Conservation Area Series, 28

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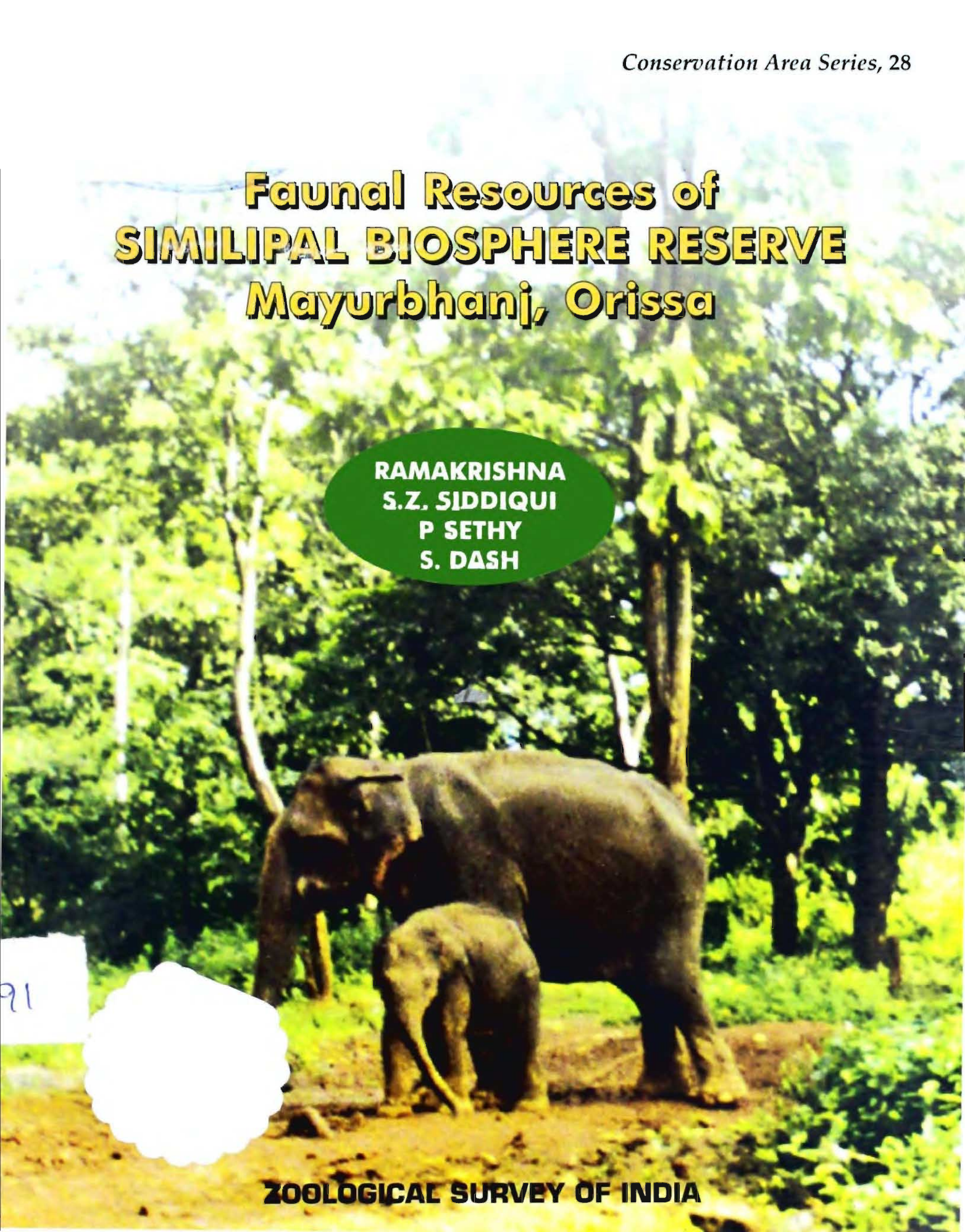

ZOOLOGICAL SURVEY OF INDIA

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Faunal Resources of SIMILIPAL BIOSPHERE RESERVE Mayurbhanj, Orissa

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Faunal Resources of Similipal Biosphere Reserve Mayurbhanj, Orissa

Conservation Area Series

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CONTENTS

1.0. INTRODUCTION

Biosphere reserves, under Man and Biosphere (MAB) program is a world wide network of protected areas with unique, threatened and representative ecosystems, declared for conservation and sustainable management of genetic diversity of wild flora and fauna. In past few years, focus has shifted from single species conservation to biodiversity conservation at the community or ecosystem level (MoEF, 1987). The current trend is to look at all groups of animals and plants rather than focusing on some particular large, threatened and glamorous ones.

The Similipal Biosphere Reserve, unique in its biotic attributes, is home to some of the charismatic and *endangered* animals such as tigers, elephants, leopards, *etc*. It is where the aesthetic beauty of pristine forest dwells and also a treasure house for lavish populations of wild flora and fauna, thereby deserving its due share of attention for its management and or conservation by Government, NGO's and individuals for future generations to cherish nature's benevolent gift.

Aware of the ever increasing threats to the worlds unique biological diversity or its *'biological capital'*, the Zoological Survey of India, under Protected Area Network (Conservation of Biodiversity Schemes) of the Ministry of Environment and Forest (MoEF), New Delhi has initiated various projects, primarily aimed at inventorying faunal resources in the country's vast and *biotically* varied protected areas, spread across the length and breadth of the country, including the Similipal Biosphere Reserve (SBR), Mayurbhanj, north Orissa. The Z.S.I., Berhampur (Ganjam), Orissa, has initiated a *multi-taxa inventorying* of the faunistic diversity in the select protected areas, suitably adapting the *Global Biodiversity Assessment* format as a *road map*, for its immediate regional needs, for generating a *baseline* data for systematic evaluation of their *faunistic diversities, conservation* and *threats*, if any. The study aims at documenting a local *inventory* (*alpha diversity*), over a period of two year (*spatial / temporal scales*) through Rapid Biodiversity Assessment (RBA) in the protected area and assess critical *gaps in knowledge*. This inventory will hopefully serve as a benchmark from exhaustive field studies and observations covering *core, buffer* and *transitional* areas. Inputs and feedback's from forest officials and exhaustive literature search has yielded an impressive tally of *400 species* of vertebrate fauna and 217 species of invertebrate fauna from the sprawling reserve. On completion, the study will serve as a state-of-art report on *regional diversity*.

Inventorisation is considered important for assessments in *evaluation of resources* and their *conservation* options, which in turn rely on adequate use of *taxic diversity*. Measurement of *species richness* of fauna, *taxic diversity, functional* and *system diversity* thus helps in successful inventorisation of biodiversity in *Similipal*. The present study primarily aims at filling this basic lacuna in knowledge on vertebrate and invertebrate faunal diversity in a research friendly scientific format for easy reference/retrieval. Along with Inventorisation, the present study also highlights Wildlife Protection Act (1972) status of various faunal

elements, habit, habitat and feeding habits and economic importance of various vertebrate groups. Besides the above data other relevant information pertaining to the reserve is also supplemented so as to interweave the co-relationships among them as-climatic conditions, soil pattern, forest types and or vegetation, threat, conservation and human habitation *etc.*

Previous notable institutional studies on vertebrate fauna are by Wildlife Wing, Govt. of Orissa, Similipal Project Tiger, Baripada (1989 and 1999), Z.S.I. (1991 and 1995), besides individual efforts by Das, Lal and Agarwal (1991–Mammalian fauna), Majumdar and Dasgupta (1991–Avifauna), Chatopadhyaya *et. al.* (1989–Avifauna), Dev (1986–Avifauna), Majumdar (1979–Avifauna), Majumdar (1953–Avifauna), Sanyal (1991), Dutta and Acharjyo (1999) and Herpetofauna by Sarkar(1991).

2.0. LOCATION AND GEOMORPHOLOGY

2.1. Location, Linkage and Area of Similipal Biosphere Reserve

The *Similipal Biosphere Reserve* is the eighth Biosphere Reserve (Govt. notification no.-16/2/85 MAB CSC declared on 22nd June 1994) in India. The study area lies in the northeast region of Orissa (Fig. 1), latitude–20°17'- 22°34' N and longitude -85°40'- 87°10' E. The total study area covers an area of 2750 Km^2 of which 845.70 Km^2 forms the *Core area* and the rest area of 1904.30 **Km^2** forms the *Buffer zone*. The *core area* is demarcated from the *buffer area* by *50 feet's* wide line of cut trees for operational/management convenience. Of the total area, about 1400 Km^2 additional area forms *Transitional zone* (*extending up to10 Kms. from the buffer line*). Addition of 77 Km^2 of Nato conservation forest, and 147 Km^2. Satokoshia conservation forest, has helped to enhance the *total area of Similipal to 4374 sq. km.*, as of now. It covers 64% of Mayurbhanj District. *Similipal Biosphere/Tiger Reserve* is approximately 510 kms by road from Berhampur [N.H-5]. In view of its rich biotic wealth, both floral and faunal, it has rightly been the focus for biodiversity inventories for evaluation and documentation of its whole gamut of biotic diversity and potential [Plates 1 & 2 & Table 8].

2.2. Status and Sanctuaries Around

The forest area was first declared as *Tiger Reserve* (1973) and had a relatively small area (845 Km^2). Later, the reserve was upgraded to the status of *Wildlife Sanctuary* (Dec. 1979) encompassing a huge area of 2750 Km^2. Further it was elevated to the status of *Proposed National Park* (Aug.1980) engulfing the *tiger reserve* (2750 Km^2) and again as *Similipal Biosphere Reserve* on 22nd *June 1994*, spread over an area of Area 2750 Km^2 (Core area 854.70Km^2, Buffer area 1904. 70Km^2 and Transitional area 1400Km^2).

Interestingly enough, the protected area also has the following : Hadgarh Wildlife Sanctuary- South of SBR, north east of Orissa, declared on 6th Dec 1978, Latitude–20°10'-20°21' N, Longitude–86°10'-86°20'E, 192Km^2 of Mayurbhanj District under Keonjhar Forest Div. and administrative jurisdiction of Mayurbhanj District; principal forest types : Sal and Moist mixed deciduous forest; the *indicative fauna*-Elephant, Leopard, Cheetal, Sambar,

etc. Kuldiha Wildlife Sanctuary–Declared on 4th Jan 1984, Latitude–20°20′-21°30′ N, Longitude–86°25′-86°45′ E, 243 Km² of Balasore District under Baripada Forest Div. and administrative jurisdiction of Balasore District; principal forest types are Sal and Moist mixed deciduous forest; the *indicative fauna* -Elephant, Leopard, Bison, Sambar *etc.* These two sanctuaries are connected by natural *corridors*, passage for various wild animals and provide a large *range of habitat extension*, especially for higher mammals.

2.3. Geomorphic profile

The biosphere reserve can legitimately take pride in its unique long geological lineage (1200 million years old – Mahadevan and Aswathanarayan, 1955) dating back to Paleozoic era, witnessing in the long process, vast geomorphic and evolutionary changes. Interestingly enough, the *Similipal Meghasan complex*, formed a part of *Gondwana continent* (*Paleozoic era*, 550 million years ago). Later, during the Continental Drift (*Paleozoic era-Permian Period*), Peninsular India remained connected with the African landmass by a land bridge through Madagascar–Arabian Sea (*Mesozoic era*). The Mesozoic era (*Cretaceous period*, 120 million years) witnessed further gross changes–linking the Similipal–Budhabalang River, incidentally oldest, to Africa through peninsular India, as evidenced by presence of 28 species of plants of African region in the Similipal National Park. Further, systematic endeavor in the evolutionary biology of the region is bound to reveal more interesting similarity in biotic attributes of the two apparently wide and varied regions (Nath, 1985).

The Similipal geological complex presents an interesting stratigraphy of interstratified *Sedimentary* and *Igneous* rock formation. Many of these rocks are metamorphosed. In its rocks, Similipal has three pitchers of *quartzite* with intervening filling of *volcanic rocks*, increasing the water holding capacity (Iyengar *et. al.*, 1964). The *Similipal Tiger/ Biosphere Reserve* consists of *Archean system* of rocks. The *magnetite* at Similipal is estimated to be 1200 million years old. The metamorphic rocks inter bedded with sub-metamorphic layer helps to increase water-holding capacity. The rock system consists of *granite, basalt, diorite, gabbro, serpentine etc* producing reddish and sandy soil that helps supports rich Sal (*Shorea robusta*) forests.

Interestingly enough its postulated, that the Similipal Hills, at present a part of Eastern Ghats, was ones connected with the Himalayas by a chain of intermediate hill ranges (ZSI, 1995) and so there is some faunal similarities with regard to occurrence and distributional records.

2.4. Drainage Pattern

Most of the rivers pass through undulating hills; giving rise to magnificient *waterfalls-Barehipani* (400m, msl) and *Joranda* (150 m, msl) are two important fascinating waterfalls providing a breathtaking view of the valley around. The Similipal forest is well-wooded, rolling, *plateau* with deep folds of hills, interlaced with numerous networks of perennial streams and rivers. There are ten *perennial* streams flowing in all directions. Khadkei, Gangahar, Sono, East Deo, Sanjo, Palpala streams flow towards the east, joining the river Bhudabalanga, which finally drains into the Bay of Bengal. Khairi, Bandhan, West Deo

streams joins river Baitarani. River Salandi originates in Similipal and drains into Bay of Bengal. Few other streams also drain into river Subarnarekha (Sahu, 1985). Therefore, Similipal is naturally endowed with a *rich watershed – rivers and streams*. SW. Monsoons were active all through 2003, during the course of our field study in early Sept. 2003. Interestingly there was increase in inflows in most parts of river Khairi, thereby effecting abundance, distribution of aquatic animal life forms in the biosphere. It also caused floods in lowlands [Plates 3 & 4].

2.5. Soil Pattern

Soil, one area mostly dependent on the geomorphology of the different land types and parent rock material. Most areas in Similipal have rich spread of red loam. Extensive pockets of laterite soil are also found across the plateau. Heavy clay occurs in the wide flat river basins, supporting varied forest types/vegetation across the reserve. The soils of SBR are *acidic* by nature, the pH varying 4.8-6.8.From the *Haematic* rocks, rich loam soil is derived, supporting woody plants with high profile of biotic activity. *Laterites* produced in deep soil layer stratification is reddish in colour, supporting healthy vegetative growth, nevertheless less depth of this layer may be a reason for poor growth of larger plants but ideal for supporting good grassland growth. This is of much value to a forest ecosystem harbouring large herbivorous population, besides, being a better hide out for numerous wild fauna in their natural habitat. *Shales* on *weathering effect* results in good amount of clay as well as clay loam very suitable for floral growth. The reddish sandy soil also favours plants, animals and micro-organismal growth, however, if present in thin layers, it supports good grass growth [Table 1].

Extensive literature search on geologic features of the biosphere reserve revealed presence of seven broad soil types –Red and Yellow soil (*Alfisols*), Laterite soil (*Ultisols and Oxisols*), Black soil (*Vertisols*), Brown forest soil (*Humults*), Grey Yellow soil, Rendzina soil, and Planosol soil. The following broad soil types are found in Similipal.

a. **Red and Yellow soil (Alfisols)**–These are moderately acidic and deficient in organic matter, Nitrogen and lime with low water holding capacity, found in upper basins of river Budhabalanga, at an altitude of 2500-3250ft, and play host to moist deciduous and semi-evergreen type of vegetation. b. **Laterite soil (Ultisols and Oxisols)** composed essentially of hydrated oxides of aluminum and iron, these soils are exclusively drained and porous and occur in Kharkhai, Badampahar regions having Sal as climax vegetation, besides mixed and scrub forest type of vegetation. c. **Black soil (Vertisols)** have a depth range from 1–2 ft, are loamy to clayey, found in the West Deo basin having Sal climax forest type. d. **Brown forest soil (Humults)**–Humults has high organic matter content and are found in the Khairi–Bandhan watershed having moist deciduous vegetation. e. **Grey Yellow soil**–This soil type ranges from sand to clay type and is less fertile, occurring in Jenabil having *savana frost tolerant* association low grade Sal forest. f. **Rendzina soil** found in Thakathaki East Deo and Sanja basins, having moist deciduous and *orchid climbers*. g. **Planosol soil**–This soil type is found in Dundruchampa, Palapala watershed having dry deciduous, semi-evergreen scrub forests.

Table-1. Showing Soil Profile along with there availability, vegetation growth within Similipal

Sl. No.	Place/Division	Soil Type	Altitude	Vegetation
1.	Budhabalanga Upper Basin	Red & Yellow earth	2500-3250m	Moist Deciduous and Semi-evergreen Forest
2.	Khairi-Bandhan Watershed	Brown Forest Soil	2018-2414m	Moist Deciduous mixed with Sal climax
3.	West Deo Basin of Tarinivilla and UBK	Black Soil		Sal Climax
4.	Thakurmunda, Bankua-Jenabil	Gray/Gray Yellow/Laterite soil	2949-3474m	Savanna frost tolerant associated with low grade Sal
5.	Thakathaki, East Deo and Sanja Basin	Rendzina	3002-3658m	Moist Deciduous Forest and Orchid Climbers
6.	Dudruchampa and Palpala Watershed	Planosol	3310m	Dry Deciduous, Semi-Evergreen, Scrub Forest
7.	Kharkhai and Badampahar	Laterite	-	Sal climax mixed with scrub forest

2.6. Mineral Wealth

The reserve is endowed with rich mineral wealth as it lies in the belt of richest mineral deposits within the country, adjacent area to the well-known Chottanagpur Plateau.

(i) *China clay* – large pockets are found in the reserve towards the Jashipur end (20°58'-80°5'), decomposed granite has composition of Alumina and Silica.

(ii) *Lead ore* (Galena) – Pithabata (20°56'-86°34') and adjoining areas have galena deposits.

(iii) *Kyanite* – This ore occurs in and around Bangriposi belt and near by edges of the reserve.

(iv) *Steatite* – Lulung, a few kilometers from Pithabata near the entry point, has Steatite deposits.

Other than the above, the reserve has fairly good deposits of Quartizite and Iron ore in many pockets of SBR.(State Gazetteer, Sinha,1971 & Geological Survey of India Report).

2.7. Climatic Conditions

Similipal enjoys a wet tropical monsoon type of climate. The region falls under the influence of southwest monsoons, generally from mid June to mid October. Often, the region witnesses cyclonic storms. The cyclones from the Bay of Bengal bring copious rains during July to October from low pressure at Bay of Bengal, which passes over north Balasore and strikes at Similipal Meghasan range. If the range were absent, then Orissa would have been a desert tract like Rajasthan. The region is located at the *end of Tropics of Cancer* and hence within subtropical climatic zone. Areas of high altitude (Budhabalanga upper basin) have max. temp. of 31.5° C., min. temp. 5.0° C. and an annual rainfall of 1894.2mm. However, the range fluctuates from higher to lower altitude, where the maximum temp. is 40°- 42°C [Table 3, & Fig 3] and min. temp. of 5°-8°C [Table 2, Plate 5 & Fig 2] and rainfall of 2500 mm [Table 4]. However, the annual rainfall/precipitation recorded from the region is 2000 mm, as per meteorological reports. The rainy season brings frequent occurrence of floods in Budhabalanga, Salandi and Baitarani resulting in loss of life, property and sand casting of fertile agricultural lands. Soil/land erosion results in loss of plant nutrients, humus and soil. Sediments carried by floodwaters affect aquatic life and results in the fluctuations of turbidity in rivers/streams which interferes with feeding and spawning habits of stream fishes during frequent occurrence of floods.

The summers are hot and dry with average humidity. Dust and thunderstorms is common feature during summers in the region [Table 5 & Fig. 4]. The winters are severe

Table-2. Showing mean minimum temperature of five stations (Ramthirtha/Chahala/ Nawana/UBK/Meghasini).

MONTHS	2001	2002	2003
JANUARY	8.42	10.27	9.15
FEBRUARY	12.36	12.57	14.31
MARCH	16.47	16.69	16.43
APRIL	20.11	20.60	21.32
MAY	22.33	22.78	21.63
JUNE	22.31	22.71	
JULY	21.98	22.95	
AUGUST	22.71	21.81	
SEPTEMBER	21.94	21.18	
OCTOBER	19.85	17.84	
NOVEMBER	16.50	12.91	
DECECEMBER	95.7	10.16	
	214.55	212.47	

Table-3. Showing mean maximum temperature of five stations (Ramthirtha/Chahala/Nawana/UBK/Meghasini).

MONTHS	2001	2002	2003
JANUARY	25.36	25.90	24.70
FEBRUARY	28.78	28.54	26.90
MARCH	28.89	30.27	29.15
APRIL	31.23	32.25	32.16
MAY	31.89	34.05	32.13
JUNE	27.14	30.83	
JULY	25.40	29.17	
AUGUST	28.06	26.97	
SEPTEMBER	29.51	27.57	
OCTOBER	28.31	28.43	
NOVEMBER	26.64	26.29	
DECECEMBER	26.64	25.55	
Total	**337.85**	**345.82**	

Table-4. Showing mean rainfall of five stations (Ramthirtha/Chahala/Nawana/UBK/Meghasini).

MONTHS	2001	2002	2003
JANUARY	10.7	51.12	00.0
FEBRUARY	14.66	00.0	39.60
MARCH	119.01	54.11	77.80
APRIL	60.54	84.67	81.52
MAY	186.85	102.31	101.80
JUNE	529.89	242.07	
JULY	815.27	210.77	
AUGUST	448.46	505.37	
SEPTEMBER	175.44	443.89	
OCTOBER	209.21	74.02	
NOVEMBER	4.88	18.99	
DECECEMBER	00.0	00.0	
Total	**2565.28**	**1787.32**	

in the valleys with deep frost particularly in south Similipal. Temperature touches bellow freezing point in the frost valley, Meghasini, Upper Barakamra and Debathali during last week of December and first week of January. In recent times (2001 and 2003) the interior and higher ranges witnessed frost, incidentally as per field observations in mid Jan. 2003, the mercury level dipped down to 1.5°C.

Monitoring the vegetation status within the reserve reveals a gradual degradation though not on an alarming scale. This course is expected to rise if not taken up seriously resulting in increase in soil/air temperature, affecting humidity, making the atmosphere dry and ultimately lowering precipitation. The precipitation behaviour in recent years reflects the rising trend of less precipitation and is expected to receive 70cm average precipitation by the middle of next century. Thus the human pressures on SBR is expected to rise as we march forward forcing nature to have its alternative in terms of climate (temperature)/precipitation, *etc.*, as its lowest was 100 cm in 1974 (Pujari, 1997).

Table-5. Showing relative humidity at 12.00 hrs of five stations (Ramthirtha/Chahala/Nawana/UBK/Meghasini).

MONTHS	2001	2002	2003
JANUARY	83.29	69.19	81.68
FEBRUARY	82.86	64.39	85.82
MARCH	87.23	65.06	82.23
APRIL	89.57	67.40	83.83
MAY	87.00	94.29	79.97
JUNE	86.90	78.20	89.67
JULY	90.65	81.48	98.87
AUGUST	83.81	83.45	
SEPTEMBER	80.50	85.60	
OCTOBER	74.26	84.23	
NOVEMBER	76.90	83.87	
DECECEMBER	72.90	82.97	

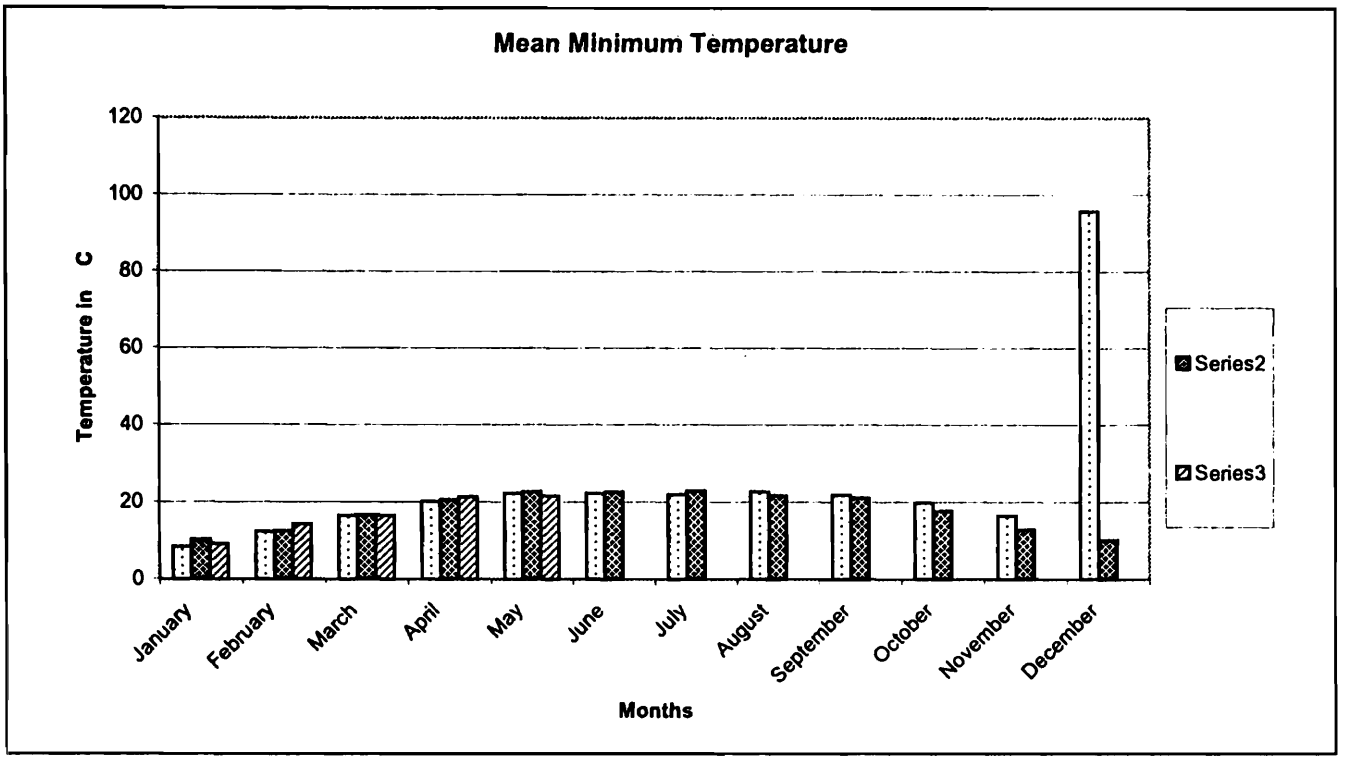


Fig. 2. Graph showing mean min. temperature at five sampling sites (Ramthirtha/Chahala/ Nawana/UBK/Meghasini).

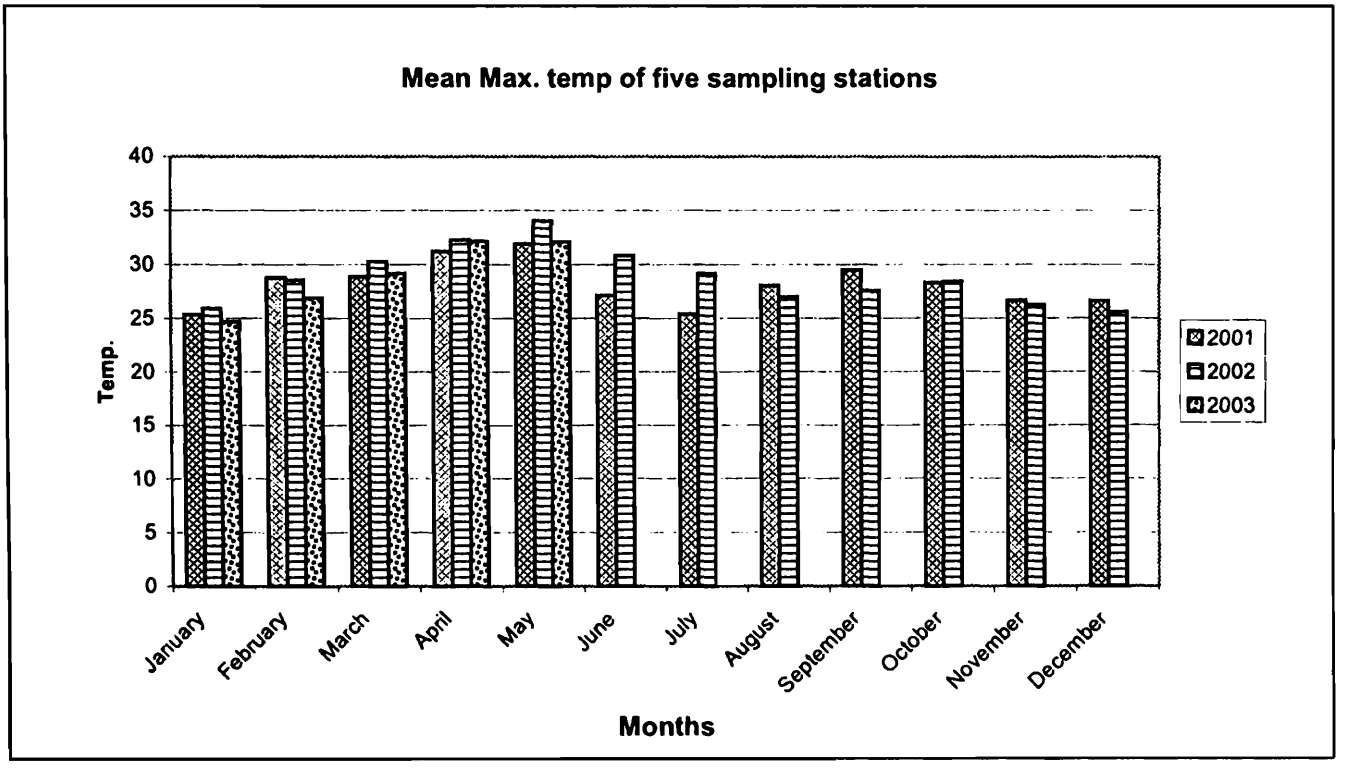


Fig. 3. Graph showing mean max. temperature at five sampling stations(Ramthirtha/Chahala/ Nawana/UBK and Meghasini).

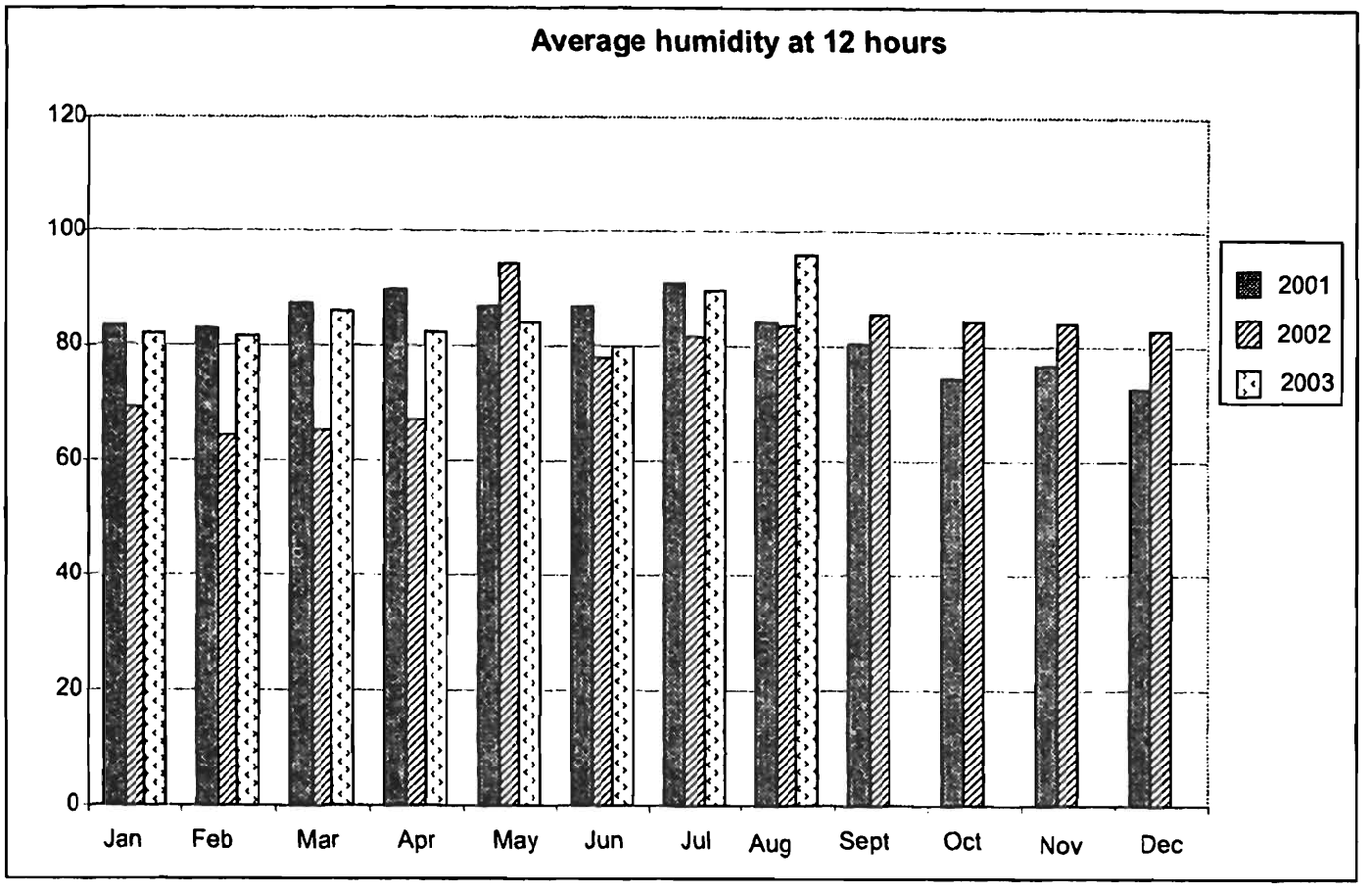


Fig. 4. Graph showing Relative Humidity at 12.00 hrs. at five sampling stations(Ramthirtha / Chahala/Nawana/UBK/Meghasini) in SBR.

3.0. FIELD STUDIES AND METHODOLOGY, GBA APPROACH

The faunal inventorying was initiated, using the various contemporary approaches methodology for Global Biodiversity Assessment (Heywood and Watson, 1995), in a phased manner for extensive exploration and documentation of the vast and varied vertebrate and invertebrate faunal groups inhibiting the protected area. In all, 05 faunal surveys (Jan. 2k3-Apr., 2k4) were undertaken, in collaboration with Conservator of Forest and *Field Director, Similipal Tiger Reserve, Bhanjpur, Baripada* and the *Wildlife Wing, Forest Dept.,* Govt. of Orissa, to cover 03 major seasons (Winters, Summers and South-west monsoons) in 39 randomly selected sampling sites/regions in the core (845 sq. km.) and buffer (1904 sq. km.) areas. Initially, the field studies in the Biosphere Reserve were done by standard *survey cum sampling methodology [random sampling,* using *quadrat* (2 m.) and *transects* (*belt transact*) respectively], *Field collections* made (*voucher specimen* wherever *feasible* and *permissible)* for eventual taxonomic determination to help document the whole gamut of taxic diversity. The inventorying was focused at the *species level,* as against (*genetic/population level*), for a exhaustive *multitaxa inventory* using a *Rapid Biodiversity Assessment* (RBA), on a *spatial* scale in a phased manner for systematic documentation of major vertebrate and invertebrate faunal elements. Aquatic gastropods and bivalves in the protected area were studied using *Plot sampling method,* near different riverbeds. A *belt transact* method is used

for the counting and measuring the butterfly faunal diversity, by connecting two randomly selected points in the area to be studied, in the reserve. The various other entomofaunal groups-orthropotera, diptera, hymnoptera fauna and Araneae inhabiting the grasslands and similar habitats in the reserve were collected by *Sweep net method*, taking into consideration, the length of each step, rate of walking, arc of the sweep, level of the arc, speed of the sweep and the number of sweeps, ensuring no two sweeps traverse the same foliage. After collections/sorting, here again the insect fauna were immobilized, killed and preserved for identification. Various groups of *unscheduled* faunae collected from different habitats were photographed (field/back in the base/camp laboratory. In addition, field ecological notes on the group's habitat and their natural colouration noted.

The faunae, so collected, were preserved using appropriate preservative methodology (Dry/Wet methods) for follow-up laboratory identification (Ghosh and Sengupta, 1982). Data on biotic/abiotic parameters – ambient atmosphere temperature, relative humidity, altitudes *etc.* using GPS, where ever available as also sited at different sampling sites/ grids for ecological evaluation. The numbers of species collected/identified have been tabulated for an overview of the vertebrate and invertebrate diversity. Present field endeavors, as also extensive literature search revealed an impressive tally of *ca.* 216 species of invertebrate and 400 spp. of vertebrate fauna from the protected area, excluding some interesting specimens.

Two field studies were taken up in Jan 03 and Sept 03, in the peak of two seasons-winters and monsoons, for observations and collections of permissible unscheduled faunal groups (lower groups of vertebrates-amphibians and fishes). During the period of study, conditions being favourable, the overall collections were fair. First field study was taken up in second week of Jan 03, when the study area and regions around north Orissa witnessed intense cold waves with temperature ranging from 1.5°C–8.0°C and so the overall collections and visual sighting was poor except for the birds. The second field study undertaken in first week of Sept 03 during monsoons which is most ideal season for all life forms for breeding and propagation, specially lower groups of invertebrates and vertebrates (nekton and herpetofauna). So during the field studies conditions being favourable, collections and sighting were good. Besides, these two seasonal studies, other vital field inputs from forest officials deputed in the study area and local people residing within the park were collected for better interpretation of ground/field data and or information during the study.

The observations/collections were done by *Random/Point Survey Sampling* method as per *Global Biodiversity Assessment* (*GBA*) guidelines as it is an *accepted standard method of assessing biotic diversity* in a given area (Heyhood & Watson, 1995). *Survey and sampling Observations* was carried out in *core, buffer* and *transitional area- ca* 39 random sampling sites were taken up during the studies for inventory, analysis and compilation of the whole gamut of vertebrate faunal diversity within the reserve. For the higher groups, being scheduled faunae, identification was restricted to visual sighting, while amphibians reptiles were hand picked/collected for morphometric measurements and follow up

taxonomic identification (in laboratory). However, other faunal specimens collected like fishe etc., were preserved temporarily in field for final taxonomic studies, field photographs were also taken of specimens, landscapes, and vegetations around for observations on habitat ecology.

In the transitional area- Jorabandh, Suniyee, Rishiya, water reservoirs were taken up for study of avifaunal diversity for observations on diversity, and seasonal abundance, etc., of the winged visitors migratory species. Interestingly enough all the three reservoirs are fed by waters from small natural springs and perennial streams that have their origin in Similipal hill ranges and so Similipal can undoubtedly be called as a *rich watershed.* Besides, these reservoirs appear to be relatively new ones and serve as rich *feeding/roosting/ nesting grounds* for many local and migratory avifaunas.

4.0. VEGETATION PROFILE

Based on published literature and our own field observations, the profile on vegetation of the region is as under : *Tropical Deciduous Forest* – Tropical biota: *Flora* – 1076 spp., *Orchids* 94 spp.–8% of the *countries orchid diversity* 1120 spp. [Table 6] and 573 spp. of *medicinal plants.* The Similipal hill ranges embraces 52 species of *rare, endangered, endemic* and *vulnerable plants. Bulbophyllum panigrahianum and Eria meghasaniensis* are *highly endemic,* being known to exist only in the region [Plate 6]. Vegetation in SBR is very rich and diverse, with the following forest types [Champian and Seth (1968)]. Similipal Forest comes under the broad category of North Indian *Tropical Deciduous Forest* with moist peninsular Sal (*Shorea robusta*) as the predominant species. According to biogeographic classification by Rodgers and Panwar (1988), the three hierarchical levels of planning units under which Similipal has been classified are, *Biogeographic zone* : Deccan peninsula, *Biogeographic province* : Chhotanagpur, *Biogeographic regions* : Mahanadian. However, Similipal represents all the features of all the four biotic provinces for which Orissa is the junction. These provinces are Eastern plateau Chhotanagpur, Lower Gangetic plain and Coast line.

1. Northern Topical Semi-Evergreen Forest (Type 2B/3C).

It extends to about 80 Kms with large variety of plants varying according to soil and micro-climatic conditions.

a. On Stream Beds : The various species of plants occurring in the area are *Salix terasperma ,Trewia nudiflora, Macaranga peltata, Aphanomixis polystachya, Symplocos laurina, Glochidion spp., Bischoffia javanica, Syzygium cumuni, Pongamia pinnata, Diospyros peregrina, Saraca indica* and at places *Terminalia arjuna* is also observed. b. *Still higher up in damp area Bombax ceiba, Alstonia scholaris, Ficus spp., Polyalthia cerasioides, Anthocephalus cadamba, Dillenia pentagyna, Litsea sp., citrus spp.* are also found in higher damp places. c. At a still higher altitude The plant species found here are *Michelia champaca, Artocarpus lakoocha, Toona ciliate, Magnifera indica, Mesua ferrea, Stereospermum suaveolens, Xylia xylocarpa* and *Bridelia retusa.*

2. Northern Tropical Moist Deciduous Forests (Type 3C/C2e).

This extends over an area of 1540 Km². sprawling all over Similipal except in moist valleys, southern and eastern aspects. However Sal forms the standing vegetation form. Sal of Quality–I occurs in small pockets with rich soil and conducive climatic conditions. The common species of trees that occur here are *Terminalia sp., Pterocarpus marsupium, Anogeissus latifolia, Schleichera oleosa, Adina cordifolia, Toona ciliata(rare), Michelia champaca, Magnifera indica, Careya arborea, Dillenia pentagyna, Gmelina aroborea, Garuga pinnata, Syzygium cumini, Xylia xylocarpa, Bridelia retusa, Irema orientalis, Cassia fistula, Flemingia chappar, Strobilanthes spp., Wendlandia exserta, Imperta cylinderica, Themeda gigantean, Cymbopogon martini, Eulaliopsis binata, Similax macrophylla etc.* and many more Ferns and Orchids are found in moist places.

3. Dry Deciduous Hill Forest (Type 5B/Clc and 3C/C3)

Found in steep and exposed area and or pockets mostly in eastern and southern Similipal extending over 250 Km². with standing dry ness for longer periods. Important species of trees found here are *Anogeissus latifolia, Sterculia urens, Boswellia serrata, Dalbergia latifolia, Cleistanthus collinus, Gardenia gummifera, G.latifolia, G.turgide, Nyctanthes arbortristis* besides ground cover of grasses, shrubs, herbs which are met in abundance all over in this forest type.

4. High Level Sal Forest (Type 3C/C 2e(i)).

This forest type is dominated by poor quality of Sal on the plateaus over an area 250 km² at an elevation of 850m. The Sal is mostly found associated with *Dillenia pentagyna, Syzygium ceresoideum and Pterocarpus marsupium, Imperata cylindria and Termeda gigantea* along with large patches of *Phoenix sylvestris.*

5. Grassland and Savannahs (Type 3C/Ds-1)

It is found on hilltops at an altitude of about 900m and in frosty valleys sprawling over an area of 80 km² having grassland as its climax. However Sal along with other frost tender species is also found. Attempts to manipulate these areas to fodder land by *Syzygium cerasoideum, Symplocos racemosa, Dillenia pentagyna* are common besides others. The *grasslands* are found on hilltops and plateau areas, at an altitude of 900m. msl. They attain lush growth during the monsoons and are dominated by several species of *Dicanthium, Imperata, Arundinella* and *Heteropogon.* Further, the grasslands are associated with legumes and weeds of the family Compositae. The grasses that grows along the nullahs is *Imperata cylindrica, Eulaliopsis binata, Phragmites karka,* besides some climbers, which rarely occur in cool shady moist river gorges.

Orchid Flora

a. Semi Evergreen and Evergreen Forests.

Acanthephippium sythethense, Tropidia angulosa, T circuligoides, Malaxis latifolia, M. rheedi and Liparis nervosa are some of the common orchids occurring in this forest type.

b. Terrestrial Orchids

Catenthe, Phaius, Nervilia, Zeuxine Pectelis are encountered.

c. Moist Deciduous and Open Forests

Vanda tessellata, V. testecea, Acampe praemorsa, A. papillosa, Rhynchostylis retusa, Cambidium aloifolium, Luisia trichorhiza, L. brachystachys, Gastrochilum inconsipicuum, Dendrobium macrostachyum and occasionally *B. aphyllum, D. peguanum* and *Oberonia falconeri* but *Acampe ochracea* are abundant. However the *striking flowers* comes from *Dendrobium moschatum, D. nobile, D. fermosum.*

d. Deep Moist Valleys

Meghasani, Bhanjabasa region harbours tropical evergreen forms like, *Chiloschista lunifera, Eria bambuseafolia, Dendrobium bicameratum, D.cathcartii,Flickergeria macraei, Bulbophyllum cariniflorum, B. polyrhizum, Thunia alba, Liperis viridiflora, L. resupinata,* besides rare epiphytic orchids like *Liparis sp.* The southern Similipal specially Jenabil, UBK, Meghasani tract is found to be the richest orchid bearing area in the state of Orissa, not only by population but also by their variety and or diversity (Mishra, 1997).

Table-6. Showing Endemic, Endangered, Vulnerable and Rare Species of Orchid Wealth found in SBR

Sl. No.	Endemic	Endangered	Vulnerable	Rare
1.	*B. panigrahianum*	*Goodyera fumala*	*Garcinia cowa*	*Acanthphippium bicolor*
2.	*Eria meghasaniensis*	*G.hispida*	*Gloriosa superba*	*Ajuga macrosperma*
3.		*G.thailandica*	*Meseua nagassarium*	*Alphonsea ventricosa*
4.		*Gnetum ula*	*Pectilis gigantean*	*Anaphalis adnata*
5.		*Liparis elliptica*	*Petropermum acerifolium*	*Bambusa nutans*
6.		*Rauvolfia serpentena*		*Radermachera xylocarpa*
				Bulbophllum macraei
7.		*Rhaphidophora glauca*		*Rubia cordifolia*
				Cynoglossum glochidiatum
8.		*Tanacetumcineraa rifolium*	*Trevesia palmata*	*Diploprora championii*
9.				*Tustica nilgherrensis*
10.				*Malaxis purpurea*
11.				*Meliosma simplicifolia*

Table 6. *Contd.*

Sl. No.	Endemic	Endangered	Vulnerable	Rare
12.				*Neocinnamomum caudatum*
13.				*Oberonia pyrulifera*
14.				*Peperomia hyneana*
15.				*Peristylus parishii*
16.				*Phoebe wightii*
17.				*Pittosporum nepaulense*
18.				*Psychotria adenophylla*
19.				*Rhus semialata*
20.				*Rubusniveus salmonia cantoniensis*
21.				*Sanerilla tenera*
22.				*Tainia hookeriana*
23.				*Toxocarpus kleinii*

5.0. FAUNAL PROFILE

INVERTEBRATES

Similipal Biosphere reserve represents a rich biodiversity of mostly hitherto unexplored invertebrate fauna. It is a natural home to a wide diverse array of invertebrate groups due to its diversified habitat. The dense, thick, close tree canopies of extensive grasslands favour abundance of various invertebrate fauna. They inhabit different forest types at various altitudes having varied habitats. Fortunately enough, the invertebrate faunal studies in *Similipal Biosphere Reserve* have not been scientifically explored. Field studies, observations and collections of permissible and unscheduled fauna from as many as 39 sampling sites, in buffer, core and transition areas of Similipal yielded 217 spp. (Fig. 2) of invertebrate fauna under following major groups : arthropods-194 spp., malacofauna-20 spp. and annelids 2spp. besdes few interesting undetermined specimens (Myriapods/Spiders).

The arthropods are the major invertebrates adapted to live on this dry land, for this invasion of terrestrial and aerial environment. They have under gone an adaptive radiation that has enabled them to occupy conceivable ecological niche in this biosphere reserve. In Similipal arthropods constitute the bulk of invertebrate fauna, followed by malacofauna and annelids. The Tasar Silk worm (*Anthera mylitta*) is unique in Similipal for silk industry (Satpathy, Pradhan & Nath, 1985). A broadsheet on the group wise composition of invertebrate diversity in the biosphere reserve has been tabulated [Table 7] and in the profile as follows.

Table-7. Showing inventory of major invertebrate faunal groups, with no. of taxa inhabiting in Similipal BiosphereReserve, Mayurbhanj, Orissa.

Invertebrates groups	**No. of taxa reported**	**Remarks**
Phylum **Mollusca**		
Class Gastropoda & Bivalve	20	First time ever report of 13 spp. of gastropodes under 9 families, and 7spp. of bivalve from the reserve.
Phylum **Annelida**		
Class. Oligocheta	02	Single species of earthworm and one spp. of leech reported from the reserve first time.
Phylum **Arthropoda**		
Class Insecta		
Order Orthoptera (Grasshopper/Crickets)	32	32 spp. of Grasshopper/ Crickets under to 4 families and 18 genera are reported till date.
Order Dermaptera (Earwings)	04	04 spp. of dermaptera fauna under 2 families, out of which one is new locality record to the reserve.
Order Hemiptera (Bugs)	10	10 species of bugs are reported from the reserve till date.
Order Ephemeroptera (May flies)	03	03 spp. of Ephemeroptera fauna under 2 families, out of which one is new locality records to the reserve
Order Odonata (Dragonflies and Damselflies)	14	14 spp. of Dragonflies under 4 families are recorded from Similipal.
Order Lepidoptera (Butterflies and moths)	54	50 spp. of Butterflies under 5 families and 26 genera, are recorded from the reserve, of which 23 spp. are new record to Similipal, besides 4spp. of moths also reported.

Table-7. *Contd.*

Invertebrates groups	No. of taxa reported	Remarks
Order Coleoptera (Beetles)	24	Previous ZSI study records 22 spp. beetles, from the reserve under 5 families and 12 genera, 2 spp. are now added to the faunal list.
Order Hymnoptera (Bees)	06	The present inventory records 3 spp. of honey bees from the protected area.
Order Diptera (True flies)	06	6spp. of Diptera fauna under 5 families and 6 genera are reported from the Biosphere.
Class Diplopoda (Millipedes)	02	Two spp. of *Julidae* millipedes and 3 spp. of *Sclopendrdae* and one spp. of *Geophilomorpha* centipedes occupy the great range of habitat in the reserve.
Class Chilopoda (Centipedes)	03	
Class Crustacea Order Decapoda (Crabs, Prawns)	04	Only 1 spp. of *Potamonidae* crabs and 3 spp. of *Palaemonidae* prawns reported from S.B.R first time forever.
Class Arachnida Order Scorpionida (Scorpions)	04	Four spp. of scorpions under *Ischnuridae,Buthidae* and *Scorpionidae* families have been reported first time.
Order Acarina (Ticks & Mites)	09	8 spp of mites, under *Tetranychidae* & *Phytoseiidae* family. Single spp. of ticks reported first time from the reserve.
Order Araneae(Spiders)	16	16 spp. of Spiders are recorded from the protected area, under 6 families, of which 11spp. are new record to the p.a.

PROFILE OF SIMILIPAL BIOSPHERE RESERVE, MAYURBHANJ, ORISSA

➢ **Geog. co-ordinates**	20°17'–22°34'N Latitudes and 85°04'–87°10' Longitudes.
➢ **Location**	North-east region of Orissa, Mayurbhanj Distt. National Highway-5 and 6 passes along the north-west edge of the protected area.
➢ **Area**	**Total area** – 2750 km², buffer – 1904.30 km², core – 845.70 km², and transitional area-1400 km².
➢ **Climate**	Hot and Dry, Temp. 5°–40°C, Rainfall – 2500 mm. dust/ thunderstorm's common in summers.
➢ **Physiography**	Oval shaped, longer axis lies in N-S direction. Similipal Hill system arises abruptly from coastal plains (Baripada). A rich watershed, feeding 10 perennial streams draining into river Budhabalanga, Baitarani and Subarnarekha. Other physiographic features : **Highest peak** – Khairiburu(1165m), **Highest waterfalls** Barehipani (400m,msl) and Joranda (150m, msl), presents a breath taking view of the deep valley down below.
➢ **Geomorphology**	Similipal basin boast of unique geological formation, The sequence of rock in Similipal basin begins with phyilites as base, followed by quartzite and Spllitic (Iyengar and Banerjee, 1964) lava with volcanic broceia, which increases the water holding capacity. The reddish sandy soil supports rich Sal vegetation.
➢ **Ecology**	The Similipal–Meghasan complex, a natural ecosystem represent the primitive Gondwana flora and fauna common to Australia, Africa and Peninsular India. Tropical moist deciduous forest of terrestrial/epiphytic orchids and characteristic Sal vegetation (Shorea roubusta) enhances biotic diversity/potential.
➢ **Agenda**	Declared Protected Area for conserving the "**Mahanadian Biogeographic Region**" and whole gamut of genetic diversity (genepools), in situ.
➢ **Biodiversity**	Tropical deciduous forest, Tropical biota: **Flora** – 1076 spp., Orchids 94 spp.–8% of the countries total orchid diversity 1120 spp. and 573 spp. of medicinal plants. **Fauna**– Vertebrates 400 species and Invertebrates 216 spp., famous for Tasar silk worms genepools like Goda model (*Anthera mylitta*)

➢ **Socio-economic value**	Centre of ecotourism, a biotically unique living laboratory, besides being a treasure house of many economic forest produces like, honey/wax/sal flower and leaves and arrow roots etc.
➢ **Human Settlements (Villages/population)**	The total no. of villages –1265 nos.; Core area–4 nos.; Buffer area – 61, and Transitional area–1200. Total population 4.5 lakhs (tribal-73.44%, S.C.-5.21% and other castes-21.35%)
➢ **Status**	Tiger reserve (1973)–845 Km^2, Sanctuary (1979)–2750 Km^2, Proposed National Park–(1980)–845 Km^2,and Biosphere Reserve(1994)–2750 Km^2 (Govt. notification no.- 16/2/85 MAB CSC).
➢ **Faunal diversity**	**Invertebrate profile** – Of the 216 species identified, arthropod followed by malacofauna and annelids. Of the arthropods, insecta species rich (80.9%) followed by Arachnida (14.9%) > Crustacea (2.06%) > Myriapoda (2.06%). Of the insecta, Lepidopteran most species rich/diverse (54 spp.) followed by Orthoptera (32spp.), coleoptera (22spp.), Odonata (14spp.), Hemiptera (10spp.), Diptera (6 spp.) and Hymnoptera (6spp.). Terrestrially Arachnids are dominants [Araneae (16spp.) followed by Acarina (9spp.), Myriapoda (4spp.) and Scorpionida (4), etc.). In the aquatic habitat, Gastropods and Bivalves (20spp.) are more diverse followed by Decapods (Crabs and freshwater prawns) etc. **Vertebrate profile** – Vertebrate fauna is dominated by 55 species of mammals, 258 spp. of birds, 37 sp. of reptiles, 13 sp. of amphibia and 31 species of fishes.
➢ **Threats and Conservation**	**Habitat destruction/loss, through Jhumming(shifting cultivation)/Podu cultivation** and **Akand Shikar** – traditional mass killing of wildlife in Chaitra Sankaranti (April-May) by the local tribals. Besides suitable rehabitation measures, raising forest guards for more effective surveillance/monitoring and more rigid implementation of recently amended Forest Wildlife Act.

MOLLUSCA

Mollusca, the second largest phylum of the animal kingdom, are a very successful, diverse and wide spread group, in the biosphere. They were observed to colonize every possible habitat in the protected area, including few trees (*Amphidromus sinensis*) and are dominant component in aquatic communities in both flowing and standing ecosystem.

Previous ZSI study (1989) incidentally records only 2 spp. (*Bellamya benglensis* and *Ariophanta interrupta*) of land and fresh water malacofauna (shelled mollusks) from the protected area. Present field studies revealed 13 spp. of land and fresh water gastropods, under 9 families (Achatinidae, Ariophantidae, Cyclophoridae, Camaenidae Pilidae, Planorbidae, Viviparidae, Thiaridae and Lymnaeidae) besides, 7 spp. of bivalves under two families (Unionidae & Corbiculidae) from the reserve. Of these, seven spp. of freshwater gastropods occur commonly (10-50%), while *Thiara, Lymnaea* and *Bellamya* spp. are more abundant (>50%). The terrestrial forms boasts of 6 spp. of gastropods under 4 families and 4 genus, of which *Cyclophorus* and *Ariophanta spp.* are common, besides *Amphidromus sinensis* an ecologically interesting arboreal/tree inhabiting form. Interesting enough, *Amphidromus sinensis* mostly inhabits Sal tree and its holes, up to 5-10 feet height, mostly in core areas. The other group- bivalves were observed occur commonly in collections along the river Budhabalanga in Similipal, where the water currents were low following insufficient rains and sediment clayey. Of the 7 species of bivalves, genus *Parreysia* were observed to abundant. Interestingly enough, 18 of the 20 species reported from the protected area are new addition to the malacofaunal list of Similipal.

ANNELIDA

Despite their common occurrence, no previous study exists on this interesting, unexplored group. Of the annelids, the *Oligochaeta* and *Hirudinoidea* commonly occur in the biosphere reserve. The present inventory adds single species of Earthworm (*Lampito mauritii*) under Megascolecidae family and 1spp. of Leech from the reserve and others are to be explored.

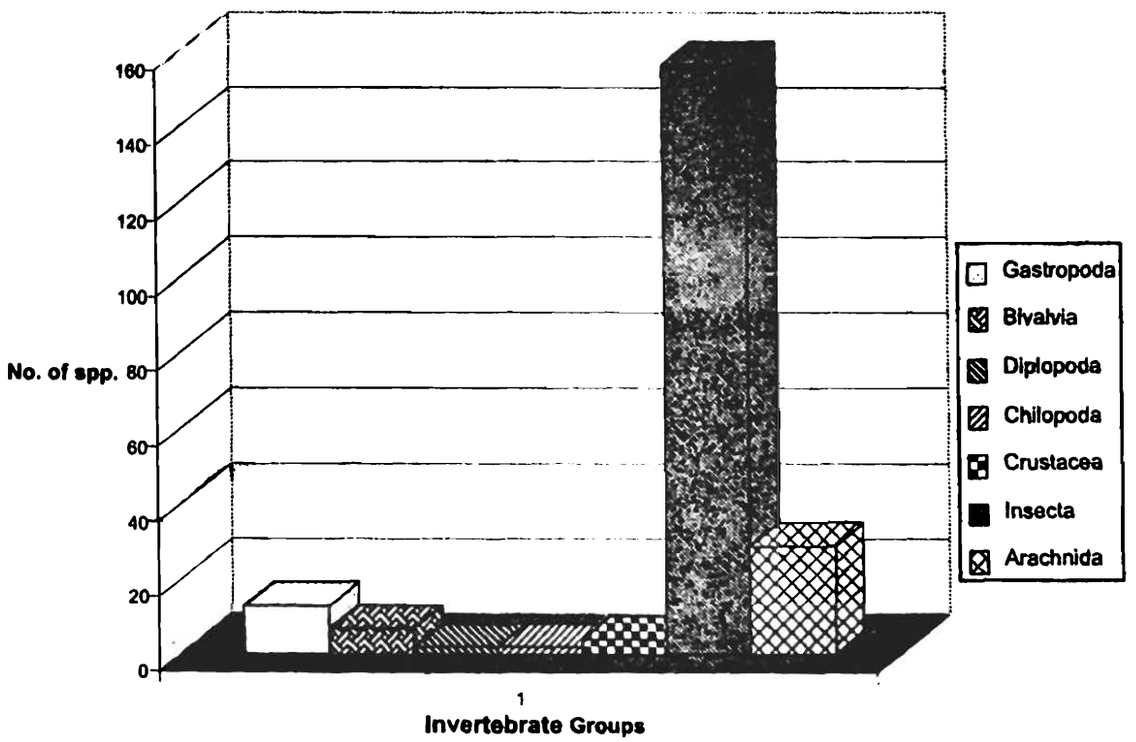


Fig. 5. Invertebrate faunal diversity in Similipal Biosphere reserve, Mayurbhanj, Orissa

ARTHROPODA

Of the invertebrates, arthropods forms the major group, adapted for life in terrestrial and aerial environment. Among the arthropods, the insect fauna are more abundant than arachnids, followed by myriapods and crustaceans, *etc.* in the reserve. Again of the insecta the butterflies (Lepidoptera) exhibit for greater species diversity/richness (54 spp.), followed by Orthoptera (32 spp.), Coleoptera (22 spp.), Odonata (14 spp.), Hemiptera (10 spp.), Diptera (6 spp.), Hymenoptera (6 spp), Homoptera (3 spp.),. Elsewhere in the terrestrial habitat, in the Protected area, Arachnids are dominants [Araneae (22 spp.), followed by Acarina, Myriapoda (5 spp.), Scorpionida (4 spp.), *etc.*].

Order THYSANURA (Silver fish)

These are small to medium sized insects found usually in concealed places- soil, leaf litter, under stones, in the reserve. Some species live in the nests of ants and termites while some inhabit houses. No previous study exists on this group of fauna in Similipal. Only single species of Silverfish was collected from the reserve, whose taxonomic identity is under confirmation.

Order EPHEMEROPTERA (May flies)

The Mayflies are soft-bodied insects with delicate, membranous wing bearing numerous veins and cross veins. The hind wing is much smaller than the forewing. They are almost entirely herbivorous and inhabit various water bodies in the reserve. The nymphs are

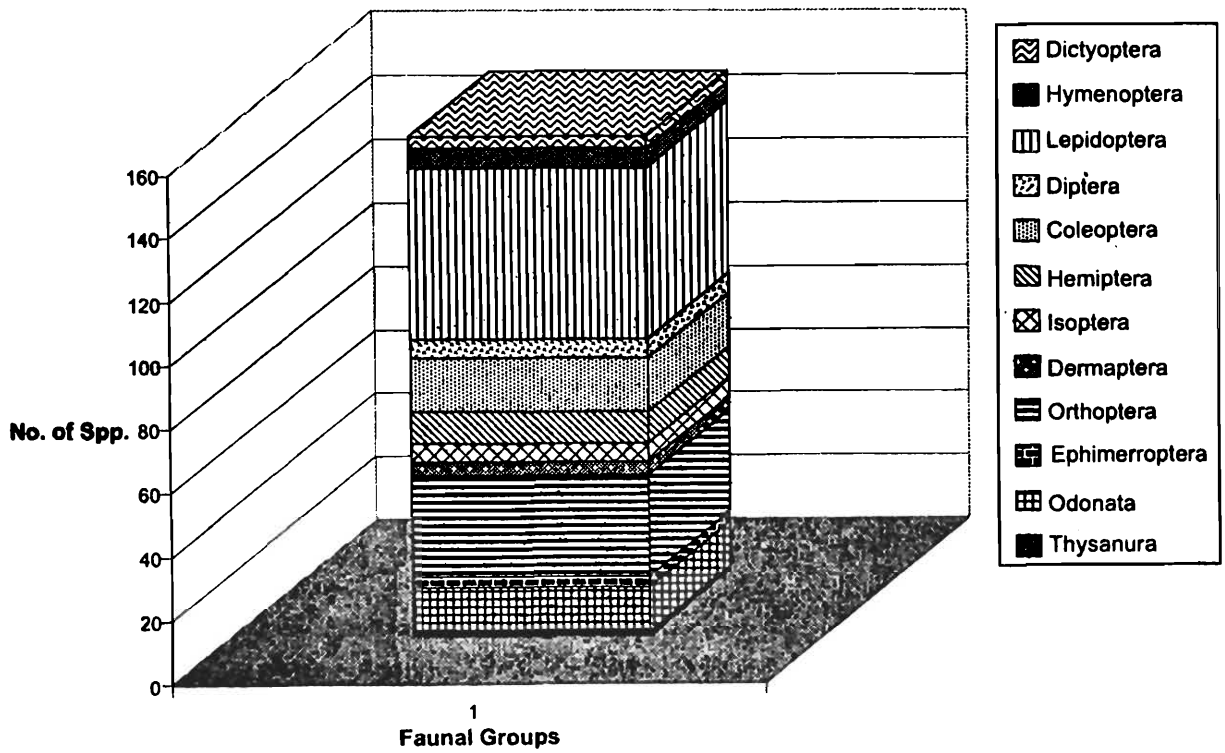


Fig. 6. Entomofaunal diversity in Similipal Biosphere Reserve.

aquatic in habitat. Previous study records 6 spp.(Srivastava & Roy 1987) from the state and 2 spp. from Similipal (Lulang and Talbandh) under Ephemeridae and Heptagenidae family. The present inventory records one more species to the faunal list under genus Ephemeridae.

Order ODONATA (Dragon flies and damselflies)

The availability of perennial water bodies, water holes and streams, besides varied associated vegetation and ideal undisturbed natural habitat, provide a good habitat for odonates in the reserve. These amphibiotic tropical insects inhabiting all kind of freshwater habitats in the reserve, permanent/temporary. They imagoes consume large number of harmful insects of crops, orchids and forest. Previous Z.S.I study (1995) records only 2 spp. of odonates, while present efforts has yielded 12 spp. (Fig. 4) under family Family Libellulidae (*Bradinopyga geminata, Branchythemis sp., Potamarcha obscura, Potamarcha congener, Pantala flavescens* and *Trithemis festiva*), Coenagrionidae (*Aciagrion hisopo hisopa, Cercion malayanum, Cercion calamorumdyeri* and *Onychargia atrocyana*), Lestidae (*Lestes viridulus*) Protoneuridae (*Disparoneura* sp.), Aeshnidae (*Anax imperator*) and Calopterygidae (*Neurobasis chinensis chinensis*) from Similipal Biosphere Reserve in this inventory. The larvae of dragonflies act as bioindicators of freshwater pollution. They are ecologically very significant, forming the apex of the invertebrate food chain in freshwater ecosystem, in term serving as important food sources for insectivorous freshwater fishes. Thus they have a regulatory influence in the management of the aquatic ecosystem.

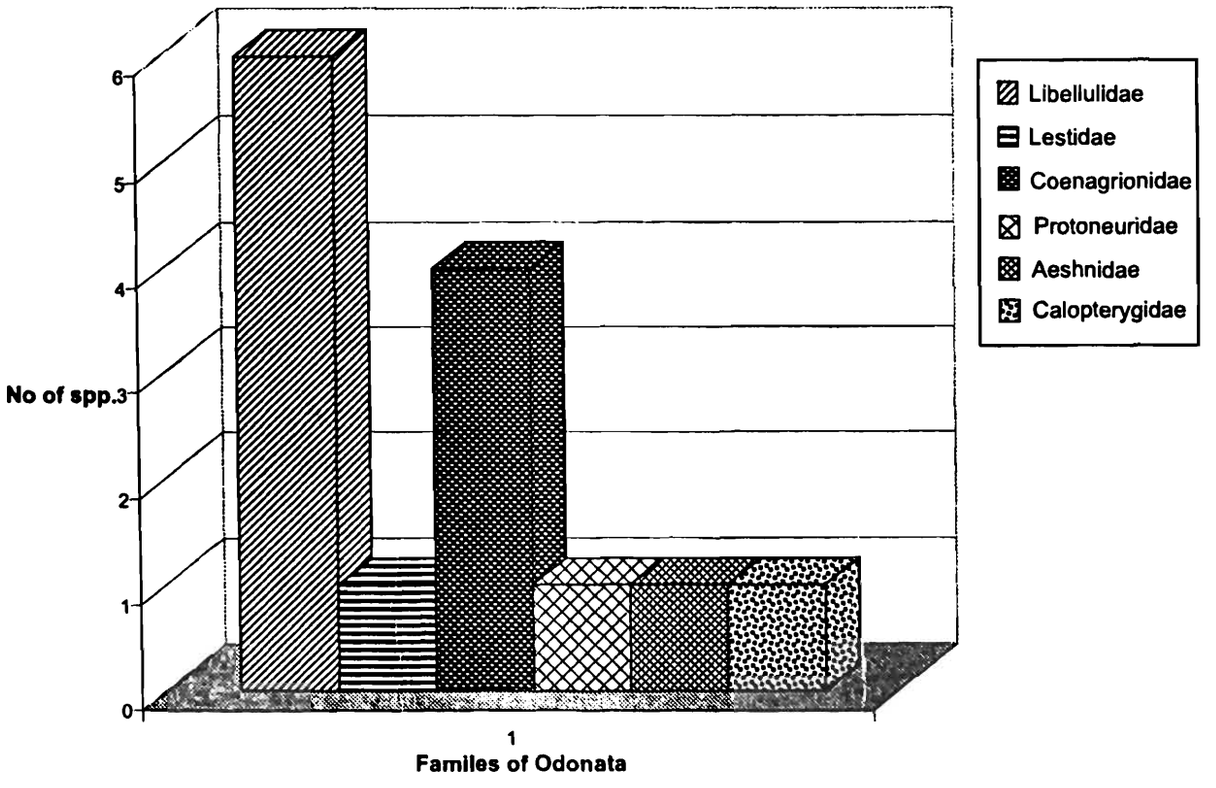


Fig. 7. Odonata faunal diversity in Similipal Biosphere Reserve.

Order ORTHOPTERA (Grasshoppers, Crickets, Kotydids)

Grasshoppers and crickets are medium to large size insects, with large prothorax and usually jumping hind legs, often with specialized auditory and sound producing organs and cosmopolitan in distribution. These occur mainly in the open grasslands, where they eat leafy vegetation in the biosphere and prefer terrestrial environment. An inventory of the orthroptera species recorded earlier by ZSI study (1987 & 89) lests a total of 28 spp. from core, buffer & transition areas of Similipal. Based upon field collection, 24 examples of orthoptera under *Terigidae, Gryllidae, Pyrogomophidae* and *Acrididae* families have been collected and efforts underway to get those identified.

Order DERMAPTERA (Earwigs)

The Earwigs are medium sized, elongated insects, with mandibulate mouthparts, fore wings reduced to leathery tegmina devoid of veins. Hind wing semicircular, capable of being folded lengthwise to fit under tegmina. Cerci modified as pincers except in a few ectoparasitic spp.. They are wide spread in distribution, omnivorous or ectoparasitic on mammals. Very little work has been done on the dermaptera fauna, in Similipal and also in the State. The Dermaptera fauna in Similipal is known to 03 species under *Pygidicranidae (2spp.)* and *Labiduridae* family, from Lulang and Talbandh respectively (Srivastava, 1987). The present inventory adds one more species to the dermaptera fauna in protected area under Pygidicranidae family.

Order HEMIPTERA (Bugs)

The Bugs are small to large insects, usually with two pair of wings. These feed on sap or cell contents of plants. Some are predatory and important vectors of plant and animal disease. Despite cosmopolitan distribution, the information available on hemipteran fauna of Similipal is fragmertory. The earlier study (ZSI, 1989) on this group list 3 spp. under *Gerridae* family from the Tiger reserve and 5 spp. from its periphery. Present study adds 2 more spp. to the fauna group. *Nepa cineria* is a new record form the reserve.

Order COLEOPTERA (Beetles)

Beetles, the common representative of this group, occur especially around the faecal or decaying matter. They vary in size from small to large and commonly called dung rollers. Earlier Z.S.I (1987&89) study records 22 spp. of beetles (Chrysomelidae, Cerambycidae, Agridae and Scrabacidae) from Similipal. Present field studies have help enhance the total to 25 species from the protected area.

Order LEPIDOPTERA (Butterflies and Moths)

Similipal Biosphere Reserve with its diverse and undisturbed natural environment provides an ideal habitat for the butterflies with its tropical Moist Deciduous Forest. Previous Z.S.I studies (1987, 1989 and 1995) records, 29 spp. of butterflies from Similipal

Tiger Reserve. Interestingly enough, present endeavor yielded 49 spp. of Butterflies (Fig. 5) and 4 spp. of moth under *Papilionidae, Pieridae, Nymphalidae, Lycaenidae* and *Hespiridae* family [Fig. 5]. Of these common rose, common grass yellow, blue pansy, glassy tiger, striped tiger were observed commonly throughout the protected area. Of the total lepidoptera fauna, the family Nymphalidae is represented by highest number spp. (24), having generic strength (16) followed by Papilionidae (10 spp.) Pieridae (4 spp.), Lycaenidae (1 spp.) and Hesperiidae (1spp.). The genus *Junonia* holds the highest position, having 4 species followed by *Princepes* (4 spp.), *Graphium* (3 spp.), *Precis* (3 spp.), *Papilio* (2 spp.) and *Euroma* (2 spp.). Field observations on butterflies by laying belt transects in the reserve, between 8 am to 12 'o' clock shows that, most of the butterflies were found to congregate in the cool and shady places, near the streams and rivers (Khairi, Sono, East Deo, West Deo, Palpala, Budhabalanga and Salandi) of the Biosphere near Pithabata, Lulung, Namtidar, Gurguria, Nawana, Jenabill, Patbill, Mandadhar, Kabatghai and Upper Baraha Kamuda. The diversity of butterflies was more in Pithabata and Gurguria sampling sites. A number of geomorphological, ecological and related biotic factors, such as topography, climate, vegetation and animals (including predators) are known to influence occurrence, distribution, abundance etc. of butterflies' fauna in the biosphere. The vast area (core, buffer and transitional) couldn't be explored thoroughly due to short-term inventory. Further detailed surveys of different sampling sites, of the reserve may explore some species of known and unknown butterfly fauna.

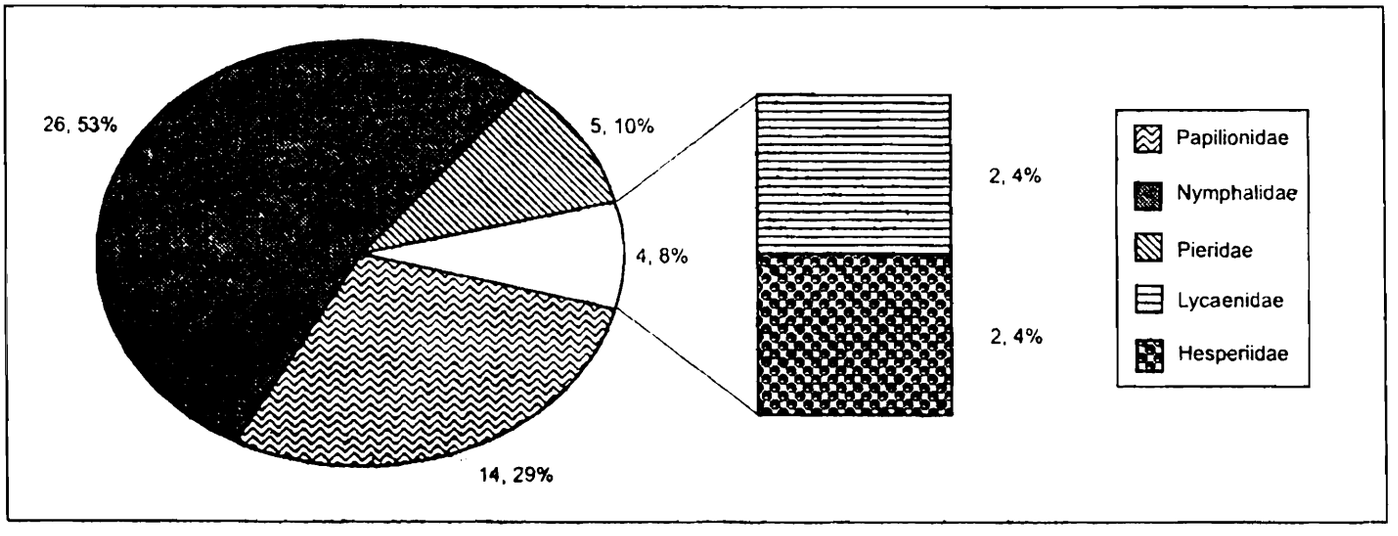


Fig. 8. Butterfly faunal diversity in Similipal Biosphere Reserve.

The anthropogenic pressures in Similipal biosphere reserve are thoughtlessly destroying the pristine, natural habitat available for the lepidoptera fauna, as the group is past loosing their host plants and open grasslands. *Forest fires* by tribals, for *Jhumming / Podu cultivation* not only leaves the area barren but also destroys several species of host plants, and thus destruction and fragmentation of their habitats in the protected area. Nevertheless many butterflies have adapted to anthropogenic landscapes and changed habitats but the continued habitat fragmentation enhances threat to the butterfly distribution and abundance.

Order DIPTERA (Mosquitoes, Flies)

There is no information on this economically important insect group and its community species profile in Similipal, in fact from the entire state of Orissa too. Earlier study (ZSI, 1987) records 5spp. of Dipteran fauna from Baripada, Mayurbhanj district. Present survey comprises 6 spp. from Similipal.

Order HYMENOPTERA (Bees & Wasps)

Despite rich in the Hymnopteran fauna in the reserve the insect group has not been well explored to date. The present inventory records only 6 spp., including 3spp. of honey bees and rest are wasps whose taxonomic study is under study. Further study on the group is bound to reveal more species from the protected area.

Order SCORPIONIDA (Scorpions)

The scorpions–large arachnids, are secretive venomous and are strictly nocturnal in habit. They were observed to occur on littoral rock and rockslides, burrows in soil, vegetation, under stones, bark of trees, surface debris, cattle dung, *etc.* in dark humid micro habitats. Females are viviparous and show maternal association with the young. Taxonomy of the group has been well documented with 102 spp. and sub spp. from tropical India (Tikader & Bastawade 1983). Surprisingly enough, the terrestrial forms in the reserve continue to be ignored. Present endeavours at multitaxa inventory of fauna records 4spp of scorpions under Buthidae *[lychas (Endotrichus) laevifrons]*, Ischnuridae *[Hormurus australasiae]* and *Scorpionidae [Heterometrus (Gigantometrus) swammerdami]* family first time ever from the protected area.

Order ACARINA (Ticks &Mites)

The ticks mostly occur in core areas of Similipal, and are small in size (2-4mm.) occurring on the leaves of small trees and grasses. When they find suitable hosts, they attach on it for it's food. Only one species of tick (*Dermacentor auratus* Supino, 1897) under family ixodidae was identified from the area, while others are pending confirmation. Earlier studies (ZSI, 1987 & 1995) reported eight spp. of mites under *Teranychidae* and *Phytoseiidae* families from Similipal Tiger Reserve.

Order ARANEAE (Spiders)

These groups of ubiquitoes but apparently tender bodied, small sized creatures are common in distribution in different grassy meadows and similar micro habitat in the reserve. Previous ZSI endeavors (1987 and 1995) at studies on fauna of Conservation areas, have revealed 03 and 05 spp. of spiders respectively, under Aranidae family from the Protected area (*Nephila maculata, Argiope catenulate* and *Argiope pulchella*). Present efforts have helped raise the tally to 08 spp., all first record from the region, taking the total number of spider species in the protected area to 13 under 6 families.

MYRIAPODA

Millipedes

These are joint-footed, many segmented worms having double pairs of legs on each body segments. They inhabit damp, humid and shady places of the biosphere and usually found beneath the fallen leaves, stones barks rotten logs and in the soil. An economically important Maerodegrader in agricultural fields; there also known to infest horticultural and field crops. Further their presence also seems as a ecological indicator of environment, for they are known to disapper at the slightest indication of soil deterioration and or ground water pollution. No previous study whatsoever attempted on the common Diplopoda (Millipedes), save present endeavour at multy taxa inventory. Field studies on the group in the protected area by the authors revealed 02 spp. of Juliform Millipedes in the group (Order-Julida, Genus *Julus*).

Atmospheric pollutions as well as ground water and soil pollution make the millipedes disappear from such habitats. Therefore the presence of variety of millipedes in the reserve indicates the reserve is totally pollution free.

Centipedes

Centipedes are solitary, cryptic, nocturnal cannibalistic, venomous myriapods of diverse colours. These inhabit semi evergreen, evergreen, and deciduous forests and diverse climatic conditions, avoid light and prefer optimum temperature below 35°C in humid crevices. In the protected area they are observed to different habitats below stones, rotten barks and damp places.

They play a valuable role in the terrestrial ecosystem by devouring insect pests. Being entomo-phagous, centipedes biologically control harmful insect pests like cockroaches, mealworms, larvae of butterflies and moths, termites and spiders, *etc*. Similarity of the niches results in their association with arachnids and hence their presence is indicative of the related fauna.

No study exists on this group of common Chilopoda (centipedes) in the biosphere. Present studies helped to report 2 spp. of *Sclopendromorpha* (*Cormocephalus dentipes* Pocock and *Rhysia longipes longipes* Newport) and one species of *Geophilomorpha* centipedes.

Order DECAPODA (Crabs & Prawns)

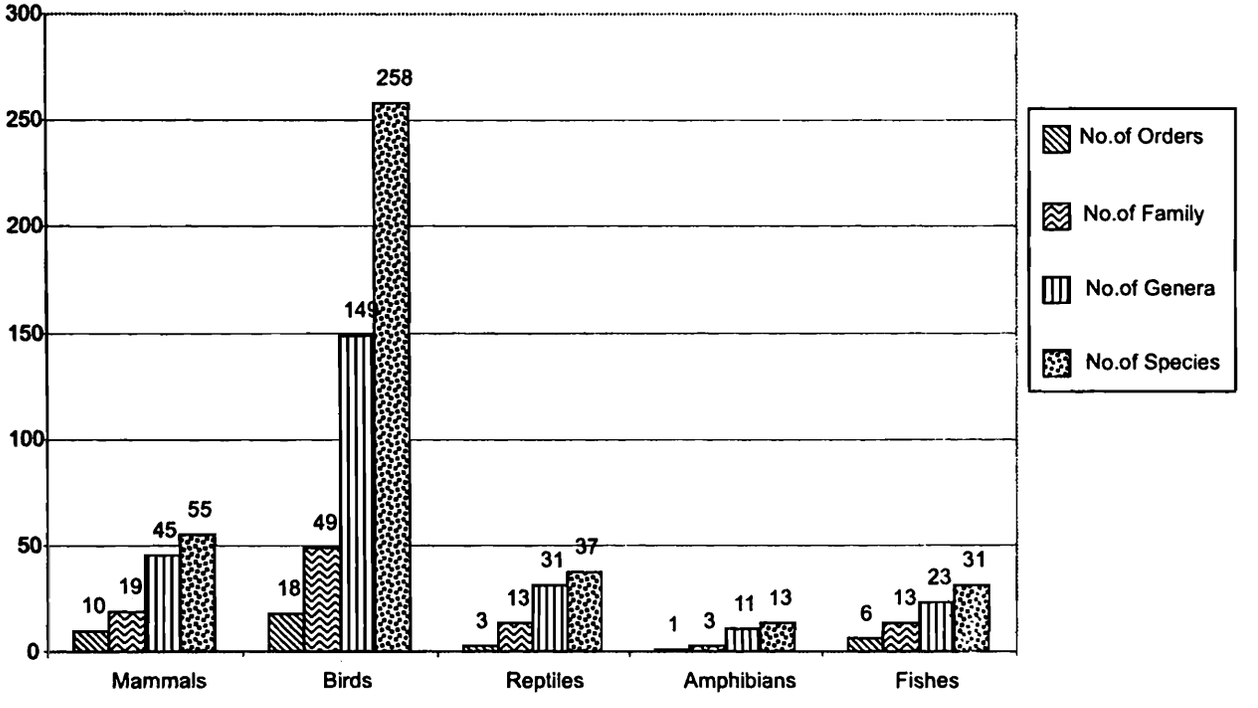
No previous reports study exists on this group of common fresh water crabs from Similipal. Field studies helped to collect lone species of Potamonidae crab [*Paratelphusa (Barytelphusa) jaquemonti* Rathbun] occurring in a good range of habitats in the biosphere reserve. The crabs were found and collected from the rivers and nalas of Similipal. The cephalothorax of the crab is depressed and expands laterally and the abdomen is greatly reduced. Size 13 to 130 mm. Besides 3 spp. of freshwater prawns under *palaemonidae* family also reported from the reserve.

VERTEBRATES

The overall abiotic environment and ecosystem are two vital factors that influence species and population diversity of flora and fauna directly and or indirectly in any ecosystem. Further, the richness of a species also depends on its lower *tropic* level, richness as life is sustained on the complex food web of one feeding or being fed by, thus supporting a *rich tropic niche level* in the ecosystem. Besides, many other factors like *protection* from enemies / *availability of roosting* and *breeding grounds* with *rich foraging habitat* also help enhance species richness and diversity in the region.

The unique reserve has varied types of vegetations, *moist deciduous / dry deciduous / semi-evergreen / sal climax / savannah frost tolerant* and *orchid climbers* which together provide a conducive environment suitable for growth and abundance of varied types of herbivores, in large numbers, besides ones feeding on fruits and seeds. Interestingly enough, growth and abundance of carnivores in turn is linked to network of herbivorous fauna in the region. Our own *field observations*/permissible *collections* and extensive literature search, on Similipal Biosphere Reserve, Mayurbhanj, North Orissa, yielded an impressive tally of *400 species* of *vertebrates*. However, more thorough explorative study may uncover additional interesting species from the vast and varied reserve. There lies lacunae or gaps in taxonomic study with regard to lower groups of vertebrate faunae-reptiles and fishes for not having their due share of attention. Therefore the present study aims fill such serious gaps in taxonomic knowledge.

Fig. 9 Histogram showing vertebrate faunal breakup of various groups, no. of order, family, genera and species. The vertebrate fauna is dominated by birds (258 spp.) > mammals (55 spp.) > Reptiles (37 spp.) and fishes (31 spp.) > amphibians (13 spp.).



5.1 Mammals

Previous review of the groups revealed 46 species of mammals. Further studies and analysis, through extensive literature search, resulted in addition of 9 more species from the reserve, thus, increasing the tally to 55 species. Stray taxonomic studies exist on the whole gamut of mammalian fauna, with little studies on lower groups of mammals. Much interest and or orientation of research is centered on higher mammalian groups-larger carnivores and herbivores like tiger, leopard, elephant, deer, *etc.*, the lower groups remaining largely neglected to date. However, the Wildlife Research Wing, Forest Department has taken up studies on the Giant Squirrel (*Ratufa indica*), one of the indicator species, besides census of tiger, leopard and elephant in the region. Interestingly enough, both the Common Tree Shrew- *Anathana ellioti* and Giant Squirrel *Ratufa indica* are endemic to the country (Alfred and Chakroborty, 2002).

In all, 55 species from 10 orders and 19 families of mammals have been reported from the reserve, dominated by carnivores (large and small cats–22 spp.), rodents (rats and squirrels–11 spp.) artiodactyls (deer, sambars, nilgai–8spp.), etc. Their distributional pattern reveals that they are much concentrated in southern portion of the reserve (*Devasthali, Upper Barahakamda, Meghasani, Tarinivilla, Bhanjabasa, Patabil* and adjoining areas), The healthy population of both herbivores and carnivores in these pockets is indicative of the favorable natural habitat, prey-predator relationship, and above all ideal forest cover and lack of human interference. However, such ideal conditions does not prevail at all times as the very presence of 04 villages in the core area pose threat of illegal poaching and smuggling for tusk, leather/hide, antlers, hoofs and nails, *etc.* Of 55 species of mammals reported from SBR, 45 species are included under different schedules (Sch. I-13, Sch. II-13, Sch. III-6, Sch. IV-7, Sch. V-6), of Wildlife Protection Act, 1972.

The mammalian fauna forms 13.75% of the total vertebrate fauna in the reserve. Notably, the reserve is famous for its large cats –tigers (102 nos., 2004 census) and leopards (132 nos., 2004 census), besides, larger mammals– elephants, sambar, wildboar, *etc.* Initially, in 1973 the tiger population was just 17 nos. and after 03 decades of the declaration of the area as Tiger Reserve, the population curve indicates 5.8 fold rise, thus the overall healthy population of vertebrates reflects improvised management strategies, followed by awareness camps, protective measures by patrolling guards, besides health care by facilitating artificial saltlicks, mud baths, *etc.*, there by helping in conservation of these wild creatures. It also pictures out the co-operation between Forest Dept., local people, administrators, land use planners, at all levels of management focusing on conservation and population growth of various fauna inhabiting in the park.

5.2. Avifauna

One of the richest pictures in avifaunal diversity and abundance is seen occurring in SBR, harboring 258 species (SBR, 1999; ZSI, 1995), and forming a major portion of the vertebrate fauna within the reserve. The avifauna in the vast region is rich and diverse. As of now, no systematic studies/catalogue exist on avifauna of the region with regard

to their habit/habitat although many species enjoy roosting in the dense colonies of tall trees, while others use holes of trunks, bare grounds and bank of water bodies, *etc.* that occurs in abundance in the reserve. The group also enjoys the pride of harboring some of the Himalayan birds (Heart spotted Woodpecker, Himalayan Tree Pie, Short-bill Mountain Thrush and Yellow Backed Sunbird). This large array of avifauna diversity falls under an equally large array of *18 orders* and *49 families*, in the following order of abundance; Muscicapidae (Babblers–6 spp., Flycatchers–8 spp., Wabblers–16 spp., Robbins and Thrushes–14 spp.) > Accipitridae (Hawks, Kites and Vultures –22 spp.) > Cuculidae (Koels and Cucukoos–15 spp.) > Strigiformes (Owls–11spp.), *etc.* The habit wise analysis of this avifaunal diversity reveals the following order : pre-dominantly *residential* (155 spp.) > *migratory* (48 spp) > *local migratory* (18 spp.) > *rare* (16 spp.) > *winter migratory* (14 spp.) > *vagrant* (4 spp.). (Ali, 1969 and Ripley, 1978). The inventory also highlights the feeding habits of the birds found here, thus enabling better interpretation of co-relationships among habitat and feeding habits. However as many as 39 species of birds endemic to India occurs in the vicinity of the reserve, as evident from major reports (Dasgupta, Basu and Datta, 2002). The reserve is also famous for one of the 6 species of Hill Myna population, from the region. Capturing of the celebrated myna by the tribals, for selling in and out of the country at lucrative prices for its excellent imitating quality, is a major threat to the Myna population. Hill myna and Peacock is the *indicative avifauna* of the reserve. Of the SBR' s large avifaunal diversity of 258 spp., over 187 spp. fall under the Scheduled fauna of Wildlife Protection Act, 1972.

Table 8. Showing the status of various avifauna occurring in the reserve.

Sl. No	Nature/Status	Number
1	Residential	155
2	Migratory	48
3	Winter Migratory	14
4	Local Migratory	18
5	Rare	16
6	Vagrant	5

5.3 Reptiles

The reserve is comparatively less represented in herpeto faunal profile as evidenced from major regional reports and documentation's. There is no change in the status of observation made on the group in previous report, as permission for long term studies in the park/biosphere are getting increasingly difficult, following recent interpretation and implementation of Forest Act by the Forest Department. Nevertheless, a much thorough explorative study will certainly yield an equally good tally of reptiles from the reserve as it has conducive habitat, ecology, varied vegetation favouring distribution of diverse herpetofauna. The fauna was identified referring current taxonomic works. [Lizards-Tikader and Sharma, 1992; Snakes -Murthy, 1986].

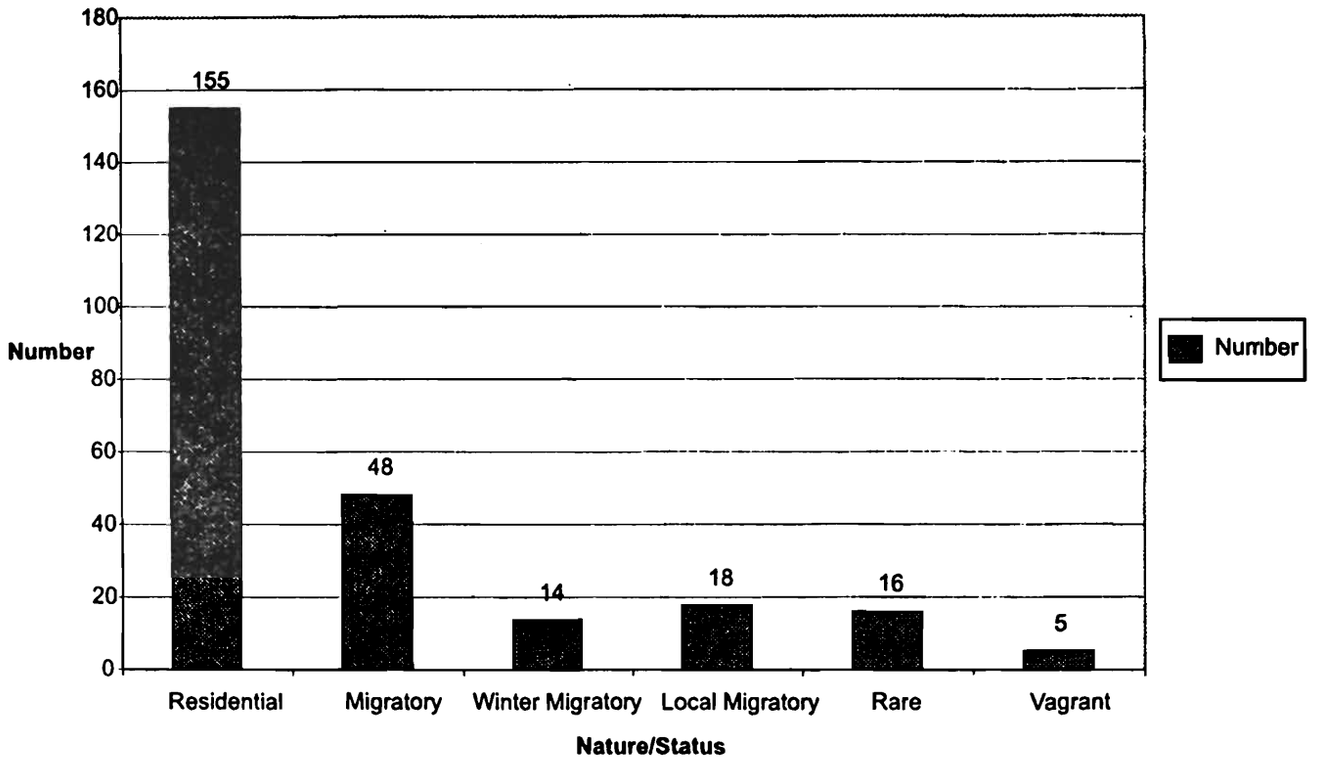


Fig. 10. Habit wise breakup of avifaunal diversity (258 spp.) in the reserve. Residential birds are abundant (155 spp, 61%) > Migratory birds (48 spp., 19%) > Local Migratory (18 spp., 7%) > Rare (16 spp., 6%) > Winter Migratory (14 spp., 5%) and Vagrant (5 spp., 2%).

Out of 110 reptiles found in Orissa (including sea turtles), 37 species are known to occur in Similipal. The group wise break up is as under : poisonous and non- poisonous snakes 19 spp., 10 spp. of Rock/Garden Lizards, Chameleons *etc.*, 3 spp. of Turtles, 1 spp. of Crocodile and 4 spp. of Skinks. Habitat wise the order of abundance is Terrestrial (14 spp.) > Arboreal (8 spp.) > Fossorial (7 spp.) > Semiaquatic and aquatic (4 spp. each). *67.86%* of 37 spp. of reptiles are in the list of various Schedules of Wildlife Protection Act, 1972. Conservation in Similipal is confined to some megaspecies of reptiles–Mugger crocodile, three species of turtles, and few snake species (Python and King Cobra) besides Lizards (*Varanus*). However, the micro species are yet to have their own share of academic attention. Though few snakes (Common Cobra, King Cobra and Rat Snake), Lizards (Varanus and Chamaeleon) and Turtles are captured by tribals for various uses, their population status in Similipal has not been assessed.

5.4 Amphibia

The amphibian fauna in India includes representatives of each of the three orders – *Caudata, Gymnophiona* and *Anura*. The first comprehensive list of Indian amphibians is by Inger and Dutta (1986) and includes 181 spp.. Later, Chanda and Ghosh (1988) added 13 spp. to the list. Das (1990) added 11 more spp. to the list. Finally, studies and compilation by Dutta, 1992, and Deuti, 1996, Alfred, Ramakrishna and Ravichandran, 2005 taken total tally of amphibians to 242 species.

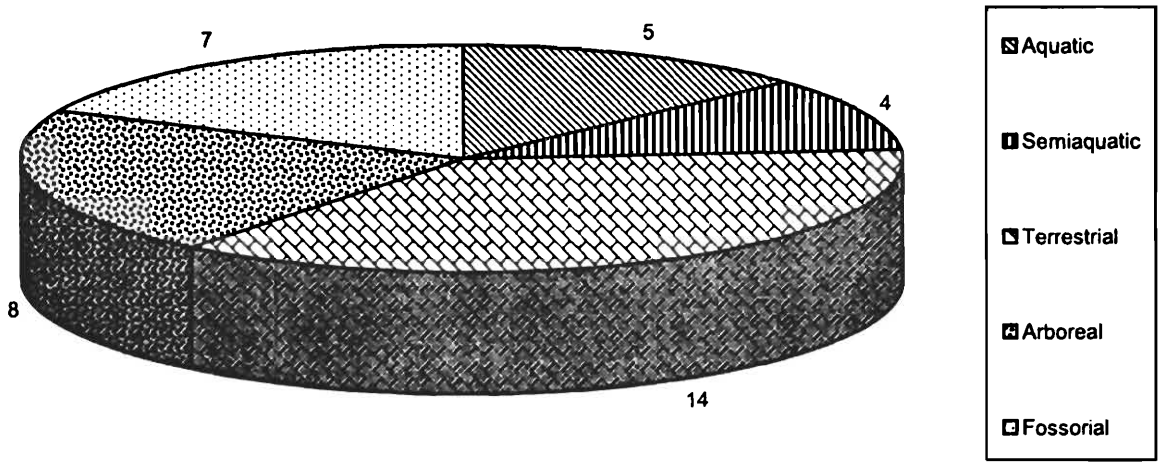


Fig 11. Habitat wise distribution of reptiles in the protected area. Terrestrial form predominant (14 spp. 37%) followed by Arboreal (8 spp., 21%), Fossorial (7 spp., 18%), Aquatic (5 spp., 13%) and Semi-aquatic (4 spp., 11%). In all, 37spp. reported of which 22 spp fall under various schedules of WLA, 1972.

Of 242 spp. of amphibians in India, the state of Orissa has 19 spp. Of these, SBR plays host to 13 spp. (1 toad and 12 frogs). The amphibian fauna in SBR is expected to be much more rich taking into consideration its varied vegetation types and water bodies. However, there is a threat to these from forest fires in the reserve. There are two *edible species* of frogs found in SBR (*Rana. crassa* and *R. tigerina*), however, there no commercial exploitation of frogs in Orissa and both the above species are included in Appendix–II of the Conservation of International Trade in Endangered Species of Wild Flora and Fauna (CITES). Recently *Philautus similipalensis* (Bush Frog) *new*, apparently *endemic species* reported from the study area (Dutta, 2003). Besides, *Tomopterna dobsonii*–Ranidae, is a new distributional record from the study area by the author.

5.5 Fishes

The fishes in this area are combination of fishes of Himalayan region and Peninsular Indian representatives as well as that of the North Eastern Hill region as evident from the range extension and distributional pattern from genus *Tor*, *Lepidocephalus* and *Nemachielus* respectively. The inventory of fishes in study area accounts for 37 species, the Similipal hill ranges sharing similarities with three different geological relicts as mentioned above thus holding good potential for Ichthyofaunal study with respect to largely unexplored fish diversity. The fish faunal profile exhibits a variety of adaptive modifications induced by swift currents and torrential streams. The fish fauna in the reserve has not been studied despite abundance of vast and varied aquatic environments– rivers, streams, pools and puddles *etc.*, in the Reserve. Previous ZSI study reports only 05 spp., followed by studies by Wild Life Research Wing, Forest Department, reporting 26 fish spp. (1999). Further, the present study, (2003) based on few select aquatic habitats in core/buffer areas yielded an addition of 11 fish spp., of which 6 spp. are new distributional records

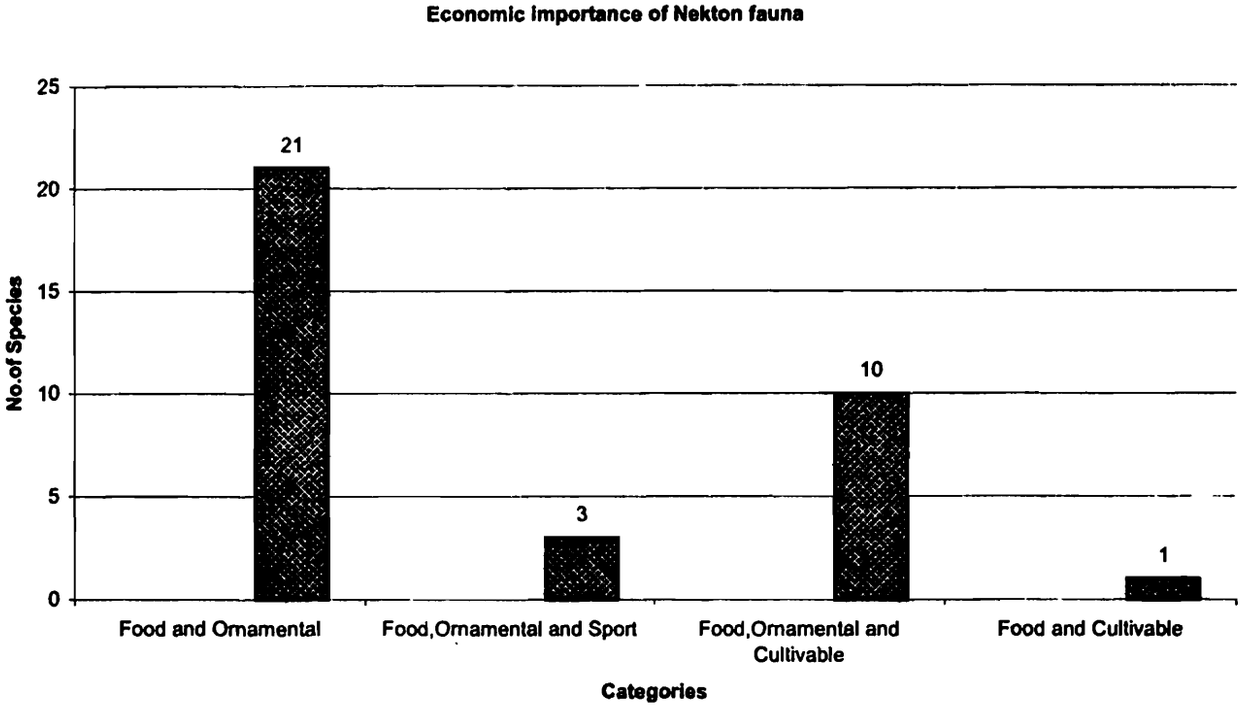


Fig. 12. Diagram showing economic importance of Nekton fauna in the reserve. The Fish faunal diversity (37 spp) is dominated by the Food and Ornamental fishes (21 spp.), in the following order of abundance : Food, Ornamental and Cultivable (10 spp.) > Food, Ornamental and Sport fishes (3 spp.) > Food and Cultivable (1sp.).

from the study area, taking the total tally of fish to 37 spp. from the region. Interestingly, the park holds characteristic Himalayan hill stream Fishes (*Tor pititora*). The Cyprinids dominate the fish fauna in the Reserve. A special type of scaled fish locally called Khajara, is found in the rivers Deo, Khairi, and Bhandan of Similipal hill reserve. These fishes are usually found in streams, prefers rapid water flow with rocky bottoms. Besides this, yet another group, *Nemacheilus* also inhabits the rapid running waters of the reserve, adjusting themselves constantly to any fluctuation in *microhabitat* or *ecological niche*. Besides these, other economically important aquaculture groups–Carps and Catfishes and Crustaceans (Decapods-Prawns) also inhabit the different water bodies. Of the 37spp., 11spp. are cultivable, while others are game and ornamental fishes of recreational interest. (Games/ Sport Fishes and aquaria species) None of the 11 cultivable species have been taken up for cultivation by the tribals, following lack of even primitive facilities (Bunding, *etc.*). Therefore it can safely be concluded that there is no commercial exploitation of aquaculture species, except for local consumption and small scale selling of fresh and dry fishes in and around nearby village markets on a marginal scale. Field observations also reveal that the use of traditional fishing methods by the tribals, is not alarming and therefore there is no threat to nekton diversity as of now. However with changing pace and development creeping in gradually, there may be a threat to natural fish distribution and abundance in the Reserve.

Table-9. Breakup of different Vertebrate groups in Similipal Biosphere Reserve

Group/Phylum	No. of Spp.	Remarks
Mammals	55	Constitutes *13.75%* of vertebrate fauna of SBR, *dominated* by *Felidae* (*larger* and *smaller* cats), and followed by *rodents*. T*igers* and *leopards* form the *indicative fauna*. 45 of the 55 spp. fall under various schedules of Wildlife Protection Act, 1972.
Avifauna	258	*Rich* in its avifaunal diversity, the group also enjoys the pride of harbouring some of the Himalayan birds (*Heart spotted Woodpecker, Himalayan Tree Pie, Short-bill Mountain Thrush* and *Yellow backed Sunbird*), having more than 60% of the states diversity. *Muscicapidae* (Babblers, Robbins and *Thrushes)* are dominant among avifaunal groups, followed by equally competent *Accipitridae (Hawks, Kites and Vultures)* Besides, these, *Peacock* and *Hill Myna* form *indicative avifaunae* .200 spp. of the 258 spp. or *77.5* % are under Wildlife Protection Act, 1972.
Reptiles	37	Reptilian fauna in the reserve is *depaurate*, specially the *Ophiofauna*. Both *poisonous* and *non-poisonous snakes togather* account for 50%, while the rest includes *Lizards* (10 spp.), *Turtles* (3 spp.) and 1 sp. of *Crocodiles (Crocodylus palustris)*. Order of abundance Skinks (4spp.) > lizards (10spp.)>snakes. 24 spp.
Amphibians	13	Constitutes *3%* of total vertebrate fauna in SBR, dominated by frogs (11spp.), besides 1 sp. of *Bufo. Philautus similipalensis new*, to science, and apparently *endemic* reported from the study area (Dutta, 2003). Two edible species are *Rana crassa* and *Rana tigerina*, besides *Rana hexadactyla*, is perhaps an introduced species in the state. Common species available are toad- *Bufo melanostictus*,and frogs- *Rana tigerina, R. limnocharis*. Further, *Microhyla ornata, Ramnella variegata, Limnonectes keralensis* and *Tomoptena rolandae* occur rarely.
Fishes	37	Nekton fauna interesting as some Himalayan hill stream fishes (*Tor putitora*) occur in the Reserve, successfully adapting themselves to the *microhabitats*. Fish fauna dominated by Cyprinids. 6 of the 37 fish species form new distributional records from the Reserve.

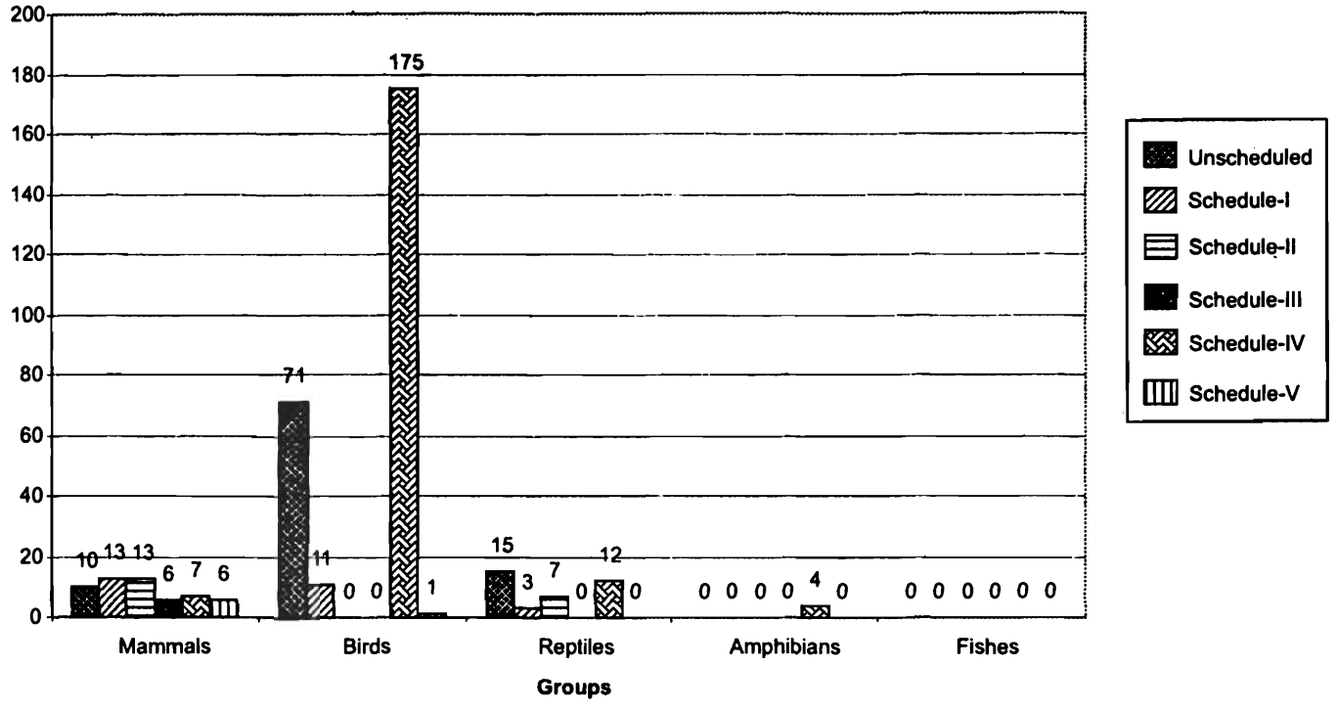


Fig. 13. Histogram showing distribution of Scheduled vertebrate fauna

6.0. SUMMARY

The Similipal Biosphere Reserve, spread over about 4374 km². area offers ideal natural landscape provides a good habitat for the wide array of invertebrate fauna with substantial incidence of endemism and species diversity in its biotic profile more so faunal diversity groups like Arachnids, Diptera, Hymnoptera, Odonates, Annelids and Malacofauna, *etc.* to quote few major taxa. The modal ecorace of Tassar (*Anthera millita*) is unique in Similipal. Present endeavors at invertebrate taxa inventory, in Similipal Biosphere Reserve, revealed 217 species of invertebrate fauna (Mollusks, Arthropods and Annelids) reported, till date. In S.B.R, the arthropods constitute the bulk of invertebrate fauna followed by Malacofauna (land and freshwater gastropods) and *Annelids.*

Class insecta is numerically dominant (80.9%) amongst the total identified fauna followed by Arachnida (14.9%) > Crustacea (2.06%) and Myriapoda (2.06%). In insecta order Lepidoptera exhibits not just species richness but equability or evenness in distribution (54 spp.) followed by Orthoptera (32 spp.) > coleoptera (22 spp.) > Odonata (14 spp.) > Hemiptera (10 spp.) > Diptera (6 spp.) > Hymenoptera (6 spp.). The terrestrial habitats in the biosphere exhibits numerical dominance by *Arachnids* [*Araneae* (16 spp.) followed by *Acarina* (9 spp.) and *Myriapoda* (5 spp.) > *Scorpionida* (4 spp.), *etc.*

The apparently monotonous rivers, streams, similar erosive habitat and associated wetlands, the *Gastropods and Bivalves* (20 spp.) exhibit for greater diversity, followed by *Decapods (Crabs and freshwater prawns) etc.* The terrestrial *gastropods,* Achatinidae *and* Ariophantidae families were observed more in numbers. Besides these, freshwater Molluscs–Thiaridae, Viviparidae *and* Limnaeidae also occur commonly in this biosphere

reserve and *Parreysia spp.* are dominant among the Bivalves in the reserve. An analysis of previous studies on faunal diversity in Similipal Tiger Reserve makes an interesting reading. Earlier report on invertebrate faunal diversity from Similipal records 120 species. The present inventory takes the tally to 217 spp, including 97 spp new addition to the faunal list, in which, 18 spp. of Mollusks (11 spp. of gastropods and 7 spp. of bivalves), 47 spp. of Insects (23 spp. of butterflies, 4 spp. of moths, 12 spp. of odonates, 1 spp of earwig, 1 spp. of silverfish, 6 spp. of bees and honey bees) 21 spp of Arachnids (4 spp. of scorpions, 1 spp. of ticks and 16 spp. of spiders), 1sp. of Tick (*Dermacentor auratus*), 5 spp. of Decapods, 1 sp. of earworm (*Lampito mauritii*) and 5 spp of Myriapods are included.

Ideally, a Biosphere Reserve primarily intends to fulfill the following three basic objectives. Conservation of biodiversity (genetic, species and ecosystem diversity) and landscapes; Ecodevlopment of the ethnic tribal habitations endemic to the protected area and lastly provides the benchmark for long term research into bio-ecological studies, environmental education, and management research in to local, national and global issues of conservation and sustainable development. The reserve has immense potentials for future research in conservation biology, ethology, biodiversity etc. Further, the reserve is an excellent illustration of how research and management need to go hand in hand, to achieve the fundamental objectives of biodiversity conservation.

The present inventory, especially of invertebrate resources an painstakingly effort to document the regional or alpha (á) diversity in the protected area, hopefully, will serve as an important input or baseline information for initiating, in future in a more systematic and comprehensive scale, studies into various aspects of invertebrate biology , ecology and biogeography, besides invertebrate taxonomy. Further the inventory also serves to highlight the importance of conservation measures in protecting the unique biotic as well as biophysical attributes of Similipal natural heritage, an endowment to not just the state/ country, indeed posterity too.

Various representative faunae collected from field studies were appropriately preserved (Anon,1990) and identified back in laboratory. The herpetofauna were identified based on visual sighting and collections were made in case of nekton faunae. The nekton fauna were identified following manuals of pioneer workers in the field–Day 1889 Talwar & Jhingran, Jayaram, 1999, and Daniel 2002, some notable fish species collected are under- Cobitidae– *Lepidocephalus guntea*, Cyprinidae–*Labeo bata, Chela fasciata, Garra mullya, Rasbora daniconius,Danio rerio,Danio sp. Puntius ticto, Puntius punctata P.vittatus* and *Barilius sp.*, Balitoridae *Nemachilus sp.*, and Channidae–*Channa orientalis.* While the majority of the fishes collected during the field study are very diverse from carps to loaches to snakeheads, Cyprinids are numerically abundant and dominate the fish fauna profile.

The herpetofauna studied during the study period are Ranidae–*Rana limnocharis, R. cyanophlyctis* and *Tomopterna dobsonii,* Microhylid–*Microhyla ornata,* Rhacophorid–*Polypedates maculates* and *Philautus similipalensis.* Bufonidae–*Bufo melanostictus,* in addition to the above amphibian fauna, reptiles observed are rock/garden lizards, Agamidae–*Psammophila blanfordianus, Calotes versicolar,* Gekkonidae–*Hemidactylus flaviviridis,* Typhlopidae–blind or oily snake *Typhlina bramina,* Scincidae–*Mabuya carinata* and *Lygosoma*

punctata. The herpetofauna were identified using following regional works, field guides/ manuals (Chanda 2002; Deuti & Bharti Gowswami 1995; Daniel 2002; Murthy 1986; and Tikader and Sharma, 1992). Further the following regional works and published reports were referred for drawing up inventory of herpetofauna (Dutta 1986, 1990, 1992, and 1997; Dutta & Acharya1990; Dutta & Hejmadi 1989, 1993).

No other higher vertebrate collections were feasible, being restricted fauna, other than the ones stated above. Therefore the inventory of higher vertebrate fauna has been compiled, based upon visual sightings and field inputs from forest officials, and field observations made from various sampling stations in *buffer/core areas* in the reserve.

Mammals – Higher cats like Tiger (*Panthera tigris*), larger mammals like Elephant (*Elephas maximus*), Hanuman Langur (*Presbytis entellus*), ungulates Wild Boar (*Sus scorfa*), Sambar (*Cervus unicolor*) , Spotted Deer (*Axis axis*), smaller mammals like Giant Squirrel (*Ratufa indica*), Indian Crested Porcupine (*Hystrix indica*), and Mongoose (*Herpestes edwardsi*), were sighted at various sampling sites.

Avifauna – The following avifauna were sighted, based upon identification using field manuals and taxonomic guides by Ali, 1979 and Riply, 1978. Red Vented Bulbul (*Pycnonotus melanicterus*), Golden Oriole (*Oriolus oriolus*), Blackheaded Oriole (*Oriolus xanthornus*), Green Bee-eater (*Meropus orientalis*), Indian Myna (*Acridotheres tristis*), Pied Myna (*Sturnus contra*), Black Drongo (*Dicrurus adsimilis*), Jungle Crow (*Corvus macrorhynchos*), House Crow (*Corvus splendens*), and Red Jungle Fowl (*Gallus gallus*) were also sighted.

In the Transitional Area, the sampling sites were *Jorabandh, Suniyee, Kuldiha* and *Rishiya*. The various avifauna sighted there in are listed below (Table 9).

Table-10. List of avifauna sighted in the transitional area

Scientific Names, Common names
Aythya fuligula, Tufted Porchard
Podiceps ruficollis, Dabchick
Cypsiurus melanicterus, Palm Swifts
Apus affinis, House Swifts
*Egretta garzetta,*Little Egret
Bubulcus ibis, Cattle Egret
Phalacrocorax niger, Little Cormorant
Corcus splendens, House Crow
Corvus macrorhynchos, Jungle Crow
Acridotheres tristis, Indian Myna
Sturnus contra, Pied Myna
Eudynamys scolopacea, Koel
Alcedo atthis, Small Blue kingfisher

7.0 HUMAN HABITATIONS

a. Settlements and Population

Based upon official figures/reports, and from our own field data, it can be said that tribal population in and around Similipal Biosphere Reserve share a very close relationship with the wildlife in the biosphere, often with a negative impact- loss of faunae specially vertebrates. About *two decades ago,* there were just *75 villages* (*40 in Karanjia, 15 in Baripada and 20 in Udala tahasil*) in both *Core* and *Buffer area* of 2750 Km^2 (Mishra,Purohit and Subba rao, 1985). However, the present scenario is much different as it now has only 65 villages in the same area. Earlier there were 10 villages in the core area, but presently only 4 and this is due to *eviction* of human settlements by Govt. of Orissa and their *rehabilitation* outside the reserve [Plate14]. Thus, there is a gradual drop in human settlements. Complementing the conservation regulations measures by the forest authorities, rehabilitations of the tribes to places outside the park have had positive results in *conserving wildlife* in the reserve and reduction in anthropogenic impact on wildlife. The four villages registered by the government of Orissa in the core area are *Jenabil* (with 22 houses), *Jamuna, Bakua* and *Kabataghai* (14-18 houses), while all else are stray/illegal settlements scattered in different parts of the region, having the following- tribals, 5.21% schedule caste and 21.35% other castes.

b. Tribes and forest produce

The major chunk of people in SBR are tribals of varied tribes namely-Bhatudi, Kharia, Mankidia, Gond, Ho, *etc.*, besides a minor population of Bhuyan and Paudi Bhuyan, with Kharia and Makidia as majority. These tribes are associated with markedly different activities. *Kharias*–spend time collecting forest products like honey, resin, arrowroot, lac, wax, *etc.*, while *Mankidias* engaged in rope making out of Siali fibre with *Gond* and Bhatudi tribes busy collecting Sabai grass and other similar activities. The day today life of these tribes sustains chiefly under the following heads- grass, bamboo and canes, fibre and flosses, oil extraction, medicinal plants, tans and dyes, gums and resins, leaves, fruits and seeds. Under the following heads are *Sabai grass, Siali fibre, Bamboo, Mohua, Kusum, Sal seeds, Tamarind, Amla, Harida, Bahada, Honey, Resin, Arrowroot, Tasar cucoons, Lac, Wax, Gum, Sal and Kendu leaves* are some of the forest products (Patnaik, 1997). These have a particular collection season and it is only in this period that the tribal communities have these as their source of livelihood. (*Mahua seeds*–May/June, *Jagerry*–round the year, *Bahada*–Jan/Feb, *Harida*–Nov/Feb). However other than depending entirely on these, some tribes have taken up agricultural and kitchen gardening practices, besides fishing and aquaculture. The core area which is a prohibited part of the Biosphere Reserve with much restrictions and regulations still bears the anthropogenic pressures due to felling of trees for *timber /firewood* and killing of smaller mammals and birds for *flesh* and *hide.* The people out here are illiterate and therefore ignorant of this steady destruction that they have been causing. They have low economic standard and so mostly dependent on forest products and on small patches of land. [Plate 15].

c. Livestock

The livestock's population fluctuates seasonally during a year, with the lowest number of goats and sheep during monsoons as villagers sell some of the animals for subsistence. The cows and buffaloes are less productive in terms of milk yield. Their utility is more for dung, both for manure and as a draught animal. There is competition between domestic livestock and wild ungulates for grasslands in village vicinity. [Table10, Fig.10].

According to 1995 survey the livestock population in the buffer area was 7866 nos. and showing steady increase as per inputs from forest officials and or records. Survey in August 1997 in four villages in core area reveals the following livestock figures.

Table 11. Showing livestock statistics in 04 villages in 1997

Sl. No.	Name of the villages (*)	Cows	Buffaloes	Goats	Sheep
01	Kabatghai (17)	097	18	138	-
02	Jamunagarh (08)	084	01	136	23
03	Jenabil (31)	197	-	188	01
04	Bakua (19)	051	-	078	-

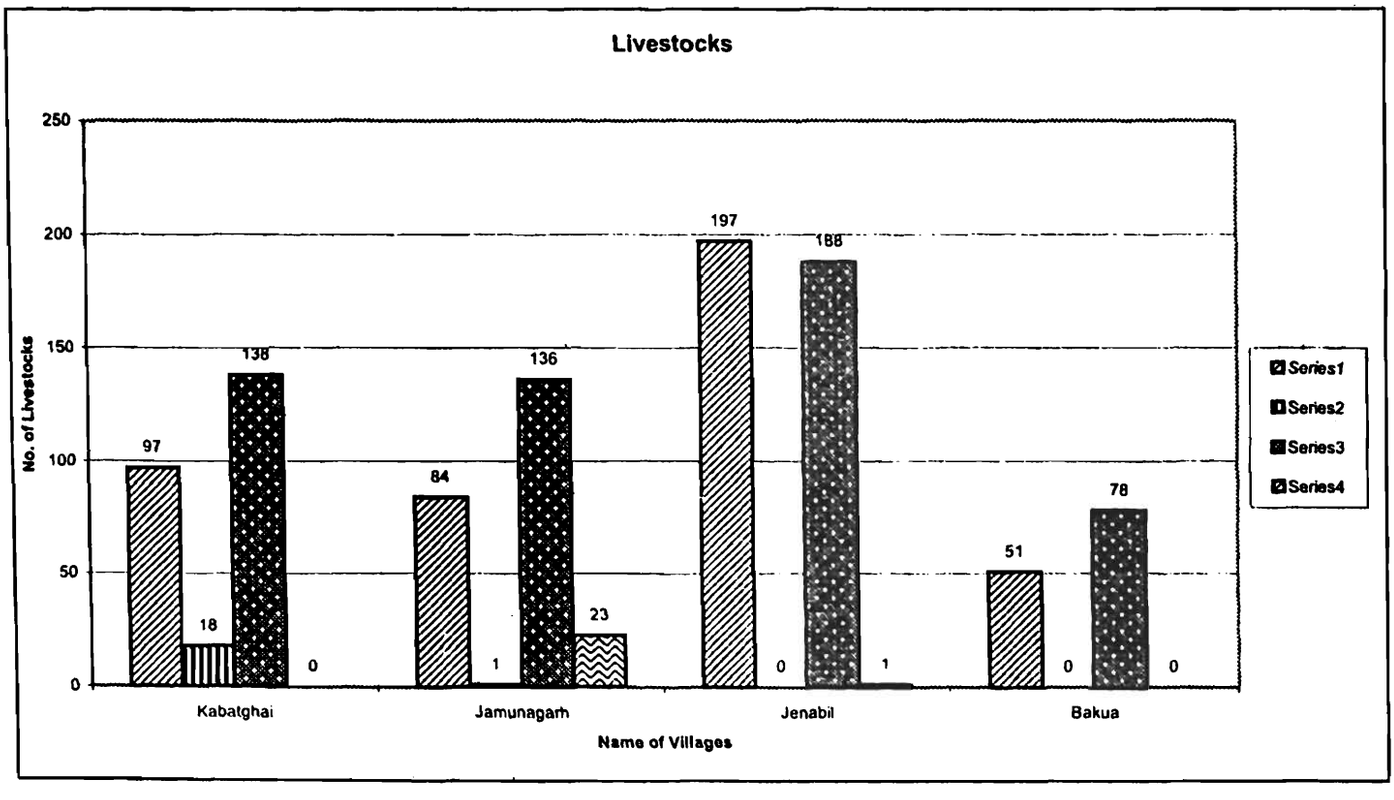


Fig. 14. Histogram showing Livestock composition in 04 villages within the core area.

8.0 THREATS AND CONSERVATION MEASURES

Major threats to faunal diversity in SBR includes *habitat alterations, human population pressure, etc.* Of these, *habitat alteration* is due to *overuse of land, deforestation* and *consequent habitat loss,* while *degradation* and *fragmentation* are other factors. The anthropogenic pressures in Similipal biosphere reserve is thoughtlessly destroying ecological habitat of the wild animals. Due to this, people are pushing the Biosphere from the biodiversity rich to biodiversity deficit state, where as, biosphere reserve aims a long term protection and conservation of vast compact areas rich with biodiversity. The major factors threatening wild life in the reserve are *Akhand Shikar, Forest fires, Poisoning and poaching, Felling of trees and Encroachment by the tribals for grazing, cultivation etc.*

Akhand Shikar

The tribals of Mayurbhanj and adjoining districts use to do mass hunting on the day following Pana Sankranti (14th April). This was controlled to a greater extent by the authorities. But presently the mass killing/hunting operations takes place from Feb. end to May end every year. If this trends continues Sch.I fauna will face extinction near future. The tribals hunt is threatening to many rare species specially herbivores population thus indirectly affecting the carnivores food chain. thus being one of the major reason of threat to loss of wildlife from the reserve.

A. Forest Fires

Forest fire in Similipal plays a very important role. It's observed that the Shikaris, graziers, cultivators and minor forest collectors often set fire to forest growth at different time so as to suit their requirements. Forest fires by tribals for *Shifting Cultivation/Jhumming/ Podu cultivation* not only leaves the area barren but also destroys several species of wild flora as well as micro-organisms, invertebrates and lower vertebrates. Firewatchers are engaged during fire seasons to report and extinguish fire appearing in the forest and to control, if at all set to fire, specially during the summer months.

Intensive fire protection measures are taken up in every summers by clearing the coreline areas. It is difficult on the part of the park management to safeguard the entire reserve sprawling over 2750 Sq Km. However, the park authorities ensure measures to protect the core area and some patches of the sanctuary or areas of frequent sighting of animals. It is noticed that large no. of rodents, birds and nests, young animals and lower vertebrate forms (herpetofauna) and their habitats are destroyed, every year due to forest fires, *etc.* [Plate 16]. Often the calves of deer, sambar, elephants, etc., sustain injury during forest fires. Fire watchers are engaged during the season to report and extinguish fire appearing in the forest for its prevention.and or control.

B. Poisoning and poaching

Vehicular poaching in Similipal Biosphere Reserve is practically absent for most entry points have check gates and are manned by staffs for round the clock duty, but the shikari's use secret paths on foot and move freely as local Adivasis. They often prepare

poison waterholes near saltlicks, which are frequently visited by major wild life forms [Table 11, Fig. 11]. Other than this, bows and arrows, local guns are also used for shooting, with tip of arrows poisoned.

This surreptitious practice has to be checked by arresting any person whose movement is suspected within the park. [Table 12, Fig. 12]. Besides, the above the reserve is also a threat to felling of trees, theft *of fire wood* and *timber* by the villagers and smugglers, there are also reports of *encroachment* of area by the tribals for grazing and or cultivation.

Table-12. Poaching cases in five years

Sl. No.	Year	No. of total wildlife death cases	No. of poaching cases	%of poaching cases as against total deaths
1.	1997-98	9	5	55
2.	1998-99	25	17	68
3.	1999-00	19	12	60
4.	2000-01	25	23	90
5.	2001-02	5	2	40
	Total	83	59	70

Source : Sanjay Patnaik, 2003.,

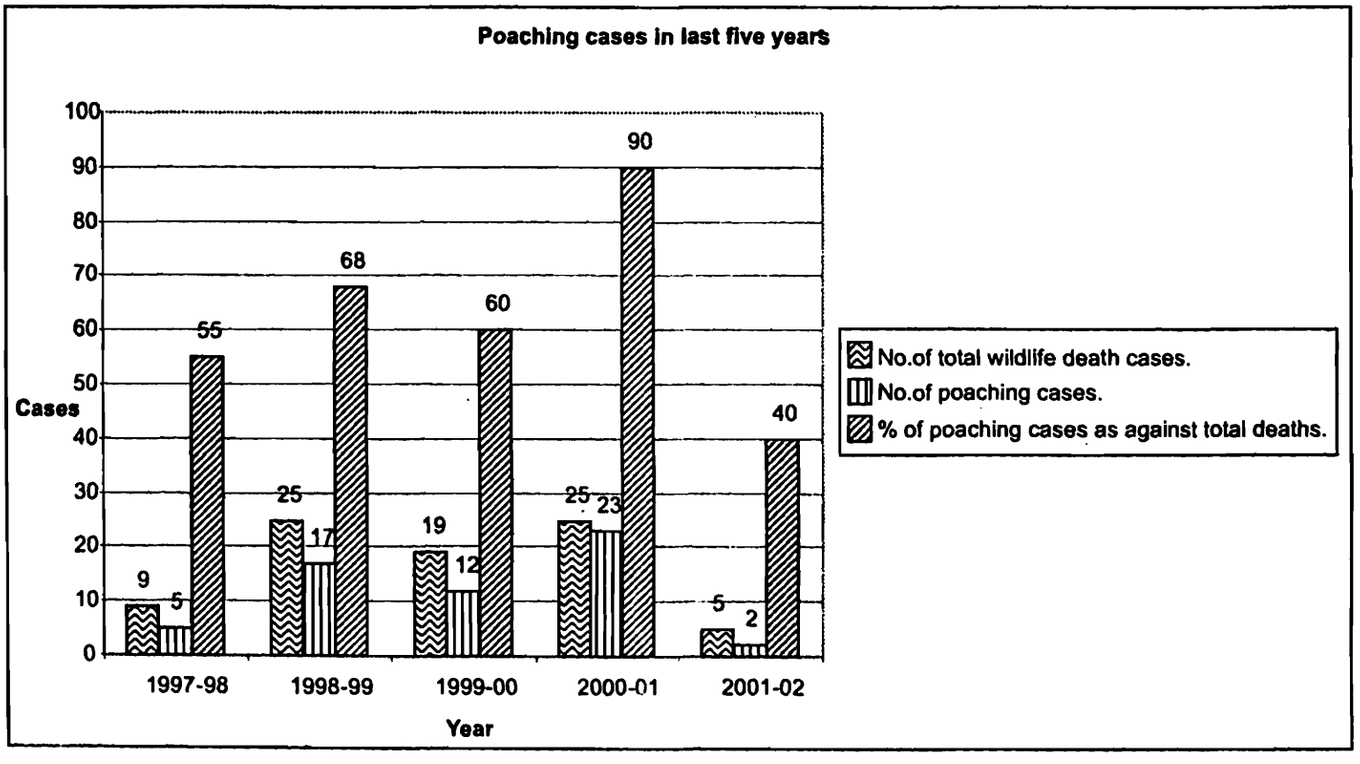


Fig.15. Histogram showing no. of total wildlife death cases, no. of poaching cases and the % of poaching cases as against total death cases during the period 1997-98 to 2001-02, the maximum being in the year 2000-01

Table-13. Wildlife deaths in five years (1997-98 to 2001-02)

Animal type	Natural deaths/accidents			Poaching		
	STR	BFD	KFD	STR	BFD	KFD
Sambar	3	-	-	-	7	3
Deer	-	-	-	6	8	4
Wild Boar	-	-	-	-	6	4
Elephant	4	1	5	1	10	1
Tiger	-	-	-	-	-	-
Leopard	1	-	-	-	1	1
Total	**8**	**1**	**5**	**7**	**32**	**13**

Source : Sanjay Patanaik, 2003.

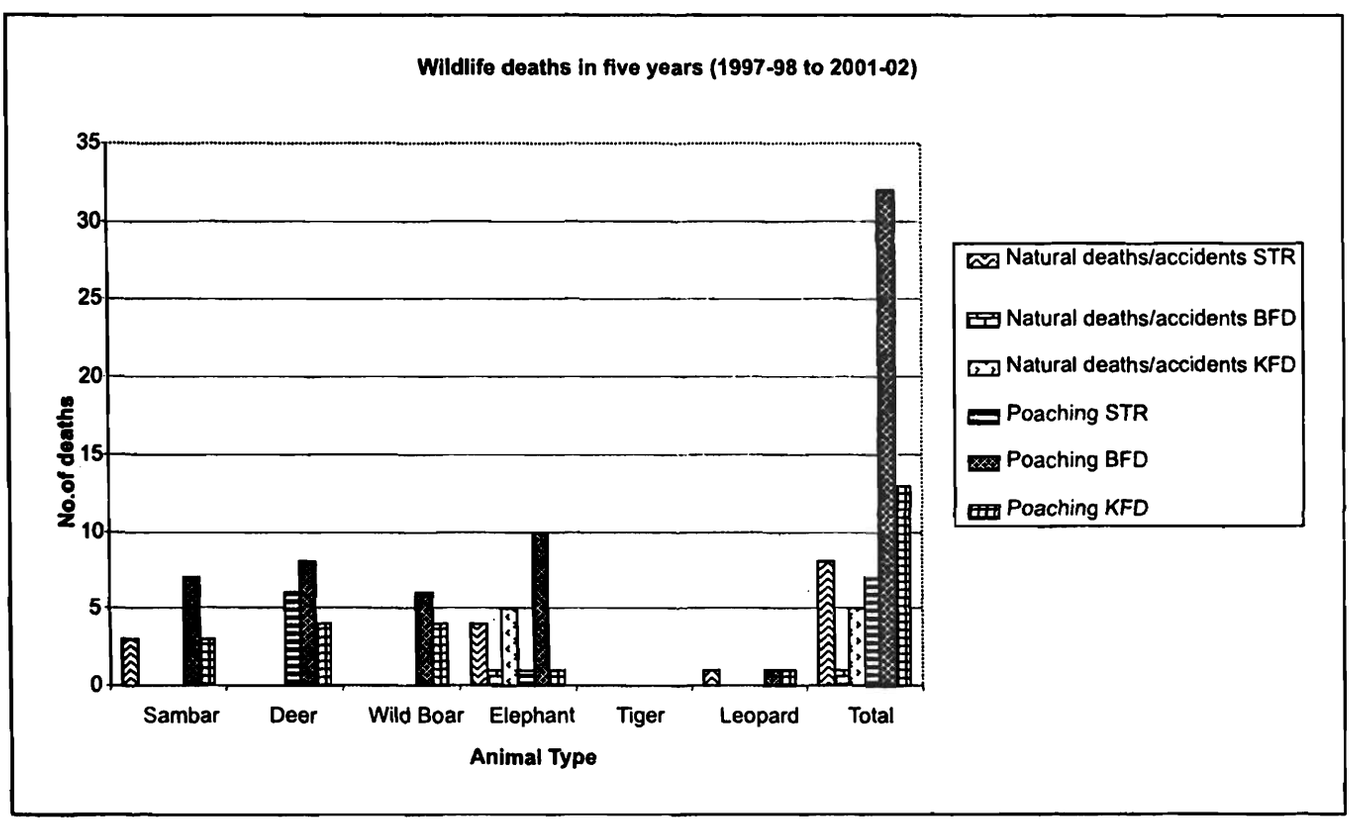


Fig. 16. Histogram showing the number of death 1997-2002

9.0 TOURISTS AND TOURISM

An upcoming, booming tourism industry is an integrated part of park management for revenue collection and much needed funds for the reserve, besides public awareness, education and recreation. The same facts have been taken up seriously with a view to attract national/international tourists to the biosphere reserve. While the wild life tourism industry needs to be encouraged, it also calls for the much-needed regulations so as to

help conserve the wild life, based on tourist information of over a period 1980-81 to 2002-03 and analysis of the same for judicious wild life tourism plans.

The tourism season in the park extends from 1st Nov. to 15th June each year, while the biosphere reserve remains close for tourists for the remaining period, for its up-keep and maintenance, *etc.*, The park authorities declared this since March 1988 due to various reasons especially for repairs of roads, bridges that are often washed away due to heavy rains and land slides. The closure is also vital and or essential to allow the animals to congregate in valleys for ensuring improved *gene flow, breeding* and *propagation* (Prusty and Singh, 1997).

Similipal, in view of its proximity and good rail and road connections to places like Calcutta, Jamshedpur, Bhubaneswar, Rourkela and Sambalpur, has large influx of tourists from these places to Similipal for various reasons- wild life tourism, and pleasant climatic conditions. The beauty of the tropical forest, rolling hills and rivers, deep valleys/gorges, rapid gorgeous falls, meadows attract large number of local and foreign tourists every year. The tourist places are usually provided with artificial salt licks for sighting of wild animals in their natural habitat.

Tourists are allowed to move along specified tourist routes and are not permitted to move into core areas which are restricted. The pathways are made so as to enable them have sight of (1) the majestic water-falls at Joranda and Barheipani. (2) watch animals in wild at the artificial salt licks at Chahala, Joranda (3) move through buffer, periphery of core area and through the Nawana valley that was the crater of a volcano that preceded Similipal in geologic time. The tourists are also permitted by the park authorities for night halts at various forest rest houses in core/buffer areas for observing wild life during night.

Permission for entry permits are issued from select places, Pithabata in east and Jashipur in the western side, the entry points being Pithabata and Tulasibani/Kaliani respectively. For day reservation the office remains open from 06 am to 12 noon and for reservation 06 am to 02 pm.

Analysis

The total no. of tourist from 1980-81 to 2002-03 are presented in table 13. There is a sudden increase in their inflow in three different years in-between the span, initially in 1987-88 (11,302) then again 1988-89 (15,045) further later 1992-93 (19,332) and finally to 1997-98 (24,413). The sudden rise from 1986-87 (8458) was probably due to the new declaration by the park authorities to close the park for tourist for certain period of the year, 15th June–15th Oct. Then there was gradual rise and fall in the inflow until 1999-2000 when the number was lowest in the last five years dipping to 13,487 because of heavy damages caused due to the two super cyclones that had badly hit the state [Table 13 & Fig 13].

Table-14. Showing No. of tourist from 1980-81 to 2002-03

Sl. No.	Year	Indians	Foreigners	Total
1.	1980-81	5,979	39	6,018
2.	1981-82	4,632	36	4,668
3.	1982-83	5,601	46	5,647
4.	1983-84	7,270	34	7,304
5.	1984-85	5,078	23	5,101
6.	1985-86	8,414	35	8,449
7.	1986-87	8,458	44	8,500
8.	1987-88	11,248	54	11,302
9.	1988-89	14,994	51	15,045
10.	1989-90	15,176	81	15,257
11.	1990-91	14,002	88	14,090
12.	1991-92	12,579	87	12,656
13.	1992-93	19,260	72	19,332
14.	1993-94	17,493	132	17,325
15.	1994-95	16,908	148	17,056
16.	1995-96	20,236	134	20,370
17.	1996-97	21,133	140	21,273
18.	1997-98	24,252	161	24,413
19.	1998-99	19,377	163	19,540
20.	1999-00	13,403	84	13,487
21.	2000-01	22,166	105	22,271
22.	2001-02	22,508	146	22,654
23.	2002-03	21,651	172	21,823

Overseas Visitors

Overseas tourist are not well aware of SBR and its wildlife wealth, its now that publicity is being given importance by authorities by conducting various awareness camps, voluntary works, tourist information being disseminated inform through booklets, pamphlets at all tourist information centers, 9 offices, railway station, bus stands, hotel-line groups, *etc*. Of the overseas tourist, the percentage pattern is as follows : U.K (26.7%)>Germany (15.9%)>Holland (8.9%) and the rest from other countries. [Table 14, Fig 14]. The no. of foreigners who visited the park from 1980-81 to 2002-03 was analyzed and was found that

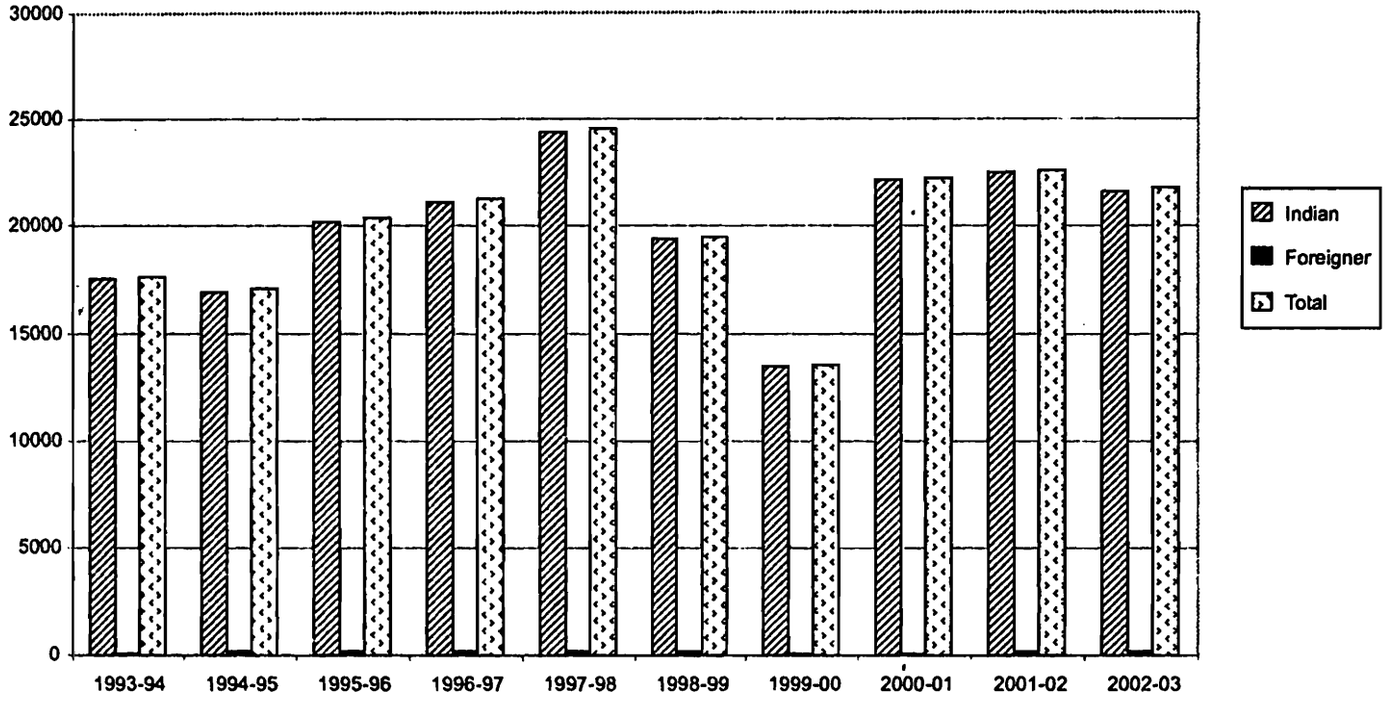


Fig. 17. Graph showing overseas and Indian tourist inflow from 1993-2003.

their number fluctuated but with sudden increase to 81 in 1989-90. The wide variations may be due to decision on the part of the park authorities to declare the reserve as closed to public for the period (July to October each year).

Table-15. Showing percentage of overseas tourists to SBR.

Sl. No.	Country	Total %
1.	United Kingdom	26.7
2.	Germany	15.9
3.	Holland	8.9
4.	Netherland	6.3
5.	Swizerland	6.4
6.	France	5.0
7.	United States	1.9
8.	Italy	3.8
9.	Australia	3.2
10.	Belgium	2.0
11.	Canada	3.3
12.	Others	16.6

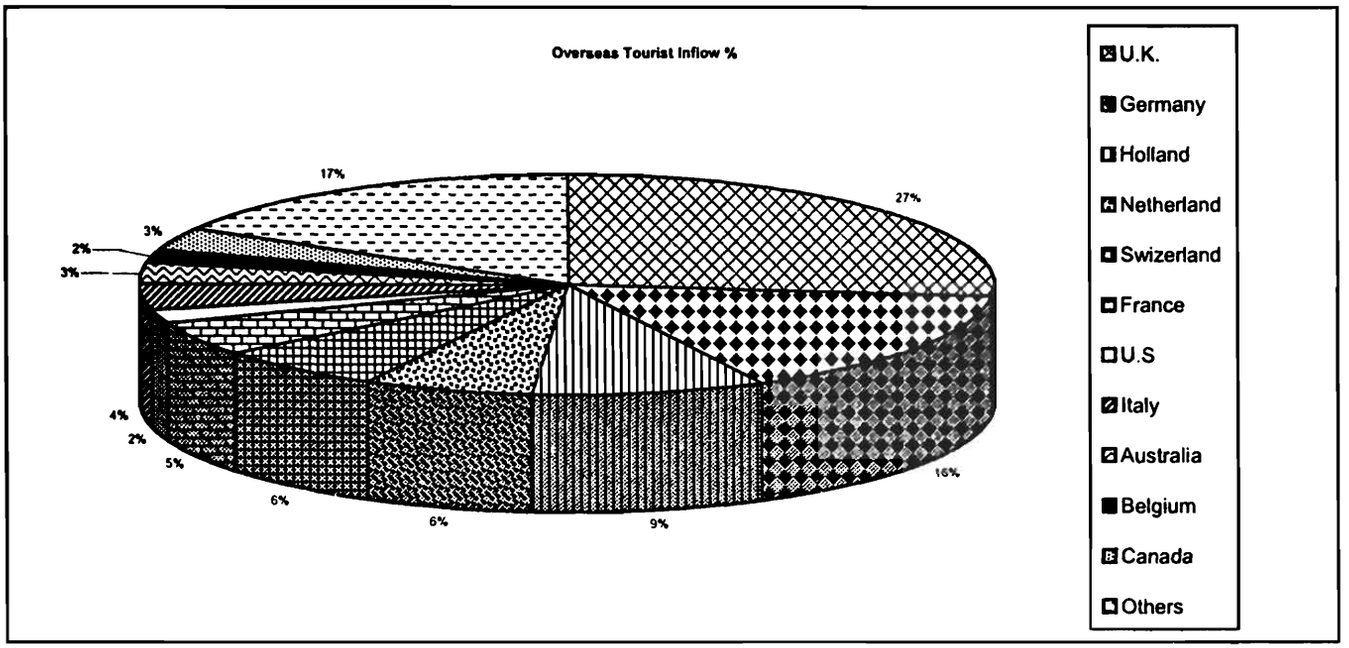


Fig. 18. Graph showing overseas and Indian tourist inflow from 1993-2003

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APPENDIX

Phylum ARTHROPODA

Class CRUSTACEA

Decapoda (Crabs & Prawns)

Suborder BRACHYURA (Crabs)

Family POTAMONIDAE

**Paratelphusa jaquemonti* Ratham

Suborder MACRURA (Prawns)

Class ARACHNIDA

Scorpionida (Scorpions)

Family BUTHIDAE

Lychas (Endotrichus) laevifrons Pocock, 1897

Family ISCHNURIDAE

**Hormurus australasiae* (Fabr., 1775)

Family SCORPIONIDAE

**Heterometrus (Gigantometrus) swammerdami* Simon, 1872

Heterometrus sp.

Araneae (Spiders)

Family ARANEIDAE

Nephila maculata (Fabricius, 1793)

Argiope catenulate (Dolecchall, 1859)

Argiope pulchella Thorell, 1881

**Tinus pirauridae*

**Hersilia savigny* (Lucas)

**Nephila maculate* (Fabricius)

**Neoscona punnasis* Tikadar

Family SALTICIDAE

Plexippus paykullii (Audouin, 1825)

Zygoballus narmadaensis Tikader, 1975

Family CLUBIONIDAE

Oedignatha microsculata Reimoser

Family OXYOPORIDAE

**Oxyopes* sp.

Family THOMISIDAE

**Thomisus* sp.

Family LYCOSIDAE

**Hipassa* sp.

Family SALTICIDAE

Plexippus paykullii (Audouin, 1825)

Zygoballus narmadaensis Tikader, 1975

Prostigmata (Ticks and Mites)

Family IXODIDAE

**Dermacentor auratus* Supino, 1897

Family TERANYCHIDAE

Schizotetranychus andropogoni (Hirst, 1926)

Family PHYTOSEIIDAE

Amblyseius coccineae Gupta, 1975

A. kalimpongensis Gupta, 1970

A. suknaensis Gupta, 1970

A. syzygii Gupta, 1975

Phytoseius macropilis (Banks, 1909)

P. kapuri Gupta, 1969

Typhlodromus homalli Gupta, 1970

Class DIPLOPODA **(Millipedes)**

2 spp. of millipedes (Under identification)

Class CHILOPODA **(Centipedes)**

Family SCOLOPENDRIDAE

Cormocephalus dentipes Pocock

Rhysia longipes longipes Newport

Class INSECTA : DICTYOPTERA **(Blattids)**

Family DEROCALYMMIDAE

Trichoblatta sericea Saussure, 1863

Family EPILAMPRIDAE

Stictolampra plicata (Navas, 1904)

Haanina auriculata (Brunner, 1865)

Family PYCNOSCELIDIDAE

Pycnoscelus surinamensis (Linnaeus, 1758)

Class INSECTA : ORTHOPTERA

(Grasshoppers, Crickets, Kotydids)

Family TETRIGIDAE

Coptotettix fossulatus Bolivar, 1987
Hedotettix gracilis (De Haan, 1842)
Ergatettix dorsifera (Walker, 1871)

Suborder ENSIFERA

Superfamily GRYLLOIDEA

Family GRYLLIDAE

Gryllus bimaculatus De Geer, 1773
Teleogryllus testaceus (Walker, 1869)
Teleogryllus longipennis (Saussure, 1877)
Modicogryllus confirmatus (Walker, 1859)

Family TRIGONIDIIDAE

Trigonidium humbertianum (Saussure, 1878)

Family PYRGOMORPHIDAE

C. oxypterus (Blanchard, 1836)
Atractomorpha crenulata Fabricius, 1739

Family ACRIDIDAE

Acrida exaltata (Walker, 1859)
Phlaeoba infumata Brunner, 1893
Pterno bimaculata (Thunberg, 1815)
Clonacris sila Rehn, 1944
Eucoptacra praemorsa (Stal, 1860)
Chondracris rosea (Degeer, 1773)
C. robustus (Serville, 1839)
Tylotropidus varicernis (Walker, 1870)
Eyprepocnemis rosea Uvrov, 1942
Gerenia bengalensis Bhowmik & Haldar, 1983
Diabolocatantops sukhdae Bhowmik, 1985

Class INSECTA : DERMAPTERA (**Ear wigs**)

Family PYGIDICRANIDAEDAE

Subfamily DIPLATYINAE

Diplatys tikaderi Srivastava
Diplatys chowdhuryi

Family LABIDURIDAE

Subfamily NALINAE

Nala lividipes (Dufour, 1820)

Class INSECTA : ISOPTERA (**Termites**)

Family TERMITIDAE

Speculitermes cyclops Wasmann, 1902

Microcerotermes annandalei Silvestri, 1923

Speculitermes sinhalensis Roonwal & Sen-Sarma, 1960

Odontotermes assmuthi Holmgren, 1913

**Danaus genutia* (Cramer, 1779)

O. bellahunisensis Holmgren & Holmgren, 1917

O. microdentatus Roonwal & Sen-Sarma, 1960

Class INSECTA : EPHEMEROPTERA **(May flies)**

Family EPHEMERIDAE

Ephemera sp.

Family HETAGENIDAEDAE

Rhithrogena parva (Ulmer, 1969)

Class INSECTA : ODONATA **(Dragon flies)**

Family LIBELLULIDAE

**Potamarcha obscura* (Rambur, 1842)

Potamarcha congener (Rambur)

Pantala flavescens (Fabricius, 1798)

**Trithemis festiva* (Schneider, 1936)

Family COENAGRIONIDAE

**Cercion malayanum* Selys

**Cercion calamorum dyeri* Fraser

**Onychargia atrocyana* Selys

**Aciagrion* sp.

Family LESTIDAE

**Lestes viridulus* Ramber

**Disparoneura* sp.

Family AESHNIDAE

**Anax imperator* Leach

Class INSECTA : HEMIPTERA (Bugs)

**Nepa cinerea*

Class INSECTA : LEPIDOPTERA (Butterflies)

Family PAPILIONIDAE (Swallow tails)

Graphium doson eleius (Frushstorfer, 1939)

**Graphium antiphates naira* (Moore, 1939)
Graphium nomius nomiu (Esper, 1939)
**Papilio clytia clytia* (Linnaeus, 1758)
**Papilio polytes* Linnaeus
**Princeps nephelus nephelus* (Boisduval, 1836)
P. polymnestor polymnestor (Cramer, 1775)
P. polytes romulus (Cramer, 1775)
P. chaon chaon Westwood
**P. demoleus demoleus* (Linnaeus, 1758)
**Pachlipata aristolochiae* Fabricius

Family PIERIDAE (White &Yellows)

**Delias eucharis* Drury
**Eurema hecabe* (Linnaeus, 1881)
**Eurema brigitta* (Wallace, 1867)
**Catopsilia pyranthe* (Linnaeus, 1758)

Family NYMPHALIDAE (Brush-footed butterflies)

**Neptis hylas* Moore, 1772
**Junonia lemonias* Linnaeus, 1912
**Junonia hierta* Fabricius, 1798
**Junonia orithya* Butler, 1885
**Junonia almana* Linnaeus, 1758
**Danaus genutia* (Cramer, 1779)
**Danaus chrysippus* (Linnaeus, 1758)
**Euploea core* (Cramer, 1780)
**Charaxes polyxena imna* (Bulter)
**Euthalia lepidea miyana* Frushtorfer, 1913
**Euthalia garuda anagama* Frushtorfer
Cyrestis thyodamus Boisduval, 1836
**Hypolimnas missippus* (Linnaeus, 1758)
**Hypolimnas bolina* (Linnaeus, 1764)
**Precis almana almana* (Linnaeus, 1758)
**Precis atlitis* (Linnaeus, 1763)
**Precis hierata hierata* (Fabricius, 1798)
**Phalanta Phalanta Phalanta* (Drury, 1770)
Mycalesis perseus tubitha (Fabricius, 1947)

Ypthima ceylonica hubneri Kirby, 1871

Ergolis ariadnae Linnaeus

Melanitis leda ismena Linnaeus

Vagrans egista sinha (Kollar)

Tanaecia lepidea Butler

Family LYCAENIDAE **(Blues)**

Zizina otis Murray, 1874

Family HESPRIIDAE **(Skippers)**

Badamia exclamationis Fabricius

Class INSECTA : COLEOPTERA **(Beetles)**

Family CHRYSOMELIDAE

Monalepta signata (Oliver, 1808)

Aphthona nigrilabris Duviver, 1892

**Phyllotretu chotanica* Duviver, 1892

Class INSECTA : HYMENOPTERA **(Bees)**

Family APIDAE

**Apis indica*

Class INSECTA : DIPTERA **(Mosquitoes, Flies)**

Family TABANIDAE

Chrysops pellucidus Fabricius, 1805

Family SYRPHIDAE

Phytomia errans Fabricius, 1787

Family SEPSIDAE

Sepsis indica Wiedemann, 1824

Family MUSCIDAE

Orthelia coerulea Wiedemann, 1819

Family CALLIPHORIDAE

Hemipyrellia pulchra Wiedemann, 1830

Inventory of Invertebrate faunal diversity. While double ** preceding species name indicates first report of distributional record from the state/protected areas. A single * preceding species name implies first record from the reserve.

FISHES

Name of species	Common Name	Status
Order SILURIFORMES		
Family BAGRIDAE		
Mystus senghala (Sykes)	Giant river catfishAdi	F,O
M. aor (Hamilton)	Long whiskered catfishAlli	F,O
Family SILURIDAE		
Eutropiichthys vacha (Hamilton & Buchanan)	Bat Bacha	F,O
Wallago attu (Schneider)	Balia	F,O,G
Ailia coila	Banaspatri	F,O
Family AMBLYCIPITIDAE		
Amblyceps mangois (Hamilton)		F,O
Order MASTACEMBELLIFORMES		
Family MASTACEMBELIDAE		
Mastacembelus aculeatus (Hamilton)	Tudi	F,O
Mastacembelus panchalus (Hamilton)	Bainri	
Family CLARIIDAE		
Clarius batrachus (Linnaeus)	Magur	C,F,O
Family ANABANTIDAE		
Anabas scandens	Kau	F,O
Family HETEROPNEUSTIDAE		
Heteropneustus fossilis (Bloch)	Singhi	C,F,O
Order CYPRINIFORMES		
Family CYPRINIDAE		
Catla catla (Hamilton & Buchanan)	Bhakur	C,F,O
Cyprinus carpio Linnaeus	Bilati Rohi	C,F
Osteobrama vigorsii (Sykes)	Chilanti	F,O
**Rasbora daniconius*	Dandei	F,O
**Danio rerio* (Hamilton & Buchanan)		F,O
**Chela fasciata* Silas		F,O
**Garra mullya* Sykes		F,O

Name of species	Common Name	Status
Tor tor (Hamilton)	Mahaseer	F,G,O
Tor putitora (Hamilton)		F,G,O
Cirhina mrirgala (Hamilton & Buchanan)	Mirkali	C,F,O
**Labeo bata* (Hamilton & Buchanan)	Pohala	C,F,O
**Puntias ticto* (Hamilton & Buchanan)	Putia	F,O
**P. sophore*		
**P. punctatus*		F,O
P. sarana (Hamilton)	Sema	C,F,O
Labeo rohita (Hamilton & Buchanan)	Rohi	C,F,O
Labeo calbasu (Hamilton & Buchanan)	Kalabainsi	C,F,O
Esomus danricus (Hamilton)		F,O
Family COBITIDAE		
**Lepidocephalus thermalis*		F,O
**Lepidocephalus guntea*		F,O
Family BALITORIDAE		
**Nemacheilus* sp.		
Order OESTEOGLOSSIFORMA		
Family NOTOPTERIDAE		
Notopterus chital	Chital	C,F,O
Order SYMBRANCHFORMES		
Family SYMBRANCHIDAE		
Amphipnous cuchia	Cuchia	F,O
Order CHANNIFORMES		
Family CHANNIDAE		
Channa marulius (Hamilton & Buchanan)	Sahala	C,F,O
Channa striatus (Bloch)	Seol	C,F,O
C. punctatus (Bloch)		C,F,O
**C. orientalis*		F,O

Single * preceding species name indicates new distributional records/reports on taxa, following present study. ** preceding species name are first records/reports from P.A. by Wildlife Research Wing, Forest Dept. Orissa. In all, 9 spp. of fishes form new records. Common names and related details follow. F food, O ornamental, C cultivable, G games, *etc.*

AMPHIBIA

Name of species	Common Name	Status	Distribution
	Order ANURA		
	Family BUFONIDAE		
**Bufo melonostictus* (Schneider, 1799)	Common Indian Toad	Common	Commonly occurring
	Family MICROHYLIDAE		
**Microhyla ornata* (Dum. & Bibr.)	Ornate Frog	Rare	Chahala, Gurguria
Ramnella variegata Stoliczka, 1872	Variable Ramanella	Rare	
Uperodon systoma (Schneider, 1799)	Marbelled Baloon Frog	Uncommon	
	Family RANIDAE		
**Euphylyctis cyanophlyctis* Schneider, 1799 [=*Rana cyanophlyctis*]	Indian Skipper Frog	Sch. IV	Commonly occurring
Hoplobatrachus crassus Jerdon, 1853 [=*Rana crassa*]	Jerdons Frog	Common	Commonly occurring
H. tigerina Daudin, 1802 [=*Rana tigerina*]	Indian Bull Frog	Sch. IV	Commonly occurring
Liminonectes keralensis Dubois, 1980	Dubois Hill Frog	Rare	Lulung
**Rana limnocharis*	Paddy Field Frog	Sch. IV	Jenabil, Lulung
Tomoptecna rolandae Dubois, 1983	Burrowing Frog	Rare	
	Family RHACOPHORIDAE		
**Polypedates maculatus* (Gray)	Tree Frog		Commonly occurring
**Philautus similipalensis* (Dutta, 2003)	Bush Frog		Lulung

REPTILES

Name of species	Common Name	Status	Habit	Distribution
	Order CHELONIA			
	Family BATAGURIDAE			
Melanochelys trijuga indopeninsularis	Indian Pond Terrapin	Moderate	Aquatic	Devasthali, Patabil
**Lissemy punctata punctata* Bonnaterre, 1789	Indian Flapshell Turtle	Sch. I	Aquatic	Deo River
**Kachuga tentoria tentoria* Gray, 1843	Indian Tent Turtle	Moderate	Aquatic	
	Order CROCODILIA			
	Family CROCODILIDAE			
**Crocodylus palustris* (Lesson, 1834)	Mugger Crocodile	Sch. I	Aquatic	Devathali, UBK, Nuagoan
	Order SQUAMATA			
	Family GEKKONIDAE			
**Hemidactylus flaviviridis* (Ruppell, 1840)	Northern House Gecko	Common	Terrestrial	
H. leschenaulti (Dum. & Bibron, 1836)	Bark Gecko	Moderate	Terrestrial	
H. brooki Gray, 1845	Brook's Gecko	—	Terrestrial	
**H. frenatus* (Dum. & Bibron,1836)	Smooth House Gecko	—	Terrestrial	
Cyrtodactylus sp.	Banded Rock Gecko	Moderate	Terrestrial	
	Family AGAMIDAE			
**Calotes versicolor* (Daudin, 1803)	Common Garden Lizard	Common	Arboreal	Chahala
C. rouxii	Forest Calotes	Moderate	Arboreal	Hatighar, Champaghar
**Psammophilus blanfordnus* (Stoliczka)	Rock Lizard	—	Arboreal	Jenabil
Chameleon zeylanicus Laaurenti, 1768	Chameleon	Sch. II	Arboreal	

Name of species	Common Name	Status	Habit	Distribution
	Family SCINCIDAE			
**Riopa punctata*	Snake Skink	Common	Fossorial	Jumbo
**Mabuya carinata* (Schneider, 1801)	Common Skink	Common	Fossorial	Chahala
**M. macularia* (Blyth)	Striped Skink	—	Fossorial	Joranda
**Lygosoma albopunctata* (Gray, 1846)	Sand Snake	—	Fossorial	Jumbo
	Family VARANIDAE			
Varanus bengalensis (Daudin, 1802)	Large Bengal Monitor	Sch. II	Terrestrial	
	Family TYPHLOPIDAE			
**Typhlina bramina* (Daudin, 1803)	Common Worm Snake	Sch. IV	Fossorial	
Typhlops diardi (Smith)	Blind Snake	Sch. IV	Fossorial	
	Family BOIDAE			
Python molurus (Linnaeus, 1758)	Indian Python	Sch. I	Arboreal	
Eryx conicus (Schneider, 1801)	Common Sand Boa	Sch. IV	Fossorial	
	Family DIPSADIDAE			
Lycodon aulicus (Linnaeus, 1758)	Common Wolf Snake	Sch. IV	Terrestrial	
Family	NATRICIDAE			
Amphiesma stolata (Linnaeus, 1758)	Stripped Keelback	Sch. IV	Semi-aquatic	
Macripisthodon plumbicolor (Cantor, 1839)	Green Keelback	Sch. IV	Semi-aquatic	
	Family COLUBIRADAE			
Psammodynastes pulverulentus (Boi)			Terrestrial	
Ptyas mucosus (Linnaeus, 1758)	Rat Snake	Sch. II	Terrestrial	
Dendrelaphis tristis (Daudin, 1803)	Bronzeback Tree Snake	Sch. IV	Arboreal	

Name of species	Common Name	Status	Habit	Distribution
Ahaetulla nasutus (Lacepede, 1789)	Vine Snake	Sch. IV	Arboreal	
Xenochropis piscator (Schneider, 1799)	Checkerd Keelback Water Snake	Sch. II	Semi-aquatic	
Chrysopelea ornata (Shaw, 1802)	Flying Snake/ Golden Tree Snake	Sch. IV	Arboreal	
	Family ELAPHIDAE			
Bungarus caeruleus (Schneider, 1801)	Common Krait	Sch. IV	Terrestrial	
B. fasciatus (Schneider, 1801)	Banded Krait	Sch. IV	Semi-aquatic	
Naja naja naja (Linnaeus, 1758)	Spectacled Cobra	Sch. II	Terrestrial	
Naja naja kaouthia (Lesson, 1831)	Momocled Cobra	Sch. II	Terrestrial	
Ophiophagus hanah (Cantor, 1836)	King Cobra	Sch. II	Terrestrial	
	Family VIPERIDAE			
Trimeresurus gramineus (Shaw, 1802)	Bamboo Pit Viper	Sch. IV	Terrestrial	

AVES

Name of species	Common Name	Status	Habit	Food Habit	Distribution
	Order PODICIPEDIFORMES				
	Family PODICIPEDIDAE				
Podiceps ruficollis (Pallas)	Little Grebe	Sch. IV	WM	Fishes	Jheels, Streams
	Order PELICANIFORMES				
	Family PHALACROCORACIDAE				
**Phalacrocorax niger* (Vieillot)	Little Cormorant	Sch. IV	R	Fishes	Jheels, Streams

Name of species	Common Name	Status	Habit	Food Habit	Distribution
	Order CICONIIFORMES				
	Family ARDEIDAE				
Ardeola striatus (Linnaeus)	Little Green Heron	Sch. IV	R		
**A. grayii* (Sykes)	Pond Heron	Sch. IV	R	Fish, frog, crab	Jheels, Streams, Mudflats
**Bubulcus ibis* (Linnaeus)	Cattle Egret	Sch. IV	R	Insects, frogs	Grazing animals
**Area alba* Linnaeus	Large Egret	Sch. IV	R		
Ixobrychus cinnamomeus (Gmelin)	Chestnut Bittern	Sch. IV	LM		Swamps, paddy fields
Ixobrychus sinensis (Gmelin)	Yellow Bittern	Sch. IV	R		Swamps, paddy fields
Ixobraychus flavicollis (Latham)	Black Bittern	Sch. IV	R		Swamps, seepage nullahs
	Order FALCONIFORMES				
	Family ACCIPITRIDAE				
Elanus caeruleus (Desfontaines)	Blackwinged Kite	—	R	Lizard, mice, frog	Deciduous forests, grasslands
Pernis ptilorhynchus (Temminck)	Honey Buzzard	—	LM	„	
Milvus migrans (Boddaert)	Pariah Kite	—	R	Lizard, mice	Human habitation
Accipiter badius (Gmelin)	Shikra	Sch. I	R	„	Open deciduous
Butastur teesa (Franklin)	White-eyed Buzzard-Eagle	Sch. I	R,E	„	Thin deciduous, scrubs
Spizaetus cirrhatus (Gmelin)	Crested Hawk-Eagle	Sch. I	R	—	Deciduous, evergreen forests
Aquila rapax (Temminck)	Tawny Eagle	Sch. I	M	Dead animals	Open scrubs, plains, cultivated lands

Name of species	Common Name	Status	Habit	Food Habit	Distribution
Sacrogyps calvus (Scopoli)	King Vulture	Sch. IV	R,LM	„	Deciduous, Semi-deciduous
Gyps indicus (Scopoli)	Longbilled Vulture	Sch. IV	R	—	Deciduous forests
Gyps bengalensis (Gmelin)	Whitebacked Vulture	Sch. IV	R	—	Open country side
Circus cyaneus (Linnaeus)	Hen-Harrier	Sch. I	M	Lizard, mice & frog	
Spilornis cheeta (Latham)	Crested Serpent Eagle	Sch. I	R	„	Hills, plains
	Family FALCONIDAE				
Falco peregrinus Tunstall	Shahin Falcon	Sch. I	Rare,R	Lizard, mice & insects	Hills, plains, scrubs
F. chiquera Daudil	Redheaded Merlin	Sch. I	R	„	Plains, foothills
F. tinnunculus Linnaeus	Kestrel	Sch. IV	LM	„	Hills, plains
	Order ANSERIFORMES				
	Family ANATIDAE				
Nettapus coromandelianus (Gmelin)	Cotton Teal	Sch. IV	LM	Insects & crustaceans	—
Tadorna tadorna (Linnaeus)	Common Shelduck	Sch. IV	M	„	—
	Order GALLIFORMES				
	Family PHASIANIDAE				
**Pavo cristatus* (Linnaeus)	Indian Peafowl	Sch. I	R,E	Insects, snakes & lizards	Deciduous, dense scrub
**Gallus gallus* (Linnaeus)	Red Jungle Fowl	Sch. IV	R	„	
Francolinus francolinus (Linnaeus)	Black Partridge	Sch. IV	Rare, R	Grains & green shoots	Tall grass, scrub
Coturnix coturnix (Linnaeus)	Common Quail	Sch. IV	M	„	Grasslands, crops

Name of species	Common Name	Status	Habit	Food Habit	Distribution
Perdicula erythrorrhynchua (Sykes)	Painted Brush Quail	Sch. IV	R,E	Grains, insects	Foothills with cultivation
**Galloperdix spadiacea* (Gmelin)	Red Spur-Fowl	Sch. IV	Rare, R,E	Seeds, berries, insects	Deciduous, scrubs
	Order GRUIFORMES				
	Family TURNICIDAE				
Turnix succitator (Gmelin)	Common Bustard-Quail	Sch. IV	R	Seeds, berries & insects	Light deciduous, partial scrub
	Order CHARADRIIFORMES				
	Family JACANIDAE				
Hydrophasianus chirurgus (Scopoli)	Pheasant-Tailed Jacana	Sch. IV	R	Insects & molluscs	Jheels, streams & tanks
Metopidius indicus (Latham)	Bronze-winged Jacana	Sch. IV	R	Insects & molluscs	& tanks Jheels, streams
	Family ROSTRATULIDAE				
Rostratula benghalensis (Linnaeus)	Painted Snipe	Sch. IV	R	Grains, molluscs	Jheels, swamps & worms
	Family RECURVIROSTRIDAE				
Haimantopus haimantopus (Linnaeus)	Black-Winged Stilt	Sch. IV	M	Worms, molluscs & insects	Jheels, marshes
	Family BURHINIDAE				
Burhinus oedicnemus (Linnaeus)	Stone Curlew	Sch. IV	R	Insects & worms	Ploughed lands, fallow land
	Family GLAREOLIDAE				
Cursorius cursor (Latham)	Cream Coloured Courser	Sch. IV	R		
	Family CHARADRIIDAE				
Vanellus indicus (Boddaert)	Red Wattled Lapwing	—	R	Insects & molluscs	Tanks, puddles

Name of species	Common Name	Status	Habit	Food Habit	Distribution
V. spinosus (Linnaeus)	Spur Winged Plover	Sch. IV	R	Insects & crabs	Sand banks
V. malabaricus (Boddaert)	Yellow-Wattled Lapwing	—	R,L M,E	Molluscs & worms	Fallow land
Vringa hypoleucos (Linnaeus)	Common Sandpiper	Sch. IV	M	Insects, molluscs, worms	
	Order COLUMBIFORMES				
	Family COLUMBIDAE				
Treron pompadora (Gmelin)	Grey Fronted green Pigeon	Sch. IV	R,V	Fruits, figs, berries	Evergreen, wet deciduous forests
T. curvirostra (Gmelin)	Thick Billed Green Pigeon	Sch. IV	R		
T. bicincta (Jerdon)	Orange Breasted Green Pigeon	Sch. IV	R		Evergreen, moist deciduous forests
T. phoenicoptera (Latham)	Green Pigeon	Sch. IV	M	Fruits & berries	Banyan, Peepal trees
Columba punicea (Blyth)	Purple Wood Pigeon	Sch. IV	Rare	Grains & seeds	Open mixed, deciduous forests
Streptopelia orientalis (Latham)	Rufous Turtle Dove	Sch. IV	R		Open scrub
S. tranquebarica (Hermann)	Red Turtle Dove	Sch. IV	R		Open scrub, cultivated lands
S. dicaocto (Frevaldszky)	Ring Dove	Sch. IV	R		Open scrub, cultivated lands
S. chinensis (Scopoli)	Spotted Dove	Sch. IV	R		Open scrub
S. senegalensis (Linnaeus)	Little Brown Dove	Sch. IV	R	Pulp	Cactus, scrubs

Name of species	Common Name	Status	Habit	Food Habit	Distribution
Chalcophaps indica (Linnaeus)	Emerald Dove	Sch. IV	Rare, R,V	Seeds & berries	Deciduous, evergreen forests
	Order PSITTACIFORMES				
	Family PSITTACIDAE				
Psittacula eupatria (Linnaeus)	Alexandrine Parakeet	Sch. IV	R		Cultivated lands
**P. krameri* (Scopoli)	Rose ringed Parakeet	Sch. IV	R		Cultivated lands
P. cyanocephala (Linnaeus)	Blossom Headed Parakeet	Sch. IV	LM,E		Fruiting trees
Loriculus vernalis (Sparrman)	Indian Lorikeet	Sch. IV	LM	Fruits, figs & nectars	Fruiting trees
	Order CUCULIFORMIS				
	Family CUCULIDAE				
Clamator coromandus (Linnaeus)	Red Winged Crested Cuckoo	Sch. IV	M		
C. jacobinus (Boddaert)	Pied Crested Cuckoo	Sch. IV	LM	Caterpillar & berries	Lowlands, hills
Cuculus sparverioides Vigors	Large Hawk Cuckoo	Sch. IV	R		Hill sides, valleys
C. varius Vahl	Common Hawk Cuckoo	Sch. IV	LM,E	Caterpillar & insects	Human habitations, groves
C. micropterus Gould	Indian Cuckoo	Sch. IV	R,V		Deciduous forests
**C. canorus* Linnaeus	Cuckoo	Sch. IV	M		Hill regions
C. poliocephalus Latham	Small Cuckoo	Sch. IV	M		Well-wooded forests
Cacomantis sonnerati (Latham)	Banded Bay Cuckoo	Sch. IV	M		Evergreen, Deciduous
C. passerinus (Vahl)	Plaintive Cuckoo	Sch. IV	R	Caterpillar & bugs	Scrubs
Surniculus lugubris (Horsfield)	Drongo Cuckoo	Sch. IV	R		Plantations, open forests

Name of species	Common Name	Status	Habit	Food Habit	Distribution
**Eudynamys scolopacea* (Linnaeus)	Koel	Sch. IV	R	Fruits, berries & insect	Groves, fruiting trees
Rhopodytes viridirostris (Jerdon)	Small Green Billed Malkoha	—	Rare, R,E		Insects & lizard
R. tristis (Lesson)	Large Green Billed Malkoha	—	R		
Tocacua leschenaultii Lesson	Sirkeer Cuckoo	Sch. IV	Rare, R,E	Fruits, berries & insect	Deciduous, scrubs
Centropus sinensis (Stephens)	Croe Pheasant	—	R	Insects, lizard & mice	Open scrubs, grasslands
	Order STRIGIFORMES				
	Family STRIGIDAE				
Otus scops (Linnaeus)	Scops Owl	Sch. IV	R		Deciduous forests
O. bakkamoena Pennant	Collared Scops Owl	Sch. IV	R		Deciduous forests
Bubo bubo (Linnaeus)	Eagle Owl	Sch. IV	R	Frog, fish, crab & birds	Rocky hills
B. crormandus (Latham)	Dusky Horned Owl	Sch. IV	R		Groves, dense
B. zeylonensis (Gmelin)	Brown Fish Owl	Sch. IV	R	Frog, fish, crab & birds	Ancient trees
Glaucidium radiatum (Tickell)	Barred Jungle Owlet	Sch. IV	R,E	Insects	Bamboo jungles
Nene cutulata (Raffles)	Brown Hawk Owl	Sch. IV	Rare, R	Insect, frog, mice & lizard	Well-wooded forests
Athene brama (Temminck)	Spotted Owlet	Sch. IV	R	Insect, mice & lizard	Groves, human habitation
Strix leptogrammica Temminck	Brown Mottled Wood Owl	Sch. IV	R		Evergreen, moist deciduous forest

Name of species	Common Name	Status	Habit	Food Habit	Distribution
Asio flammeus (Pontoppidan)	Shorteared Owl	Sch. IV	R		Tall grasses near jheels
Tyto alba (Scopoli)	Barn Owl	Sch. IV	R	Rats & mice	Deserted trees
	Order CAPRIMULGIFORMES				
	Family CAPRIMULGIDAE				
**Caprimulgus indicus* Latham	Indian Jungle Nightjar	Sch. IV	R		Open scrub jungle
C. macrurus Horsfield	Long tailed Nightjar	Sch. IV	R	Beetles & moths	Evergreen, moist deciduous forest
C. asiaticus Latham	Indian Nightjar	Sch. IV	LM		Scrubs, human habitations
C. affinis Horsfield	Franklin's Nightjar	Sch. IV	LM		
	Order APODIFORMES				
	Family APODIDAE				
Chaetura sylvatica (Tickell)	White Rumped Spine Tail	—	R,E		Evergreen, moist deciduous forest
**Apus affinis* (J.E. Gray)	House Swift	—	R	Insects	Deserted, ancient trees
**Cypsiurus parvus* (Lichtenstein)	Palm Swift	—	R	Insects (flies)	Palm trees near jheels
Hemiprocne longipennis (Rafinesque)	Crested Swift	—	R	Winged insects	Deciduous forests
	Order TROGONIFORMES				
	Family TROGONIDAE				
Harpactes fasciatus (Pennant)	Malabar Trogon	Sch. IV	R,E	Caterpillar & berries	Evergreen, moist deciduous forest

Name of species	Common Name	Status	Habit	Food Habit	Distribution
	Order CORACIIFORMES				
	Family ALCEDINIDAE				
**Alcedo atthis* (Linnaeus)	Small Blue Kingfisher	Sch. IV	R	Fish, tadpole, & lizard	Streams, ponds
**Halcyon smyrnensis* (Linnaeus)	White Breasted Kingfisher	Sch. IV	R	Fish, tadpole, & lizard	Streams, nullahs
	Family MEROPIDAE				
Merops leschenaulti Vieillot	Chestnut-headed Bee-eater	—	R		Mixed deciduous forests
M. philippinus (Linnaeus)	Bluetailed Bee-eater	—	V		Well-wooded near jheels
**M. orientalis* (Latham)	Green Bee-eater	—	LM	Diptera, Hymenoptera	Open/ Cultivated land
Nyctyornis athertoni (Jardine & Selby)	Bluebeared Bee-eater	—	R		Evergreen, moist deciduous forests
	Family UPUPIDAE				
**Upupa epops* Linnaeus	Hoopoe	—	R,LM	Insects & pupae	Plains, hills, cultivated lands
Tokus birostris (Scopoli)	Common Grey Hornbill	Sch. IV	R,E	Fruits, insects, mice	Peepal, Banayan trees
Anthracoceros malabaricus (Gmelin)	Large Pied Hornbill	Sch. I	R		
	Family CORACIIDAE				
Coracias benghalensis Linnaeus	Indian Roller	Sch. IV	R		Groves, deciduous forests
	Order PICIFORMES				
	Family CAPITONIDAE				
Megalaima haemacephala (P.L.S. Muller)	Crimson Breasted Barbet	Sch. IV	Rare, R	Figs, berries, insects	Humid forest tracts

Name of species	Common Name	Status	Habit	Food Habit	Distribution
M. asiatica (Latham)	Blue Throated Barbet	Sch. IV	R	Figs, berries, insects	Groves
M. zeylanica (Gmelin)	Large Green Barbet	Sch. IV	R,E		Moist/dry deciduous forests
M. lineata (Vieillot)	Lineated Barbet	Sch. IV	R		
	Family PICIDAE				
Hemicirus canente (Lesson)	Heart Spotted Woodpecker	Sch. IV	R	Ants, termites, grubs	Moist deciduous forests
Picumnus innominatus Burton	Speckled Piculet	Sch. IV	R		Moist deciduous forests
Micropternus brachyurus (Vieillot)	Rufous Woodpecker	Sch. IV	Rare	Figs, ants, pupae	Evergreen forests
Dinopium benghalense (Linnaeus)	Golden Backed Woodpecker	Sch. IV	R,E	Bettles, insects	Thin deciduous forest
Picoides maci (Vieillot)	Fulvous Breasted Pied Woodpecker	Sch. IV	R		Plains, hills
P. marhattensis (Latham)	Yellow Fronted Pied Woodpecker	Sch. IV	R	Insects	Plains, foothills
Chrysocolaptes festivus (Boddaert)	Black Backed Woodpecker	Sch. IV	R,E		Foothills
C. lucidus (Scopoli)	Large Golden Woodpecker	Sch. IV	Rare, R		Moist deciduous forests
	Order PASSERIFORMES				
	Family PITTIDAE				
Pitta brachyura (Linnaeus)	Indian Pitta	—	Rare, R,E	Insects	Scrub forests

Name of species	Common Name	Status	Habit	Food Habit	Distribution
	Family ALAUDIDAE				
Mirafra javanica Horsefield	Singing Bush Lark	Sch. IV	R		Foothills, grasslands
M. assamica Horsfield	Bush Lark	Sch. IV	R		Scrub forests, fallow land
M. erythroptera Blyth	Redwinged Bush Lark	Sch. IV	R,E		Scrub forests, fallow land
Eremopterix grisea (Scopoli)	Ashy-crowned Finch Lark	Sch. IV	R,E		Wasteland, grazing grassland
Calandrella cinerea (Gmelin)	Short-toed Lark	Sch. IV	R		Cultivated, grassland
Alauda gulgula (Franklin)	Eastern Sky Lark	Sch. IV	R	Seeds, insects	Grassy hill tops
	Family HIRUNDINIDAE				
Riparia ripari (Linnaeus)	Collared Sand Martin	—	M	Insects	
Hirundo concolor (Sykes)	Dusky Crag Martin	—	R	„	Rocky hills
H. rustica (Linnaeus)	Swallow	—	M	„	Near jheels, rivers
H. smithii (Leach)	Wire Tailed Swallow	—	M	„	Near jheels, rivers
H. daurica Linnaeus	Redrumped Swallow	—	M	„	Rocky hills, cultivated land
**Delichon urbica* (Linnaeus)	House Martin	—	R	„	Valleys, grassy hill sides
	Family LANIIDAE				
Lanius cristatus Linnaeus	Brown Shrike	—	WM		Scrubs, grasslands
Lanius schach Linnaeus	Rufous Backed Shrike	—	WM		

Name of species	Common Name	Status	Habit	Food Habit	Distribution
	Family ORIOLIDAE				
**Oriolus oriolus* (Linnaeus)	Golden Oriole	Sch. IV	R	Insects, fruit, berries	Semi-evergreen forests
**O. xanthornus* (Linnaeus)	Blackheaded Oriole	Sch. IV	R	Insects, fruit, berries	Deciduous forests
	Family DICRURIDAE				
**Dicrurus adsimilis* (Bechstein)	Black Drongo	Sch. IV	R	Insects, nectar	Cultivated lands
D. leucopheus Vieillot	Ashy Drongo	Sch. IV	R	,,	Grooves
D. caerulescens (Linnaeus)	White-bellied Drongo	Sch. IV	Rare, E	,,	Moist deciduous forest
D. aeneus (Vieillot)	Bronzed Drongo	Sch. IV	R	,,	,,
D. hottentottus (Linnaeus)	Hair Crested Drongo	Sch. IV	R	,,	,,
D. paradiseus (Linnaeus)	Greater Racket-tailed Drongo	Sch. IV	Rare, R	,,	Evergreen forests
	Family CAMPEPHAGIDAE				
Tephrodornis virgatus (Temminck)	Large Wood Shrike	—	R		
T. pondicirianus (Gmelin)	Wood Shrike	—	R	Bettle, moth, caterpillar	Scrub forest
Coracina novaehollandiae (Gmelin)	Large Cuckoo Shrike	—	R	Insects, berries	Deciduous forest
C. melaschristos (Hodgson)	Grey Cuckoo Shrike	—	M	,,	,,
C. melanoptera (Riipell)	Black Headed Cuckoo Shrike	—	M,E	,,	,,
Hemipus picatus (Sykes)	Pied Flycatcher Shrike	—	M	,,	Moist deciduous forest

Name of species	Common Name	Status	Habit	Food Habit	Distribution
Pericrocotus flammeus (Froster)	Scarlet Minivet	Sch. IV	R	Insects, larvae	Deciduous forest
P. roseus (Viellot)	Rosy Minivet	Sch. IV	M	„	„
P. cinnamomeus (Linnaeus)	Small Minivet	Sch. IV	Rare	Insects, larvae	Evergreen forest
	Family ARTAMIDAE				
Artamus fuscus Vieillot	Ashy Swallow Shrike	—	R	Beetles, butterflies	Palm, date trees
	Family STURNIDAE				
Sturnus malabaricus (Gmelin)	Grey Headed Myna	Sch. IV	R	Berries, figs, nectar, insects	Open forest
S. pagodarum (Gmelin)	Black Headed Myna	Sch. IV	R,E	„	„
**S. contra* (Linnaeus)	Pied Myna	Sch. IV	R	„	„
Acridotheres tristis (Linnaeus)	Common Myna	Sch. IV	R	„	Human habitation
A. fuscus (Wagler)	Jungle Myna	Sch. IV	R	„	Thin-wooded forest
Gracula religiosa Linnaeus	Hill Myna	Sch. IV	R	„	Foothills
	Family CORVIDAE				
Dendrocitta vagabunda (Latham)	Indian Tree Pied	Sch. IV	R,V	Fruits, insects, frogs	Moist deciduous forest
D. formosa Swinhoe	Himalayan Tree Pied	Sch. IV	R		„
**Corvus splendens* Vieillot	House crow	Sch. IV	R	Omnivorous	Human habitations
**C. macrorhynchus* Wagler	Jungle Crow	—	R	„	„
	Family IRENIDAE				
Aegithina tiphia (Linnaeus)	Common Iora	Sch. IV	M, Rare	Insects	Deciduous forests
Chloropsis aurifrons (Temmnick)	Goldfronted Chloropsis	Sch. IV	R		„
C. cochichinensis' (Gmelin)	Goldmantled Chloropsis	Sch. V	R		Evergreen forest

Name of species	Common Name	Status	Habit	Food Habit	Distribution
	Family PYCNONOTIDAE				
Pycnonotus melanicterus (Gmelin)	Blackheaded Yellow bulbul	Sch. IV	Rare	Fruits, nectar & insects	Evergreen forest
P. jacosus (Linnaeus)	Redwhiskered Bulbul	Sch. IV	R	,,	Scrub forest
**P. cafer* (Linnaeus)	Redvented Bulbul	Sch. IV	R	,,	Deciduous forests
P. luteolus (Lesson)	Whitebrowed Bulbul	Sch. IV	R,E	,,	Open scrub forest
	Family MUSCICAPIDAE				
Pellorneum ruficeps Swainson	Spotted babbler	Sch. IV	R		Ravines
Trechostoma abbotti (Blyth)	Abott's Babbler	Sch. IV	R		
Stachyris rufifrons (Hume)	Redfronted Babbler	Sch. IV	R		
Dumetia hyperthra (Franklin)	Rufousbellied Babbler	Sch. IV	R,E	Nectar, insects, larvae	Grassland, scrub forest
Macronous gularis (Horsfield)	Yellow-breasted Babbler	Sch. IV	R	,,	
Chrysomma sinense (Gmelin)	Yellow-eyed Babbler	Sch. IV	R	,,	
Turdoides caudatus (Dumont)	Common Babbler	Sch. IV	R	Nectar, berries, insects	Thorny scrubs
T. malcolmi (Sykes)	Large Grey Babbler	Sch. IV	R,E	,,	Dry scrub forest
T. striatus (Dumont)	Jungle Babbler	Sch. IV	R,E	Berries, grains, insects	Deciduous forest
Alcippe poioicephala (Jerdon)	Quaker Babbler	Sch. IV	R	,,	Evergreen, moist deciduous
Pomatorhynus horsfieldii Sykes	Slatyheaded Scimitar Babbler	Sch. IV	R	,,	

Name of species	Common Name	Status	Habit	Food Habit	Distribution
Muscicapa latirostris Raffles	Brown Flycatcher	Sch. IV	M	„	Deciduous forests
M. parva Bechstein	Redbreated Flycatcher	Sch. IV	M	Flies, insects	Groves, Scrub forests
M. superciliaris (Jerdon)	Whitebrowed Blue Flycatcher	Sch. IV	WM	„	
M. poliogenys (Brooks)	Brook's Flycatcher	Sch. IV	M,E	„	
M. tickelliae (Blyth)	Tickell's Blue Flycatcher	Sch. IV	M	„	Deciduous, scrub forest
M. thalassina Swainson	Verditer Flycatcher	Sch. IV	M	„	Deciduous forest
Culicicapa ceylonensis (Swainson)	Greyheaded Flycatcher	Sch. IV	M		Evergreen forest
Rhipidura aureola (Lesson)	Whitebrowed Fantail Flycatcher	Sch. IV	R		Deciduous, scrub forests
R. albicollis Vieillot	White-throated Fantail Flycatcher	Sch. IV	R		Thick deciduous forest
Terpsiphone paradisi (Linnaeus)	Paradise Flycatcher	Sch. IV	R	Flies	
Hypothumis azurea (Boddaert)	Blacknaped flycatcher	—	R		
Cisticola juncidis (Rafinesque)	Streaked Fantail Wabler	—	M		Paddy field, grassland
Prinia hodgsonii Blyth	Franklin's Wren-Wabler	—	R		Deciduous forests
P. gracilis (Lichtenstein)	Streaked Wren-Wabler	—	R		
P. subflaba (Gmelin)	Indian Wren-Wabler	—	R	Insects	Grassland, paddy fields
P. socialis Sykes	Ashy Wren-Wabler	—	R,E	„	Deciduous, grassland, scrub forests

Name of species	Common Name	Status	Habit	Food Habit	Distribution
P. flaviventris (Delessert)	Yellowbellied Wren Wabler	—	R		
Orthotomus sutorius (Pennant)	Tailor Bird	—	R	Insects & nectar	Scrub forest, deciduous forests
Locustella certhiola (Pallas)	Grasshopper Wabler	—	M		
Acrocephallus dumetorum Blyth	Blyth's reed Wabler	—	M		Cultivated land
A. agricola (Jerdon)	Paddyfield Wabler	—	M		Cultivated land, grassland
Sylvia hortensis (Gmelin)	Orphean Wabler	—	WM		Scrub forest
Phylloscopus collibita (Vieillot)	Brown Leaf Wabler	—	M		
P. affinis (Tickell)	Tickell's leaf Wabler	—	M		Scrub forests
P. fuscatus (Blyth)	Dusky Leaf Wabler	—	M		
P. inornatus (Blyth) Wabler	Plain leaf	—	M		
P. magnirostris Blyth	Longbilled Leaf Wabler	—	WM		Evergreen forests
P. trochilloides (Sundevall)	Dull Green Leaf Wabler	—	WM		Deciduous forests
Seicirus burkii	Blackbrowed Flycatcher Wabler	—	M		
Erithacus calliope (Pallaś)	Ruby Throat	—	M		
E. svecicus (Linnaeus)	Blue Throat	—	M	Caterpillars, beetles	
Copsychus saularis (Linnaeus)	Magpie-Robin	—	R	Insects, nectar	Human habitations
C. malabaricus (Scopoli)	Shama	—	R	Insects	
Sexicoloides fulicata (Gmelin)	Black Redstart	—	M		Dry deciduous, scrub

Name of species	Common Name	Status	Habit	Food Habit	Distribution
Saxicola torguata (Linnaeus)	Stone Chat	—	M		
S. caprata (Linnaeus)	Pied Bush Chat	—	M		Grassy hill sides
Saxicoloides fulicata (Linnaeus)	Indian Robin	—	R	Insects	Dry deciduous, scrub forests
Monticola cinclorhychus (Vigor)	Blackheaded Rock Thrush	Sch. IV	M	„	Moist deciduous forests
M. solitarius (Linnaeus)	Blue Rock Thrush	Sch. IV	WM	„	Cliffs, rocky hills
Zoothera citrina (Latham)	Orange-headed Ground Thrush	Sch. IV	R		Shady ravines
Z. dauma (Latham)	Shortbilled Mountain Thrush	Sch. IV	M		Dense evergreen forests
Turdus merula Linnaeus	Blackbird	Sch. IV	R		Evergreen forests
T. unicolor Tickell	Tickell's Thrush	Sch. IV	WM, E		
	Family PARIDAE				
Parus major (Linnaeus)	Grey Tit	Sch. IV	R	Insects, fruits & seeds	Deciduous forests
P. xanthogenys Vigors	Yellow-cheeked Tit	Sch. IV	R	Insects	Mixed scrub
	Family SITTIDAE				
Sitta castanea (Lesson)	Chest-nutbilled Nuthatch	—	R		Foothills
S. frontalis Swainson	Velvetfronted Nuthatch	—	R		Deciduous
	Family MOTACILLIDAE				
Anthus hodgsoni Richmond	Indian Tree Pipit	Sch. IV	WM		Plantations
A. trivialis (Linnaeus)	Tree Pipit	Sch. IV	M		Cultivated land

Name of species	Common Name	Status	Habit	Food Habit	Distribution
A. campestris (Linnaeus)	Tawny pipit	Sch. IV	M		
A. cervinus (Pallas)	Redthroated Pipit	Sch. IV	M		
A. novaeseelandiae Gmelin	Paddyfield	Sch. IV	R	Insects	Open ground
A. similis Jerdon	Brown Rock Pipit	Sch. IV	R	„	Grassy hills, opengrounds
Motacilla indica Gmelin	Forest Wagtail	—	WM	„	Evergreen, deciduous forests
M. flava Linnaeus	Yellow Wagtail	—	WM	„	River sides, jheels
M. citreola Pallas	Yellowheaded Wagtail	—	WM	„	
M. cinerea Tunstall	Grey Wagtail	—	WM	„	
M. alba Linnaeus	Pied Wagtail	—	LM	„	River sides, jheels
M. madraspatensis Gmelin	Large Pied	—	LM,E	„	Pools, streams
	Family DICAEIDAE				
Dicaeum agile (Tickell)	Thickbilled Flowerpecker	Sch. IV	R	Berries	Deciduous, semi-evergreen forests
D. erythrorhynchos (Latham)	Tickell's Flowerpecker	Sch. IV	R,E	Berries	Deciduous forests
D. ignipectus (Blyth)	Firebreasted	Sch. IV	R	Nectar, insects	
	Family NECTARINIIDAE				
Nectarinia zeylonica (Linnaeus)	Purplerumped Sunbird	Sch. IV	R,E	Nectar	Scrub, cultivated land
Nectarinia asiatica (Latham)	Purple Sunbird	Sch. IV	R	Nectar, insects	Deciduous forests
Aethopyga ignicauda (Hodgson)	Firetailed Sunbird	Sch. IV	R		Foot hills
Aracnothera longiostris (Latham)	Little Spiderhunter	Sch. IV	R		Deciduous, evergreen forests

Name of species	Common Name	Status	Habit	Food Habit	Distribution
	Family ZOSTEROPIDAE				
Zosterops palpebrosa (Temminck)	White-eye	Sch. IV	R	Nectar, fruits	Scrub forests
	Family PLOCEIDAE				
**Passer domesticus* (Linnaeus)	House Sparrow	—	R	Grains, Insects	Scrub forests, human habitations
Petronia xanthocollis (Burton)	Yellow-throated Sparrow	—	R	Grains, seeds	Scrub forests
Ploceus philippinus (Linnaeus)	Common Baya	Sch. IV	R		Grassland, cultivated land
P. benghalensis (Linnaeus)	Blackthroated Baya	Sch. IV	LM, E		
P. manyar (Horsfield)	Streaked Weaver Bird	Sch. IV	R		Swampy area
Estrilda amandava (Linnaeus)	Red Munia	Sch. IV	LM		
Lochura malabarica (Linnaeus)	White-throated Munia	Sch. IV	R	Seeds	Grassland
L. striata (Linnaeus)	Whitebacked Munia	Sch. IV	R	„	Scrub, deciduous forests
L. kellarti (Jerdon)	Rufousbellied Munia	Sch. IV	R,E	„	Scrub, grassland
L. punctulata (Linnaeus)	Spotted Munia	Sch. IV	R	„	„
L. malacca (Linnaeus)	Blackheaded Munia	Sch. IV	R	Termites	Marshy fields
	Family FRINGILLIDAE				
Carpodacus erythrinus (Pallas)	Common Rose Finch	Sch. IV	M	Figs, insects	Bush land
	Family EMBERIZIDAE				
Emberiza melanocephala Scopoli	Blackheaded Bunting	Sch. IV	M	Grains	
E. bruniceps Brandt	Redheaded Bunting	Sch. IV	M	„	Cultivated fields
Melaphus lathami J.E. Gray	Crested Bunting	Sch. IV	M		Grasslands, Cultivated fields

MAMMALIA

Name of species	Common Name	Status	Food Habit	Distribution
	Order INSECTIVORA			
	Family SORICIDAE			
**Suncus murinus* (Linnaeus)	Grey Musk Shrew	Common	Herbivorous	Upper Barha Kamda (UBK)
	Order SCANDENTIA			
	Family TUPAIIDAE			
Anathana elliot (Waterhouse)	Common Tree Shrew			UBK, Jamuna, Devasthali
	Order PRIMATES			
	Family CERCOPITHECIDAE			
**Presbytis entellus* (Dufresne)	Hanuman Langur	Sch. II	Herbivorous	Kabatghai, Joranda
**Macaca mulatta* (Zimmermann)	Rheseus Macaque	Sch. II	Herbivorous	UBK, Joranda, Barheipani
	Order CHIROPTERA			
	Family PTEROPODIDAE			
Rousettus leschenaulti (Desmarest)	Leschenault's Rousette	Sch. V	Herbivorous	
Cynopterus sphnix (Vahl)	Short-nosed Fruit Bat	Sch. V	Herbivorous	Kaptipada
Pteropus giganteus (Brunnich)	Indian Flying Fox	Sch. V	Herbivorous	Buffer area
	Family RHINOLOPHIDAE			
Rhinolophus rouxi (Temminck)	Peninsular Horseshoe Bat		Insectivorous	
	Family VESPERTILIONIDAE			
Pipestrellus mimus Wroughton	Indian Pygmy Pipestrelle		Insectivorous	
P. coromandra	Indian Pipestrelle		Insectivorous	Human habitation
Scotophilus khuli Leach	Greater Yellow bat		Insectivorous	

Name of species	Common Name	Status	Food Habit	Distribution
	Order CARNIVORA			
	Family URSIDAE			
**Melrsus ursinus* (Shaw)	Sloth Bear	Sch. II	Omnivorous	Makabari
	Family CANIDAE			
Canis aureus Linnaeus	Asiatic Jackal	Sch. II	Scavengers	UBK, near village area
C. lupus (Sykes)	Wolf	Sch. I	Carnivorous	Kiajahari
Cuon alpinus (Pallas)	Indian Wild Dog	Sch. II	Carnivorous	UBK, Joranda, Jenabil
Vulpes bengalensis (Shaw)	Indian Fox	Sch. IV	Carnivorous	Near villages
	Family MUSTELIDAE			
**Lutra perspicillata* Geoffroy	Smooth-coated Otter	Sch. II	Carnivorous	UBK, Bhanjabasa, Joranda
Arctonyx collaris Cuvier	Hog Badger	Sch. I	Carnivorous	Jamuni
Mellivora capensis (Schreber)	Ratel	Sch. I	Carnivorous	Bhanjabas
**Herpestes edwardsi* (Geoffroy)	Common Mongoose	Sch. IV	Carnivorous	Nigirda
H. auropunctatus (Hodgson)	Small Indian Mongoose	Sch. IV	Carnivorous	
H. smithi Gray	Ruddy Mongoose	Sch. IV	Carnivorous	
	Family VIVERRIDAE			
Paradoxurs hermaphroditus (Pallas)	Common Palm Civet	Sch. II	Carnivorous	Chahala
P. jorandensis Ali	White-banded Palm Civet	Sch. II	Carnivorous	
Viverricula indica (Desmarest)	Small Indian Civet	Sch. II	Carnivorous	Joranda
Viverra zibetha Linnaeus	Large Indian Civet	Sch. II	Carnivorous	
	Family HYAENIDAE			
Hyaena hyaena (Linnaeus)	Striped Hyena	Sch. III	Scavenger	Near villages

Name of species	Common Name	Status	Food Habit	Distribution
		Family FELIDAE		
Felis bengalensis Kerr	Leopard	Sch. I	Carnivorous	Tarinibila, Patabil, Kabatghai
Felis viverrina Bennett	Fishing Cat	Sch. I	Carnivorous	Haldia, Joranda
Felis chaus Guldenstaedt	Jungle Cat	Sch. II	Carnivorous	Near villages
**Panthera tigris* (Linnaeus)	Tiger	Sch. I	Carnivorous	Chahala, Joranda
Panthera pardus (Linnaeus)	Leopard	Sch. I	Carnivorous	Bakua, Bhanjabasa, Kabatghai
Neofelis nebulosa	Clouded Leopard	Sch. I	Carnivorous	Chahala, Kabatghai, Talbandh
		Order PROBOSCIDEA		
		Family ELEPHANTIDAE		
**Elephas maximus* Linnaeus	Indian	Sch. I	Herbivorous	Chahala, Joranda
		Order ARTIODACTYLA		
		Family SUIDAE		
**Sus scrofa* Linnaeus	Wild Boar	Sch. III	Herbivorous	UBK, Joranda, Patabil, Kandadhenu
**Tragulus meminna* (Erxleben)	Mouse Deer	Sch. I	Herbivorous	Kabatghai, Karkachia
**Cervus unicolor* Kerr	Sambar	Sch. III	Herbivorous	UBK, Jaoranda, Jenabil
**Axis axis* (Erxleben)	Spotted Deer	Sch. III	Herbivorous	Bhanjabasa, Chahala, Devasthali, Bakua
Muntiacus muntjak (Zimmermann)	Barking Deer	Sch. III	Herbivorous	UBK, Bhanjabasa, Chahala, Devasthali

Name of species	Common Name	Status	Food Habit	Distribution
	Family BOVIDAE			
**Bos gaurus* (Smith)	Gaur	Sch. I	Herbivorous	Devasthali, Patabil, Meghasani
**Boselaphus tragocamelus*(Pallas)	Nilgai	Sch. III	Herbivorous	
Tetracerus quadricornis (Blainville)	Chousingha	Sch. I	Herbivorous	Nigirda, Devasthali, Bhanjabasa
	Order PHOLIDOTA			
	Family MANIDAE			
Manis crassicaudata Gray	Indian Pangolin	Sch. I		Chahala, Barheipani
	Order RODENTIA			
	Family SCIURIDAE			
Funambulus pennantii Wroughton	Five-striped Palm Squirrel	Sch. IV	Herbivorous	
F. palmarum (Linnaeus)	Three-striped Palm Squirrel		Herbivorous	Chahala, Nawana, Bakua, Joranda
**Ratufa indica* (Erxleben)	Indian Giant squirrel	Sch. II	Herbivorous	Chahala, Karkachia, Joranda
Petaurista petaurista (Elliot)	Giant Flying Squirrel	Sch. II	Herbivorous	UBK, Chahala
	Family MURIDAE			
Mus booduga (Gray)	Indian Field Mouse	Sch. V	Herbivorous	Barheipani
Mus musculus (Linnaeus)	House Mouse	Sch. V	Herbivorous	
Rattus rattus (Linnaeus)	Common House Rat	Sch. V	Herbivorous	
Cremnomys blanfordi (Thomas)	Blanford's Rat	—	Herbivorous	
Vandeleuria oleracea (Bennett)	Longtailed Tree Mouse	—	Herbivorous	

Name of species	Common Name	Status	Food Habit	Distribution
Bandicota bengalensis (Gray)	Lesser Bandicoot Rat			
	Family HYSTRICIDAE			
**Hystrix indica* Kerr	Indian Crested Porcupine	Sch. IV		Commonly occurring
	Order LAGOMORPHA			
	Family LEPORIDAE			
Lepus nigricollis ruficaudatus	Blacknaped Geoffroy	Sch. IV	Herbivorous	Commonly

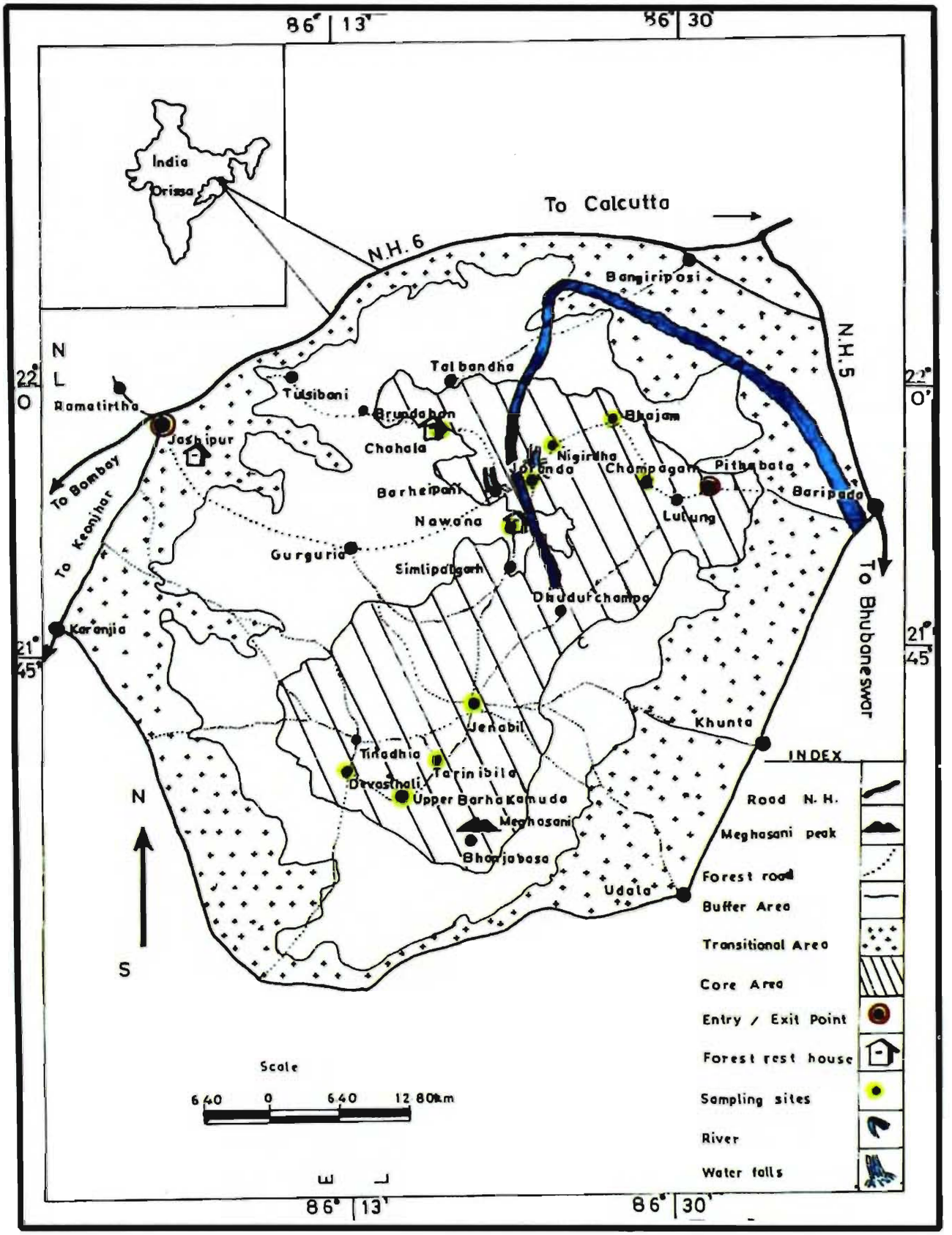

Fig. 1. Topographic Map of Similipal Biosphere Reserve, Mayurbhanj, Orissa, showhing among others, random sampling sites/points–12 (after Forest Dept., Govt. of Orissa)

Plate 1. Entry Point to Similipal Biosphere Reserve at the Eastern Side – Pithabata

Plate 2. Entry Point to Similipal Biosphere Reserve at Gurguria

Plate 3. Photograph showing Barehipani Waterfall (400m, amsl)

Plate 4. Photograph showing habitat diversity (free flowing erosive habitat – Khairi River) in the Buffer area

Plate 5. Photograph showing forest destroyed due to heavy frost

Plate 6. Photograph showing Dense Deciduous Forest in SBR

Plate 7. Photograph showing Grassland at Chahala in SBR

Plate 8. Elephant and its calf, an *indicator species* at Guguria

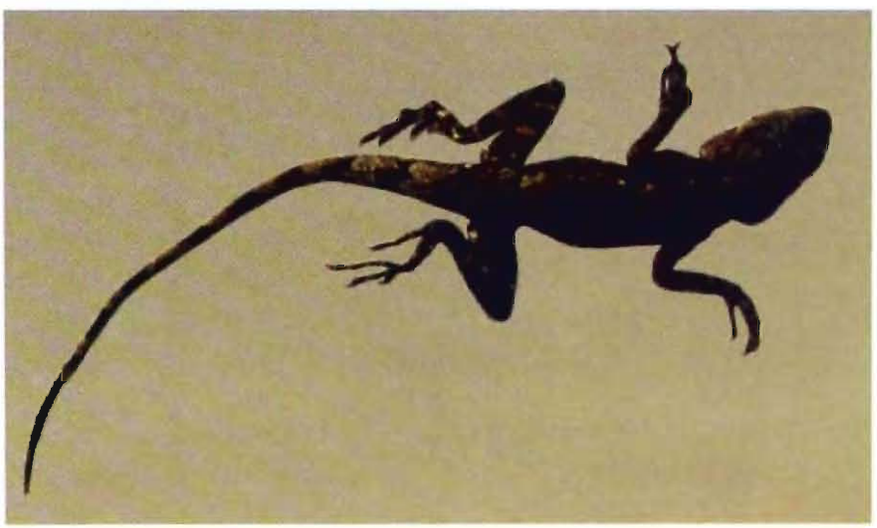

Plate 9. Photograph showing *Psammophilus blanfordanus* from the reserve

Plate 10. Photograph of Burrowing/Paddy field frogs from *amphibious habitat* in the reserve

Plate 11. Photograph of amphibians from Gurguria–*Bufo melanostictus* (1 ex) and *Rana cyanophlyctis* (2exx)

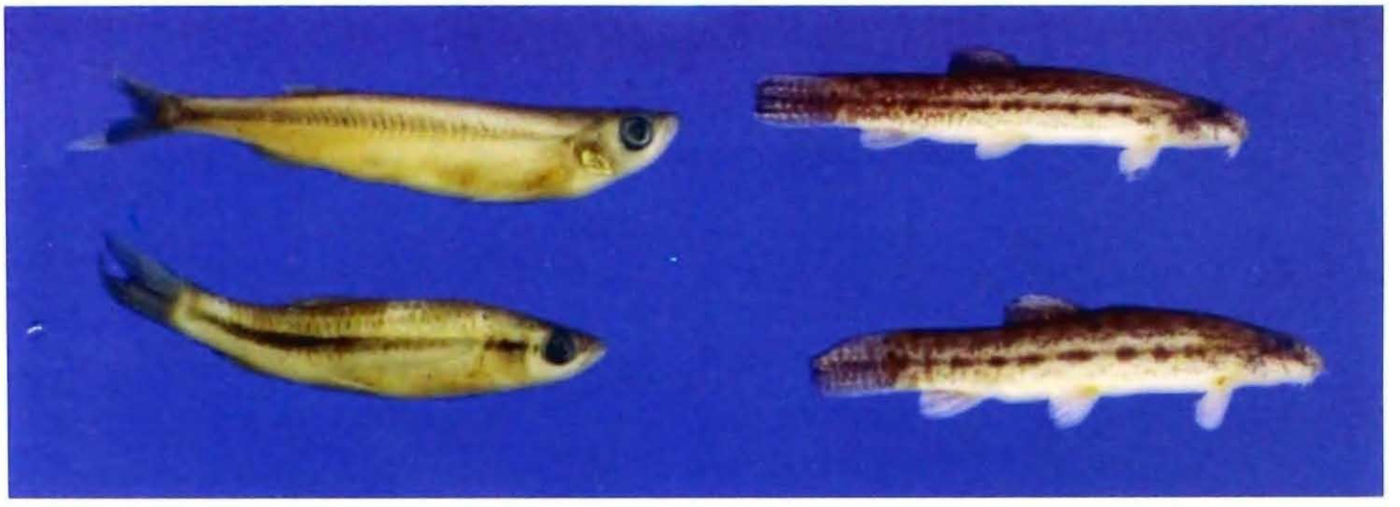

Plate 12. Profile of interesting records of fish fauna from the biosphere reserve–*Chela fasciata* (1 ex.), *Rasbora daniconius* (1 ex.) and *Lepidocephalus guntea* (2exx.)

Plate 13. Photograph showing profile of fish nekton fauna from Khairi River *Danio rerio* (1ex), *Nemacheilus sp.* (1ex).

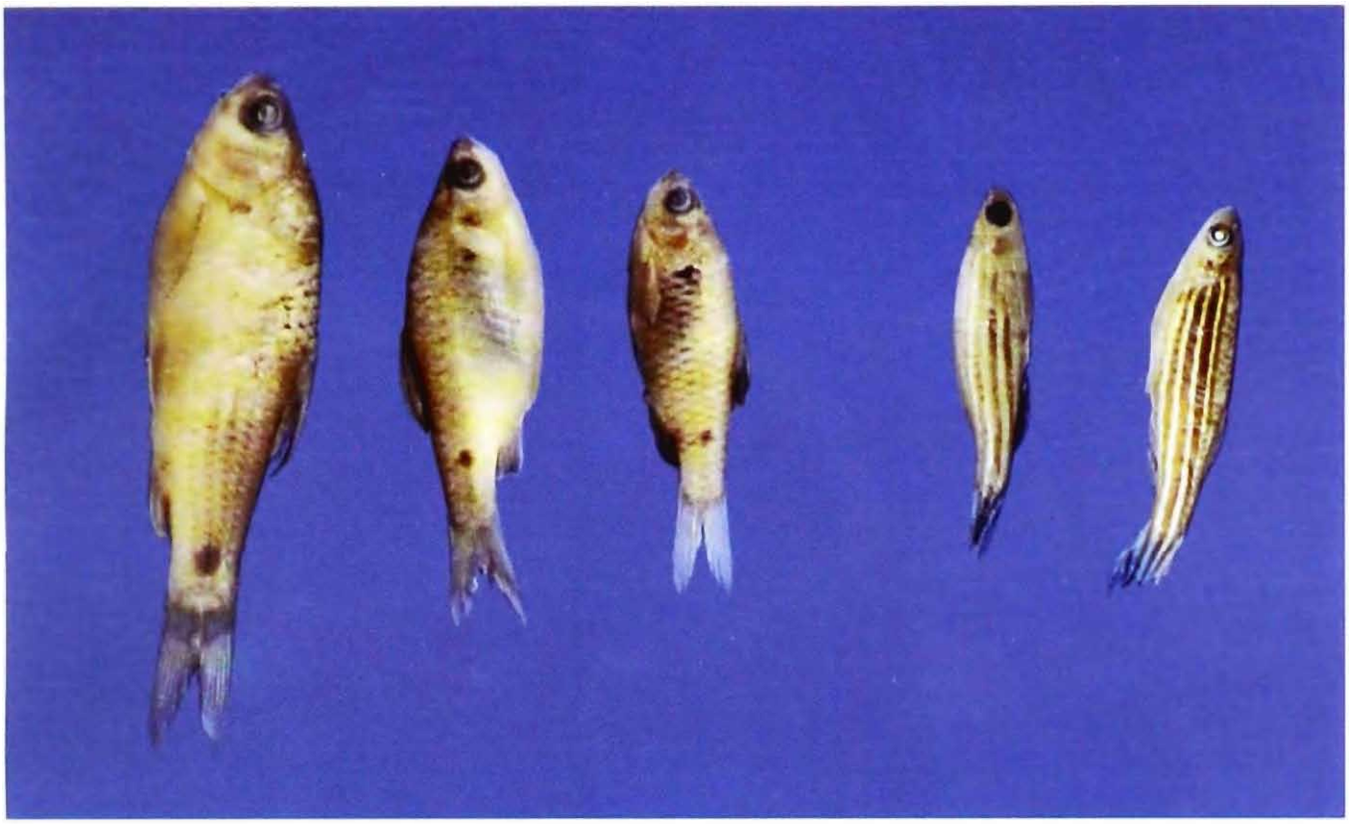

Plate 13A. Photograph showing profile of fish nekton fauna from Khairi River *Puntius punctatus* (1ex.), *P. ticto* (2exx.) and *Danio rerio* (2 exx.)

Plate 14. Human habitation in *Upper Barahakamda*, in core area of the biosphere reserve

Plate 15. Collection of forest products by the tribal people residing within the reserve forest.

Plate 16. Photograph showing forest destroyed due to forest fire