

# BIODIVERSITY STUDY OF SELECTED AREAS OF KANIYAMBETTA PANCHAYATH – WAYANAD

Savitha P S, Dept. of Zoology, Sree Sankara College, Kalady.

Dr. Mini K D, Asst. Professor, Dept. of Zoology, Sree Sankara College, Kalady  
Corresponding author; Savitha P S

## ABSTRACT

The survey of biodiversity in Kaniyambetta panchayath for a duration of 6 months presented many organisms. Diverse organisms were found belonging to both Chordata and Nonchordata. The study recorded 49 species, out of which 37 were invertebrates and the rest vertebrates. Among invertebrates most of the organism belonged to the Phylum Arthropoda which was the largest Phylum in the animal kingdom. 10 species of birds, 4 species of Mammalia, one species each of Annelida, Mollusca, Amphibia and Reptilia were also identified. The identification was done with the help of reference books and internet facility. The decline in the number of some species indicated the loss of biodiversity which might be due to the unscientific approach of human population to the ecosystem. The Loss of biodiversity threatened the proper functioning of the ecosystem.

**Keywords; Biodiversity, Flora, Invertebrates, Chordates, Arthropods.**

## INTRODUCTION

The term biodiversity was coined in 1985 as a contraction of the phrase "biological diversity" and was first coined in 1985 by Walter Rosen of the National Research Council. Biodiversity is comprised of different levels like genes, species, communities of creatures and finally the entire ecosystem. Biodiversity is a measure of variations at the genetic, species and ecosystem level (8). Biologists most often define biodiversity as the totality of genes, species and ecosystems of a region. (7) .

Generally, three levels of biodiversity are discussed – genetic, species and ecosystem diversity.

- Genetic diversity occurs within species as well as between species. It is all the different genes contained in all individual plants, animals, fungi and microorganism. Members of a species share genes, the bits of biochemical information that determine, in part, how the animals look, behave and live (1).
- Species diversity occur between different species as well as it is all the differences within and between populations of species. Species is the basic unit of classification and species richness is a simple count of species. Species evenness quantifies how equal the abundances of the species are (4).
- Ecosystem diversity is the variations within individual ecosystems as well as it is all the different habitats, biological communities and ecological processes. It is the largest scale of biodiversity, and within each ecosystem there is a great deal of species and genetic diversity (2).

The systems that sustain all life on Earth, including humans, depend on biodiversity. We cannot have the healthy ecosystems that we depend on to give us the air we breathe and the food we consume without a diverse variety of animals, plants, and microorganisms. People also appreciate nature in and of itself. People have an innate appreciation for some parts of biodiversity, but as we learn more about it, we realise that everything in biodiversity, including bugs and germs we can't see or may not find attractive, is crucial. Humans rely on biodiversity in a variety of ways, making its preservation crucial.

Scientists estimate that millions more species are at risk but have not yet been officially recognised. In 2006, many species were formally classified as rare, endangered, or threatened. 16,119 out of the 40,177 species that were evaluated using the IUCN Red List criteria are currently classified as being at risk of going extinct (5). Jared Diamond describes habitat destruction, overkill, introduced species, and secondary extinctions as an "Evil Quartet" (6).

We must work tirelessly to protect, manage, and conserve biodiversity. This method will include all protected areas, from huge wilderness reserves to tiny sites for specific species and reserves for restricted purposes. Protected areas are places that have been set aside by law and are maintained for biodiversity preservation. Over 750 million hectares of terrestrial and marine ecosystems are protected in 8,163 areas worldwide, or 1.5% of the planet's surface. India is the second-most populous nation, so any plan for conservation must take socioeconomic development into account because the country's biological resources are under threat from the growing human population. Additionally, because our nation is predominately an agricultural one, policymakers should understand that biodiversity protection and sustainable use are essential to all forms of development planning.

India has added 557 new species to its fauna, which includes 407 new species and 150 6 new records, reveals Animal Discoveries 2020, a document published recently by the Zoological Survey of India (ZSI). India hosts four biodiversity hotspot which include the Himalayas, the Western Ghats the Indo-Burma region and Sunderland (including the Nicobar Islands). India has a considerable biodiversity. It is one of the seventeen nations with the highest levels of biodiversity, and it is home to 7.6% of all mammalian, 12.6% of all avian, 6.2% of all reptilian, 4.4% of all amphibian, 11.7% of all fish, and 6.0% of all flowering plant species (3).

This project is conducted in Kaniyambetta panchayath in the district of Wayanad, Kerala. Wayanad is an Indian district in the north-east of Kerala state with administrative headquarters at the municipality of Kalpetta. It is the sole Plateau in Kerala. About

885.92 sq.km of area of the district is under forest. Kaniyambetta is a panchayath in Wayanad district of Kerala state, southern India. This panchayath is home for variety of species like honeybee, butterflies, millipedes, moths, ants, caterpillar, dragon fly (phylum Arthropoda) varieties of birds (class Aves) snails (phylum Mollusca) earthworms (phylum Annelida) etc.

### RELEVANCE OF THE STUDY

The biodiversity is the major field of study and research for natural, biological and social science. The studies help to promote the development of human beings, animals and plants, social and economic development and so on. It is very significant to monitor the biodiversity of selected sites especially a place like Wayanad rich in diverse types of organisms. It is very important to protect our natural resources as the biodiversity loss might lead to the degradation of our ecosystem.

### METHODOLOGY

#### Study area

Selected areas of Kaniyambetta Panchayath, Wayanad.

#### Method

The biodiversity occupying in the selected areas of Kaniyambetta Panchayath (Wayanad district) was chosen for the study. The total area of Kaniyambetta Panchayath is 37.865 sq.km. The study was carried for a period of six months. The observation was done whenever possible and captured the photos of the organisms spotted. With the help of this photographs the organisms were identified using internet and reference books. The data collected was systematically arranged. The details of the organisms were given in description.

### OBSERVATION AND RESULT

The study was conducted in Kaniyambetta panchayath of Wayanad district. Total number of 49 species of organisms were recorded (37 invertebrates and 12 vertebrates). Majority of organisms belongs to the phylum Arthropoda as it is the largest phylum in the animal kingdom. 10 species of birds, one species each of Mammalia, Annelida, Mollusca, Amphibia and Reptilia were also identified. The list of organisms spotted and identified is given in the following tables.

**Table 1: Invertebrates**

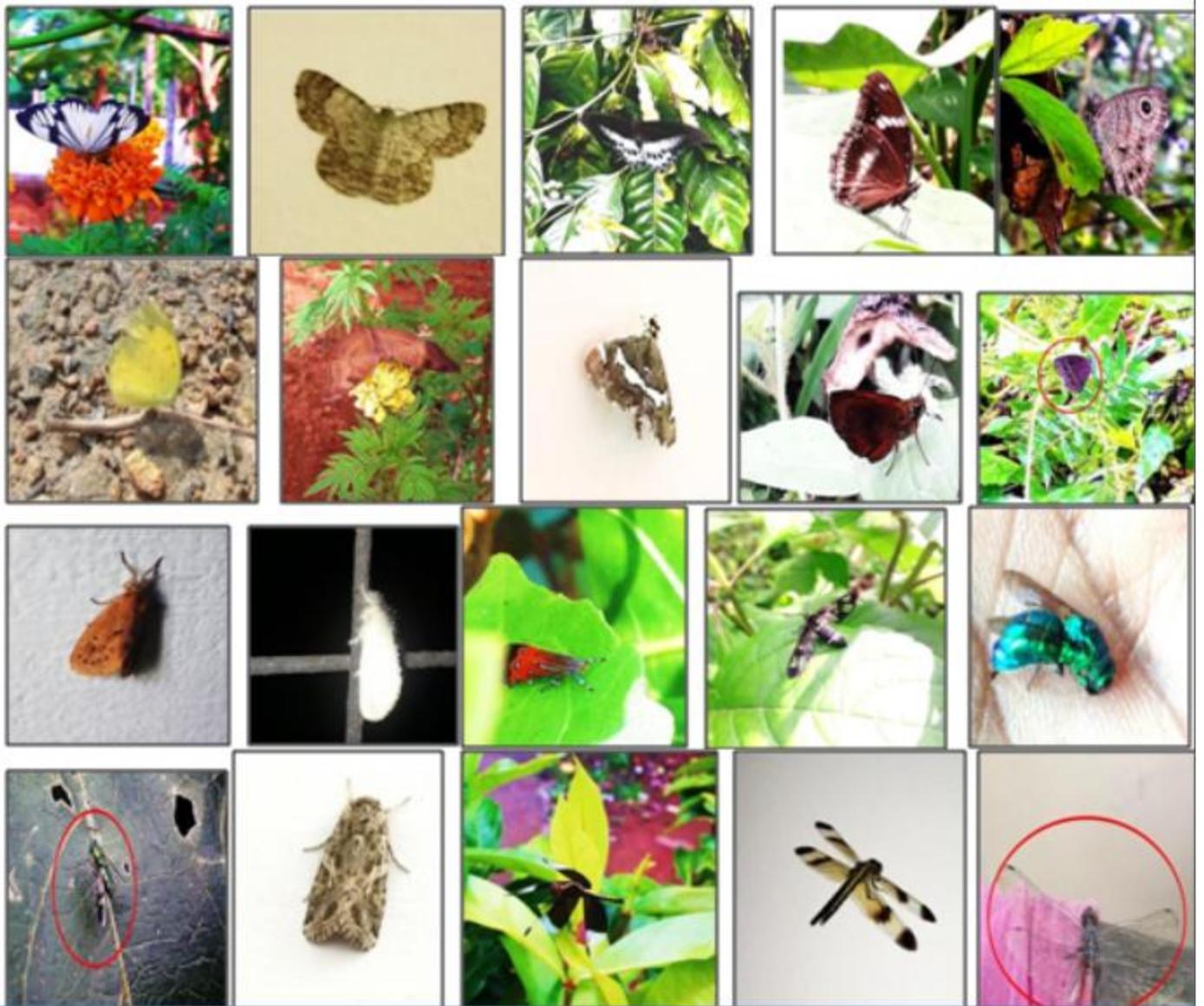
Common Name	Binomial Name	Phylum	Class	Order	Family	Genus	Species
White marbled moth	<i>Nyctemera coleta</i>	Arthropoda	Insecta	Lepidoptera	Erebidae	<i>Nyctemera</i>	<i>coleta</i>
Pingasa	<i>Pingasa rubicunda</i>	Arthropoda	Insecta	Lepidoptera	Geometridae	<i>Pingasa</i>	<i>rubicunda</i>
Blue Mormon	<i>Papilio polymnestor</i>	Arthropoda	Insecta	Lepidoptera	Papilionidae	<i>Papilio</i>	<i>polymnestor</i>
Blue moon butterfly(fe male)	<i>Hypolimnias bolina</i>	Arthropoda	Insecta	Lepidoptera	Nymphalidae	<i>Hypolimnias</i>	<i>bolina</i>
Common five ring	<i>Ypthima baldus</i>	Arthropoda	Insecta	Lepidoptera	Nymphalidae	<i>Ypthima</i>	<i>baldus</i>
Small grass yellow	<i>Eurema brigitta</i>	Arthropoda	Insecta	Lepidoptera	Pieridae	<i>Eurema</i>	<i>brigitta</i>
Chocolate pansy	<i>Junonia iphita</i>	Arthropoda	Insecta	Lepidoptera	Nymphalidae	<i>Junonia</i>	<i>iphita</i>
Beet webworm moth	<i>Spoladea recurvalis</i>	Arthropoda	Insecta	Lepidoptera	Crambidae	<i>Spoladea</i>	<i>recurvalis</i>
Chesnut bob	<i>Lambrix salsala</i>	Arthropoda	Insecta	Lepidoptera	Hesperiidae	<i>Lambrix</i>	<i>salsala</i>
Smooth eyed bush brown	<i>Orsotriaena medus</i>	Arthropoda	Insecta	Lepidoptera	Nymphalidae	<i>Orsotriaena</i>	<i>medus</i>
Rosy footman	<i>Miltochrista miniata</i>	Arthropoda	Insecta	Lepidoptera	Erebidae	<i>Miltochrista</i>	<i>miniata</i>
Swan moth	<i>Sphrageidus similis</i>	Arthropoda	Insecta	Lepidoptera	Erebidae	<i>Sphrageidus</i>	<i>similis</i>
Moth	<i>Tricyanaula aurantiaca</i>	Arthropoda	Insecta	Lepidoptera	Gelechiidae	<i>Tricyanaula</i>	<i>aurantiaca</i>
Handmaiden moth	<i>Syntomoides imaon</i>	Arthropoda	Insecta	Lepidoptera	Erebidae	<i>Syntomoides</i>	<i>imaon</i>

Cuckoo wasp	<i>Trichrysis cyanea</i>	Arthropoda	Insecta	Hymenoptera	chrysididae	<i>Trichrysis</i>	<i>cyanea</i>
Asian long-legged fly	<i>Condylostylus sp.</i>	Arthropoda	Insecta	Diptera	Dolichopodidae	<i>Condylostylus Bigot</i>	<i>spp</i>
Lawn armyworm	<i>Spodoptera mauritia</i>	Arthropoda	Insecta	Lepidoptera	Noctuidae	<i>Spodoptera Guenee, 1852</i>	<i>mauritia</i>
Pied paddy skimmer (male)	<i>Neurothemis thullia</i>	Arthropoda	Insecta	Odonata	Libellulidae	<i>Neurothemis</i>	<i>thullia</i>
Pied paddy skimmer (female)	<i>Neurothemis thullia</i>	Arthropoda	Insecta	Odonata	Libellulidae	<i>Neurothemis</i>	<i>thullia</i>
Crimson tailed marsh hawk (male)	<i>Orthetrum pruinsum</i>	Arthropoda	Insecta	Odonata	Libellulidae	<i>Orthetrum</i>	<i>pruinsum</i>
Crimson tailed marsh hawk (female)	<i>Orthetrum pruinsum</i>	Arthropoda	Insecta	Odonata	Libellulidae	<i>Orthetrum</i>	<i>pruinsum</i>
Slender skimmer	<i>Orthetrum sabina</i>	Arthropoda	Insecta	Odonata	Libellulidae	<i>Orthetrum</i>	<i>sabina</i>
Banana stalk fly	<i>Telostylinus lineolatus</i>	Arthropoda	Insecta	Diptera	Neriidae	<i>Telostylinus</i>	<i>lineolatus</i>
Rambur's forktail	<i>Ischnura ramburii</i>	Arthropoda	Insecta	Odonata	Coenagrionidae	<i>Ischnura</i>	<i>ramburii</i>
Gaint shield mantis	<i>Rhombodera extensicollis</i>	Arthropoda	Insecta	Mantodea	Mantidae	<i>Rhombodera</i>	<i>extensicollis</i>
house fly	<i>Musca domestica</i>	Arthropoda	Insecta	Diptera	Muscidae	<i>Musca</i>	<i>domestica</i>
Pantropical jumping spider	<i>Plexippus paykulli</i>	Arthropoda	Arachnida	Araneae	Salticidae	<i>Plexippus</i>	<i>paykulli</i>
Black wood spider	<i>Nephila kuhlii</i>	Arthropoda	Arachnida	Araneae	Nymphalidae	<i>Nephila</i>	<i>kuhlii</i>
Weaver ant	<i>Oecophylla smaragdina</i>	Arthropoda	Insecta	Hymenoptera	Formicidae	<i>Oecophylla</i>	<i>smaragdina</i>
Bullet ant	<i>Paraponera clavata</i>	Arthropoda	Insecta	Hymenoptera	Formicidae	<i>Paraponera</i>	<i>clavata</i>
Rufous grasshopper	<i>Gomphocerippus rufus</i>	Arthropoda	Insecta	Orthoptera	Acrididae	<i>Gomphocerippus</i>	<i>rufus</i>
Nine spotted Lady bug	<i>Coccinella novemnotata</i>	Arthropoda	Insecta	Coleoptera	Coccinellidae	<i>Coccinella</i>	<i>novemnotata</i>
Large dung beetle	<i>Helicopriss dominus</i>	Arthropoda	Insecta	Coleoptera	Scarabaeidae	<i>Helicopriss Hope, 1873</i>	<i>dominus</i>
White marked tussock moth (larvae)	<i>Orgyia leucostigma</i>	Arthropoda	Insecta	Lepidoptera	Erebidae	<i>Orgyia</i>	<i>leucostigma</i>
Ivory millipeds	<i>Chicobolus spinigerus</i>	Arthropoda	Insecta	Spirobolida	Spirobolidae	<i>Chicobolus chamberlin, 1947</i>	<i>spinigerus</i>
Red palm weevil	<i>Rhynchophorus ferrugineus</i>	Arthropoda	Insecta	Coleoptera	Curculionidae	<i>Rhynchophorus</i>	<i>ferrugineus</i>

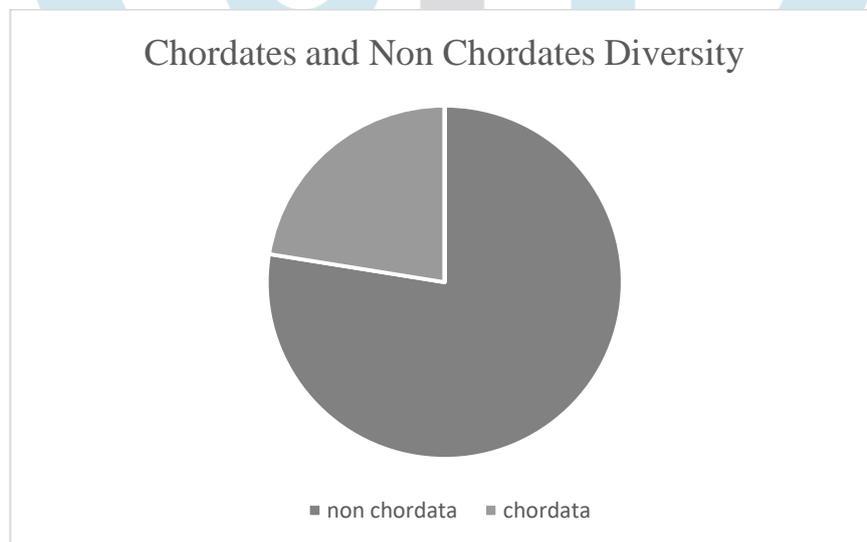
Earthworm	<i>Lumbricus terrestris</i>	Annelida	Clitellata	Haplotaxida	Lumbricidae	<i>Lumbricus</i>	<i>terrestris</i>
Shiny glass snail	<i>Zonitoides nitidus</i>	Mollusca	Gastropoda	Achatinoida	Gastrodontoidea	<i>Zonitoides</i>	<i>nitidus</i>

**Table 2: Vertebrate**

Common tree frog	<i>Polypedates leucomystax</i>	Chordata	Amphibia	Anura	Rhacophoridae	<i>Polypedates</i>	<i>leucomystax</i>
Common house gecko	<i>Hemidactylus frenatus</i>	Chordata	Reptilia	Squama	Reckoned	<i>Hemidactylus</i>	<i>frenatus</i>
Red whiskered bulbul	<i>Pycnonotus jocosus</i>	Chordata	Aves	Passeriformes	Pycnonotidae	<i>Pycnonotus</i>	<i>jocosus</i>
Long billed sunbird	<i>Cinnyris lotenius</i>	Chordata	Aves	Passeriformes	Nectariniidae	<i>Cinnyris</i>	<i>lotenius</i>
Black naped monarch	<i>Hypothymis azurea</i>	Chordata	Aves	Passeriformes	Monarchidae	<i>Hypothymis</i>	<i>azurea</i>
Golden fronted leaf bird	<i>Chloropsis aurifrons</i>	Chordata	Aves	Passeriformes	Chloropseidae	<i>Chloropsis</i>	<i>aurifrons</i>
Indian peafowl	<i>Pavo cristatus</i>	Chordata	Aves	Galliformes	Phasianidae	<i>Pavo</i>	<i>cristatus</i>
White throated kingfisher	<i>Halcyon smyrnensis</i>	Chordata	Aves	Coraciiformes	Alcedinidae	<i>Halcyon</i>	<i>smyrnensis</i>
House crow	<i>Corvus splendens</i>	Chordata	Aves	Passeriformes	Corvidae	<i>Corvus</i>	<i>splendens</i>
Oriental magpie robin	<i>Copsychus saularis</i>	Chordata	Aves	Passeriformes	Muscicapidae	<i>Copsychus</i>	<i>saularis</i>
House sparrow	<i>Passer domesticus</i>	Chordata	Aves	Passeriformes	Passeridae	<i>Passer</i>	<i>domesticus</i>
Indian palm squirrel	<i>Funambulus palmarum</i>	Chordata	Mammalia	Rodentia	Sciuridae	<i>Funambulus</i>	<i>palmarum</i>







## DISCUSSION

Biological diversity or biodiversity are expressions that refer to the variety of life on the planet, or to the property of living systems to be distinct. It includes plants, animals, microorganisms, ecosystems, and ecological processes in a functional unit. The biodiversity study of Kaniyambetta Panchayath in Wayanad commenced in August 2021 and ended in January 2022. Kaniyambetta is a panchayath located in Wayanad district of Kerala. The nearest city is Kalpetta at a distance of 8km. Agriculture is the mainstay of the economy with coffee, black pepper, and vanilla being the main cash crop. Muthanga forest is located at a distance of 42 km and Tholpetty at a distance of 38km from Kaniyambetta. The observation of fauna was carried out both at day and night. Some common birds like *Pycnonotus jocosus*, *Corvus splendens*, *Passer domesticus*, *Copsychus saularis* was seen every day during the study. Butterflies and moths were commonly recorded throughout the study. *Pavo cristatus* was spotted rarely. The butterflies were seen abundant were flowering plants and other nectar sources were rich. Dragon flies were seen near the paddy field and near the streams. The less flooded areas might draw the dragonflies to. They breed in water and feed on insects found near water, such as mosquitoes. Population of earthworms was found declining in many areas of my study. Decreasing

population of earthworm indicates the decline in the biodiversity. Loss of Biodiversity also threatens the structure and proper functioning of the ecosystem. Tillage, farming, stirring of soil pollution, climate change etc. are considered as the factors affecting the earthworm population. Intensive use of manure and acidic soil with a pH value below five harm the worm, although it remains unclear whether herbicides affect earthworm's ability to reproduce. Biodiversity loss includes the worldwide extinction of different species, as well as the Healthy ecosystems clean our water, purify our air, maintain our soil, regulate the climate, recycle nutrients and provide us with food. Biodiversity is the key indicator of the health of an ecosystem. A wide variety of species will cope better with threats than a limited number of them in large populations. Local reduction or loss of species in a certain habitat, resulting in a loss of biological diversity. Considering this factor affecting the biodiversity proper planning and management should be established to protect the biodiversity.

## CONCLUSION

The survey was carried for the period of 6 months in Kaniyambetta panchayath of Wayanad district. Wayanad is a hotspot for biodiversity of the Western Ghats and is home to many species of flora and fauna. During the survey 49 organisms were recorded and identified, which include 37 invertebrates and 12 vertebrates. The invertebrates belonging to Phyla Arthropoda, Annelida and Mollusca. The vertebrates included under the Phyla Amphibia, Reptilia, Aves and Mammalia. Birds were the dominant group of vertebrates observed during the course of the study, in which the crow population was the leading one.

The study revealed the association between insects, birds, butterflies etc. with the nature. Wide variety of organisms was associated with the nature rendering ecosystem balance. Paddy and coffee are the major crops of Kaniyambetta Panchayath which entice Dragon flies especially Pied paddy skimmer and Rambur's fork-tail abundantly to this area in the month of December. Reduced number of earthworm was also noticed in the soil which indicated the impact of pollutants in the soil. The unscientific and indiscriminate management of nature and natural resources heading towards environmental degradation and resource depletion. My study on biodiversity is an attempt to acquire an understanding and awareness about the fauna around me and the need to conserve them.

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