

UNIVERSITY OF SCIENCES AND TECHNOLOGY HOUARI BOUMEDIENE

FACULTY OF BIOLOGICAL SCIENCES

TCE-ANGLAIS

Chapter Botany



"Plants have been a part of our lives since the beginning of time.

From plants, we get vegetables and drugs which are crucial and beneficial to our health".



Avicenna (980-1037).Philosophy, medicine, science

Presented by CHABANE

Course Outline

Part I. Algae-Fungi -Lichens

Introduction

Living things,

Botany, definition

Classification and Principal Groups (See lecture)

Part II. Embryophyta

Introduction and characteristics

Classification and Principal Groups (See lecture)

Without seed formationBryophyta Ex. *Bryum sp.*

Ferns Ex. *Polypodium vulgare*

With seed formationConiferophyta Ex. *Pinus halepensis*

Angiosperm (**Monocots**) Ex. *Allium triquetrum*

Angiosperm (**Dicots**) Ex. *Borago officinalis*

Part III. Interests of Plants and Uses

Plant ecology

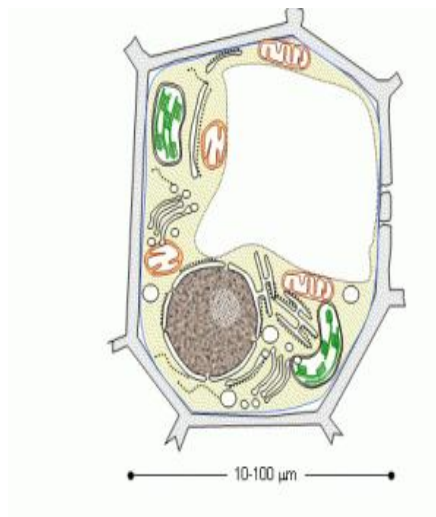
Plant biotechnology

Pharmacognosy and traditional medicine

Introduction

Living things are organisms that display the key characteristics of life. These characteristics include the ability to grow,, take in and,, excrete waste, respond to,, and possess an organized, more complex than that of non-living things.

Botany Botane, comes from Greek and means, it is the,, interesting to plants. Currently,, is defined as,, organism with,, activity. It is a natural,, group with,, constituted by cellulosic compounds. **Plant** is defined as multi cell organism with photosynthetic activity, it is a natural autotrophic group with cell wall constituted by cellulosic compounds (see plant cell).



.....

Plant cell is characterized byshape, surrounded by with many
Cell structures as,and

Classification and Principal Groups (see lecture)

Nowdays, there are tree taxa based on, existed in all living things in the world. (Woese et al., 1990), named

-
- Archaea
-

.....is divided to 5 kingdoms (**Cavalier – Smith, 1998**)

- Kingdom of Autotrophic with cell composed of
- Kingdom of Fungi, , symbiotic or....., with cell wall composed of
- Kingdom of Animalia . Animals as consumers with digestive nutritional mode without cell wall.
- Kingdom of Chromista = brown line
- Kingdom of Chromista

The plant is classified by giving the name of and(**Binomial nomenclature**) according to **Linnaeus** (.....) who invented the system of..... still used today for each plant, animal, bacteria or fungi. **Genus** and **species** written in **italic character** or **underlined**.

Algae: *Algae* are a very large and diverse group ofphotosynthetic organisms, ranging fromgenera such as *Chlorella* and the diatoms toforms such as *Ulva*and others. Characterized by a lack of complexand (without leaves, , and roots).



Ex. « Sea lettuce »

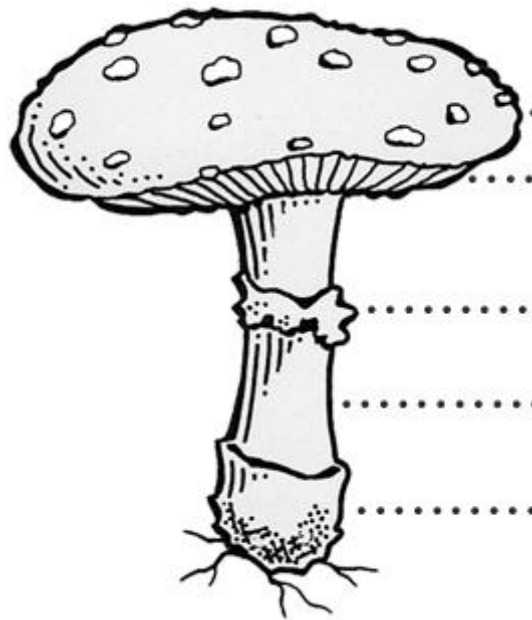
..... (multicellular) formed of twoof cells rich of

Fungi a taxonomic kingdom, or in some classification schemes a division of the kingdom....., comprising all the fungus groups and sometimes also the slime molds, also called..... any organisms that lack....., leaves,, and....., reproduce by....., and live as saprotrophs or..... The group includes moulds, mildews, rusts, yeasts, and mushrooms.

The main body of most fungi is made up of fine, branching, and usually colorless threads called..... Each fungus will have vast numbers of these hyphae, all intertwining to make up a tangled web called the.....

A mushroom has..... The part underground is called the..... It gets food for the mushroom. Sometimes it dies quickly, but if it gets enough food it may live for hundreds of years.

The umbrella-shaped body of a..... that we can see is called the fruit or..... It only lives for a few days. The fruit **starts out** as a small button which grows into aand a **cap**. The **stalk** or **stem** grows quickly because it can **absorb** a lot of water. As the cap becomes larger it **unfolds** like an umbrella. Soon small plates, called....., **appear** under the mushroom's..... They have small **spores** on them. When these spores fall off the mushroom the wind blows them away. If they fall on a warm, wet area a new mycelium **develops**.



EX.(Cap with margin....., stem withand mycelium in.....).

Lichens are composite,made up fromand The dominant partner is a fungus. Fungi (.....) are incapable of making their own food. They usually provide for themselves as parasites or decomposers. The second partner partners are algae (....., Chlorophyta).



Ex. *Xanthoria parietina* showing(discs)

The anatomic structure of this lichen allows the observation of many tissues as followed:

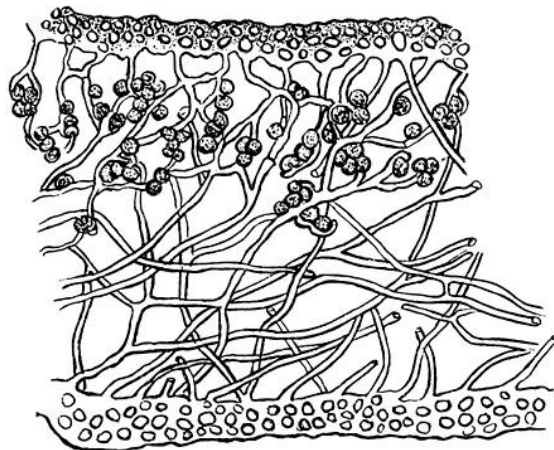


Fig. 8. *Physcia parietina* De Not. Vertical section of thallus obtained by synthetic culture $\times 130$ (after Bonnier).

.....

Part II EMBRYOPHYTA

Listen and understand (see lecture)

Recognize and underline the key words of each group of plants.

Are the most familiar subkingdom of green plants that form vegetation on earth. Living embryophytes include most familiar plants such as mosses, Ferns, cycadophyta, coniferophyta and Angiosperms (Monocotyledonous dicotyledonous). It called as “embryo”-phytes because they formed an embryo after reproduction.

Most species are terrestrial, land plants are mostly photosynthetic. The embryophytes support directly our life as foods (ex. rice, corn, wheat, potato etc.), luxuries (tobacco, coffee, paper etc.), feeds (timothy, alfalfa etc.), material (cotton, pine etc.), drugs (opium, digitalis etc.).

Land plants basically show alternation between the haploid gametophyte diploid sporophyte.

Mosses: Simplest plants of damp terrestrial land with simple stems and leaves. No true roots, they have rhizoids and no vascular tissues.

Ferns A fern is a member of vascular plants that reproduce via spores and have neither seeds nor flowers. They differ from mosses by being vascular. They have stems and leaves like other vascular plants and roots.

Coniferophyta conifer (cone-bearer) + -ophyta: Organisms collectively called Conifers because all of them can produce cones. A cone is a collection of sporophylls. The vegetative organs can be distinguished as the roots, stems and leaves. They do not produce flowers, but the sporophylls would form collections and make up the cones. They have a simple reproduction. The plant produces naked seeds. Naked seed means that the seed is exposed in air, or not totally enclosed with other structures, as the pericarps etc.)

Angiosperms, the largest and most diverse group within the kingdom Plantae (flowering plants). Angiosperms are vascular seed plants in which the ovule (egg) is fertilized and develops into a seed in an enclosed hollow ovary. The ovary itself is usually enclosed in a flower, that part of the angiospermous plant that contains the male or female reproductive organs or both.

Traditionally, the flowering plants have been divided into two major groups, or classes: the Dicots (Magnoliopsida) and the Monocots (Liliopsida).

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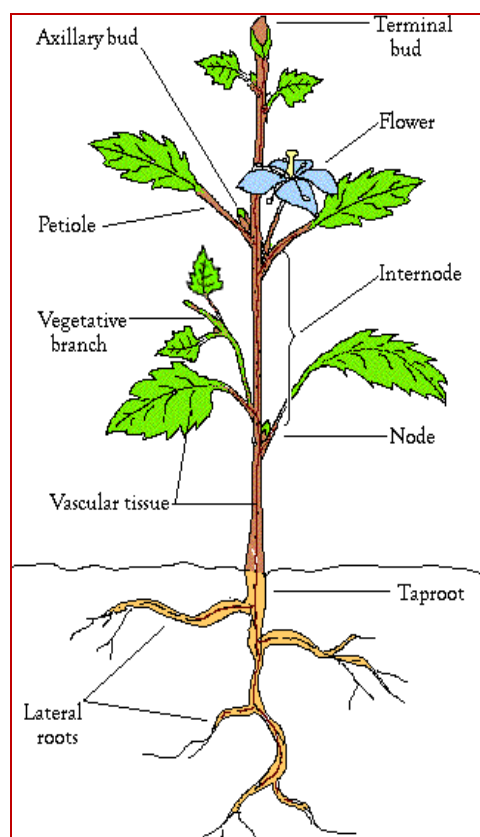
Discover: complete the presenter's paragraph according to the lecture.

Morphology of plants, is an interested tool used in the identification of plants. This concerns particularly vegetative and reproductive structures:

*..... Of vascular plants are divided to two organ systems:

- **Shoot system** composed of **stems and leaves**
- **Root system** composed of two types of **roots: taproots (Dicots)** and **fibrous roots (Monocots)**.

*..... used for the classification of plants than vegetative characters are varied;
Flowers and fruits in the **angiosperms**. **Seed cones** in **Conifers and Other Gymnosperms** and **Sori** in **Ferns**

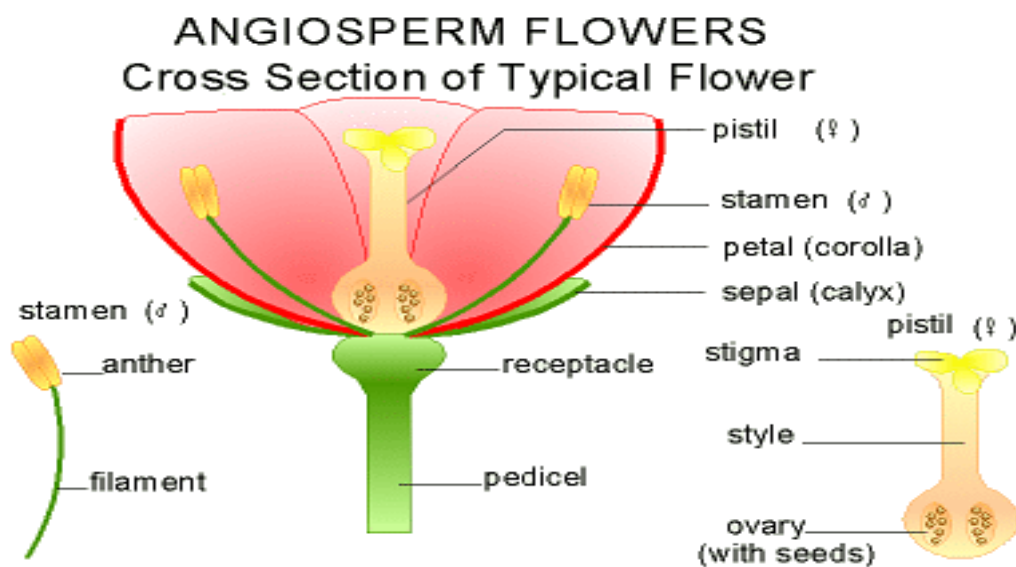


Morphology of plant « Angiosperm »

Many characteristics of the flower are important to be considered for classification of angiosperms

*Symmetry of flower,flower is **regular** andflower is **irregular**.

***Flower constitution**, theoretical flower is constituted by **Calyx + Corolla + Stamen + Pistil**. **S**: calyx of sepals, **C**: corolla of petals, **S** = **stamen** consisting of anther and filament, **P** = **pistil** consisting of stigma, style, and ovaries, with the terms carpels, locules, ovules, and/or placenta referring to parts of the ovary.



Flower constitution

Part III. Interests of Plants and Uses

Plants and Ecology (see lecture)

Ecology (from greek: οἶκος, "house"; -λογία, "study of") is **the scientific analysis** and study of interactions among organisms and their environment, such as the interactions organisms have with each other and with their abiotic environment. Topics of interest to ecologists include the diversity, distribution, amount (biomass), number (population) of organisms, as well as competition between them within and among ecosystems.

Plants, as the base for food chains, serve as the structural and functional foundation ofand managed systems.

Plant biotechnology (see lecture)

Biotechnology developsto produce adventitious plants efficiently....., and has been successful in developing a high frequency somatic embryogenesis protocol and identifying highly regenerable cultivars.



Production of many plants by in vitro culture

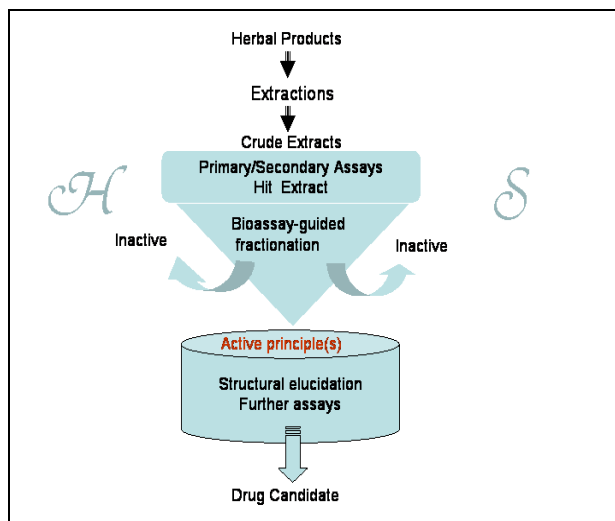
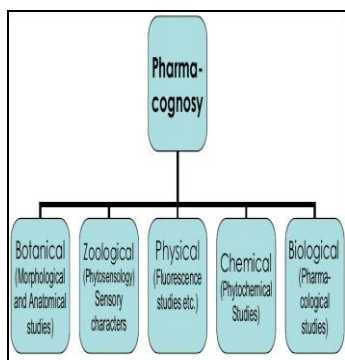
Phytopharmacy (see lecture)

Survey & Documentation ofof biosphere

Pharmacological studies to ascertain efficacy off

Acute, sub acute and chronic toxicity studies to ascertain safety of herbal extracts/formulations

.....discovery fromsources.



Interests of pharmacognosy in drug establishment

References

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Qiu, Y.-L. *et al.* (2006) The deepest divergences in land plants inferred from phylogenomic evidence. *Proc. Natl. Acad. Sci. USA* 103: 15511-15516.

Stevens, P. F. (2001 onwards) Angiosperm Phylogeny Website. Version 8, June 2007

https://www.google.dz/?gws_rd=ssl#q=algae

Lichens : <http://bnhs.co.uk/focuson/lichen-challenge/html/index.htm>

[http:// Plant Biotechnology - Experience and Future Prospects](http://PlantBiotechnology-ExperienceandFutureProspects).

Exercices

Exercise 1. Tick the right boxes

1. Embryophytes characters

“embryo”-phytes formed anafter reproduction.

“embryo”-phytes do not formed anafter reproduction

“embryo”-phytes have no true roots.

2. Mosses are simplest plants with

True roots

No true roots, named rhizoids

No true roots, no rhizoids

They have rhizoids, true roots

3. The coniferophyta produces other parts of reproduction

Coniferophyta produces cones

Coniferophyta produces neither cones nor flowers

Coniferophyta produces flowers

4. Angiosperms are composed by

Shoot system and root systems

Neither roots nor stems

They have not leaves either

Exercise 2. Listen and take notes about some plants. Discuss your answers with your partner then write two important characters of each one below.



A



b



c

Exercise 3. Complete the scheme below and propose a title according to the characteristic chosen (symmetry, ovary position...).

