

PREFACE

The field of ecology deals with the study of the interconnected network of species and the environment. Evolution related studies find the mechanisms that modern species have evolved from ancestral ones. The Ecology and Evolution subject is a good choice for students interested in fundamental questions about the evolutionary origins of species and how they function or do not survive in their evolving environments. In this context, students have the opportunity to study throughout detail the morphological and physiological adaptations of a variety of animals, plants and micro-organisms to a changing world, the ecological relationships of organisms from the individual to the global scale, and the mechanisms that are in place.

Biodiversity plays a key role in the preservation of healthy habitats and, as a result, the conservation of ecosystem services for an ever-growing human population. To get an idea of the variety of ecosystem services that we use every day, think about how much energy and time it would cost to make Mars hospitable to human life, for example in terms of atmospheric control, freshwater, soil formation, nutrient cycles, weather regulation, etc. Unfortunately, the resources that we desperately need for our long-term survival and well-being are threatened by our own actions. Global change, caused by human activity, is happening all around us.

The systemic effects of climate change, habitat loss and destruction, over-harvesting, deforestation, altered nutrient cycles, invasive species and their interactions impact nearly all Earth's habitats. Evolution and ecology are proving to be so closely connected that it is becoming extremely difficult to distinguish. This knowledge profoundly affects our

thinking about how evolution affects biodiversity trends, especially in the facets of global change.

This book covers the core concepts that investigate the ecology, evolution and diversity of form and function of the organisms primarily in the Kingdoms Animalia and Plantae. It sheds light on Forefront considerations of ecology, biodiversity, and evolutionary biology. It also presents emphasis on current developments for applications, including societal and economic impacts and moral and ethical implications. Evolutionary topics include genetic and phenotypic variation, natural selection, adaptation, speciation, and macroevolution. Also cover behavioral, population, and community ecology including applied ecological issues.