Ecology

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1 March 2024

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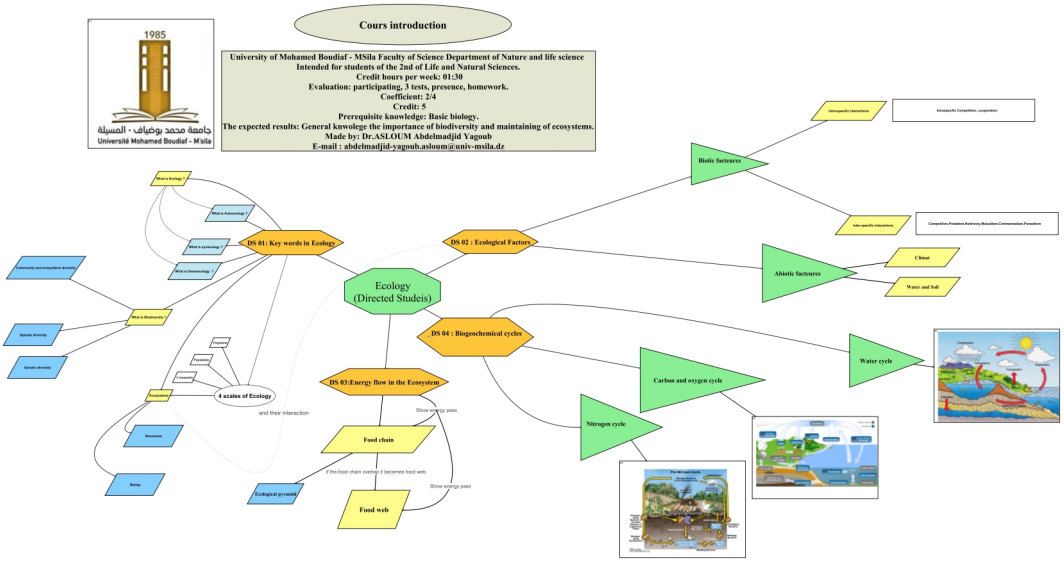
Objectives

- To gain an understanding of the broad biological significance of ecological theory.
- To gain an understanding of the questions that ecologists study, the methods they use, and the questions that remain unanswered.
- To develop your ability to apply quantitative skills to analyze and interpret ecological data.

Introduction

Understanding how our living environment works is essentially a study of ecological systems. Ecology is the science of how organisms interact with each other and with their environment, and how such interactions create self-organising communities and ecosystems. This science touches us all. The food we eat, the water we drink, the natural resources we use, our physical and mental health, and much of our cultural heritage is to a large degree products of ecological interactions of organisms and their environment. This Very Short Introduction celebrates the centrality of ecology in our lives. ecology has evolved rapidly from natural history to become a predictive science that explains how the natural world works, and which guides environmental policy and management decisions. Drawing on a range of examples, he shows how ecological science can be applied to management and conservation, including the extent to which theory has shaped practice. Ecological science has also shaped social and cultural perspectives on the environment, a process that influences the politics of the environment. , in light of current and future environmental challenges.



Quiz

Quiz

What it is Ecology?

- the study of the living things.
- the study of the relationships between living organisms and their physical environment.
- the study of the biocenosis.

Quiz

What is the original source of almost all energy in most ecosystems?

- Carbohydrates.
- Water.
- Sunlight

Quiz

What does a food web represent?

- All connections of energy flow throughout all organisms in a habitat.
- How carnivores get their food.
- A single pathway or energy flow between organisms.

Quiz

The image provided is an example of a(n):

- Producer.
- Consumer.
- Autotroph.

DS 01: Key words in Ecology

1. What is Ecology ?

1 - WHAT IS ECOLOGY? Etymologically, ecology comes from the Greek oikos (house, habitat) and logos (science); It is literally the science of the home, of the habitat. The term was introduced in 1866 by the German biologist Ernest Haeckel. Several definitions are proposed, but we will retain the more recent definition proposed by Dajos (1983) for whom: "Ecology is the science that studies the conditions of existence of living beings and the interactions of all kinds that exist between these living beings on the one hand, and between these living beings and the environment on the other hand *Ramade, F. (2009).* *Ramade, F. (2009).*

2 - BIOTOPE (ECOTOPE): It is the inert part of the environment. It includes all the geographical and physicochemical characteristics constituting the environment (climate "climatope", nature of the soil "edaphotope", relief, water...) directly or indirectly acting on the living beings it hosts. This action can last throughout the life of the living being or only part of it *Ramade, F. (2009).* *Ramade, F. (2009).*

3 - ECOLOGICAL FACTOR: Any element or characteristic of the environment, living or non-living, capable of directly acting on the organism, either throughout its life or during a limited phase of its life cycle. An ecological factor can be biotic or abiotic.

4 - Interaction of the environment and living beings Living beings: are completely eliminated, or their numbers are greatly reduced when the intensity of ecological factors approaches or exceeds tolerance limits.

- Law of the minimum by Liebig (1840) An ecological factor is limiting when it is absent or reduced below a critical minimum, or when it exceeds a tolerable maximum level.
- Limiting factor The manifestation of any ecological process is conditioned in its speed and extent by that of the factors which are least represented in the environment. An ecological factor plays the role of a limiting factor when it is absent or reduced below a critical threshold or when it exceeds the maximum tolerable level. It is the limiting factor that will prevent the establishment and growth of an organism in an environment.
- Law of Tolerance Stated by Shelford in 1911, the law of tolerance states that for any environmental factor there exists a range of values (or tolerance interval) within which any ecological process dependent on this factor can occur normally. It is only within this interval that the life of such or such organism, population, or biocenosis is possible.
- Ecological Valence The ecological valence of a species is the ability of that species to inhabit environments characterized by more or less variation in ecological factors.

5- Notion of habitat and ecological niche: Each living being occupies a fairly homogeneous space in which it lives, moves, feeds, develops, reproduces, and dies. This space occupied by individuals of a given species is called habitat. The niche of a species refers to the type of place occupied by individuals of that species in the environment, as well as the relationships they have with the rest of the ecosystem, including their habitat, diet, activity rhythms, and relationships with other species. Therefore, the ecological niche of a species constitutes its habitat and its function in the ecosystem.