

Introduction to Botany. Lecture 3

Alexey Shipunov

Minot State University

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Outline

1 Questions and answers

2 Plants in general

3 Plants₁ and plants₂

4 Ways of life

- Energy and food
- Chemistry of life



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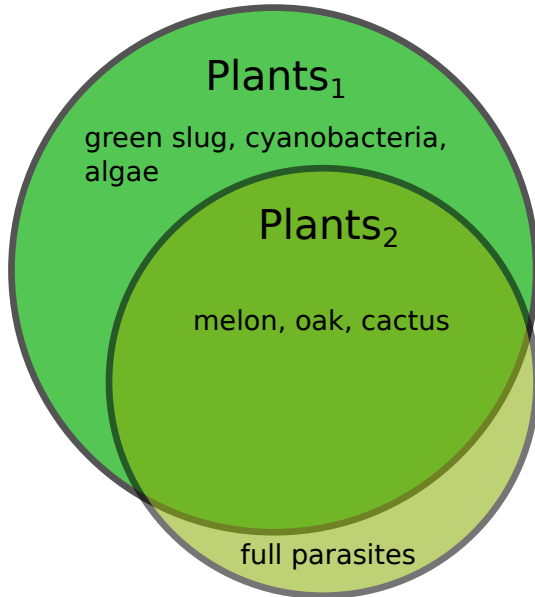
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Last question



Hydnora



Root parasite



Pilostyles



Internal parasite



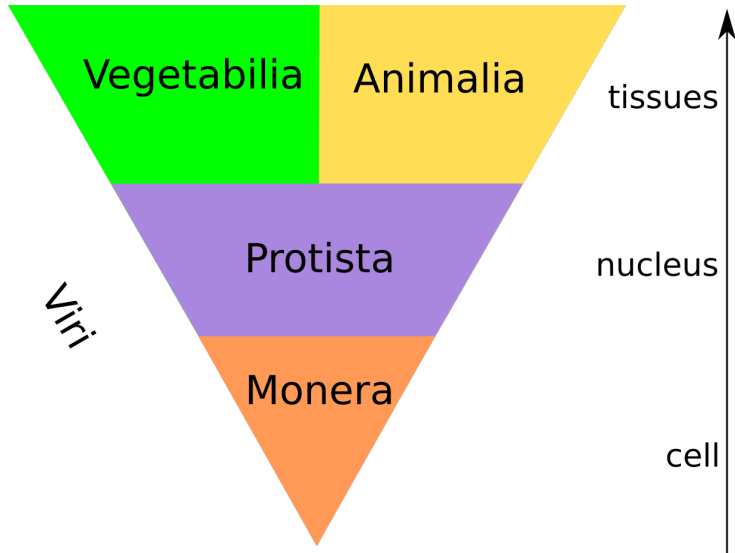
Dodder



Stem parasite



Pyramid of life



Questions about pyramid

What is Monera? Prokaryotes: (1) Bacteria and (2) Archaea

What is Protista? Eukaryotes without tissues

Where are eukaryotes? Protista, Vegetabilia and Animalia

Where are fungi? They belong to different protists

Where are plants₂? Vegetabilia

Where are plants₁? It is not applicable here

Why are two groups on one level? Vegetabilia and Animalia both have tissues but obtained them for the radically different purposes. Animals acquired *kinoblast* and *phagocytoblast* **to hunt and digest**, and plants have *epidermis* and *photosynthetic tissue* **to survive on land**.



Plants₁ and plants₂ (updated)

- Plants₁ are all photosynthetic organisms
- Plants₂ are **Vegetabilia**: multi-tissued, terrestrial, primarily photosynthetic eukaryotes



Ways of life

Energy and food



Ways of life

- How to obtain energy?
 - ① From sun light: **phototrophy**
 - ② From chemical reactions with inorganic matter (“rocks”): **lithotrophy**
 - ③ From breaking organic molecules into inorganic (typically, carbon dioxide and water): **organotrophy**
- How to obtain building blocks?
 - ① From assimilation of carbon dioxide: **autotrophy**
 - ② From other living beings: **heterotrophy**



Six life styles and taxonomy

	Phototrophs	Lithotrophs	Organo-trophs
Autotrophs	Plants ₁ : some Monera, some Protista, most of Vegetabilia	Some Monera	Some Monera
Heterotrophs	Some Monera	Some Monera	Majority of Animalia and many Protista and Monera



Plants₁, plants₂ and life styles

- Plants₁ are **photoautotrophs**
- Plants₂ are photoautotrophs too but there are exceptions: **fully parasitic plants**. Formally, many parasitic plants are plants₂ but not plants₁
- Carnivorous plants (like sundew or Venus flycatcher) are all photoautotrophs! They “eat” animals to obtain fertilizers: nitrogen and phosphorous.



Ways of life

Chemistry of life



Very basics of chemistry

- Atoms
 - Protons
 - Neutrons
 - Electrons
- Atomic weight
- Isotopes
- Elements
- Periodic table: rows and columns
- Chemical bonds: ionic, covalent, hydrogen
- Valence and group
- Molecules
- Molecular weight



Summary

- “Carnivorous” plants are not carnivores
- We will need to know multiple chemical terms (see in the lecture)



For Further Reading



A. Shipunov.

Introduction to Botany [Electronic resource].

2015.

Mode of access:

http://ashipunov.info/shipunov/school/biol_154

