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Environmental biology basics

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ABSTRACT

The impact of natural and human-altered ecosystems on organisms, species, and communities is described by environmental biology. It explores the interconnections among biology, ecology, evolution, environmental science, and conservation. It is a thriving field that is in dire need of enthusiastic, passionate, and well-trained professionals. Environmental biologists focus on the biology of ecosystems and environmental processes, causes and consequences of environmental change, and how environmental change impacts life on earth.

KEYWORDS

biology; environment; evolution; environmental science; ecology; conservation

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INTRODUCTION

It is easy to forget that our modern society depends largely on the environmental processes. The basis of our economy depends on the soils that sustain our agriculture, the rivers that provide our water, the minerals that provide the raw materials for the goods we consume, and the plants and animals that serve as our food [1]. Human inventiveness has introduced chemicals and materials into the environment. The natural environment is different from the built environment, which comprises the areas that are influenced by humans.

Environmental biology is a discipline in science at the intersection of environmental science, ecology, evolution, conservation, and global change. Environmental biology examines the ways organisms, species, and communities influence, and is impacted by, natural and human-altered ecosystems. It covers all the fundamental concepts of the life sciences, including genetics, speciation, evolution, growth and differentiation, metabolism and bio-energetics, ecology, and behavior. It addresses many relevant issues that affect us on a daily basis, such as energy conservation, air pollution, sustainable development, environmental toxins, and so on [2].

ENVIRONMENTAL BIOLOGY AND ECOLOGY

Environmental biology is synonymous with ecology because they both depict the same thing and they appear like the two sides of the same coin. Although both fields study ecosystems, environmental biology focuses more on the biological organisms of the environment. Ecology is literally the study of houses or more broadly, environments. It is the study of how living organisms interact with their environment. Its main focus has been on various types of ecosystems – terrestrial, freshwater, marine and on how human activity has influenced these ecosystems.

There are several types of ecology, such as ecosystem ecology, restoration ecology, physiological ecology, landscape ecology, animal ecology, practical ecology, and plant ecology [3]. Ecologists essentially seek to explain interactions, interrelationships, behaviors, and adaptations of organisms. It is important to note that ecology is not synonymous with environment, environmentalism, natural history, or environmental science. Ecological literacy involves a basic understanding of how the world works and understanding the connections between living and nonliving things.

ENVIRONMENTAL BIOLOGISTS

Environmental biologists study the biology of specific organisms and their interactions with the environment. They are responsible for monitoring environmental conditions and collecting water and soil samples from the field. Some monitor pollution levels to ensure compliance with state and federal laws. They assist companies to comply with regulations and conduct environmental impact assessments for their development projects. Environmental biologists often need to document their findings [4]. Becoming an environmental biologist has never been more exciting. Environmental biologists are needed in different areas such as food and agriculture, environmental education, the natural resources sector, environmental consulting, non-governmental environmental organizations, environmental R&D, conservation and environmental protection, government agencies, biotechnology, and renewable energy.

They work for their local environmental agencies, municipalities, the National Park Service, Forestry Service, Department of Commerce, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, National Institutes of Health, and other agencies. They also serve as field technicians, laboratory technicians, international relations, researchers for private or government laboratories, etc. [5, 6].

Training on environmental biology could focus on:

(i) the biology of ecosystems and environmental processes,
(ii) the causes and consequences of environmental change, and
(iii) how environmental change impacts life on earth.

It will provide the following skills [7]:

- Contemporary field and lab methods in ecology, evolution, and conservation biology
- Contemporary field and lab methods in environmental science for soil, water, air, and climate assessments
- Assessment of how toxic compounds impact life on earth, from individuals to species to communities
- Climate change impact assessments
- Climate change modelling with a focus on biodiversity impacts
- Environmental impact assessments and audits
- Design of applied environmental and ecological experiments
- Quantitative methods for collecting and interpreting ecological and environmental data
- Application of ecological research for environmental policy- and decision-making
- Earth imaging, including Geographic Information Systems (GIS) and Remote Sensing (RS), for environmental problem solving and conservation
- Development of strong communication skills, including critical reading and writing

While responsibilities may vary significantly from one job to another, environmental biologists are responsible for the following [7]:

- Plan and execute complex analytical biological testing following field and laboratory standard operating procedures
- Manage biological and project timelines by using testing expertise, advanced chemical and biological knowledge, and statistical tools
- Be prepared to present results to various stakeholders, both collegial and business
- Build professional international relationships to support the advancement of knowledge
- Understand, apply, and communicate scientific concepts and results.
- Ensure that equipment is maintained for quality control and assurance of lab results, and for safety purposes
- Document and analyze all lab and field results, paying particular attention to calculations and observations in lab documentation
- Review peers' data analyses for accuracy and scientific integrity
- Alert the project leader of unusual results and samplings and of any difficulties or problems encountered during the scope of work.

CONCLUSION

Environmental issues are now part of every career path and employment area. These issues are immensely complex, involving aspects of history, philosophy, behavior, science, economics, social justice, and politics. Environmental biology is the branch of biology that focuses on how organisms interact with the environment, and how they adapt to changing environments. The job outlook for environmental biologists is growing faster than the average for all occupations. Many schools now offer courses on environmental biology, some online. Introducing education and awareness of environmental biology into the academic curriculum helps students grasp the scientific foundation of environmental issues so they can better understand the world around them and it impact on it.

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