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Biodiversity in Animals - An Overview

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Abstract: ***It's the variety of animals, plants, fungi, and microorganisms like bacteria that make up our natural world—the diversity of life you'll find in one area. Ecosystems work together as an intricate web to maintain balance and support life by supporting all of these species and organisms. In order for all life on Earth, including humans, to function properly, biodiversity is vital. We cannot have healthy ecosystems that provide us with the air and food we eat without a wide range of animals, plants, and microorganisms. Nature itself is also valued by people.***

Key words: Biodiversity, Biodiversity in Animals, Ecosystem, Ecological Balance.

Introduction

Biodiversity is a term used to refer to the abundance and variety of life on our planet. It encompasses every living thing, from bacteria and plants to animals and humans. Scientists estimate that 8.7 million species exist, though only 1.2 million have been identified and described thus far; the vast majority being insects. Therefore, millions of unknown organisms are still waiting to be discovered. Biodiversity is a crucial element for sustaining life on Earth and without it, life would not continue to exist.[1]

Different species that exist today have evolved unique traits that distinguish them from other species over generations. Scientists use these differences to distinguish between species. Species that have evolved so differently from one another that they cannot reproduce with each other are considered different species. All organisms that can reproduce with each other fall into one species.[2]

Scientists are intrigued by the amount of biodiversity on a worldwide basis, with so much still to be discovered. Likewise, they research the variety of species within individual ecosystems, like forests, grasslands, tundras and lakes. A single grassland could include anything from beetles to snakes to antelopes and regions with an ideal environment for plants such as warm, moist tropical climates generally have the most diverse ecosystems. On top of that, they also observe organisms too small to view unassisted such as those present in soil or water samples observed under a microscope. [3]

In 1985, the term biodiversity was coined. It refers to variations among plants, animals, and microorganisms in the biosphere. As well as reflecting the number and relative frequency of different organisms in an ecosystem, biodiversity also reflects how they are organized at different levels.

In addition to providing nourishment, shelter, fuel, clothing, and several other resources, biodiversity also generates monetary benefits from tourism. For a sustainable livelihood, it is crucial to have a good understanding of biodiversity.

Types of Biodiversity

- **Species diversity:** In science, species diversity refers to the variety of different types of species found in a particular area. It is the most basic level of biodiversity. It includes all the species from plants to microorganisms. In humans, for example, there is a lot of diversity among individuals of the same species.
- **Genetic diversity:** In biology, it refers to the differences in the genetic resources of organisms. Each species has its own genetic constitution, which is why every human looks different. Similarly, different varieties of rice, wheat, maize, barley, etc., are available in the same species.

[1] "2018. What is biodiversity? - definition, types and importance. BYJUS. Retrieved from https://byjus.com/biology/biodiversity/"
[2] "2018. What is biodiversity? - definition, types and importance. BYJUS. Retrieved from https://byjus.com/biology/biodiversity/"
[3] "Biodiversity. Nationalgeographic.org. Retrieved January 12, 2023 from https://education.nationalgeographic.org/resource/biodiversity"

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- **Ecological diversity:** In ecological biodiversity, plants and animals live together and are connected by food chains and food webs. Ecosystems are composed of living organisms as well as non-living organisms. The diversity of ecosystems in a region, such as deserts, rainforests, mangroves, etc., includes ecological diversity.[4]

Biodiversity in Animals

In zoology, animal biodiversity deals with reptiles and amphibians. Herpetology is concerned with tetrapods that are poikilothermic and ectothermic. Amphibians are highly sensitive to environmental changes. A few amphibians and reptiles that produce venoms and toxins can be used for medicinal purposes. Snake venom can be used to treat heart strokes as an anticoagulant.

There are many species of animals that have been domesticated, trained, and used to produce food, agriculture, and are the primary biological capital for livestock development due to their diversity. In addition to maintaining rural development, this plays an important role in food safety. However, its management has been poor. In recent years, a lot of animals have gone extinct and this is a matter of great sadness.

Several levels of biodiversity can be studied. At the highest level, one can examine all the different species on the planet. At a much smaller scale, one can examine biodiversity within a pond ecosystem or neighborhood park. There are many challenges in science when it comes to understanding the relationship between all life on Earth.

A species is a group of living organisms that can interbreed in order to form biodiversity. Blue whales, white-tailed deer, pine trees, sunflowers, and microscopic bacteria are all examples of species. Biodiversity refers to the entire range of species in an area.

Let us say we are taking a look at the biodiversity of a local pond. Initially, we can identify a variety of plants, including cattails and water lilies. If we wait a while, we may see a garter snake, a bullfrog, or a red-winged blackbird. We can see invertebrates and worms under leaves, grasses, and in the water of the pond if we look closely.[5]

Do you think that you have done everything in the pond? You haven't even scratched the surface. We would be able to see hundreds or even thousands of different bacteria living in the pond water under a microscope. All of these species are part of this ecosystem's biodiversity.

To properly catalog all life on Earth, we must also recognize the genetic diversity that exists within species, as well as the diversity of habitats and ecosystems. Genetic diversity is the variation in genes that exist within a species. Thinking about dogs is a good way to understand genetic diversity. Dogs are all part of the same species, but their genes determine if they are Chihuahuas or Great Danes. Dogs possess a lot of genetic diversity—just think about all the colors, shapes, and sizes they possess.

The concept of ecological biodiversity refers to the diversity of ecosystems, natural communities, and habitats, as well as the interaction between species and their environment. By the types of species found in both ecosystems, as well as the temperature and rainfall, the forests of Maine and Colorado are different. Despite looking similar, these two ecosystems have a lot in common that makes them both unique.[6]

Biodiversity Facts

- The number of species on Earth is estimated between 3 and 30 million, although some studies predict that there may be more than 100 million.
- There are currently only 1.7 million species on Earth, so we have a long way to go before we know how many species there are.
- Tropical rain forests have the greatest diversity of life than temperate or boreal ecosystems.
- There are many kinds of animals, but the most diverse group is the invertebrates. Invertebrates include insects, crustaceans, sponges, scorpions, and many other types.
- Over half of all animals already identified are invertebrates, of which beetles are among the most numerous.

[4] "Biodiversity. Nationalgeographic.org. Retrieved January 12, 2023 from https://education.nationalgeographic.org/resource/biodiversity"
[5] "Titley, Mark & Snaddon, Jake & Turner, Edgar. (2017). Scientific research on animal biodiversity is systematically biased towards vertebrates and temperate regions. PLOS ONE. 12. e0189577. 10.1371/journal.pone.0189577."
[6] "Titley, Mark & Snaddon, Jake & Turner, Edgar. (2017). Scientific research on animal biodiversity is systematically biased towards vertebrates and temperate regions. PLOS ONE. 12. e0189577. 10.1371/journal.pone.0189577."

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A large number of medical discoveries have been made through research into plant and animal biology and genetics. Research will never be able to predict whether a new vaccine or drug would have been developed if a species had gone extinct or lost genetic diversity.

Approximately 17 out of the roughly 190 countries in the world have earned the label "megadiverse" due to their hosting of 70 percent of global biodiversity. India is among these nations, with only 2.4% of its land area constituting 7-8% of the planet's species diversity. This includes 91,000 documented animal species and 45,500 plant species within its ten bio-geographic regions. Interestingly, 12.6% of mammals, 4.5% of birds, 45.8% of reptilians, 55.8% amphibians and 33% flora endemic to India - which can be found nowhere else in the world - are included in this figure.

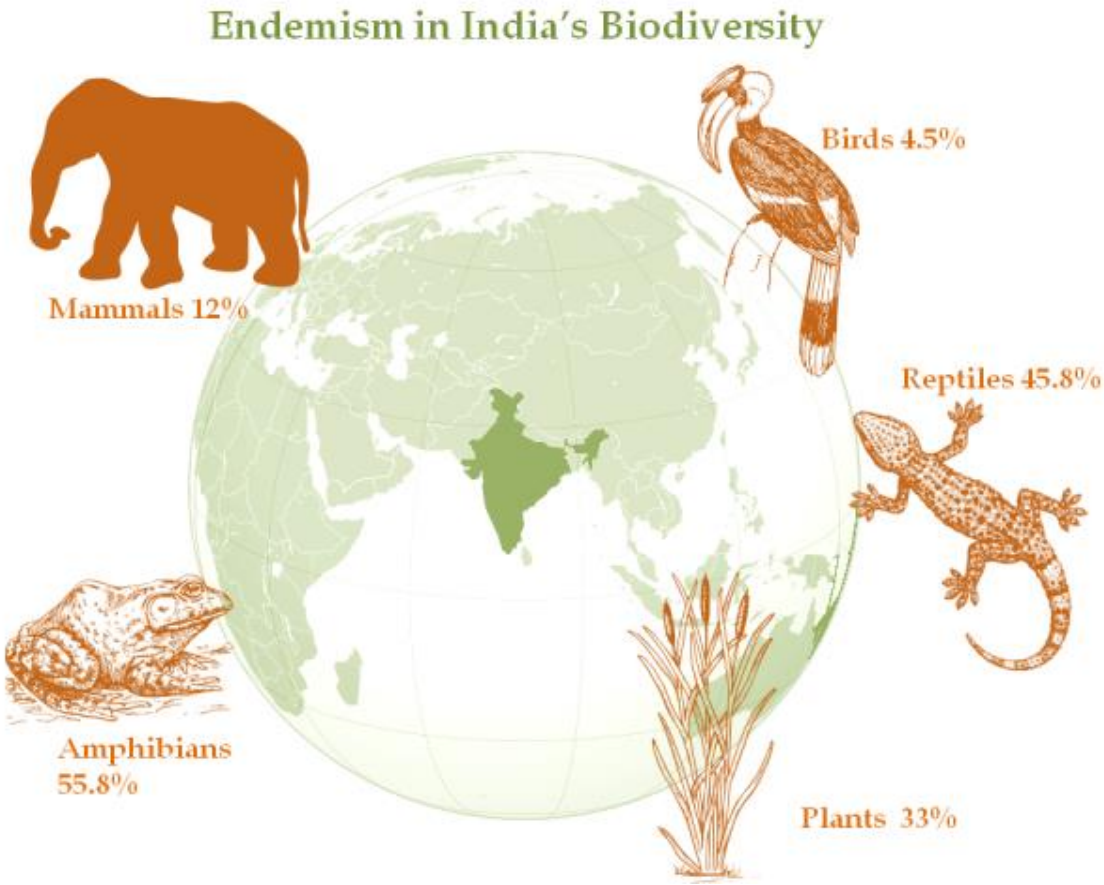

Fig 1. Animal Biodiversity in India

This figure shows the diversity of endemic species in India. These endemic species are found nowhere else in the world. The baseline data on existing species and their macro- and micro-habitats are also inadequate, suggesting that there are about 4,00,000 more species present in India that need to be recorded and described.[7]

For the past 3.5 billion years, evolution has given rise to immense biodiversity in India, traditionally a part of its culture. As the country's economy shifts from mainly agricultural to a more diverse system, it is taking a toll on land use due to the size of India's population--nearly one-fifth of the globe. Consequently, habitats are being lost and broken up, posing a major risk to biodiversity.[8]

There are also three of 34 "global biodiversity hotspots" in India, which are unique, biologically rich areas with severe conservation threats. Since hotspots are degrading rapidly, conservation science must be pursued immediately and vigorously in order to curtail biodiversity decline and protect its unique flora and fauna. As a result of this biodiversity, human communities are sustained and

[7] "Biodiversity in India. India Biodiversity Portal. Retrieved January 12, 2023 from https://indiabiodiversity.org/page/4246006"
[8] "Biodiversity in India. India Biodiversity Portal. Retrieved January 12, 2023 from https://indiabiodiversity.org/page/4246006"

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nourished. Several million people in India indirectly benefit from ecosystem services provided by two great mountain chains, the Himalayas and the Western Ghats.[9]

Animal Biodiversity Importance

All species have an important role to play in maintaining an ecosystem. They capture and store energy, as well as produce and decompose organic matter. These services are essential to human survival, which is why we must not be the cause of their extinction. Biodiversity also safeguards different cultures and spiritual heritage, making its conservation paramount. Not only that, but its variety of animal life has been used in various ways, including domesticating them for food production and other agricultural purposes. Consequently, it is evident that biodiversity serves a vital purpose in the livability of our planet.

Conclusion

Biodiversity is a valuable asset to humanity and our societies, providing us with food security and nutrition, energy, sources for medicines and pharmaceuticals, and access to freshwater- all of which contribute to good health. It also offers economic opportunities and recreational activities that boost wellbeing. In addition to the material welfare and local economic resilience it brings, biodiversity likewise provides a sense of community security and human health benefits. Technically referred to as 'ecosystem services', these advantages are even more important in terms of their impact on the environment: healthy ecosystems maintain essential natural processes such as soil turnover, water purification, and pest control, which are only possible because of the species that support them.

[9] "Biodiversity in India. India Biodiversity Portal. Retrieved January 12, 2023 from https://indiabiodiversity.org/page/4246006"

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