

Abiotic vs. Biotic



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Abiotic factors refer to non-living physical and chemical elements in the ecosystem. Abiotic resources are usually obtained from the lithosphere, atmosphere, and hydrosphere. Examples of abiotic factors are water, air, soil, sunlight, and minerals.

Biotic factors are living or once-living organisms in the ecosystem. These are obtained from the biosphere and are capable of reproduction. Examples of biotic factors are animals, birds, plants, fungi, and other similar organisms.

Comparison chart

Differences —

Similarities —

Abiotic

Introduction In ecology and biology, abiotic components are non-living chemical and physical factors in the environment which affect ecosystems.

Examples Water, light, wind, soil, humidity, minerals, gases.

Factors Affect the ability of organisms to survive, reproduce; help determine types and numbers of organisms able to exist in environment; limiting factors restrict growth.

Affects Individual of a species, population, community, ecosystem, biome, biosphere.

Biotic

Biotic describes a living component of an ecosystem; for example organisms, such as plants and animals.

All living things — autotrophs and heterotrophs — plants, animals, fungi, bacteria.

Living things that directly or indirectly affect organisms in environment; organisms, interactions, waste; parasitism, disease, predation.

Individual of a species, population, community, ecosystem, biome, biosphere.

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What are biotic and abiotic factors?

Biotic components are living organisms in an ecosystem. A biotic factor is a living organism that affects another organism in its ecosystem. Examples include plants and animals that the organism consumes as food, and animals that consume the organism.

The following video covers the biotic and abiotic factors that influence most ecosystems, and introduces key vocabulary relevant to ecology:



This is a good SlideShare presentation that covers the definition and examples of biotic and abiotic factors in an ecosystem:



Relevance

The scope of abiotic and biotic factors spans across the entire biosphere, or global sum of all ecosystems. Such factors can have relevance for an individual within a species, its community or an entire population. For instance, disease is a biotic factor affecting the survival of an individual and its community. Temperature is an abiotic factor with the same relevance.

Some factors have greater relevance for an entire ecosystem. Abiotic and biotic factors combine to create a system or, more precisely, an ecosystem, meaning a community of living and nonliving things considered as a unit. In this case, abiotic factors span as far as the pH of the soil and water, types of nutrients available and even the length of the day. Biotic factors such as the presence of autotrophs or self-nourishing organisms such as plants, and the diversity of consumers also affect an entire ecosystem.

Influencing Factors

Abiotic factors affect the ability of organisms to survive and reproduce. Abiotic limiting factors restrict the growth of populations. They help determine the types and numbers of organisms able to exist within an environment.

Biotic factors are living things that directly or indirectly affect organisms within an environment. This includes the organisms themselves, other organisms, interactions between living organisms and even their waste. Other biotic factors include parasitism, disease, and predation (the act of one animal eating another).

Interaction Examples

The significance of abiotic and biotic factors comes in their interaction with each other. For a community or an ecosystem to survive, the correct interactions need to be in place.



A simple example would be of abiotic interaction in plants. Water, sunlight and carbon dioxide are necessary for plants to grow. The biotic interaction is that plants use water, sunlight and carbon dioxide to create their own nourishment through a process called photosynthesis.

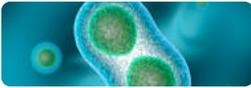
On a larger scale, abiotic interactions refer to patterns such as climate and seasonality. Factors such as temperature, humidity and the presence or absence of seasons affect the ecosystem. For instance, some ecosystems experience cold winters with a lot of snow. An animal such as a fox within this ecosystem adapts to these abiotic factors by growing a thick, white-colored coat in the winter.

Decomposers such as bacteria and fungi are examples of biotic interactions on such a scale. Decomposers function by breaking down dead organisms. This process returns the basic components of the organisms to the soil, allowing them to be reused within that ecosystem.

References

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- Biology 01-2 Ecosystems - Biotic and Abiotic Factors - *HollowayScience on YouTube*
- Wikipedia: Biosphere

Related Comparisons



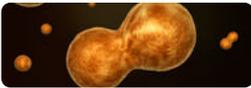
Diffusion and Osmosis



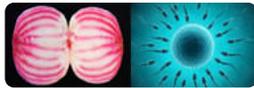
Erosion vs Weathering



Plant Cell vs Animal Cell



Mitosis and Meiosis



Asexual vs Sexual Reproduction



Photosynthesis vs Cellular Respiration

Comments: Abiotic vs Biotic

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