

Biogeography. Lecture 8

Alexey Shipunov

Minot State University

January 29, 2018



Outline

History of Life

The Really Short History of Life

Very Basics of Ecology

Ways of life

Ecological factors

Biotic ecological factors: ecological interactions



Outline

History of Life

The Really Short History of Life

Very Basics of Ecology

Ways of life

Ecological factors

Biotic ecological factors: ecological interactions



Darwin Day and extra credit



History of Life

The Really Short History of Life



Introduction to Biogeography and Tropical Biology

http://ashipunov.info/shipunov/school/biol_330/intr_biogeogr_trop_biol/intr_biogeogr_trop_biol.pdf

Questions?



Very Basics of Ecology

Ways of life



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

	Phototrophs	Lithotrophs	Organotrophs
Autotrophs	Plants	Bacteria	Bacteria
Heterotrophs	Bacteria	Bacteria	Animals



Very Basics of Ecology

Ecological factors



Ecological factors

- ▶ Everything what surrounds organism
- ▶ Types of ecological factors:
 - ▶ Abiotic
 - ▶ Biotic
 - ▶ Anthropogenic



Abiotic: classification A

- ▶ Resources
- ▶ Conditions



Abiotic: classification B

- ▶ General (seasonal)
 - ▶ Temperature
 - ▶ Solar radiation
 - ▶ Content of environment (humidity etc.)
- ▶ Particular
 - ▶ Environment pressure (atmosphere pressure, gravitation etc.)
 - ▶ Environment movement (wind, currents)
 - ▶ Relief



Very Basics of Ecology

Biotic ecological factors: ecological interactions



Two-species model

- ▶ Species I and species II may influence each other differently
- ▶ For example, species I may facilitate the increase the number of species II individuals (+ interaction)
- ▶ At the same time, species II could be neutral to species I (0 interaction)



Six basic ecological interactions

	+	0	-
+	mutualism	commensalism ¹	exploitation ²
0	...	neutralism	amensalism
-	interference ³

¹ Includes phoresy (transportation), inquilinism (housing) and metabiosis (“sponging” like in sucker fishes)

² Includes predation, parasitism and phytophagy

³ Includes competition, allelopathy and aggression



Summary

- ▶ Ecology studies relation between organisms and environment



For Further Reading



A. Shipunov.

Biogeography [Electronic resource].

2014—onwards.

Mode of access:

http://ashipunov.info/shipunov/school/biol_330



A. Shipunov.

Introduction to Biogeography and Tropical Biology [Electronic resource].

2017—onwards.

Mode of access: [http:](http://)

[//ashipunov.info/shipunov/school/biol_330/intr_biogeogr_trop_biol/intr_biogeogr_trop_biol.pdf](http://ashipunov.info/shipunov/school/biol_330/intr_biogeogr_trop_biol/intr_biogeogr_trop_biol.pdf)

