

INTERACTIONS WITHIN COMMUNITIES

- A community is all the populations that are in an ecosystem at a given time.
- An ecological niche is an organism role in the ecosystem; it includes its interactions with the abiotic and biotic components of the ecosystem.
- A fundamental niche is the biological characteristics and the resources the individuals can use under ideal conditions.
- A realized niche is the biological characteristics and the resources the individuals actually use.
- Ex/ Lions compete with hyenas and vultures for similar resources.
- Interactions between organisms of two species can be classified into two groups; interspecific competition, predation and symbiosis.
- Symbiosis is when two species maintain a close relationship; includes parasitism, mutualism and commensalisms.

Interspecific competition

- occurs between organisms of different species, and it limits population growth.
- Interference competition is when the individuals actually fight over a resource.
- Ex/ Tree swallows and bluebirds fight over birdhouses.
- Exploitative competition is when the individuals of different species consume shared resources.
- Ex/ Arctic foxes and snowy owls prey on the same population of arctic hares.
- The greater the niche overlap is between populations the more competition that is experienced.
- If resources are limited then two species could not remain in competition for the same niche indefinitely; Gause's principle.
- There are three effects of interspecific competition:
 1. The population size could decrease of the weaker competitor.
 2. The behaviour may change for one of the competitor, so it could survive using different resources.
 3. One population may migrate to a habitat that has more resources.
- Resource partitioning involves organisms of different species occupying nonoverlapping ecological niches.
- Anolis lizards in the Caribbean occupy different perching sites so they can coexist in the same geographic range.
- Ex/ Three species of plant can grow in the same area because they have different root lengths (fibrous vs tap root systems) that allow them to obtain nutrients at various depths in the soil.
- Due to interspecific competition populations of species have evolved adaptations to enable them to use resources so they can survive.
- Character displacement occurs when disruptive selection pressures leads two species in the same geographical range having divergent traits.
- Ex/ Three-spined sticklebacks in freshwater lakes.
- The mouth size of the species were determined by their feeding habits.

Seatwork

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Predation

- an interspecific interaction where the population density of the predator increases while the population density of the prey decreases.
- when there is a lot of prey the predator has more food available to them so their population increases.
- as the predator population increases they continue to feed on the prey, so the prey population decreases. (see Fig. 8 on pg. 681)
- the peaks in the cycle always belong to the prey, and the predator's curve always lags behind the prey's curve.
- the factors that can affect a predator-prey cycling include food supply, additional predators, weather conditions and hunting.

Defence Mechanisms

- organisms have developed ways to protect them from predators.
- Plants have morphological features (thorns, hooks, spines and needles) and chemical defences (oils that have a bad smell, or taste bad) to protect them.
- passive defence is a mechanism that does not cost a lot of energy for the organism like hiding, or using camouflage.
- active defence is a mechanism that does cost the organism more energy like running away from a predator.
- Through Batesian mimicry organisms resemble other organisms that are distasteful (like the viceroy and the monarch)
- Through Mullerian mimicry organisms resemble each other and they are both poisonous or dangerous.

Symbiosis

- in this type of relationship the individuals of two different species live in close physical relationships and at least one of them benefit from the relationship. There are three main categories of symbiosis:
 1. mutualism occurs when both species benefit.
 - Ex/ bacteria in the gut of cows breakdown cellulose and lignin so the cows can digest them, and the bacteria obtain nutrients.
 - obligatory mutualism occurs when neither species involved could survive without the other. (as in the above example)
 2. commensalism occurs when one species benefits and the other neither benefits or is harmed.
 - Ex/ caribou clear away snow when they walk, thereby uncovering small mammals making it easier for arctic foxes to find their food.
 3. parasitism occurs when one species lives off another (host).
 - microparasites are small parasites that reproduce very rapidly (ex/ Plasmodium (a blood protozoan) causes malaria)

- macroparasites are larger parasites (ex/ tapeworm)
- endoparasites live inside their host (ex/ adult tapeworms that live in the digestive systems of their host)
- Ectoparasites live on the outside of their host (ex/ lice, ticks and fleas)
- social parasites manipulate the social behaviour of another species. (ex/ cowbirds lay an egg in the nests of other smaller birds, so they do not have to build their own nest or feed their young)
- the egg hatches before the other eggs so they get the most food, and a higher survival rate.

Read and make notes Pg. 686 Disruption of Community Equilibrium.

Seatwork

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