DISTRIBUTION OF SPECIES AND ECOSYSTEMS IN GEOGRAPHIC SPACE AND THROUGH GEOLOGICAL TIME IN HARYANA

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Abstract

This research article has discussed the distribution of species and ecosystem is dependent on climatic factors. According to the geological time scale, the earth evaluated the species and environment according to the period. Moreover, the movement of the plate is another reason for the distribution of species and ecosystems. Haryana is the most significant biodiversity state of India. The climate and location of this state have helped to contain several species and different types of ecosystems in this state. According to the geological time, the distribution of species and ecosystem proved by the fossils and rock dating of this area.

Keywords: *Geological time scale, Gondwanaland, Eon, plate tectonic*

Introduction

The distribution of species and ecosystems is related to the geological areas of the earth. The formation of the earth is related to the distribution of species and ecosystems. The earth formed about 4.54 billion years ago. Climate change is affecting the species and ecosystem effectively. According to the geological time scale, the species and ecosystems are changed with the evaluation of earth formation. The fossils and rock dating are the most important evidence of the distribution of species and ecosystems. Analysis of the history of the earth has helped to understand the distribution of species and ecosystems.

Literature review

Evolution of Eons

Geological time scale is the most important geological approach that helps to understand the evolution of species and ecosystems of the earth. In the words of Altermann *et al.* (2012), the

geological time scale has been divided into some parts according to time. The largest division of the geological time scale is Eons. Four types of eons are Phanerozoic, Proterozoic, Archean, and Hedean. Proterozoic, Archean, and hedean, these three eons are known as a Precambrian time. These three eons came before the period of Cambrian. The Phanerozoic era is divided into three eras. Ersa is the smallest division of eons. The three eras of Phanerozoic eons are Paleozoic, Mesozoic, and Cenozoic (Cárdenas and Harries 2010). Furthermore, the areas are also divided into periods. The 'paleozoic' era is divided into six periods one is 'Cambrian' another five are 'Ordovician', 'Silurian', 'Devonian', 'Carboniferous', and 'Permian'. Moreover, the 'Mesozoic' era was also divided into three periods: 'Triassic', 'Jurassic', and 'Cretaceous'. Another most significant era is the 'Cenozoi'c. This era has two parts one is 'Tertiary' and another one is 'Quaternary'.

Distribution of species and ecosystem

Paleoproterozoic and Archean eons are long periods of geological time. In this period earth was only single-cell life. According to *Stanton et al. (2012),* after the evaluation of the earth, multicellular life has been found. The Proterozoic eon is divided into three parts one is Paleoproterozoic another is Mesoproterozoic and Neoproterozoic. In Mesoproterozoic, sandstone, mudstones, and volcanic sedimentary deposits were deposited in shallow areas and multicellular life has been found in this era. In Neoproterozoic, multicellular life was developed and volcanic sequences and sedimentary rock formed in this period. In the Cambrian period, the earth experienced a cold climate. In this period, animals such as trilobites, mollusks, and graptolites first appeared on the earth in this period.

Ordovician is the other most important period of the earth. In this period the earth has faced a cold climate and dramatic volcanic eruptions. In the early Paleozoic era, the Silurian is the other most effective period of the geological time scale. In this period the earth has experienced tropical to subtropical climate (Cárdenas and Harries 2010). This period included corals, brachiopods, graptolites, and trilobites. In the Devonian period, the earth faced a semi-arid climate. Moreover, in this period fish and the first higher plants arrived. The Carboniferous period was dominated by giant ferns and forests. In the other words, in the Permian period, there

were several groups of animals. In the Triassic period reptiles and the first dinosaurs were involved in this period.

In the Jurassic period, dinosaurs were the most dominant animals on the earth. In the Cretaceous period, the earth experienced a warm climate, and ammonites and dinosaurs were involved. Moreover, in the Cenozoic period, the earth had a very warm climate and in this period the first humans arrived. According to geological time, the distribution of species and ecosystems evaluated for change in climate and environment. Stigall (2014), argued that India is the most significant content of distribution of species and animals. Various climatic activities and environments have changed the animals and ecosystem distribution of different states of this nation. Haryana is the most effective state of India. In these states, several distributions of species and ecosystems have been found for climatic change.

Methodology

The methodology is the most significant aspect of research study. In research analysis methodological part has helped to complete the study successfully. In the methodology, the two most important elements are data collection and data analysis. In the data research study, appropriate data collection methods have helped to find authentic results of the study. The data collection method has divided into two sections. One is the primary and another is the secondary data collection method (Wolffsohn *et al.* 2017). The primary data collection method is used in the case study analysis. In the other words, secondary data collection method is based on online sources. This study has selected the secondary data collection method to find the realistic result of the research study.

The secondary data collection method has can divide into two parts, quantitative data and qualitative secondary data collection method. This research study has conducted *secondary qualitative data collection method* to increase the significance of the study. From the secondary data this research study has selected *thematic and systematic analysis* to understand the importance of the research study. Moreover, the research philosophy is other most significant aspect of the research study (Lather 2013). This research study has adopted positivism philosophy to increase relevance of study. In other words, this research study has followed descriptive research design to analyze qualitative data and get authentic results of the research.

Result and discussion

Systematic analysis

Sources	Relevance	Findings
Buddand and Pandolfi 2010	This paper has represented the evolution of species and ecosystem according to the geological time scale. The climate change has significantly affected the distribution of species and ecosystem of the earth. According to the time scale, climate changes and different species and environmental conditions evolved.	According to the geological time scale, the earth has faced different climatic changes and with this climatic change has evaluated the species and environment of the earth. The fossils of the species and rock bedding are proof of the evaluation of species and ecosystem.
Chatterjee *et al.* 2017	This paper has represented the evaluation of species and environment of India according to the geological time scale. This paper also described the movement of plates and the distribution of species.	The movement of plates is another most effective reason for species and ecosystem distribution. The evaluation of the earth has helped to understand the distribution of the species and ecosystem.

Table 1: Systematic analysis of the distribution of species and ecosystem in geographic space
(Source: Chatterjee *et al.* 2017)

Thematic analysis

Theme 1: Evaluation of species and ecosystem in India

India has different diversity and several species for different climates. Plate tectonics is the major cause of the distribution of species and ecosystems. The history of the earth has depicted that in early times, Gondwanaland and Laurasia were the same continents. After the movement of plate tectonics, these two plants are divided into two parts. In this regard, many species and ecosystems have shifted for this season (Reddy *et al.* 2014). Glpossopetorious plant was located in Gondwanaland earlier but after plate movements that shifted in Laurasia. Moreover, Mesosourus reptiles also shifted for plate movement. This movement of the earth and the earthquake and topographical changes has distributed the species and climatic change of India.

Theme 2: Distribution of species and ecosystem in Haryana

Haryana is the most significant biodiversity state of India. This start has contained 1.34% geographical area of the nation. According to the geological time scale, the climatic change and plate tectonic movements have created the distribution of species and ecosystems in this area. The locational factor and geographical aspects have helped to change the ecosystem and distribution of species. The average rainfall of this state has been verified to be 200mm to 1400 mm (Singh and Laura 2012). Moreover, the average temperature range of this status is between 1-degree centimeters to 45-degree centimeter. This state has found the deciduous forest, tropical thorn forest, and subtropical pine first for the effective climatic factor. In this first area, blackbuck, nilgai, panther, mongoose, the wild fog has been found. Moreover, in this geographical area, 450 different types of species and birds are also seen in this area.

Conclusion

After all these discussions it can be concluded that the distribution of species and ecosystem are dependent on climatic change. According to geological time, the formation of the earth has changed according to the geological period. Moreover, the change of earth formation distributed the species and ecosystem. Haryana is the most significant biodiversity state of India. The climatic factor of this state has helped to evaluate the species and ecosystem of the state.

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