

A Review on the Studies on Vertebrate Diversity, Status, Threats and Conservation of Rukhi Hill Forest, Nayagarh, Odisha

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Abstract—A small study was conducted in different pockets of Rukhi Hill, Nayagarh from June 2018 to March 2019 regularly in 4-5 days in every week. The standard methodologies were followed in the assessment of vertebrate fauna. The key parameters for identification of vertebrate species are good photographs, visual observation and vocal sounds. After spontaneous field study we observed that 12 species of amphibians, 22 species of reptiles, 46 species of avifauna both migratory and residential and 22 species of mammals presently inhabit in the study area. All the finding animals were marked on WPA Status, CITES Status and IUCN Redlist category. Further their status, threats were studied and conservation measures were also proposed. The current scenario of study area, there is need of awareness and moderate use of natural resources for conservation and sustainable development.

Keywords: Biodiversity Conservation, Vertebrate Assessment, Conservation measures, IUCN, Sustainable development.

1. INTRODUCTION

Biodiversity refers to variety of Flora, Fauna and microorganisms in a particular area. Macro fauna in the forest is generally vertebrates. The dominant groups of animals on the earth are vertebrates. They are placed at the top in every matter likely abundance, large body sizes and food-chain (Das et al., 2016). The vertebrates like wild boar, porcupine, pangolin, sambar deer, barking deer, some birds, various herpetofaunas currently inhabit in this area. The major important fauna inhabit in protected areas; but many other fauna, who habit in different forests are neglecting. Although the number of such animals is huge, they shall be conserving through various strategies. Otherwise total ecology may disrupt. Assessment is the main parameter for conservation and useful for ecological balance and sustainable development (IUCN, 2010). Worldwide, populations of wild flora and fauna are being depleted due to anthropogenic disturbances

(Barnosky et al., 2011; Dirzo et al., 2014). The main causes for declination of biodiversity in the study area are deforestation, global climate change, forest fire, collection of fire wood, illegal expansion of urban areas etc. Chivian and Bernstein, (2010) predicts that by 2050, climate change alone is expected to threaten 25% or more of all species on land with extinction. Natural habitats and species are declining by between 0.5 and 1.5% per year; As a result of our activities, 32% amphibians, 12% birds and 25% mammals are threatened with extinction in the next century (UNEP FI, 2008).

2. MATERIALS AND METHODS

• Study Area

Nayagarh is bounded by districts of Angul and Cuttack in North West Kandhamal in West, Ganjam in South and Khordha in the East (Fig.1). Rukhi Hill Ranges (Fig.2) are placed in the southern side of Nayagarh town which is located in 20° 06' 56" – 20° 07' 40" N latitude and 85° 04' 52" – 85° 06' 15" E longitude.

The Rukhi Hill Forest comprises of various types of flora and fauna. The forest mostly seen in the hill are South Indian moist mixed deciduous forest, deciduous forest, mixed tropical green forest, Miscellaneous forest, tropical moist deciduous forest etc. The Rukhi Hill also contain hill rocks, as it is placed in the eastern Indian states, the primary forest is tropical moist deciduous forest. The main soils seen in this forest are (Forest & Hill soils) tropical brown forest soil, laterite soil and red loam etc. The climate of Nayagarh district is characterized by hot summer and high humidity all the year around and good seasonal rainfall. Three prominent seasons are observed in a year. These are hot and dry summers, hot and humid rainy season and moderate winter season. It is a

semi tropical region hill forest. The floral diversity of this hill mainly composed of rich in Sal forest (*Shorea robusta*), Sissoo (*Dalbergia sissoo*), Teak (*Tectona grandis*) and Eucalyptus (*Eucalyptus globulus*) etc.

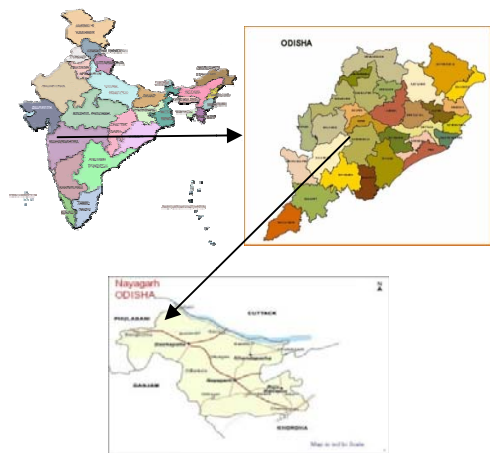


Figure 1- Location of Study Area

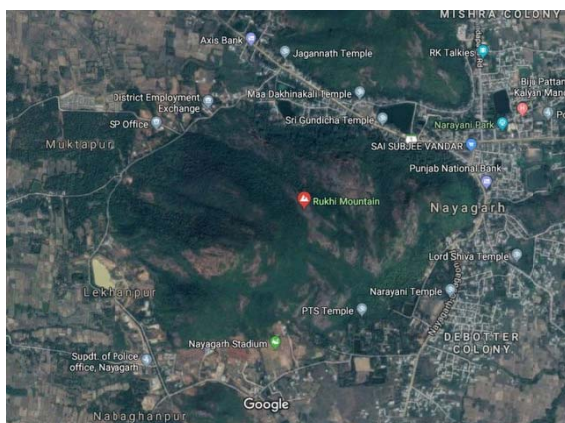


Figure 2- Study Area (Satellite View)

• **Methodology**

The study has been conducted from June 2018 to March 2019 regularly in 4-5 days in every week. During morning 03 hours (06:00- 09:00) and evening 2.5 hours (16:00- 18:30) were devoted for the field study. The standard methodologies were followed which are given in the “Handbook of Biodiversity Methods Survey, Evolution and Monitoring” (Hill et al., 2005), “Practical methods in Ecology” (Henderson, 2003). Besides these, the book of W.J. Sutherland (2004) also followed for better study. The key parameters for identification of vertebrate species are good photographs, visual observation and vocal sounds (Daniel 2002; Daniels 2002; Prater 2005; Manikadan et al., 2012).

3. RESULT AND DISCUSSION

After spontaneous field study we observed that 12 species of amphibians, 22 species of reptiles, 46 species of avifauna both migratory and residential and 22 species of mammals presently inhabit in the study area.

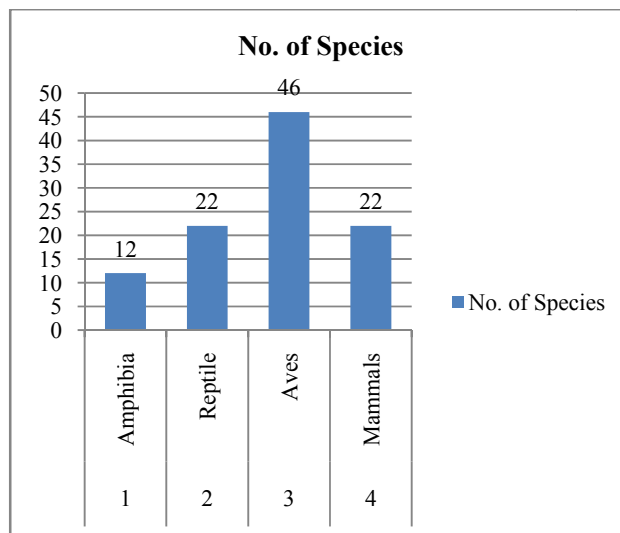


Chart 1- Bar Chart Showing Total Findings of Vertebrates in Study Area.

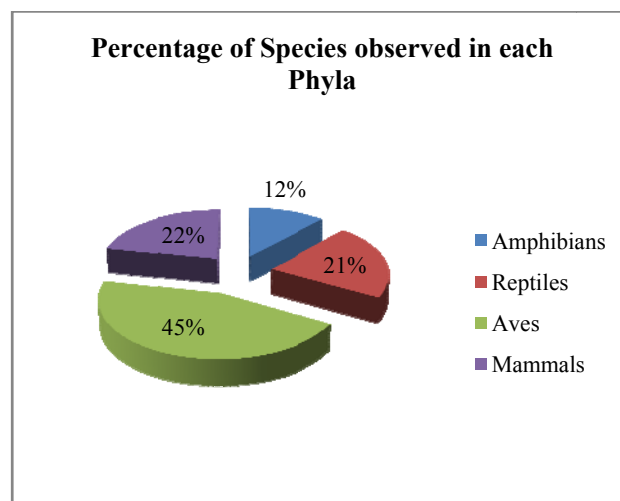


Chart 2- Pie Chart Showing Percentage of Species found from each Phyla.

Table 1. Checklist of all Vertebrate findings at Rukhi hill with IUCN Status

Sl. No.	Scientific Name	Common Name	IUCN Status
AMPHIBIANS			
1	<i>Haplobatrachus tigerinus</i>	Indian Bull Frog	LC

2	<i>Euphlyctis hexadactylus</i>	Indian Pond Frog	EN
3	<i>Haplobatrachus crassus</i>	Jerdon's Bull Frog	LC
4	<i>Euphlyctis cyanophlyctis</i>	Indian Skipper Frog	LC
5	<i>Sphaerotheca breviceps</i>	Indian Burrowing frog	LC
6	<i>Fejervarya limnocharis</i>	Asian grass Frog	LC
7	<i>Polypedates maculatus</i>	Indian Tree Frog	LC
8	<i>Duttaphrynus melanostictus</i>	Common Toad	LC
9	<i>Bufo stomaticus</i>	Indian Marbled Toad	LC
10	<i>Microhyla ornate</i>	Ornate narrow mouthed Toad	LC
11	<i>Ramanella variegata</i>	Termite Nest frog	LC
12	<i>Kaloula taprobanica</i>	Painted Frog	LC
REPTILES			
1	<i>Chamaeleo zeylanicus</i>	Indian Chamelion	LC
2	<i>Eutropis multifasciata</i>	Golden Skink	LC
3	<i>Eutropis macularia</i>	Bronze Grass Skink	LC
4	<i>Lygosoma punctata</i>	Common Dotted Garden Skink	LC
5	<i>Calotes versicolor</i>	Garden Lizard	LC
6	<i>Monilesaurus rouxii</i>	Roux's Forest Lizard	LC
7	<i>Hemidactylus leschenaultia</i>	Leschenault's Gecko	LC
8	<i>Varanus bengalensis</i>	Common Indian Monitor	EN
9	<i>Ptyas mucosa</i>	Indian Rat Snake	LC
10	<i>Amphiesma stolatum</i>	Buff Striped Keelback	LC
11	<i>Xenochrophis piscator</i>	Checkered Keelback	LC
12	<i>Dendrelaphis tristis</i>	Bronze back tree Snake	LC
13	<i>Lycodon jara</i>	Twin spotted wolf Snake	LC
14	<i>Ahaetulla nasuta</i>	Green Vine Tree snake	LC
15	<i>Macropisthodon plumbicolor</i>	Green keelback	LC
16	<i>Bungarus fasciatus</i>	Banded Krait	LC
17	<i>Bungarus caeruleus</i>	Common Krait	LC
18	<i>Naja kauthia</i>	Monocellate Cobra	LC
19	<i>Naja naja</i>	Spectacled Cobra	LC
20	<i>Eryx johnii</i>	Indian Sand Boa	LC
21	<i>Python molurus</i>	Indian Rock Python	LC
22	<i>Daboia russelii</i>	Russell's Viper	LC
Aves			
1	<i>Corvus splendens</i>	Indian Crow	LC
2	<i>Corvus leuallantii</i>	Indian Jungle Crow	LC
3	<i>Gracula religiosa</i>	Hill Myna	LC
4	<i>Acridotheres fuscus fuscus</i>	Jungle Myna	LC
5	<i>Acridotheres tristis</i>	Common Myna	LC
6	<i>Gracupica contra</i>	Pied Starling (Pied Myna)	LC

7	<i>Leptocoma zeylonica</i>	Purple rumped sunbird	LC
8	<i>Passer domesticus</i>	House Sparrow	LC
9	<i>Amandava amandava</i>	Red Avadavat	LC
10	<i>Geokichla citrina</i>	Orange Headed Ground Thrush	LC
11	<i>Dicrurus macrocerus</i>	Black Drongo	LC
12	<i>Pycnonotus jocosus</i>	Red Whiskered Bulbul	LC
13	<i>Pycnonotus cafer</i>	Red vented Bulbul	LC
14	<i>Copsychus saularis</i>	Oriental Magpie Robin	LC
15	<i>Turdoides striata</i>	Jungle babbler	LC
16	<i>Oriolus kundoo</i>	Indian Golden Oriole	LC
17	<i>Ploceus philippinus</i>	Baya Weaver	LC
18	<i>Hirundo rustica</i>	Common Swallow	LC
19	<i>Hirundo smithii</i>	Wire tailed Swallow	LC
20	<i>Anthus trivialis</i>	Tree Pipit	LC
21	<i>Columba livia</i>	Rock Pigeon	LC
22	<i>Spilopelia chinensis</i>	Spotted Dove	LC
23	<i>Streptopelia decaocto</i>	Collared Dove	LC
24	<i>Ardeola grayii</i>	Indian Pond Heron	LC
25	<i>Bubulcus ibis</i>	Cattle Egret	LC
26	<i>Egretta garzetta</i>	Little Egret	LC
27	<i>Ardea intermedia</i>	Median Egret	LC
28	<i>Microcarbo niger</i>	Little Cormorant	LC
29	<i>Centropus bengalensis</i>	Lesser Coucal	LC
30	<i>Eudynamis scolopaceus</i>	Asian Koel	LC
31	<i>Centropus sinensis</i>	Greater Coucal	LC
32	<i>Coracias benghalensis indicus</i>	Indian Roller	LC
33	<i>Halcyon smyrnensis</i>	White throated Kingfisher	LC
34	<i>Merops orientalis</i>	Little Green Bee-eater	LC
35	<i>Merops philippinus</i>	Blue tailed Bee-eater	LC
36	<i>Anastomus oscitans</i>	Asian open billed Stork	LC
37	<i>Elanus caeruleus</i>	Black Winged Kite	LC
38	<i>Pavo cristatus</i>	Indian Peafowl	LC
39	<i>Gallus gallus</i>	Red Jungle fowl	LC
40	<i>Vanellus indicus</i>	Red Wattled Lapwing	LC
41	<i>Tringa ochropus</i>	Green Sandpiper	LC
42	<i>Ocyeros birostris</i>	Indian Grey hornbill	LC
43	<i>Psittacula krameri</i>	Rose ringed Parakeet	LC
44	<i>Psittacula eupatria</i>	Alexandrine Parakeet	NT
45	<i>Aerodramus unicolor</i>	Indian Swift	LC
46	<i>Dinopium javanense</i>	Flameback Woodpecker	LC
MAMMALS			
1	<i>Rusa unicolor</i>	Sambar Deer	VU
2	<i>Muntiacus muntjak</i>	Indian Muntjac	LC
3	<i>Sus scrofa</i>	Indian Wildboar	LC
4	<i>Funambulus palmarum</i>	Three striped palm Squirrel	LC
5	<i>Golunda ellioti</i>	Indian Bush rat	LC
6	<i>Rattus rattus</i>	Black rat	LC
7	<i>Hystrix indica</i>	Indian Porcupine	LC
8	<i>Semnopithecus entellus</i>	Hanuman Langur	EN

9	<i>Macaca mulatta</i>	Rhesus Macaque	LC
10	<i>Viverricula indica</i>	Small Indian Civet	LC
11	<i>Canis aureus</i>	Indian Jackal	LC
12	<i>Vulpes bengalensis</i>	Indian Fox	LC
13	<i>Canis lupus</i>	Indian Wolf	LC
14	<i>Herpestes edwardsi</i>	Indian Grey Mongoose	LC
15	<i>Felis chaus</i>	Jungle Cat	LC
16	<i>Hyaena hyaena</i>	Striped Hyena	NT
17	<i>Corynorhinus townsendii</i>	Micro Bat	LC
18	<i>Pteropus giganteus</i>	Indian Flying Fox	LC
19	<i>Lepus nigricollis</i>	Indian Hare	LC
20	<i>Manis crassicaudata</i>	Indian Pangolin	EN
21	<i>Suncus murinus</i>	Asian House Shrew	LC
22	<i>Prionailurus bengalensis</i>	Leopard Cat	LC

4. THREATS TO VERTEBRATES

Some anthropogenic activities were seen during study. These are as follows-

Habitat destruction: The harvesting and utilization of the natural resources by human beings is the leading cause of habitat destruction. The expansion of agricultural fields in the close vicinity of Rukhi Hillis causing much severe structural threats to biodiversity especially by creating disturbance to Vertebrate Fauna. The illegal expansion of urban area and agriculture development are the main cause of habitat destruction in Rukhi Hill Forest. Collection of firewood is the daily practice of local people.

Poaching: Unlawful hunting by local community creates interruption in feeding and breeding of various mammals such as Sambar Deer, Barking Deer, Indian Hare, Indian Porcupine and Indian Pangolin. These herbivore animals have been killed for food or commercial uses. Hunting causes a severe disturbance in the biodiversity and also affects the ecosystem.

Grazing: The main human induced factors include grazing of livestock, hunting, agriculture and encroachment of land near the study area. Livestock grazing has been an important issue for the conservation of biodiversity. Free roaming of livestock in the study area was a great threat for the survival of faunal species.

5. CONSERVATION STRATEGIES

Some conservation Strategies were proposed-

- Preservation of endangered species through strict protection against poaching of animals and deforestation.
- Providing adequate forest cover to different wild animals within their habitat is necessary for their shelter and protection from weather, predators and enemies.
- To safeguard the natural habitat of the forest with its immensely rich biodiversity, people in general and the

youth in particular is to be made aware of the status, problems and conservation concerning wildlife and its habitat.

- Strict enforcement of laws according to the Wildlife (protection) Act-1972 (W.P.A.) will provide the safety and well being of wild animals.

6. CONCLUSION

Vertebrates are one of the well-studied groups of animals found in Rukhi hill forest. Various anthropogenic activities are the main causes of declination of biodiversity in this hill. Illiterate and lack of awareness among people is also the main cause for declination. There is an urgent need to safeguard vertebrate diversity by protecting natural habitat of the Hill Forest. Otherwise each and every species may become history in the study area.

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