



Biodiversity and Climate Change

Kumar A

School of Biotechnology, Devi Ahilya University, Khandwa Road, Indore, India

***Corresponding author:** Kumar A, School of Biotechnology, Devi Ahilya University, Khandwa Road, Indore, India, Tel: 917312470372; E-mail: ak_sbt@yahoo.com

Received: March 29, 2018; **Accepted:** May 14, 2018; **Published:** May 23, 2018

Abstract

Biodiversity is the presence of different varieties of a particular form of life. Some people have divided biodiversity into three levels namely variety of different species like plants, animals and microorganisms; genetic diversity indicating variety of genes in different prokaryotic and eukaryotic organisms; and diversity of ecosystem which means different habitats like different places, tropical and temperate forests, different aqua-systems, different mountains, differently weathers deserts, wetlands and so on. Nowadays, there is much concern about decrease in biodiversity and its correlation with the climate change. Many species have become endangered.

Keywords: *Biodiversity; Climate change; Genetic diversity; Plants; Microorganisms; Ecosystem*

Introduction

Biodiversity is considered as the presence of different varieties of life on the earth. Some people consider it as different varieties of a particular form of life. When different varieties of life is considered, it indicates different plants, animals, fungi and microbes present on our earth including different forms of habitat inclusive of terrestrial, mountains, aquatic ecosystem including sea and other rivers, canals and so on [1].

Now it has been widely accepted that there is a correlation between biodiversity and climate change [2]. If there is disappearance of certain forms of life, it leaves negative impact on the climate. It results in negative consequences for

Citation: Kumar A. Biodiversity and Climate Change. 2018;13(1):140.
© 2018 Trade Science Inc.

humans and nature. Biodiversity through ecosystem services has been considered to have support to climate change mitigation and adaptation [2]. Here, it has been tried to explain biodiversity and its impact on climate change.

Different Types of Biodiversity

The following different types of biodiversity have been recognized:

Species diversity

It deals with variety of different species of life on the earth including aquatic atmosphere like oceans and rivers. Here different species means different plant species, different animal species and different microbes and fungi.

Ecosystem diversity

It deals with different habitats. Different forms of life present in different ecosystems like different places, different types of forests, different deserts, different aquatic systems, mountains, coral reefs etc. In ecosystem, correlation between biotic system (living organisms namely animals, plants, microbes) and abiotic (non-living) components (sunlight, air, water, mineral elements) is considered.

Genetic diversity

It deals with different varieties of genes present in plants, animals and microorganisms. Here different genetic diversity is considered with in a species as well as between different species. When we consider diversity within a species, it is like different varieties of a form of life. Different varieties (more than 120) of soybean are available on this earth planet. Similarly, different varieties of mango tree, dogs have been reported.

Risk Factors for Diversity

It has been considered that there are number of risk factors responsible for extinction of many species. These are habitat destruction by way of destruction of forest and agriculture land in order to use these lands for urbanization (construction of houses and setting of industries), over hunting (hunting of wild life animals/misuse of resources). Introduced species, and chains of extinctions [3,4].

Climate Change and Biodiversity

The scientists around the globe as well as societies have realized the need to measure and predict the impact of increase in industrial fossil fuel combustion causing environmental pollution and change in the use of the land from agriculture and forest for construction of buildings; and to correlate the impact with climate change and loss of biodiversity.

Importance of Biodiversity

If we talk of the good healthy ecosystem, it indicates presence of wide varieties of plants and animals in addition to microbes in that area. Animals may be from smaller animals to larger wild animals like lion, zebra, bears, wolves. Similarly, for plants starting from smaller plants to very large perennial plants. If any species gets endangered, it may result in harm to that ecosystem. However, if invasion of a foreign species occurs in that habitat which may give similar results.

How Biodiversity Affects humans?

The life of humans and many other animals is dependent on the ecosystem/biodiversity since biodiversity plays important role in providing food, medicines, and environmental well-being. There are number of crops which are used for food and there are many insects which help in pollination of these crops. It is found that only one pollinator can't carry pollination for all the crops and that's why biodiversity is important. Besides, there are many organisms which provide foods viz. honey, berries, nuts etc. directly which are used as part of diet. Similarly, it has been shown that secondary metabolites produced by the plants can be used as medicines for certain diseases. These have antibacterial activities. Biodiversity is important for scientists in order to search more potent drugs. Biodiversity is also important in many other ways to humans. Some of the beneficial activities are fossil fuel generation, carbon sequestration, water filtration. Plants are important since in photosynthesis, they evolve oxygen which is necessary for respiration of humans and other animals. Besides, plants also synthesize carbohydrates in photosynthesis which are used as food by humans. Biodiversity is also important for bioremediation. Nowadays, Phyto-rhizoremediation is being tried to convert toxic substances present in the environment into non-toxic or lesser toxic substances. In phyto-rhizoremediation, use of microbes as well as plants is taken for cleaning the environmental pollution. Biodiversity also provides ecosystem services or benefits to people. These benefits include: hurricane storm surge protection, carbon sequestration, water filtration, fossil fuel generation, oxygen production and recreational opportunities. Without a myriad of unique ecosystems and their respective diverse plant and animal life, our quality of life may become threatened.

Conclusion

To conclude, biodiversity is very important and plays much important role in climate change. Efforts must be continued to preserve biodiversity.

Acknowledgements

Authors acknowledges the facilities of the Department of Biotechnology, Ministry of Science and Technology, Government of India, New Delhi (DBT) under the Bioinformatics Sub Centre as well as M. Sc. Biotechnology program used in the present work.

REFERENCES

1. What is Biodiversity and How Does Climate Change Affect It? State of Planet, Earth Institute, Columbia University. 2018.
2. Climate Change and Biodiversity. Rio Conventions' Ecosystems Pavilion. 2017.
3. Brook BW, Fordham DA. Hot topics in biodiversity and climate change research. F1000 Research. 2015;4.
4. What is Biodiversity? Convention on Biological Diversity. 2007.