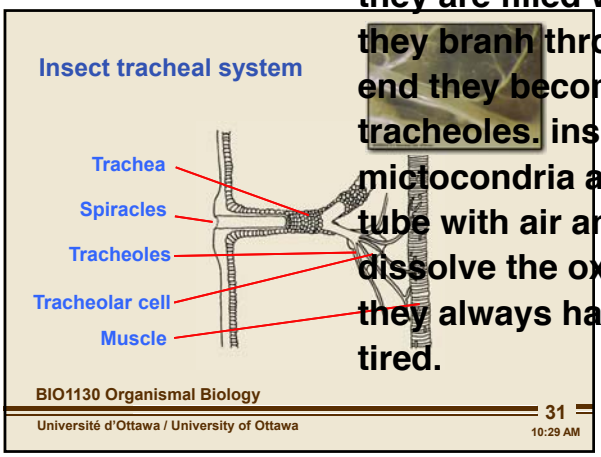


the arthropods have an exoskeleton. they come up on land. the dominant group are the insects. they take the segmented body plans. theyve taken segments and fused them together in and made called tagma. now whats happening is certain segments have different roles. the head is for feeding, the thorax is for movement, the abdomen is for eggs and other shit.

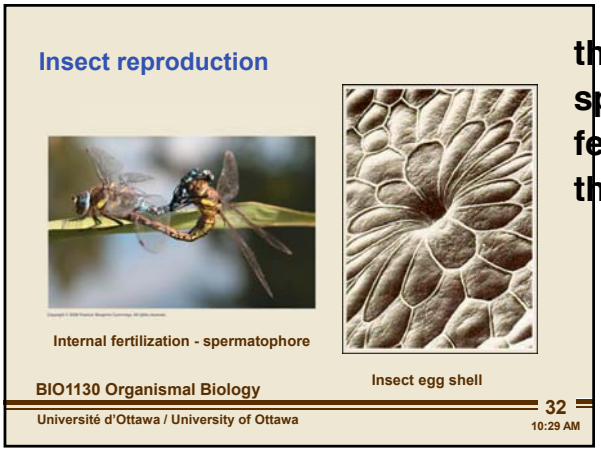
the insects are the first group to fly. they can m habitats that are inland. they can fly to excape they had to develop a folding mechanism.



the skeleton is on the outside. the vast majority is called procuticle. if we dont water proof it, the water will diffuse out
and the thing ~~will dry out. the Epicuticle will be cr~~eated. It has waxed and proteins. it is secreted from the glands from the bottom and is constantly being replaced and replinished. you need gas exchange.

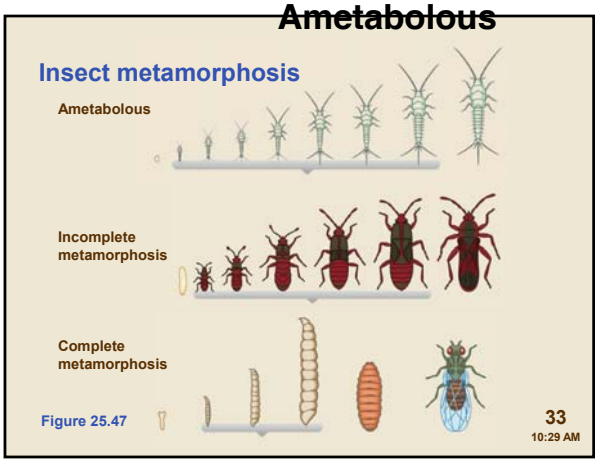


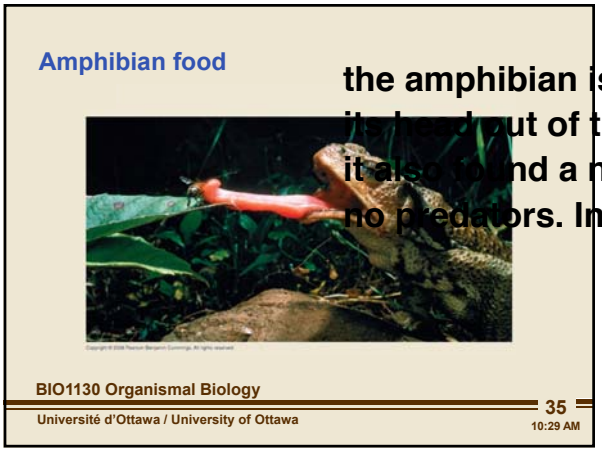
they take that epictuticle and bend that cuticle back back and they branch all the way through the insect. they are filled with air and there is no loss in water. they branh through and are filled with air. only at the end they become small enough they become tracheoles. inside the ~~muscle tissue will the~~ mictocondria and the right beside it will be a small tube with air and it diffuses in it. no liquid is used to dissolve the oxygen. ~~they never go into lactate load.~~ they always have oxygen. their muscles are never tired.



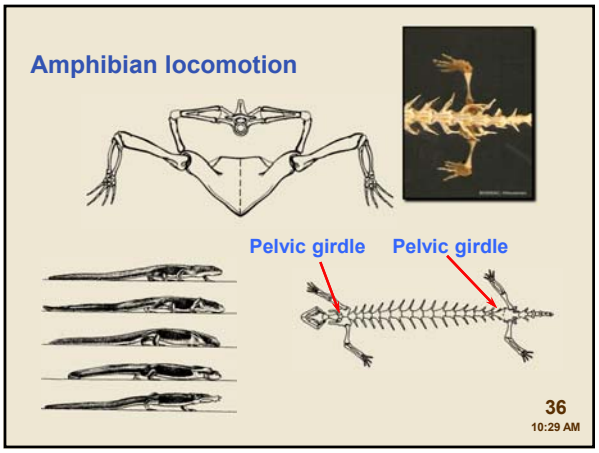
the male has a a water proof casing that contains its sperm callled a spermatophore which he gives to the female. the female opens it. in the sperm competition that is ~~what they were trying to get from the~~ female.

Complete metamorphosis is caterpillar, crystae and butterfly.
Incomplete metamorphosis they just get bigger and bigger.
Ametabolous

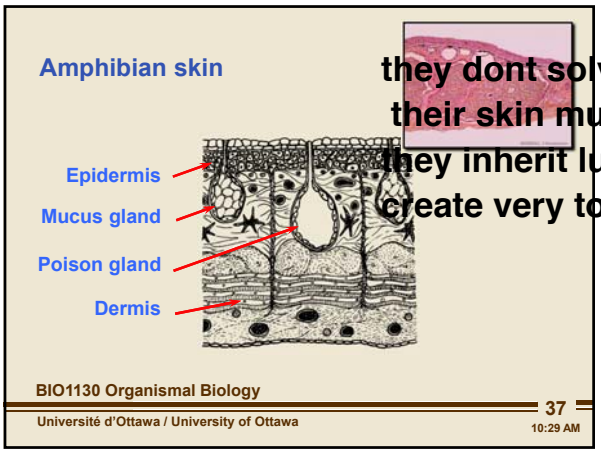




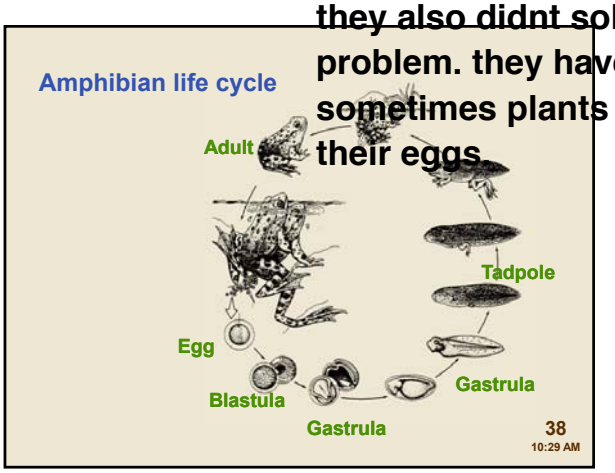
the amphibian is the one in the devonian, that was able to push it ~~body~~ out of the water and gulp air. one of the things that happene it also found a new food source. the insects are abundant and have no predators. Insectivores. they did it with their tongues.



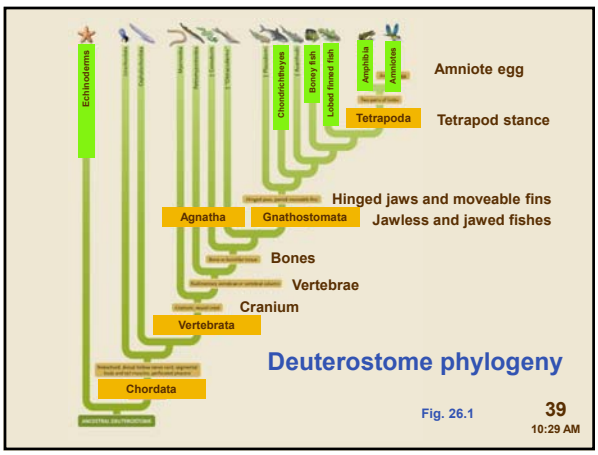
we have a new skeleton to combat gravity. The ~~Tetrapoda. a bony skeleton with 4 sets of limbs~~ they are attached to the axial skeleton. the ske is attached to the main limbs. they do a pushu their bodies off the ground. the skull will articu ~~axial column. when they move they~~ do a push and their body does a wiggle like fish, they wil move around.



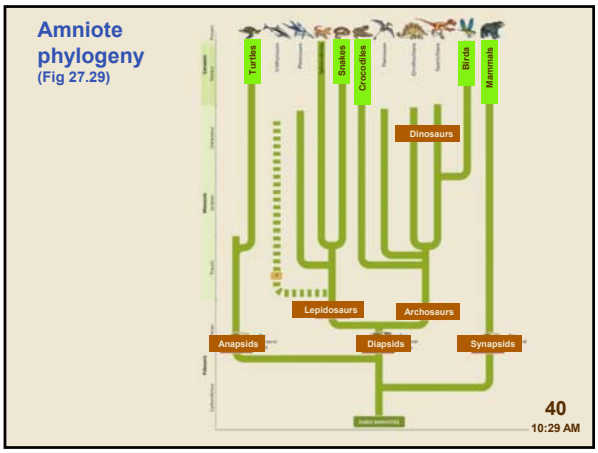
they dont solve the ~~water proof body surface problem.~~ their skin must be kept moist at all times. they inherit lungs from lung fish. they have poison glands that create very toxic poison.

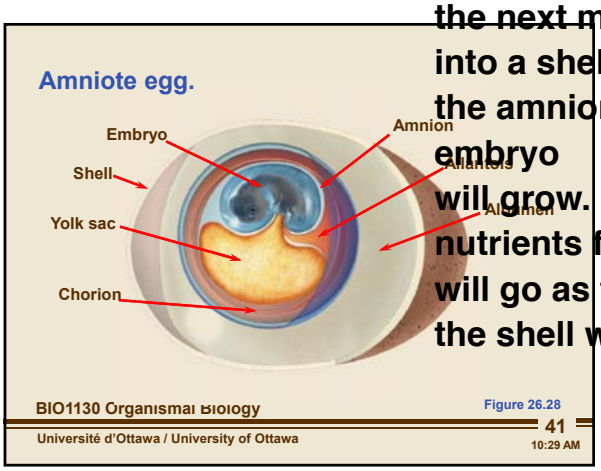


they also didnt solve the fertilizing the egg with a sperm problem. they have failed on water proofing and repoduction. sometimes plants that contain water will be where they lay their eggs.

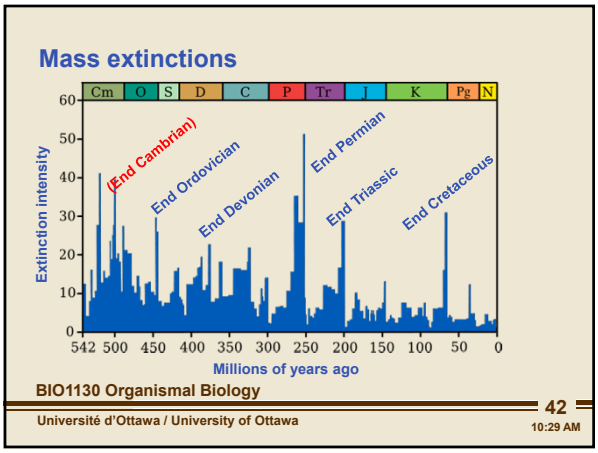


the next group coming are going to be the amniotes: turtles, birds and mammals, dinosaurs.





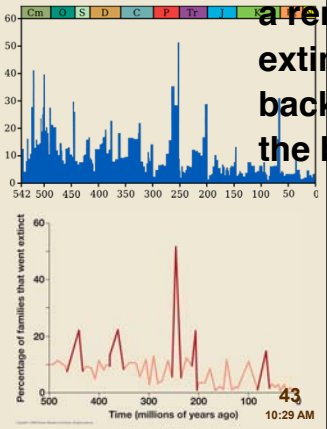
the next major innovation. they are going to wrap it into a shell. a Chorion which will contain the amnion. the amnion contains a fertilized zygote in which the embryo will grow. It contains yolk and albumen which are nutrients for the embryo. Allantois is where all the waste will go as the embryo grows. unlike the insects the shell will not be put on until the egg is fertilized.



Big ass exctinction.

Types of extinction

- Background extinction
- Mass extinctions



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a removal of 50% of the biodiversity dissapearing. extinctions are always occuring which are called background extinctions. there is always change going on the background.

Causes of mass extinction

- Asteroid impacts
- Elevated Carbon dioxide
  - Flood basalts
  - Volcanoes
  - Gas hydrates
- Marine anoxia
- Sea level changes

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the one at the end of cenozoic is asteroids. on common in mass extinctions is elevated CO2 not only do we get the warming effect, we also CO2 in the water, which is called anoxia. all the org

Flood basalts

video

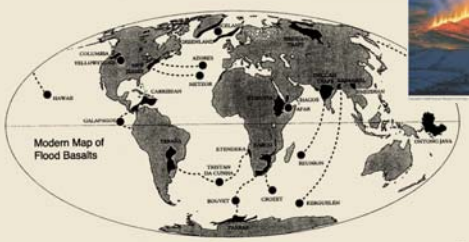

Figure 27-15

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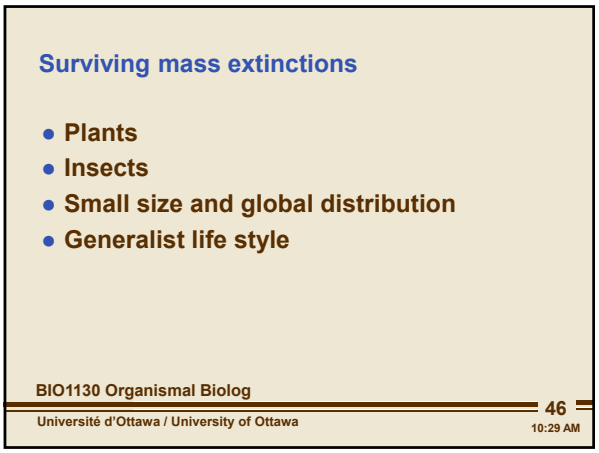
these are ruptures in the earth where magma come earth.when the continents drift apart the layer erup levels are expelled in the air. Flood basalts have be every mass extinction.

methanogens make methane, the pressure of the w the methan into solids. the solid methane when it c water, the solid becomes into a gas.



there are survivors. the one group that always
plants. because they allow for domancy and sp
insects survived very well as well. this is caus
small size. if you have a global distribution so
that survivor will repopulate. if you are small a
generous life cycle you will survive a mass ext