

BT101-Ecology Biodiversity & Evolution I

Assignment 01, Due Date:24-11-2022

Sample Solution by

Muhammad Kashif 03460319909

Assignment Question :

What is Ecosystem? Differentiate b/w Interspecific & Intraspecific Competition?

Most Important

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paraphrasing tools will result in low marks ,because VU has has revised and has given strict measures regarding this case .

A)What is an Ecosystem?

An ecosystem is a structural and functional unit of ecology where the living organisms interact with each other and the surrounding environment. In other words, an ecosystem is a chain of interactions between organisms and their environment. The term “Ecosystem” was first coined by A.G.Tansley, an English botanist, in 1935.

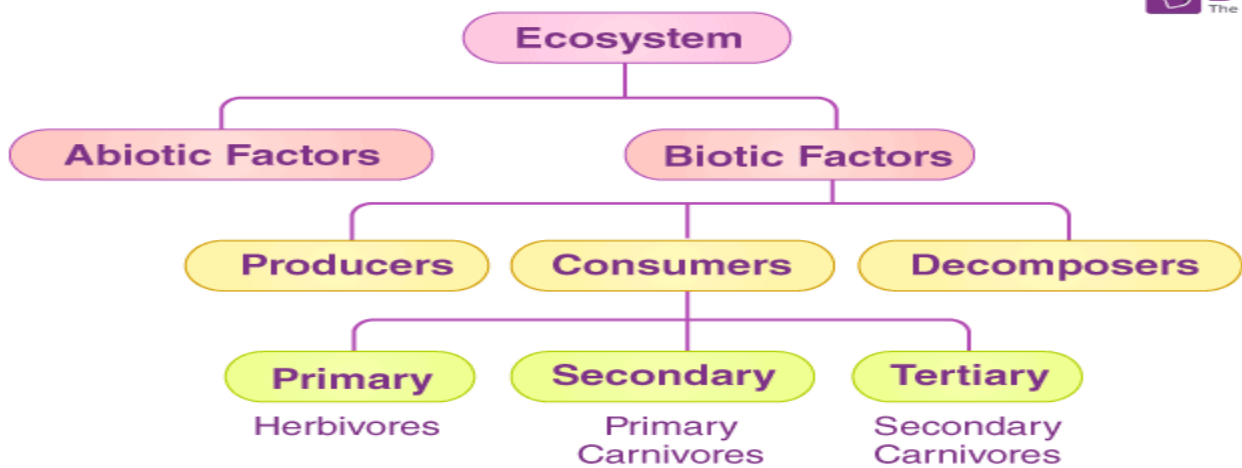
Read on to explore the structure, components, types and functions of the ecosystem in the notes provided below

The structure of an ecosystem is characterised by the organisation of both biotic and abiotic components. This includes the distribution of energy in **our environment**. It also includes the climatic conditions prevailing in that particular environment.

The structure of an ecosystem can be split into two main components, namely:

- Biotic Components
- Abiotic Components

The biotic and abiotic components are interrelated in an ecosystem. It is an open system where the energy and components can flow throughout the boundaries.



Biotic Components

Biotic components refer to all living components in an ecosystem. Based on nutrition, biotic components can be categorised into autotrophs, heterotrophs and saprotrophs (or decomposers).

- **Producers** include all autotrophs such as plants. They are called autotrophs as they can produce food through the process of photosynthesis. Consequently, all other organisms higher up on the food chain rely on producers for food.
- **Consumers** or heterotrophs are organisms that depend on other organisms for food. Consumers are further classified into primary consumers, secondary consumers and tertiary consumers.
 - *Primary consumers* are always herbivores as they rely on producers for food.
 - *Secondary consumers* depend on primary consumers for energy. They can either be carnivores or omnivores.
 - *Tertiary consumers* are organisms that depend on secondary consumers for food. Tertiary consumers can also be carnivores or omnivores.
 - *Quaternary consumers* are present in some food chains. These organisms prey on tertiary consumers for energy. Furthermore, they are usually at the top of a food chain as they have no natural predators.
- **Decomposers** include saprophytes such as fungi and bacteria. They directly thrive on the dead and decaying organic matter. Decomposers are essential for the ecosystem as they help in recycling nutrients to be reused by plants.

Abiotic Components

Abiotic components are the non-living component of an ecosystem. It includes air, water, soil, minerals, sunlight, temperature, nutrients, wind, altitude, turbidity, etc.

Difference Between Interspecific and Intraspecific Competition

What is Interspecific Competition

Interspecific competition is the competition that occurs between different species in the same ecological area. The competition occurs for limited resources such as food, light, water, and territory. Two types of interspecific competition patterns can be identified between species based on the mechanism. They are:

1. **Exploitative competition** – Here, the usage of a type of limited resources by a particular species makes the resource unavailable to the second species in the competition.
2. **Interference competition** – It is the direct interaction of different species for resources.



Figure 1: Competition Between *Panthera leo* and *Crocuta crocuta*

There are two other types of interspecific competition based on the outcome.

1. **Scramble competition** – Here, the competitor species are equally suppressed by the competition and the outcome can be either the reduction of survival or the birth rate.
2. **Contest competition** – Here, one or a few competitors are not affected by the competition while all of the other competitors are affected seriously.

What is Intraspecific Competition

Intraspecific competition is the competition among members of the same species for limited resources in the same ecological area. It depends on the density of the population and the influence of this type of competition is high in a highly-dense population. More importantly, it is one of the main driving forces for evolution since it changes the population dynamics such as population size and composition. Here, only the individuals that are most suitable to the environment can survive.



Figure 2: Male Hartbeest Strenuously Defend Their Territories

Same as interspecific competition, intraspecific competition can also be subdivided into the exploitative competition, interference competition, scramble competition, and contest competition. Exploitative competition occurs when the members compete indirectly while interference competition occurs when the members compete directly. The most dramatic form of interspecific competition occurs among mates.

Interspecific competition refers to a form of competition between different species inhabiting the same ecological area while intraspecific competition refers to the competition for resources between members of the same species.

Competition

The competition in interspecific competition is between members of different species while the competition in intraspecific competition is between the members of the same species. This is the main difference between interspecific and intraspecific competition.

Adaptations

Also, interspecific competition occurs between individuals with different adaptations while intraspecific competition occurs between individuals with similar adaptations.

Requirements

Another difference between interspecific and intraspecific competition is the reason for the competition. Interspecific competition occurs for a specific requirement while intraspecific competition occurs for all types of requirements of the species.

Influence

One important difference between interspecific and intraspecific competition is the effect of the competition. Interspecific competition can suppress either both or one species while intraspecific competition directly affects the population size and composition.

Severity of the Effect

The effect of the interspecific interaction is not much severe while the effect of the intraspecific interaction can be severe.

Examples

Some examples of interspecific competition include competition between lions and tigers for similar prey and weeds growing in the field along with the paddy while some examples of intraspecific competition include finding mating partners, territorial competition, and dominance competition between members of the same species.

Conclusion

Interspecific competition is the competition between members of the different species either for food or territory while intraspecific interaction is the competition between the members of the same

species for territory, food, and mating. The main difference between interspecific and intraspecific competition is the type of members involved in the competition.