CHAPTER 12

Bio-Indicator Species and Their Role in Monitoring Water Pollution

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Impact of Climate Change on Freshwater Ecosystem and Its Sustainable Management

Birjees Hassan, Humaira Qadri, Md. Niamat Ali, Nissar Ahmad Khan, and Ali Mohd Yatoo

Abstract Freshwater ecosystems are vital for global biodiversity and ecosystem services. Freshwater ecosystems are susceptible to the impacts of environmental change, which may cause irreversible damage to these ecosystems upon which huge amount of biodiversity and ecosystem services are dependent. Within the next few decades the climate change will have considerable ecological impacts on most of the fresh water ecosystems as per the current climatic predictions. Different freshwater ecosystems will be affected differently by climate change. One of the most important and major impact to be caused by climate change will be on fresh water flow regime. The speed of climate change will be abrupt and uneven rather than slow and even. Impacts caused by climate change on freshwater ecosystems will be visible both physically and chemically. It is very hard and more complex to forecast the impact on freshwater recourses due to climate change. In most of the cases, climate change together with other man made pressures will cause much damage to freshwater ecosystems. It is very difficult to predict impact of climate change on freshwater ecosystems in the next few decades using current global climate models. Rather than focusing on impact assessment a risk based approach should be adopted to assess and respond to climate change. A number of measures are required to protect freshwater ecosystems such as reducing extraction of water from ground and surface water, maintaining water flows, management of macrophytes, artificial

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Chapter 2
Effect of Pesticides on Fish Fauna: Threats, Challenges, and Possible Remedies

Shafat Ali, Adil Farooq Wali, Ali Mohd Yatoo, Sabhiya Majid, Saiema Rasool, Rehan Khan, Md Niamat Ali, Javaid Ahmad Wani, Sanah Farooq, Shabhat Rasool, Hilal Ahmad Wani, and Muneeb U. Rehman

2.1 Introduction

Pesticides are the chemical compounds with toxic nature purposefully employed to destroy a range of harmful organisms. Pesticides not only encompass insecticides but also fungicides, herbicides, and those substances that are toxic to pests (Matthews 2006). The major proportion of pesticides synthesized all over the world is utilized

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Chapter 13

miRNAs: the genetic regulators of immunity

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13.1 Introduction

The development and function of immune cells are vital for host defense against external and internal threats and for immune resolution following the elimination of threats, which requires rapid changes in the transcriptome and proteome. These changes are tightly regulated at both the transcriptional and posttranscriptional levels, where microRNAs (miRNAs) have been demonstrated to be crucial molecular players. miRNAs are small noncoding RNAs (about 18–22 nucleotides in length) produced by a multistep process involving a series of enzymes and proteins (Dillo Bhattacharyya & Filipowicz, 2007). The genes encoding miRNAs are transcribed by either RNA polymerase II or III as primary miRNAs (pri-miRNAs) containing a cap structure at the 50 end and polyadenylation at the 30 end (Lee et al., 2004). The nuclear microprocessor complex, composed of the ribonuclease (RNase) III enzyme Drosha and the RNA-binding protein DGCR8, processes pri-miRNAs into the precursor miRNAs (pre-miRNAs) which are exported into the cytoplasm facilitated by Exportin 5 and the GTP-binding nuclear binding protein RAN-GTP (Bohnsack, Czaplinski, & Gorlich, 2004; Denli, Tops, Ketting, & Hannon, 2004; Gregory et al., 2004; Lee et al., 2003; Okada et al., 2009). RNase III enzyme Dicer then cleaves pre-miRNAs into mature miRNA duplexes through binding to the two-nucleotide overhang at their 30 end generated by Drosha (Gottesman, 2004; Macrae et al., 2006). One strand of the miRNA duplex is usually incorporated into the miRNA-induced silencing complexes (miRISCs) through the Argonaut (Ago) proteins, which guide the binding of miRNAs to complementary sites mainly located in the 30

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Next Generation Research in Aquaculture

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A Molecular Approach to Immunogenetics

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Past, Present and Future of Micronucleus Test (MNT) and its Role in Fish Toxicogenon

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Abstract

The rapidly developing field of toxicogenomics is the application of genomic address questions in the field of toxicology, expected to have a major impact fields of genotoxicity and carcinogenicity. Genotoxicity is a destructive effec genotoxins on cellular genetic material (DNA, RNA) destroying its integrity include physical (ionizing radiation), chemical (EMS) and biological (reserp etc.) agents causing mutations. Nowadays, genotoxicity assays have becom component of regulatory requirement. In-vitro as well as in-vivo methodol evaluation of genotoxicity or mutagenicity, exert numerous genotoxicologic Different endpoints must be taken into considerations for the assessment of One such vital end point, the micronucleus (MN) test (MNT) is always inclu genotoxicity test guidelines for long time in many classes of genotoxins. M induction is a key characteristic of genotoxic compounds and analysis of micronu resulting from DNA strand breakage (clastogens) or to investigate genoprotect recent years, each of the in-vivo and in-vitro micronucleus assy has become a

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Environmental Phthalate Exposure in Relation to Reproductive Outcomes and Other Health Endpoints in Humans

Sareena Rives Ul Aziz, Aabid Bashir

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Chapter 17
Environmental Phthalate Exposure in Relation to Reproduction Outcomes and Health Endpoints

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ABSTRACT

Environmental pollutants, like xenobiotic substances released as byproducts of anthropogenic actions, naturally lead to pollution of the environment. They negatively affect the environment through unfavourable impacts on growth, development, and reproduction of organisms including humans. One of the outstanding examples of xenobiotics is endocrine disrupting compounds (EDCs) such as phthalate esters (PAEs), which have the efficacy to disturb numerous biological systems including the invertebrate, reptilian, avian, aquatic, and also the mammalian systems. Phthalates are family of xenobiotic hazardous compounds amalgamating in plastics to intensify their plasticity, flexibility, longevity, versatility, and durability. Ignoring the rising issue on the hazardous nature of various phthalates and their metabolites, ruthless usage of phthalates as plasticizers in plastics and as additives in innumerable consumer products continues due to their low eminent properties, their cost-effectiveness, and lack of suitable alternatives. Globally epidemiological human studies showed various phthalates and their metabolites ingested passively by man from the general environment, foods, drinks, breathing air, and routine household products cause various dysfunctions. This comprehensive chapter on the hazards of phthalates would benefit the general population, academia, scientists, clinicians, environmentalists, and law or policymakers to decide upon whether usage of phthalates to be continued swiftly without sufficient deceleration or regulated by law or to be phased out from earth forever.

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Chapter 8
Vermicomposting: An Eco-Friendly Approach for Recycling/Management of Organic Wastes

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Honey: Types, Composition and Antimicrobial Mechanisms

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Abstract

Honey has been broadly recognized as a source of nourishment and medic by both old and new generations. It has been utilized by people to treat num illnesses through topical application for at least 2700 years, but recent resea have revealed the antiseptic and antimicrobial activities of honey. It has

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Bacterial Fish Diseases

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