Ecology Exam 1 Cheat Sheet

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Definitions

Ecology

The **scientific study** of the **interations** amoung **organisms** and the **environment**

Biotic

living (procuders, reducers)

Abiotic

nonliving (air,energy)

Environmentalism

The study of **ecological problems** in the **human context** (economics, morals)

Dynamic steady state

occurs when gains and losses are in balence (matter and energy)

Species Interactios

Predation	an organism kills and consumes another
Parasitism	one organism lives in or on another
Competition	when 2 organisms have negative effect on each other because they depend on the same resource
Mutualism	when 2 species benifit from each other
Commen-salism	when 2 species live closely, one benifts but the other is unaffected
Amensalism	when 2 specise living close to e ach other, one is negatively affected, but the other is unaffected

Solar Energy Terms

Electromagnetic Radiation

Energy from the Sun; packed in particles called photons

Photosynthetically active region

wavelengths of light that are suitable for photosysnthesis **400 nm** (Violet) to **700 nm**(red)

Solar Energy Terms (cont)

Chloroplasts

specialized cell organelles. Chlorophylls are pigments that absorb the light.

Light Reactions

convert energy from **photons** into **chemical energy**

Dark Reactions

aka Calvin cycle, use **chemical energy** and **CO2** to make **sugar

Photorespiration

RuBP combines with a molecule of **O2**, resulting in **CO2** and **loss of energy**. reverses the gains made by photosynt-hesis

C3 Photosynthesis

CO2 + RuBP -> 2 G3P
-catalized by RuBP
-Disadvantages: they need a large amount of Rubisco, and need a lot of O2
-

Heat Gain and Loss Terms

Radiation

the emmision of electromagnetic energy by a surface

Conduction

the transfer of the kinetic energy of heat between substances in contact

Convection

the transfer of heat by movement of liquidds and gases

Evaporation

water goes from liquid to gas. removes heat from a surface

large organisms lose and gain heat

less rapidly than smaller organisms due to surface area

When temps vary

it is **easier** for a lerge animal to maintain a constant internal temperature

Heat Gain and Loss Terms (cont)

Thermal Inertia

the resistance to a change in temp due to a large body volume

Organization in Ecology

individual =>population =>community =>e-cosystem =>landscape =>biosphere

Individual approach

understands how **adaptations** enable it to survive

Population approach

examines **variation** in the number, density, and composition of individuals

Community approach

understands **diversity and interactions** of organisms living in the same place

Ecosystem approach

describes the **storage** and **transfer** on energy and matter

Biosphere approach

Examines **movements of energy** and chemicals over the earths surface

Habitat and Niche

Habitat

place or physical setting in which organism lives

Examples

freshwater, coastal, forests, deserts

Niche

range of conditions tolerated, resources required. No 2 species have the same niche

Examples

different insects prefer to feed on different plants that might be in the same field

Thermal Optima

Thermal Optima	the temperature in which an organism best performs

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Thermal Optima (cont)

Its determined by the properties of an organism	e.g. enzymes and lipids, body form, cells and tissues
Temps that exceed thermal optima can hurt	e.g. Coral Bleaching

Photorespiration

-Reverses the gains made by photosynthesis
-catalized by Rubisco
-becomes more problematic in hot and dry conditions
-Rubisco has a greater tendency to react with O2 when **O2 concentration is high**, **CO2 concentration is low**,or **temperature is high**
-when its hot or dry, stomata will partially close and CO2 concentrations in leaves will be low

C4 Photosynthesis

-adds a more efficient enzyme
CO2 + PEP -> OAA
-adds a CO2 concentrating mechanism
-disadvantages:less tissue is used for photosynthesis. energy needed for the CO2 pump
-C4 plants are more active at hot times of the year
-C4 grasses occur primarily in warm climates

CAM Photosynthesis

CAM photosythesis	a pathway in which the initial assimilation of carbon into OAA occurs at night
like C4 plants	CAM plants are better adapted to warm

Themoregulation

Thermo-regulation	the ability of an organism to control their body temp

Themoregulation (cont)

Homeot-herms	organisms that maintain constant temp. allows biochemical reactions to work most efficently (humans)
Poikil-otherms	organisms that do not have ocnstant body temperature (reptiles)
Endotherms	Organisms that can generate metabolic heat to raise body temp
	mammels and birds, requires alot of work and energy
Ectotherms	Organims with body tempsd-etermined by their external environments
	Reptiles, amphibians, insects. tend to be smaller.

Food Chain

Producers	(autotrophs) convert light/-chemical energy into resources
Consumers	(heterotrophs) obtain their energy from other organisms
Mixotroph	can switch between producers and consumers
Scavengers	consume dead animals
Detritivores	break down dead organic matter (detritus) into smaller particles
Decomp-osers	break down detritus into simpler elements that can be recycled

Salt Balance in Aquatic Animal

Solute	a substance dissolved in water. Always different than the concen-tration in the surrounding water.

Salt Balance in Aquatic Animal (cont)

Semipe-rmeable Membranes	membranes that allow only particular molecules to pass thorugh. Reduces free movement of solutes
Osmosis	net movement of water across a semipermeable membrane, towards a higher solute concentration
Osmotic Potential	the force with which a solution attracts water by osmosis. expressed in pressure units (MPa)
Osmoregul-ation	mechanims organisms use to maintain a proper solute balance
Hypero-smotic	tissue solute concentrations are **higher** than surrounding water
	Freshwater Fish
Hyposmotic	tissue solute concentrations are **lower** than surrounding water
	Saltwater Fish
Salt Balance in mangroves	mangrove roots are in salt water, so its hard to take up the water with a high salt load. they have developed specal salt glands on leaves, their cells maintain high sugar, and roots exclude salt by active transport back into the water