
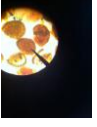


Plant diversity

- الوحدة عن النباتات .. المطلوب منا ندرس 3 نباتات .. Marchantia .. Fern .. pinus ..
والجدول التالي راح حاول لخص فيه الي شفناه باللاب ..
- كلمة same يعني الصورة الي بالكتاب هي نفس الي شفناه بالاسلايد ... وبعد هالكلمة مكتوب لون , الي هو اللون الي
شفنا الاسلايد فيه ..

	General description	Slides we have seen in the lab
Marchantia	Non-vascular	<p>(4)</p> <ul style="list-style-type: none"> - marchantia gemmae cup figure 17-4 page 243, same -marchantia antheridium figure 17-5 page 243 , same shape,pink or brown -marchantia archeogonia figure 17-6 page 244, same shape, ازرق فالالتح - marchantia sporophyta figure 17-7 page 244 , same
Fern	Vascular & seedles	<p>(3)</p> <ul style="list-style-type: none"> - fern sorus figure 17-16 A , page 251 , same shape , pink  - sporangium figure 17-16 B , page 251 ,  - fern gametophyta figure 17-17 page 251 , same (heart shapeeee)
Pinus	Vascular & seed & gymnosperms	<ul style="list-style-type: none"> - male cone figure 17-20 page 254 B , same -female cone figure 17-20 page 254 , same

Introduction :

- kingdom : Plantae >> multicellular eukaryotes that have :
 - well developed tissues
 - chlorophylls and other pigments (help during photosynthesis)
 - cell walls made of Cellulose >> remember < fungi contain cell walls but it's made of chitin >

Plants are divided into : - vascular - non-vascular
Vascular are divided into : - seed - seedlees
Seed are divided into : - angiosperms - gymnosperms
Angiosperms are divided into : - monocotyledonous - dicotyledonous

- Members of this kingdom have evolved from : aquatic ancestors

1 – Non-vascular plants : The Bryophytes

- classified into three phyla :

Hepatophyta (liverwort)	<ul style="list-style-type: none">- grow in moist- two forms : thallose & leafy (we studied only thallose)- Thallose (simple plant body) liverwort consist of a flat , green , ribbon-like dichotomously-branched thallus..-Thallus is anchored to the substrate by (rhizoids)- rhizoids arise from the lower surface- eg for thallose : Marchantia
Bryophyta (mosses)	- NOT IS SYLLYBUS
Anthocerophyta (hornwort)	

- Plants in these phyla lack vascular tissue
- Most are small (less than 20 cm , and many are less than 2 cm).. this limit in size , is because they lack true vascular tissues (xylem & phloem)
- absence of true roots , leaves and stems
- Bryouphytes exhibit alternation of generations in their life cycle (p . 241)
- meiosis (الانقسام المنصف) Occurs in sporangia .. results : produce haploid spores ابواغ 1 ن

- spores germinate into haploid multicellular organism (gametophyte) which produce male & female gametes .
- The haploid gametophyte is the dominant form in the life cycle of bryophytes .
- During sexual reproduction , motile sperm swims from the antheridia to eggs in an archegonium
(both of these are known as gametangia)
- Once fertilized , the egg develops into diploid $2n$ sporophyte , and then produce a sporangium.
- Meiosis occurs within the sporangium.. results : produce haploid $1n$ spores

Phylum Hepatophyta (liverwort) :

- Here is a table for the exercises 1 – 5 about the *Marchantia*

17 – 1 : external features	<ul style="list-style-type: none"> - dichotomous branching - midrib running down the center of all branches - gemmae cup : a tiny structure in the dorsal surface responsible for asexual reproduction and contain tiny flat cells called gemmae - Rhizoids : in lower surface , anchor thallus to soil and absorb minerals & nutrients. - Archegoniophore : female gamete producing - Antheridiophore : male gamete producing
17-2: reproductive structure	<ul style="list-style-type: none"> - asexual reproductive structures are : Gemmae cups - small multicellular bodies produced within gemmae cups called : gemmae , those can grow to form a new gametophyte
17-3: male reproductive structures	<ul style="list-style-type: none"> - Antheridiophores...they are stalks coming off the male gametophyte that bear the male gametangia (the antheridia) where male gametes (sperms) are produced
17-4 : female reproductive structures	<ul style="list-style-type: none"> - Archegoniophores...bear the female gametangia (the archegonia) where female gametes are produced.
17-5 : sporophyte :	<ul style="list-style-type: none"> - each sporophyte has a foot buried in the gametophyte tissue . a stalk (or seta) and a capsule (or sporangium) - the capsule has a jacket surrounding the many spores and elongate spiral elaters - elaters aid in the spore dispersal

II : Seedless vascular plants : Ferns and fern allies (phylum polypodiophyta) :

- vascular
- more complex than non-vascular Bryophytes
- possess true stems , roots , and leaves
- exhibit alternation of generations
- sporophyte is the dominant generation

Phylum polypodiophyta (ferns) :

17-10 : external structure	<ul style="list-style-type: none">- ferns are very leafy , leaves arise from an underground stem (rhizome)- each leaf consist of a stalk and a blade- blade is subdivided into pinnae- in the lower surface of the pinnae , there are clusters of sporangia called : sori (sorus)- each sorus has a protective covering called the indusium
17-11 : reproductive structure , sori	<ul style="list-style-type: none">- the sporangia are the semi-transport , golden-brown spheres extending on stalks from a common receptacle .- the responsible for dispersing the spores is : a thick layer of cells around part of the outside rim of each sporangium ... this band is called : Annulus- lip : a row of thin-walled cells near the stalk of the sporangium , opened due to tension of water which force the sporangium to contract and breaks open at the lip- tension is released when the thinner walls of sporangium lip open , causing the spores to be ejected forcefully
17-12 : fern gametophyte	<ul style="list-style-type: none">- when fern spore germinates , it develops into : gametophyte plant (the prothallus)- bisexual gametophyte prothallus : contain both antheridia and archegonia
17-13 : fern young sporophyte	<ul style="list-style-type: none">- a motile sperm release .. from (antheridia) ... swim through water to fertilize eggs in (archeogonia) .. the developing diploid (2n) zygote divides and grows into a young sporophyte.

III : The Vascular seed plants : Gymnosperms and angiosperms معرفة ومغظة البذور

Gymnosperms (phylum pinophyta)	Angiosperms (phylum magnoliophyta)
<ul style="list-style-type: none"> -produce seeds exposed on leaves or modified stems..and develop on specialized leaves (sporophylls) - four phyla of gymnosperms exist : *cycadophyta *ginkgophyta *gnetophyta *<u>pinophyta</u> -vascular plants and have true leaves , stems and roots. 	<ul style="list-style-type: none"> - Produce seeds enclosed by an ovary (enclosed in fruits , developed from ovaries) - vascular , produce flowers & fruits - phylum magnoliophyta is separated into : * Liliopsida (monocotyledinae) * Magnoliopsida (dicotyledinae)

- seed plants arose from : heterosporous ancestors that produced two kinds of spores :
 - * microspore : develops into a male gametophyte (which produce pollen grain)
 - *megaspore : developed into a female gametophyte (which produce eggs that grow in the female gametophyte)
- the embryo & the female gametophyte form the seed

Gymnosperms (phylum pinophyta) :

- we will study the *Pinus* which is a common gymnosperm

17 – 14 : external structure :	<ul style="list-style-type: none"> - needle-shaped leaves that adapted to dry conditions . - larger persistent and woody cones are female cones (female strobili) - smaller cones are male cones (male strobili) - pollen is produced in male strobili
17-15 : reproductive structures , the male one	<ul style="list-style-type: none"> - consist of a series of microsporophylls - pollen sacs = microsporangia , found in the under side of each microsporophylls - pollen grains = microspores , found inside the pollen sacs
17-16 : the female one	<ul style="list-style-type: none"> - ovuliferous = megasporophyll - ovule = megaspore
17-17 : pinus seed	<ul style="list-style-type: none"> - pinus seed = fertilized ovule - structures from the outside : seed coat , developing stem-root (radical & plumule) , seed leaves (cotyledons)

Angiosperms (phylum magnoliophyta) :

monocot	dicot
<ul style="list-style-type: none">- include : lilies , orchids , irises and grasses- have one cotyledon in seed-leaves with parallel venation-flowers parts in multiples of 3 and a complex arrangement of vascular tissue in stem .- we will study Corn (Zea maize) , see page 257 , figure 17-24	<ul style="list-style-type: none">- include roses , peas , sunflowers , oaks , maples , and buttercups .- have two cotyledons in the seed- leaves with netted or reticular ventaition-flower parts in multiple of 4 or 5and a circular arrangement of vascular tissue- we will study Capsella ..see page 257 , figure 17-24

17- 18 : flower morphology of a typical dicot and monocot :

- see page 256 , the figure !!