

Biogeography. Lecture 8

Alexey Shipunov

Minot State University

February 1, 2016



Outline

Basics of ecology

Ecological niche

Ecosystems and biosphere



Basics of ecology

Ecological niche

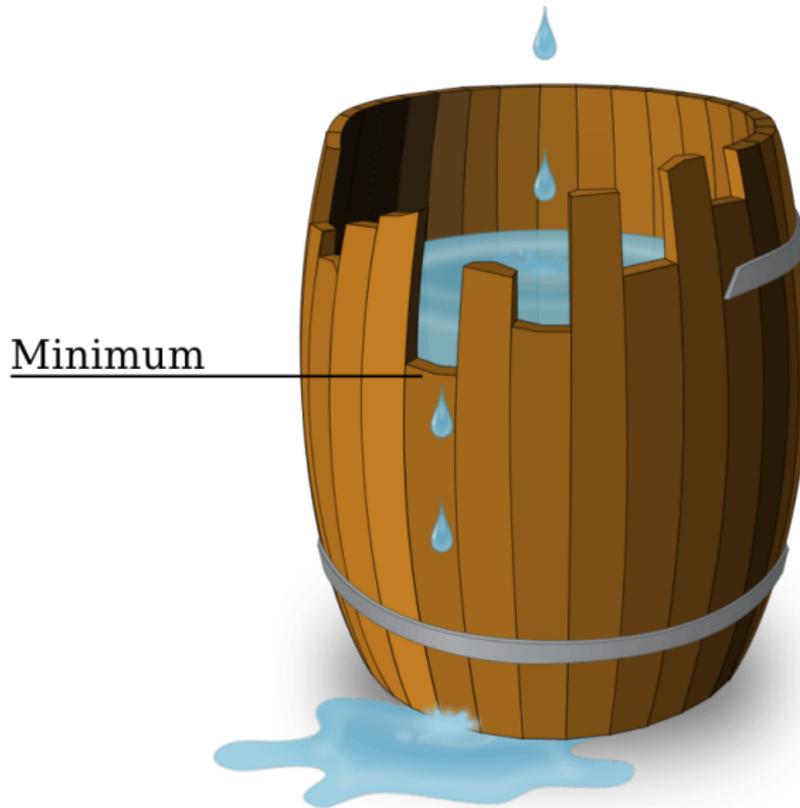


The cloud in hyper-space of ecological factors

- ▶ Response function: euryoecious and stenoecious species
- ▶ Fundamental and realized niche
- ▶ Liebig's law of the minimum



Liebig's barrel



Basics of ecology

Ecosystems and biosphere



Features of ecosystem

- ▶ Biomass, diversity, structure (feeding network, stratification)
- ▶ Self-reproduction and self-regulation
- ▶ Biosphere is the largest ecosystem possible
- ▶ Ecosystem could be split in different ways, for example into life forms and then into populations

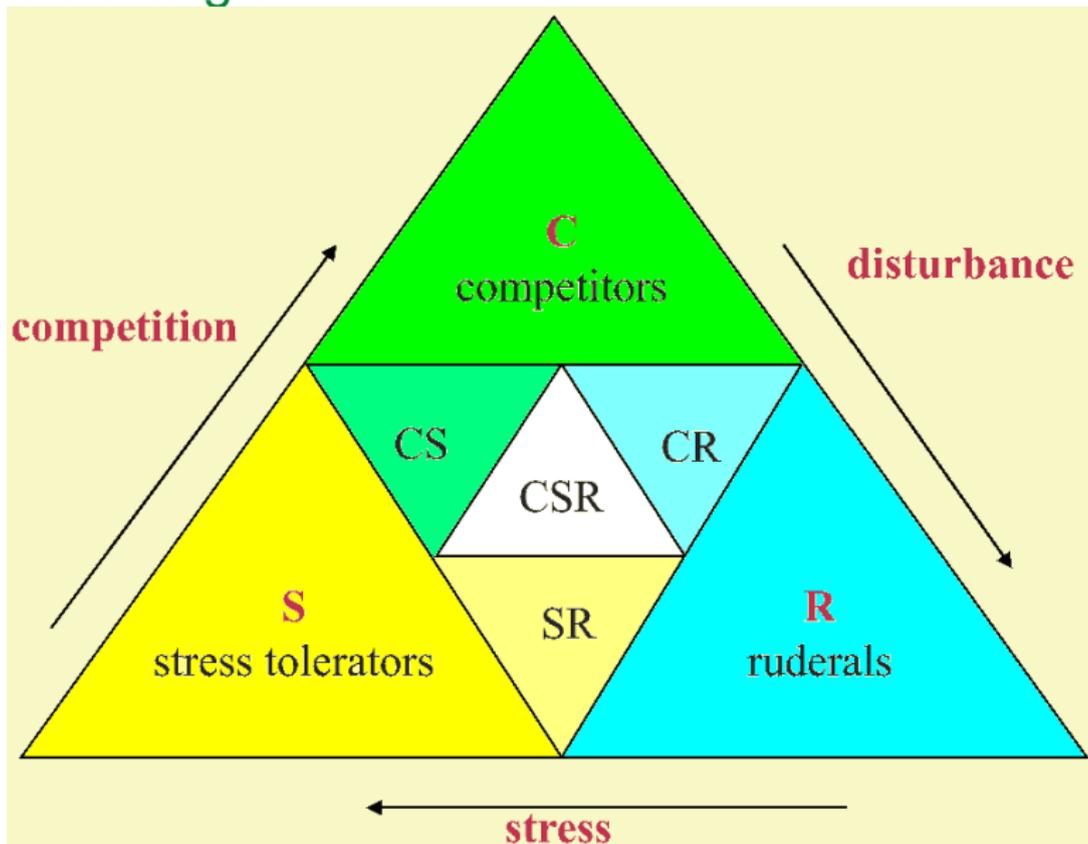


Populations

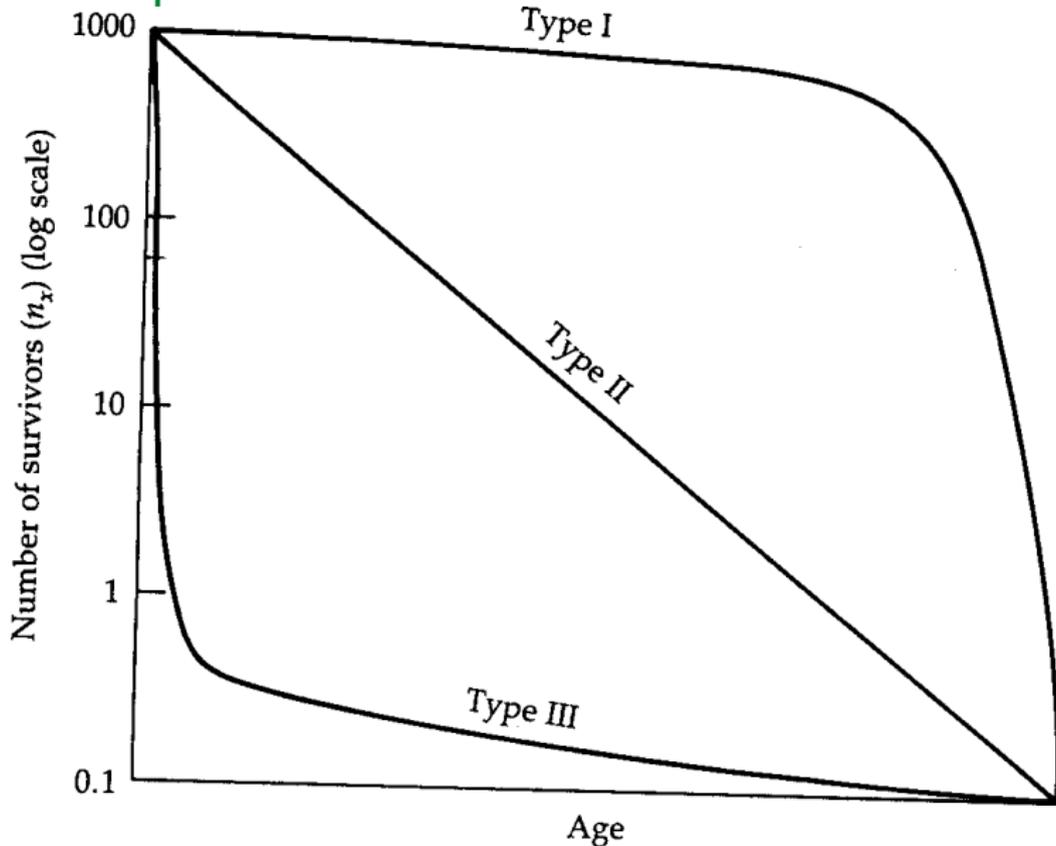
- ▶ Plant strategies: C (competitive), S (stress tolerant) and R (ruderal, or rapid propagation).
- ▶ Survivorship curves, population growth curves, r- and K-strategy



Grime's triangle



Survivorship curves



Strategies

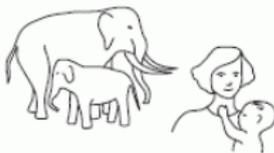
r strategy

- Precarious equilibrium with the environment
- High rates of increase
- Violent and in some cases regular cycles of growth and decline



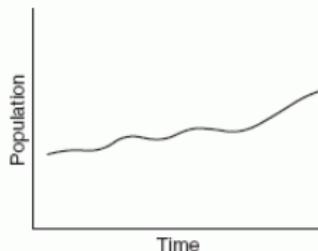
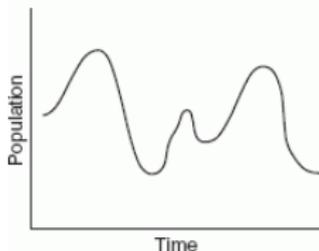
K strategy

- Stable equilibrium with the environment
- Rates of increase compatible with environment
- Slow and irregular cycles



Bioreproductive characteristics

- | | |
|----------------------------------|---------------------------------|
| • Small bodies | • Large bodies |
| • Short lives | • Long lives |
| • Short gestation | • Long gestation |
| • Large litters | • Single births |
| • Short intervals between births | • Long intervals between births |
| • Short length of generation | • Long generations |
| • High potential rates of growth | • Low potential rates of growth |



For Further Reading



A. Shipunov.

Biogeography [Electronic resource].

2014—onwards.

Mode of access:

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



Ecology.

<http://en.wikipedia.org/wiki/Ecology>

