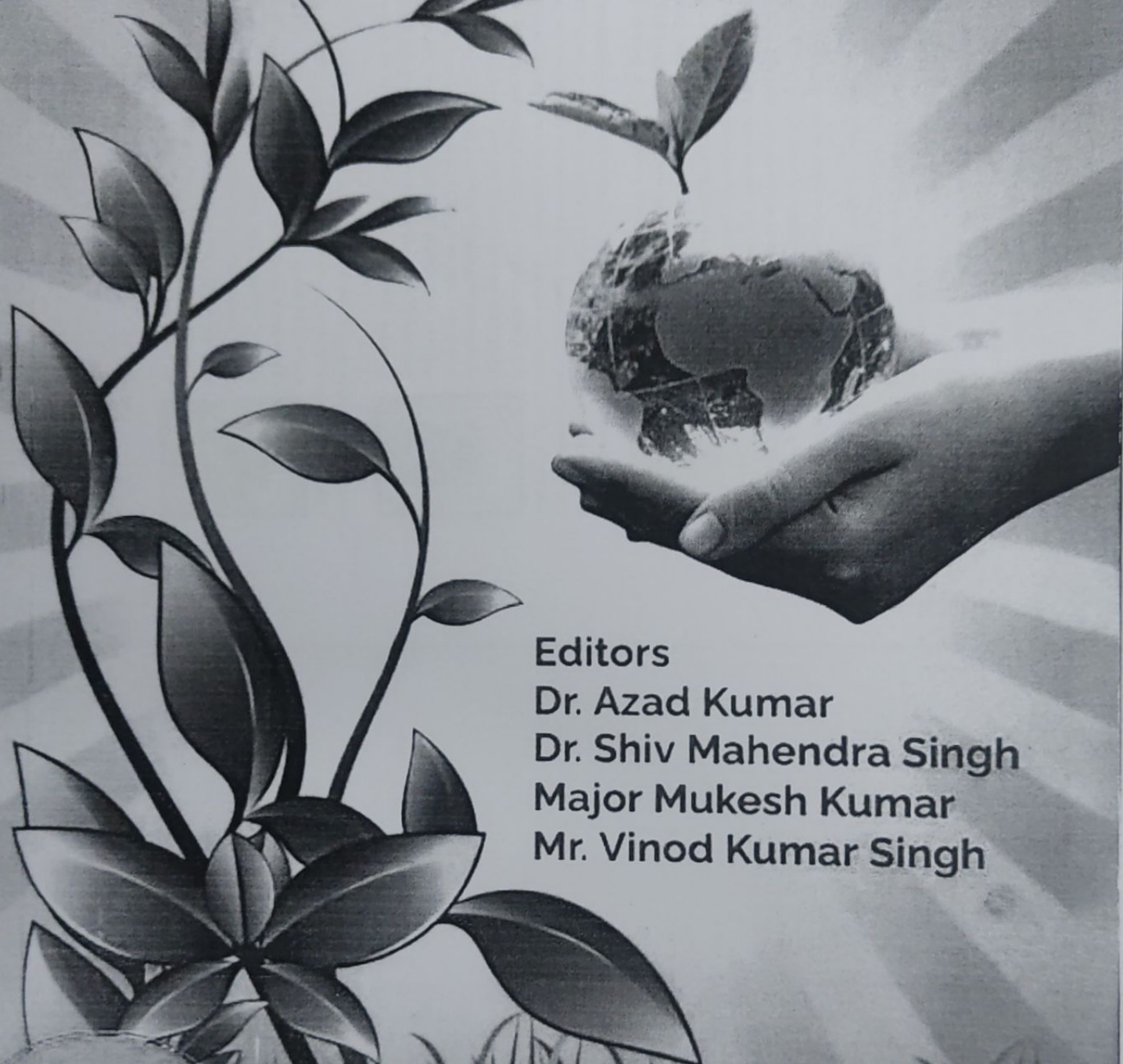


RECENT ADVANCES IN CHEMICAL SCIENCE FOR THE PROTECTION OF NATURE



Editors

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CHAPTER:1 THREATS TO BIOLOGICAL DIVERSITY: DISEASE AND HUMAN ACTIVITIES

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ABSTRACT

Parasites and infectious diseases have a substantial impact on the population dynamics and evolution of their hosts. They are both a common component of natural ecosystems and make up a large amount of biodiversity collectively. Because of the effects that diseases have on host variety and abundance, they also pose a particularly difficult problem for conservation biologists. From one perspective, they might promote species coexistence and protect genetic variation in wild populations, which would boost biodiversity. On the other hand, Infection outbreaks have the potential to threaten biodiversity by accelerating or causing the extinction of populations or species. This typically happens in conjunction with human-caused environmental changes or the inadvertent introduction of disease strains with a high propensity for virulence. It is essential to monitor epidemics and assess their effects on natural ecosystems in order to design conservation measures and sustain biodiversity.

Keywords: Parasites, Biodiversity, Disease, Virulence, Human Activities

INTRODUCTION

Biodiversity is defined as "the variability among living organisms from all sources, including, among others, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are a part; this encompasses diversity within species, between species, and among ecosystems." A healthy ecosystem is resilient and able to maintain its shape and characteristics over time. A diverse ecosystem is one that is healthy, as diversity and complexity of the system were once thought to be indications of ecosystem health. Over the past ten years, researchers have started to focus more on the importance of biodiversity for the spread and maintenance of diseases in ecosystems, and subsequently, the role of ecosystems in human health.

It was claimed that the dilution effect—higher biodiversity of non-reservoir hosts for a pathogen—would decrease transmission events and infection risk based on a vector-borne model of Lyme disease. This was further modified to account for additional vector- and non-vector-borne diseases, demonstrating both the lack and presence of the dilution effect in the wild. The purpose of this review is to shed light on disease systems that have been investigated in relation to biodiversity and the risk of disease transmission. In addition, the approaches and tactics are required to close the knowledge gaps in our present understanding of the influence of biodiversity on disease systems.

CHAPTER: 7

ACID RAIN: ITS CAUSES AND CONSEQUENCES

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Abstract

The acidity of rainwater is a major global environmental problem. Acid rain is typically a combination of sulphurous and nitric acids, with the exact composition depending on the emissions of these two gases. When these acids combine with other air components, protons are released, increasing the acidity of the soil. Soil acidification causes the mobilisation and leaching away of nutrient-rich cations and increases the availability of toxic heavy metals. These changes reduce soil fertility, which slows the growth of trees in the forest and the production of plants in the fields. Acidification of water bodies has severe consequences on fish and other aquatic animals. Human health is indirectly affected by acidification as well. Acid rain has a negative impact on every living thing in an environment. Concrete and metal can be corroded by the chemicals in acid rain. Reduced emissions of acid rain precursors and, to a lesser extent, liming has helped alleviate the acidity problem in terrestrial and aquatic environments over the past two decades.

Keywords: Acid rain, acidification, chemicals, environments, health,

Introduction

From the earliest days of civilization, humans have exploited the planet's many resources. They have constructed facilities to take advantage of various forms of energy on Earth to make their lives easier. The majority of today's electricity comes from power plants that burn fossil fuels like coal, oil, and natural gas. While this kind of development undoubtedly makes our lives easier, it also leads in pollution due to the discharge of harmful substances into the environment. Air pollution has increased due to the increased release of gaseous and particle pollutants into the atmosphere from the combustion of fossil fuels in industry and transportation, as well as from industrialisation and urbanisation (Tripathi and Gautam, 2007; Dwivedi and Tripathi, 2007). One of the most serious environmental problems caused by air pollution is the production of acid rain.

When clouds release their acidic contents as rain, it has a devastating effect on aquatic ecosystems like lakes, streams, and forests, killing off many species of plants and animals. One of the main factors that determines whether or not human and animal life can survive is the amount of rain that falls. Due to the fact that it provides Earth with much-needed water, rainfall is crucial to its continued existence of life. The acidity of rain is increasing due to pollution from factories, cars, and other sources, despite the fact that rain has a naturally acidic pH. Acid rain comes in a variety of forms, including fog, hail, and snow. Robert Angus Smith, in his 1872 paper titled "The air and rain beginning of chemical climatology," was the first to use this

This book covers environmental challenges, their origins, and potential solutions. Environmental concerns have a negative impact on humans, plants, animals, and the bioenvironment. At the individual, organizational, or state level, environmental protection is the action of safeguarding the environment for the benefit of people and the environment. The carbon dioxide equivalent of greenhouse gases in the atmosphere has already crossed 400 parts per million, with a total "long-term" GHG above 455 parts per million. There is a possibility that the level of greenhouse gases in the atmosphere is greater than what could eventually trigger climate change. The climate change is a real threat. Humanitarian needs are increasing, and this is the primary driver. Extreme weather caused massive devastation and affected a huge number of people. Furthermore, there are currently 4,444 more weather disasters per year. Weather-related disasters now account for about 70% of all disasters, up from 50% two decades ago. This book covers the full field of environmental science. This book discusses the transformation of atmospheric carbon dioxide into platform chemicals, the adsorption of heavy metals on natural adsorbent surfaces, the photocatalytic degradation of dyes, the causes of environmental pollution, sustainable development, waste water treatment by natural adsorbents, eco-friendly hotel tourism, and the emergence of nanotechnology for environmental protection.

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