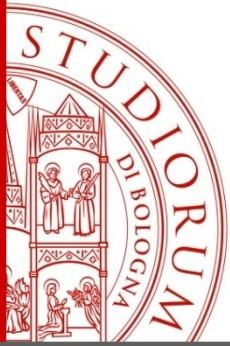


BIOLOGY OF HUMAN AND ENVIRONMENTAL HEALTH

Interuniversity Degree

**University of Padua / University
of Bologna**

April 11 2025



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

**Teaching Courses of the Third year in Bologna focused on
Environmental Health**

Plant Human and Environment Interactions

Prof. Stefano Del Duca

Biology of Human and Environmental Health

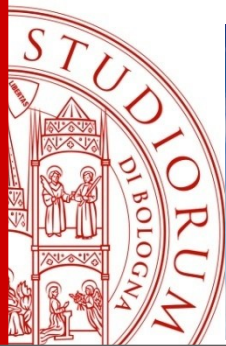
Plant Human and Environment Interactions

Credits 6

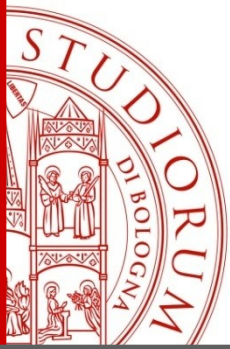


(5+1lab)



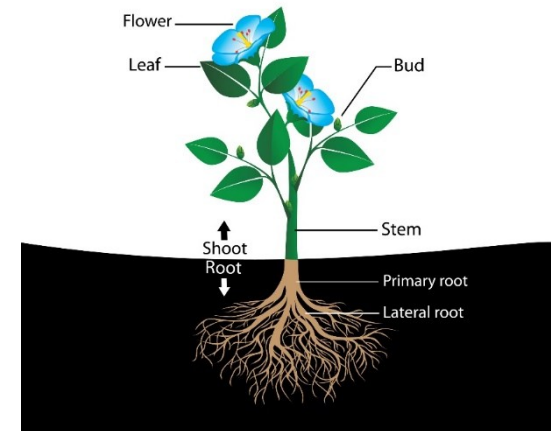
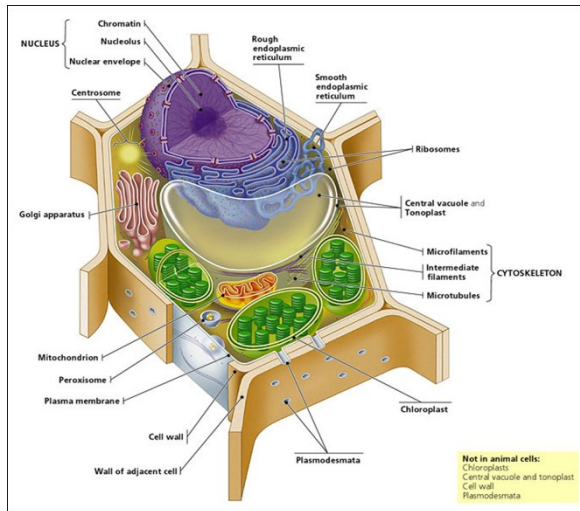


- Global change drivers include climate change, land use changes, biological invasions and pollution.
- The myriad of signals from the environment surrounding plants generate a pool of responses



MAIN TOPICS

1. Brief description of the anatomy and cytology of plants



2. The adaptation strategies of plants to different environmental conditions

Protective adaptations to high T and oxidative stress due to high light intensity

Jacobaea maritima



(a)

Epithelantha



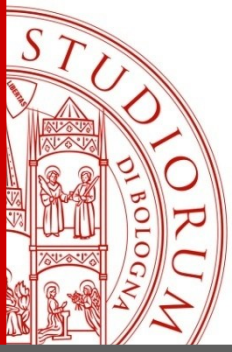
(b)



Dudleya brittonii

The temperature increases reduces global yields of major 33 crops





ABIOTIC STRESS

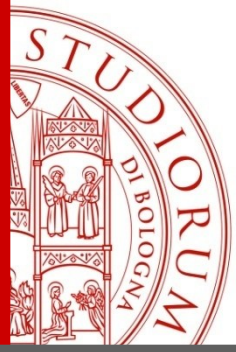
Any deviation from optimal growth conditions in terms of nutrition, light, temperature, water, CO_2 or O_2 availability, ... etc.



Desertification



High temperature



the
Sahel
area



Effect of abiotic stress related to Global warming: migrations from the Sahel to Italy driven by weather-climatic variations

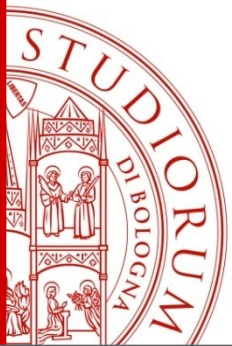
BIOTIC STRESS



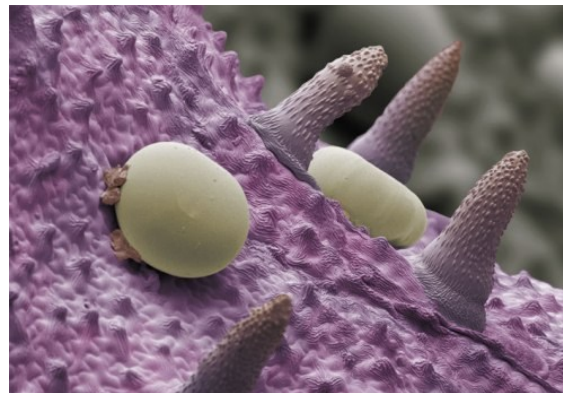
Chewing insect



Cucumber mosaic virus



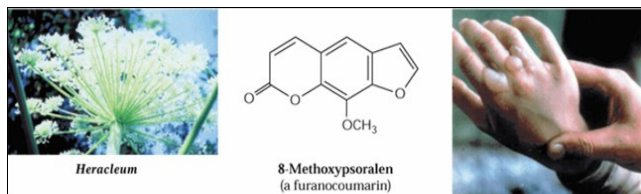
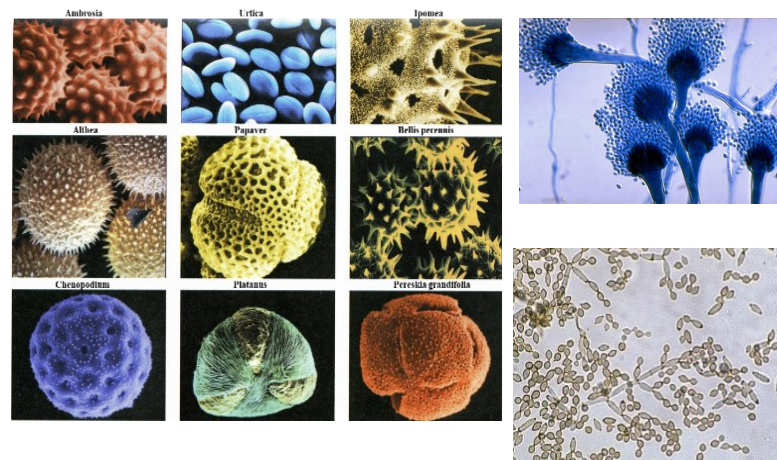
3. Natural products



4. Allergens released by plants: main airborne bio-allergens: pollen and fungi. Alien plants.



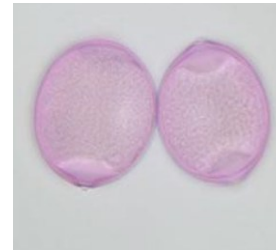
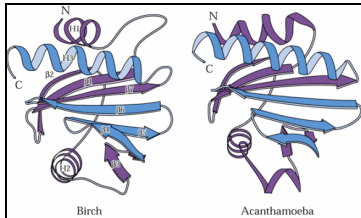
Ambrosia artemisiifolia

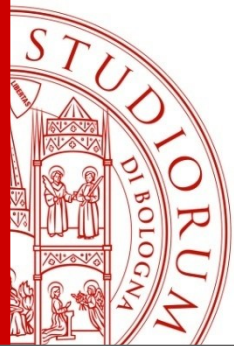


Heracleum mantagazzianum

5. Food allergens of plant origin and respiratory allergens of pollen origin

Same allergen in pollen
and fruit

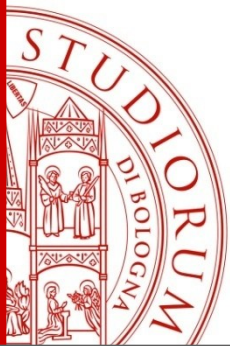




6. Role of plants as organisms capable of monitoring environmental quality



Leaves able to monitor O3...
and other pollutants



7. Possible use of plants in environmental phytoremediation



soil

Pteris vittata



Air

Areca lutescens



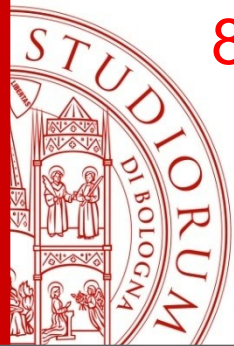
Carex elata



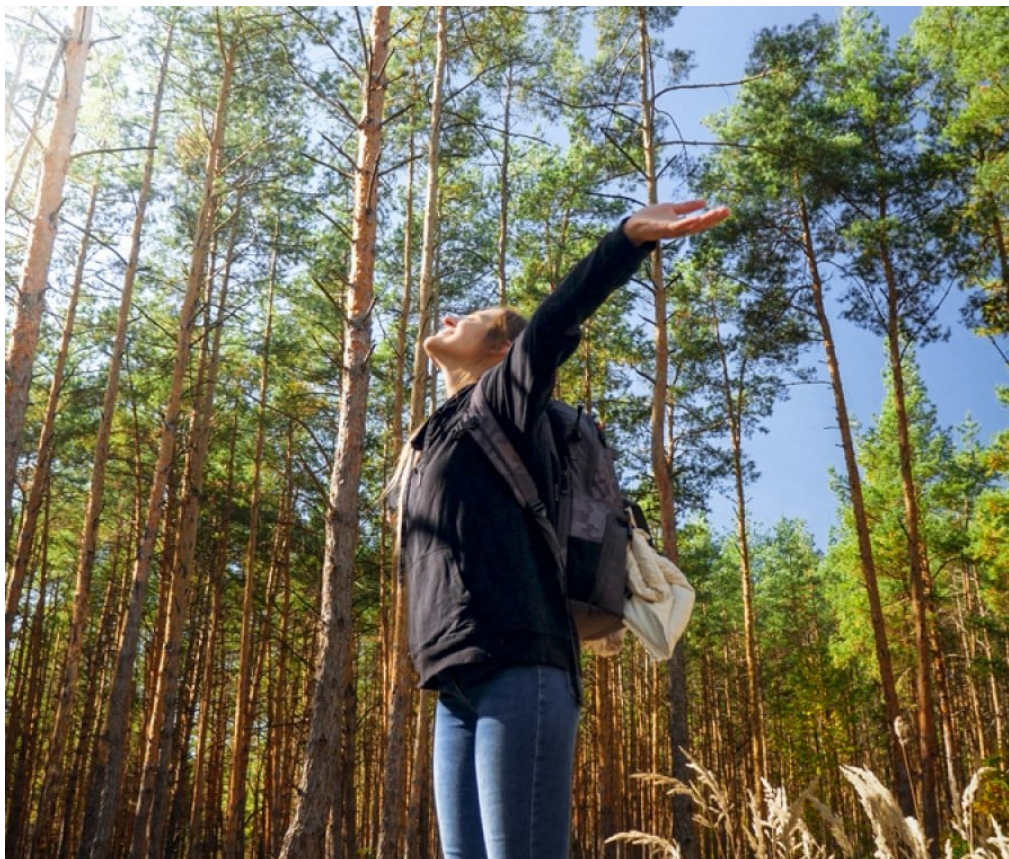
Water

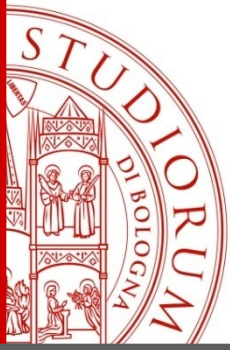
Eichornia crassipes





8. Volatile plant metabolites that have therapeutic effects: the forest therapy



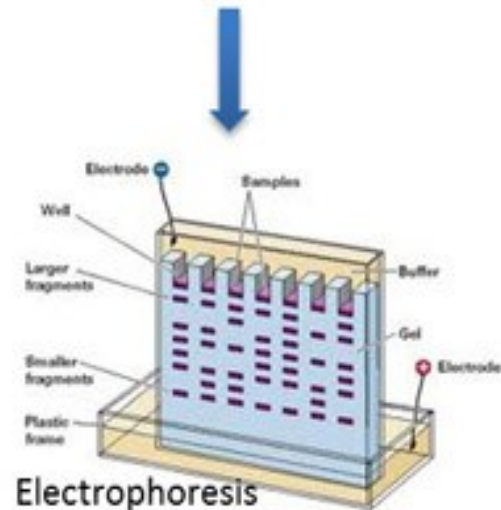


Laboratory activities

1. Western blotting:
2. Measure of photosynthetic performance by Handy Pea
3. Aerobiological collected sample: microscope analysis

Western blotting

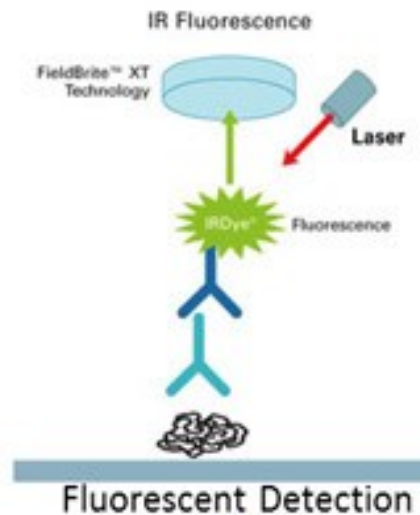
Sample Preparation



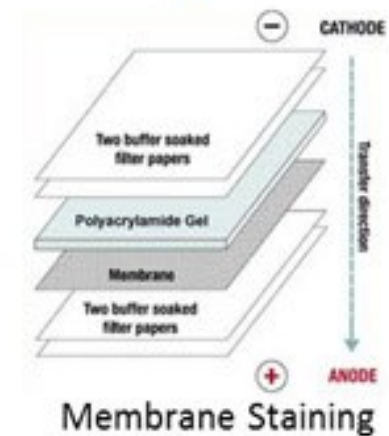
Electrophoresis



Transfer

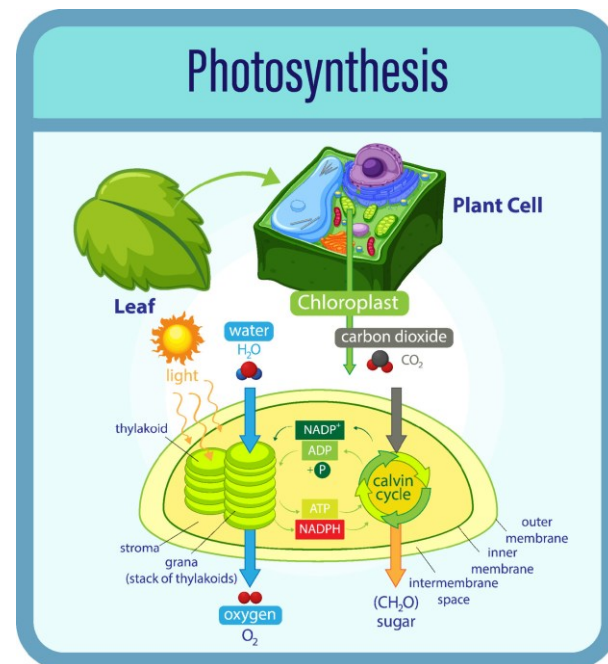


Fluorescent Detection

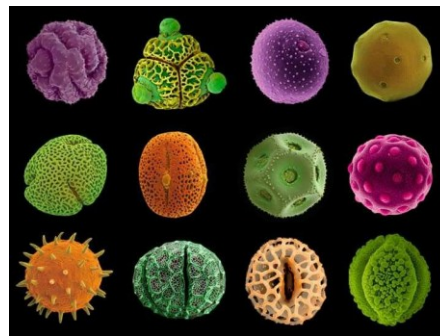
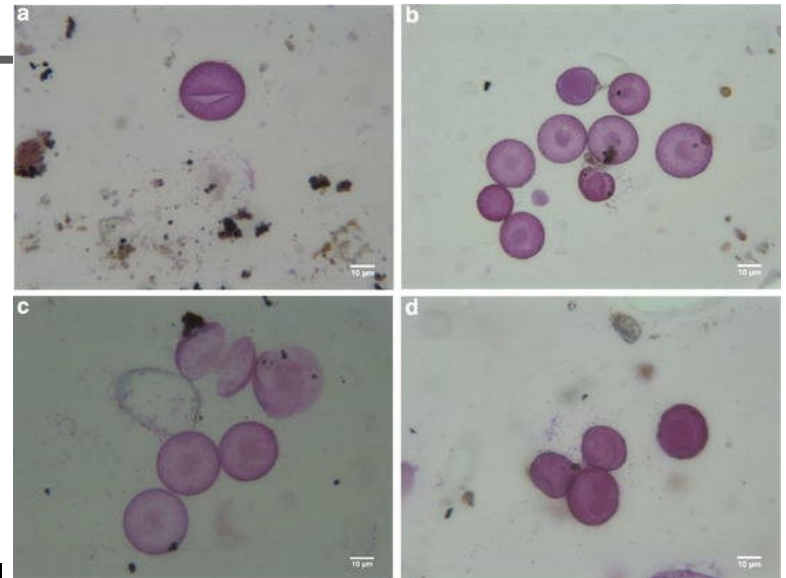


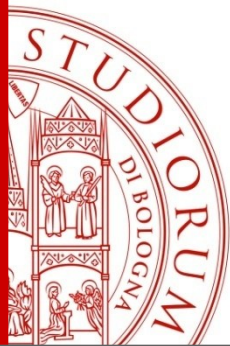
Membrane Staining

2. Measure of photosynthetic activity in stressed plant and in control



3. Aerobiological collected sample: microscope analysis





Thank you for your attention