Golden Research Thoughts

Abstract:-

Madhya Pradesh is an unique state of India which is quite beautiful and rich in natural resources along with its fauna and flora. It is essential to give the important National Parks of M.P. In Bandhavgarh National Park 26 species of fish, 3 species of amphibian, 13 species of Reptilian fauna, 24 species of mammalian and 51 species of birds covering 36 genera and 23 families are recorded in the present study.

Keywords:

Bandhavgarh National Parks, biodiversity and ecology.

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STUDIES ON BIODIVERSITY OF BANDHAVGARH NATIONAL PARK UMARIA (M.P.) WITH SPECIAL REFERENCE TO THEIR ECOLOGY

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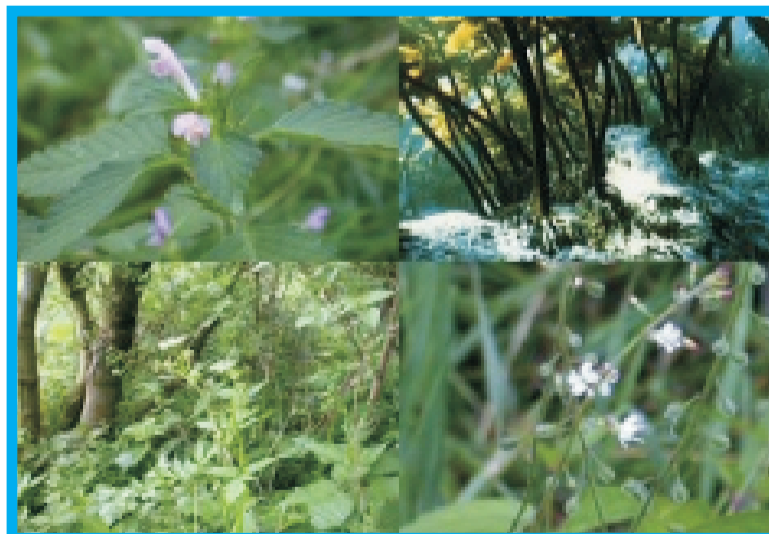
INTRODUCTION

Recent environmental research has given a great thrust on the aspect of animal resources and biodiversity as a viable parameter for monitoring environmental status of an area. Species assemblages have been characterised in terms of diversity and density of individuals in their respective biomes. On this basis these assemblages are characterised with regard to their cohesiveness. The more hospitable the environment the greater will be its biodiversity. Several ecologists have devised several formulae for this purpose. Conservation of the evolutionary heritage of the diversity on the biosphere is one of the challenges modern humanity is facing. Conservation of the gene pool, species, biological populations and their habitats have to be given priority in the effort of conservation.

The basic component in the biodiversity can be named as the species. Different status given to these species as rare, endangered, threatened have to be identified first. After this preliminary study the respective habitates of these species have to be studied. The causative factors for the reducing numbers have to be identified and then the respective biomes be categorized as hospitable, inhospitable or antagonistic according to different levels of hospitality indices to the respective organisms. After this is achieved, the occuring species should be catgorised up to assemblages. Various species diversity indices like the Shannon Wiever index, Menhinneck index etc. should be evaluated and the assemblages as a whole be evaluated to find out their range of cohesion. A large variety of indices are available to quantify the diverse biological communities. Ecologists recommend that any measure of biodiversity should incorporate biological differences or the heterogeneity of the community as an important component.

DESCRIPTION OF STUDY AREA:

One of the largest National Parks in the state, the (Bandhogarh) National Parks boasts of one of the most beautiful, rich and pictureseque forests in India. The nature has gifted this area with some what virgin landscape which are sight worthy especially during winters, just after the rainy seasons. It is situated in the (Umariya) districts of Madhya Pradesh at the latitudes 23o15'N and 24o15'N and longitudes 81o45'E. The intention to declare 1938 sq.km. of the area as National Park was Published by GOMP in 1981. The area compresses of 994.5 sq.km. of R.F. 766 sq.km. of P.F. and about 177.5 sq.km. of other areas. There are variety of vertebrate small fishes fauna, amphibians, reptiles, birds and mammals, which are still to be identified. The Bandhavgarh National Park along with great variety of flora and its remarkable latitudinal and topographic variations provide an ideal habitat for animals of wild life.

NATIONAL PARKS OF MADHYA PRADESH :

Madhya Pradesh is a unique state of India which is quite beautiful and rich in natural resources along with its fauna and flora. It is essential to give the important National Parks of M.P. There are 9 important National Parks in M.P. as given in the following tables:

Table : National Parks of Madhya Pradesh.

S. No.	Name of the park	District where situated	Area (in km²)
1.	Bandhavgarh	Umaria	448.480
2.	Fasil	Mandala	000.270
3.	Kanha	Mandala	940.000
4.	Madhav	Shivpuri	337.000
5.	Panna	Panna	542.660
6.	Pench	Sheoni/ Chhindwara	292.857
7.	Sanjai	Sidhi/ Sarguja	1938.012
8.	Satpura	Goshangabad	585.173
9.	Van Vihar	Bhopal	4.450

The analysis of physico-chemical characteristics of the tank sediments were done from October 2013 to September 2014. Bottom sediment samples were collected from different sampling stations with the help of 'Ekman Dredge'. Physico-chemical analysis of bottom sediments were done as follows:

1.Hydrogen Ion Concentration (pH):A fresh sediment suspension of known dilution (1:10; w/v) prepared in distilled water and pH was measured by portable standard gun type grip pH meter.
2.Chloride:A fresh sediment suspension of known dilution (1:10; w/v) prepared in distilled water. After the preparation of suspension, it was filtered through Whatman Filter Paper No. 44 From this filtered solution chloride content was determined by titration method. The chloride content of river sediment was estimated by titrating 50 ml of prepared suspension with 0.041 N silver nitrate up to the appearance of yellow colour, using potassium chromate solution as an indicator. The values of chloride were computed as :

$$\text{Chloride sediment in mg/l} = \frac{\text{ml of titrant x } \text{N x } 35.46 \text{ x } 1000}{\text{ml of sample taken}}$$

where, N = Normality of silver nitrate solution

3.Hardness and Alkalinity : The estimation of hardness and alkalinity of the tank sediment was carried out by the preparation of filtered water extract of sediment. 50 gm of sediment taken in a reagent bottle, 500 ml of distilled water was added and shaken for one hour. The sediment suspension having sediment, water ratio of 1:10 was filtered, using Whatman filter paper No. 01 Method of calculation is the same as for water analysis.

4.Phosphate :For the estimation of sediment phosphate 200 ml of 0.002 NH2SO4 was added to one gram of air dried sediment. Suspension was shaken for 30 minutes and filtered through Whitman's filter paper No. 50. The method of calculation of PH4-P in suspension is the same as for the water analysis. From this solution phosphate was computed by following formula :

$$\text{Phosphate PO4P mg/g} = \frac{X}{1000} \text{ x } \frac{V}{W}$$

where,   X   =   PO4 P in suspension
            V   =   Total volume of the suspension
            W   =   Weight of the dried mud in gms

Methods for the Soil Analysis:

      Soil samples were collected from the sampling sites of Bandhogarh National Park, Umaria with an iron soil sampler size 7.6 x 10.8 x 22.8 cm. Samples were taken from the depths 0.9 inches deep by inserting the sampler in each site, every soil sample was carefully sealed in separate polythene bag and was brought to the laboratory for the analysis in the same day. Samples were taken from 9.00 Am to 2.00 PM along with the water sampling.

1. pH (Hydrogen Ion Concentration) :pH of the soil of this Tank indicates the quality of soil is in the range of acidic to alkaline. The pH of soil is measured by pH meter. Soil sample 10 gms diluted with 20 ml distilled water, for half an hour and make up the volume of 50 ml stand for further 15 minutes and pH has been measured by emerging electrode into slurry of soil, the instrument is calibrated by buffer solution previously.

2.Bulk Density: Bulk density is apparent density. It the ratio of mass of the soil to that of its total volume the mass determined by drying to constant weight where the volume is easy to measure accurately for measurement of volume at the site a cylinder is used the waH remains thin practicable to minimise any complication. Certain light sandy and organic soil can be removed after drying a plate horizontally the double walled cylinders are quite better for removing soil core.

3.True Density: This is the nature of soil particles for measurements of true density sample dried and crushed and shieved (2mm). 10 gm soil sample taken for the testing, and picnometer may be used for specific gravity, water used for the determination of true density in process.

4.Sand, Silt and Clay : The sand, silt and clay percentage test of soil of Sanjay National Park has been carried out by soil hydrometer. The moisture contents of soil is determined at the time of being and take the reading in hydrometer finally the soil sample pH previously by using the chemical calgon and sodium carbonate. The reading finally calculated in percentage by calculation formula.

5.Electrical Conductivity: Electrical conductivity of the soil denotes the ion concentration in soil sample. It is measured by conductivity meter. The supernatent liquid of soil samples from its slurry is being separated and measured in conductivity meter. The reading obtained electrical conductivity of soil.The soil is the placenta of life, a scientist once wrote, and truly the earth does nourish nearly everything on this planet, but to the ancients, mother earth was an actual scientific fact. (living earth by Petter Frab, Page 1)

RESULTS AND DISCUSSION :

      Biodiversity is an essential process in our daily lives (Davis & Heywood, 1963) and a necessary tool for our survival (Heywood & Baste, 1995). For example, we need to know which plants, animals, and fungi are useful, and which are dangerous or poisonous. The recognition and characterization of biodiversity depends critically on three scientific disciplines: (1) Taxonomy (provides the reference system and depicts the pattern or tree of diversity for all organisms), (2) genetics (gives a direct knowledge of the gene variation found within and between species) and (3) ecology (provides knowledge of the varied ecological system in which taxonomic and genetic diversity is located, and of which it provides the functional components). It is the nature of biodiversity that surprises and uniqueness abound; predictive methods, such as the use of indicator species, latitudinal gradients, and mapping of hot-spots, are of limited value. The most commonly used units of biodiversity are species, the basic kinds of organisms. Just 1.75 of the 13 to 14 million species have so far been described, and most of these are still poorly known in

biological terms (there is not even a comprehensive catalogue of these 1.75 million species, Bisby 1995).

Each species has a unique distribution, which is the product of its ecological and evolutionary history. A 'habitat' may be defined as the space used by an organisms, together with other organisms with which it coexists, and the landscape and climate elements that affect it (Hawksworth & Kalin-Arroya, 1995). The term species' habitat will differ greatly at different scales and for different kinds of organisms. The red list is an important flagship for the conservation of endemic taxa that are known to be threatened by humans (Groombridge, 1993). Of the current 5,925 listed animal species, 717 are confirmed to only one country. The ongoing development of new criteria for listing species on the IUCN red list (Mace et al., 1992). Mace (1993) is specially relevant to endemics, and research should aim at establishing the validity of these test criteria for the preservation of endemics.

Since 1600 AD, 484 animals and 654 plant species (mostly vertebrate and flowering plants) are recorded as having gone extinct (WCMC, 1995), although it is certainly an under estimate of the true total, particularly with regard to tropical species. The rate of recorded extinctions in groups such as birds and mammals has increased drastically during this period. Nearly three times as many species of birds and mammals were recorded as becoming extinct since 1810 AD (1112 species), as were recorded as going extinct between 1600 and 1810 (38 species) (WCMC, 1992). The smaller the area and the more severe the environmental change, the higher the rate of local loss of populations of species. Considerable uncertainty surrounds any attempt to compare recent extinction rates with rates calculated from the fossil record.

In Bandhavgarh National Park 26 species of fish, 3 species of amphibian, 13 species of Reptilian fauna, 24 species of mammalian and 51 species of birds covering 36 genera and 23 families are recorded in the present study The distribution of birds in Bandhavgarh National Park may be called peculiar because of the vast habitat diversity & varieties of microhabitats.

Fish Resources of the park:

Common species of fish fauna within the water bodies of park studied during present investigation:

1.Hilsa ilisha (Ham.)
2.Hisha motius (Ham.)
3.Notopterus notoptreus (Pallas)
4.Puntius chola (Ham.)
5.P. sarana (Ham.)
6.P. saphore (Ham.)
7.Catla catla (Ham.)
8.Cirrhinus mrigala (Ham.)
9.Labeo calbasu (Ham.)
10.Labeo rohita (Ham.)
11.Wallago attu (Schn.)
12.Heteropneustes fossilis (Bloch)
13.Clarias batrachus (Linn.)
14.Mystus bleekeri (Day)
15.M. seenghala (Sykes)
16.Rita rita (Ham.)
17.Bagarius bagarius (Ham.)
18.Channa marulius (Ham.)
19.C. punctatus (Bloch)
20.C. striatus (Bloch)
21.C. gachua (Ham.)
22.Nandus nandus
23.Anabas testudineus (Bloch)
24.Xenentodon cancila
25.Mastacembelus armatus (Lacepede)
26.M. pancalus (Ham.)

Amphibian Resources of the Park:

Indian species of Amphibia found in Bandhavgarh National Park, Umaria (M.P.) during this investigation:

1.Rana tigrina
2.Bufo melanostrictus
3.Hyla arborea

Reptilian Resources of the Park:

Reptilian fauna found in Bandhavgarh National Park, Umaria (M.P.) are listed below:

1.Gecho gecko
2.Calotes versicolor

3.Varanus monitor
4.Mabuia vittatta
5.Chameleon vulgaris
6.Naja naja
7.Bungarus caerulieus
8.Natrix piscicator
9.Python morulus
10.Crocodilus palustris
11.Chrysemis picta
12.Kachuga tectum
13.Kachuga kachuga

Birds Resources of the Park:

Birds fauna found in Bandhavgarh National Park, Umaria (M.P.) are listed below:
1.Ardea goliath (Cretzschmar)
2.Ardea cinerea (Linnaeus)
3.Ardea alba (Linnaeus)
4.Ardeola grayii (Sykes)
5.Bubulcus ibis (Linnaeus)
6.Egretta garazetta (Linnaeus)
7.Ciconia episcopus (Boddaert)
8.Threskiornis aethiopica (Latham)
9.Pseudibis papillosa (Temminck)
10.Anas acuta (Linnaeus)
11.Anas poecilorhyncha (J.R. Forster).
12.Aythya ferina (Linnaeus)
13.Eastern merganser Mergus merganser (Linnaeus).
14.Aviceda jerdoni (Blyth)
15.Gyps bengalensis (Gmelin)
16.Gyps indicus (Scopoli)
17.Gyps percnopterus (Linnaeus)
18.Gallus gallus (Linnaeus)
19.Gallus sonneratii (Temminck)
20.Pava cristatus (Limnaeus)
21.Grus grus (Linnaeus)
22.Grus antigone (Linnaeus)
23.Columba livia (Gmelin)
24.Columba elphinstonii (Sykes)
25.Centropus sinensis (Stephens)
26.Eudynamys scolopace (Linnaeus)
27.Psittacula eupatria (Linnaeus)
28.Psittacula krameri (Scopoli)
29.Tyto capensis (A. Smith)
30.Buba bubo (Linnaeus)
31.Bubo zeylonensis (Gmelin)
32.Halcyon smyrnensis (Linnaeus)
33.Halcyon pileata (Boddaert)
34.Coracias benghalensis (Linnaeus)
35.Buceros bicornis (Linnaeus).
36.Anthracoceros malabaricus (Gmelin).
37.Dinopium benghalense (Linnaeus).
38.Chrysocolaptes festivus (Boddaert)
39.Calandrella raytal (Blyth)
40.Calandrella cinerea (Blyth)
41.Hirundo rustica (Linnaeus)
42.Sturnus contra (Linnaeus)
43.Acridotheres tristis (Linnaeus)
44.Acridotheres ginginianus (Latham)
45.Acridotheres fuscus (Wagler)
46.Corvus splendens (Vieillot)
47.Corvus macrorhynchos (Wagler)
48.Pericrocotus ethologus (Bangs & Phillips)
49.Pycnonotus melanicterus (Gmelin)
50.Pycnonotus cafer (Linnaeus)
51.Prinia sociaiis (Sykes)

Mammalian Resources of the Park:

Common wildlife of mammalian species of Bandhavgarh National Park, Umaria, (M.P.) are:

1.	Tachyglossus sp.	2.	Ratus ratus
3.	Rhianolophus sp.	4.	Sovex sp.
5.	Herpestes sp.	6.	Funambulus sp.
7.	Manis sp.	8.	Tiger
9.	Panther	10.	Chital
11.	Sambar	12.	Neelgai
13.	Chinkara	14.	Barking deer
15.	Wild pig	16.	Bhalu
17.	Wild dog	18.	Rabbit
19.	Wolf	20.	Jackal
21.	Hyna	22.	Wild cat
23.	Red monkey	24.	Black monkey

The recent suggestion if in situ conservation represent a modern technique for conservation of germ plasm, conservation of genetic resources by this technology has been tried by Institute of Science Banglore. The results of these new techniques need to be a form by conducting such experiments on a wide scale. The present product is an attempt on these lines to find out the present status of Bandhavgarh National Park ecosystem and try the modern method of conservation by making proper evaluation. It is also proposed to study the diversity and density of the existing germ plasms and find out the suitable nature for conservation of the respective and dens species.

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