

PREFACE

Existence in the world consists of living and non-living things. The two species should coexist in order to share the resources available within the natural community. We need to study and understand ecology to understand this mutual relationship. The science of ecology is all about relations. By carefully applying the principles of ecology, we can learn to predict, extinguish, counteract and prevent the hypothetically adverse effects we may have on the globe around us. Governments and citizens around the world are becoming increasingly aware of the consequences of atmospheric pollution and climate change. In large-scale studies, plants and animals were subjected to carefully controlled atmospheres and varying ecological factors. Researchers use this knowledge to explain how we react to pollution levels and to make predictions regarding future climate change. Ecology allows us to understand how the world works. It provides useful evidence of the interdependence between people and the natural world, as well as of the environmental impact of human activity. By studying ecology, the emphasis is placed on how each species needs the other for peaceful coexistence. The lack of understanding of ecology has led to the degradation of land and the environment, which is the home of other species, leading to the extinction of the species because of lack of knowledge e.g. dinosaurs, mammoth, white shark, black rhinos, sperm whales etc. The aim of this book is to familiarize you with ecological theory and its applications.

Organization of the book

The book is comprised with seven chapters. This introduction to ecology covers population, community and ecosystem level ecology of plants and animals. It focuses on the interactions of organisms with each other and with their abiotic environment. These include the study of different types of populations, communities and ecosystems. Topics include population structure and growth, species interaction, energy flow, nutrient cycling, succession, and applications to current environmental management issues.

Chapter 1 presents an introduction to ecology. In this chapter you will know the importance and history of ecology. Why and how to study of ecology and scientific method. It also presents a look on evolutionary ecology.

Chapter 2 presents a focus on natural selection and speciation. Natural selection favors those features of the organisms of a population that brings them into a more efficient adaptive relationship with their environment. Presently, natural selection is considered as the phenomenon of differential and non-random reproduction of divergent genotypes in a population.

Chapter 3 focuses on behavioral ecology that deals with the study of ecological and evolutionary causes of behavior in organisms. Behavior is influenced by genetics and the environment and should increase the reproductive fitness of a species. Common behaviors studied including things like learning, communication, foraging, reproductive strategies and social behaviors.

Chapter 4 explores on population ecology that deals with the dynamics of species populations and how these populations interact with the environment. It is the study of how the population sizes of species change over time and space.

Chapter 5 lays emphasis on the study of the organization and functioning of communities of organisms. As populations of species interact with one another, they form biological communities.

Chapter 6 sheds light on applied ecology which is focused on applying ecological knowledge to problems. This field takes ecology out of the realm of the academic and into the real world using the research conducted by ecologists to answer difficult questions about the natural environment.

Chapter 7 focuses on exotic species, plants, and animals. An exotic species refers to a plant, animal or microorganism species, which is introduced into an area where it does not occur naturally. Plants are introduced into new ecosystems in both agriculture and horticulture. In addition, settlers bring seeds of plants from their homelands due to the economic or medicinal properties of those plants.